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INTERCOMMUNICATION—

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LEGAL INTELLIGENCE.

OBITUARY.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

LAST YEAR.

THAT one year very much resembles another is to a certain extent true, but it is no less true that each succeeding year has a character and an individuality of its own distinctly marked and well defined. The past year was memorable in many respects. It was a year of many great events at home and abroad, which have now passed into history. It comes more within our province to remember, however, that 1867 was the year of the Paris International Exhibition, and a year of many public improvements and beneficial changes in various directions. From the Exhibltion let us hope we derived some valuable lessons. That wonderful display of the world's handicraft taught us at least this—that we require to make up for deficiencies and shortcomings in some things. There are already indications that as a people we have taken this truth to heart, and are turning it to practical account. We allude to the subject of technical education, which has now become a national question, and an important work has been begun among us. Some other movements of a largely beneficial kind have been inaugurated. The investigations that have taken place with regard, for instance, to the working of trades' unions, the management of our workhouses and infirmaries, the sanitary condition of towns, and the causes that affect the public health, are all steps in the right direction, and have contributed to the common weal. We have yet to wait, however, for the complete result and full benefit that may reasonably be expected as the outcome of these and similar investigations. In the matter of public improvements of various kinds, considerable progress has been made. We have recorded from week to week the labours of the architect and the engineer, as well as those of the social science reformer and the art teacher during the past year. Nor is the record a slight one. As regards architecture, we may observe that the year was noteworthy for important, and, let us add, instructive competitions. The New Law Courts competition was, of course, the great architectural event of the year. The designs of the different competitors were fully and impartially criticized and illustrated in the BUILDING NEWS. Next in importance was the National Gallery competition, which also hangs fire. Regarding both, we shall no doubt have something more to say by-and-by. Then there was the several competitions for the Town Halls of Manchester and Grantham, for the London Orphan Asylum; the County Asylum, Derby; the Worcester Orphan Asylum; the new offices for the Board of Works, Poplar; Lutton Corn Exchange; Leicester Clock Tower, and Dorchester Church, and Ryde Church. A fortnight since, we gave the particulars of the Liverpool Labourers' Dwellings competition. The New Public Offices and Vestry Hall at Stratford was the result of a competition, the successful architects being Messrs. Giles and Angell, whose design we gave on December 20th. The Corporation of Great Yarmouth offered prizes for the best design for a terrace of first-class houses, and also for semi-detached villas. In the one case, the premium was won by Mr. J. T. Bottle; in the other, by Mr. Dodds, and both designs appeared in our pages. In the competition for the New Mechanics' Institute, Nottingham, the three premiums were awarded respectively to Mr. Simpson, Messrs. Clarke and Son, and Mr. Sutton. A number of local boards advertised designs for new workhouses and infirmaries, or alterations and additions to existing ones. Some of these have been completed, while others are in progress.

As regards public buildings outside of the metropolis, a first place must be given to Mr. Scott's Preston Town Hall, which last year saw completed. It is thirteenth century Gothic, and one of the best buildings of its kind recently erected. The cost was about £80,000. Rochdale Town Hall, also Gothic, is the design of Mr. W. H. Crossland, of Leeds, and, built at a cost of £30,000, was also completed last year. At a similar outlay, Bradford has erected an exchange in the Venetian Gothic, the architects being Messrs. Lockwood and Mawson. The west wing of the New Exchange, Liverpool, has been opened, and the contracts taken for the other two wings. At Penzance, public buildings, in Italian Renaissance, have been erected by Mr. J. Matthews at a cost of £15,000. Colston Hall, Bristol, by Mr. J. Foster, was recently opened, and report speaks highly of the work, which, however, is not yet finished. The entire cost is set down at something like £40,000. New town halls have also been erected at Walsall by Mr. G. B. Nicholls, of West Bromwich, and at Headcorn by Mr. A. Chambers; and Burnley Town Hall is in course of erection. Petersfield has had a corn exchange, designed by Mr. Chancellor; Llangollen, a court house and assembly rooms, by Messrs. Lloyd; and Shrewsbury, Bacup, Matlock, and Dawley, market halls. The Middlesborough Exchange now in progress is to cost £30,000, and a new cattle market is spoken of for Rochester. Other places are providing for their special wants according as they feel what these are. Thus, at Leeds, a mechanics' institute and school of art has been built—the architect selected was Mr. C. Broderick. The new grand hotel at Scarborough, which has cost nearly a quarter of a million pounds, is also from Mr. Broderick's designs. It is in the Italian style. Literary institutions of a similar kind have been opened at Windsor, Salisbury, and Frome. At Witley, a school (King Edward's) has been erected at a cost of £26,000; and a convalescent hospital at the same place, at a cost of £16,000, from the designs of Mr. S. Smirke, R.A. At Horton Kirby, a home for little boys was completed at a cost of £12,000—Mr. T. C. Clarke, architect. Mr. F. C. Cockerill has given us a grammar school at Highgate, and Messrs. Norton and Masey, an international college near Hounslow; £15,000 has been expended on the portion completed. A Wesleyan theological college was erected at Headingley, near Leeds, and an Independent college at Taunton.

Church building has been extensively engaged in during the year, though the churches, as a rule, are not very remarkable. The following are among the more noticeable:—St. Stephen's, Poplar, in the Second Pointed style, by Messrs. Francis, architects, will cost about £20,000; St. Peter's and St. Paul's, Cork, designed by Messrs. Pugin and Ashlin, at a cost of £24,000; St. Stephen's, Lewisham, in the Late First Pointed style, cost £10,000, Mr. Scott, architect. Mr. R. Plumbe's Congregational Church at Stratford deserves mention for its artistic design, which is Italian. It cost £12,000. Another Congregational church, in the Italian Gothic, was erected at Driffield, at a cost of £15,000, from the design of Mr. H. J. Paull; and a third at Halifax (First Pointed) by Messrs. Ive, at a cost of £9,000. The cathedral church of St. Andrew's, Scotland, by Mr. R. Anderson, of Edinburgh, a commodious and elegant structure, appears among our illustrations for the year. But it would be idle to attempt to enumerate even a tenth part of what has been done in this direction. Each religious body has been "lengthening its cords, and strengthening its stakes," and churches and chapels have sprung up on all sides. It may, however, be added here that a Dominican priory was built at Carisbrook, Isle of Wight, at the expense of the Countess of Clare, the cost being £12,000; and that Messrs. Hadfield and Son, of Sheffield, were the architects of the interesting convent of the Sisters of Notre Dame, erected a short time since at Mount Pleasant, Liverpool. Of this church we also gave an illustration. Considerable progress has also been made with the restoration of the various cathedrals under the direction of Mr. Scott, Mr. Street, and Mr. J. Prichard. The completion of the Chichester tower and spire, by Messrs. Slater and Carpenter, must be noticed among the works completed during 1867.

Most of the improvements within the metropolis were so recently noticed by us that further allusion to them is hardly necessary. In large buildings we have the Metropolitan Meat Market, and the Columbian Market, both of which are advancing rapidly, though as yet far from being completed. Mr. C. A. Long's Town Hall, at Shoreditch, is nearly finished; the Hop and Malt Exchange, which has cost £50,000, the design being Mr. W. H. Moore's, has been opened, and a number of other works are in progress, including the new London University, under the direction of Mr. Pennethorne, at Burlington House, the Record Office, and the New Palace at Westminster, superintended by E. M. Barry. We have had four or five new theatres. Mr. Phipps has converted old St. Martin's Hall, or rebuilt it, into a spacious and elegant playhouse, which has been named the Queen's; the New East London Theatre has been designed by Mr. Hudson; the Holborn Amphitheatre—neat, elegant, and comfortable—by Messrs. Smith and Son; and the New National Standard, which was opened last week. St. George's Hall, Langham-place, has likewise been converted into an opera house by Mr. J. Taylor, architect.

In street architecture we might point to the Belgrave mansions on the Westminster

estate as being at least conspicuous in appearance and bran new, if not designed in the best taste. Skill and labour are equally active in other directions. The Thames Embankment and the Holborn Valley Viaduct are being pushed forward with great energy. It is said that by the end of the present year the new roadway on Holborn will be so far advanced as to admit of traffic. A splendid improvement was effected by the removal of Middle-row, which may be said to be "conspicuous by its absence." It is another satisfaction to be able to record the completion of the main drainage of London. This is certainly a great work fraught with great benefits. Alexandra Park and Palace are well nigh finished, though Southwark and Finsbury Parks still show little inclination to get into shape. Several undertakings of considerable importance are projected, and among them an hospital in London especially devoted to the succour of the resident foreign population. Another hospital is to be erected in Southwark Bridge-road, by Baron Rothschild. A strong effort will also be made this session to get the tramway system introduced into the metropolis. It is proposed to lay down five or six distinct tramways in situations deemed most convenient for passenger traffic.

In the engineering world much likewise has been done. The national dockyards and fortifications at Chatham and Portsmouth are progressing. Some idea may be formed of the magnitude of these works from the fact that something like £8,000,000 will be expended upon them. The docks at Barrow-in-Furness, built for the accommodation of the iron trade lately established there, were opened with great ceremony in August. The Devonshire Dock has a water area of 30 acres, and a depth of 22 feet, with an entrance 60 feet wide. A second dock, to be named after the Duke of Buccleuch, will be 33 acres, and the area of the timber-pond 35½ acres. The wharves adjoining are 100 acres in extent, and the stone quays a mile and a-half in length. The total cost is estimated at £300,000, and the contractors are Messrs. Brassey and Field, the engineers Messrs. M'Lean and Stileman. The progress which South Wales has made during the last twenty years has been something marvellous, in a commercial point of view, and its shipments of coal, iron, and other produce have more than quintupled during that time. At Cardiff, the trustees of the Marquis of Bute have commenced a new dock and low-water pier, which, when completed, will open up a short water communication with the West of England, and steamers will be able to run at all states of the tide from the Welsh to the West of England side. At Llanelly, arrangements are in progress to construct a new dock, and the contract has been already let to Griffiths and Thomas, of Newport. The necessary Parliamentary notices have also been given by the Alexandra Dock Company, Newport, to proceed with their undertaking in sections, and it is expected that early in the spring the first sod will be cut. The first engine and train passed over the Mont Cenis Railway in August. The train was worked on the centre rail system, the summit elevation being 6,700ft. above the sea-level. The railway over the Brenner Pass of the Alps has also been opened. It is understood that Preston is to have additional dock accommodation, at a considerable outlay of money. A promenade pier has been opened at Rhyl, at a cost of £17,000; and another at Weston-super-Mare costing £20,000. This pier stretches from Anchor Head to Birnbeck Island, and is 1,100ft. long and 20ft. wide. The abutments and three of the five piers of the Blackfriars-bridge are completed. The Runcorn bridge over the Mersey (London and North-Western Company) is nearly completed. It is a work of three spans of 300ft. each. Of the Millwall Docks the first section is finished. It comprises a water area of more than 33 acres, with about 2,000 yards of wharf frontage, and a graving dock 413ft. long and 86ft. wide, with an entrance of 65ft. wide. Doubtless we have failed to mention many other undertakings that deserve mention in a record of the year. What we have enumerated, however, will convey some notion of the architectural and engineering labours of 1867. In looking back on them, we may not unreasonably say that should the year on which we have just entered prove as fruitful as its predecessor, it will leave no cause for regret.

HONOUR TO WHOM HONOUR IS DUE.

EVERYBODY we suppose will acknowledge the propriety and rightfulness of the above adage; but unfortunately everybody will not act up to its teaching. Almost everyone can teach by precept, but alas! far too few teach by example. It will be seen that a correspondent in another column to-day calls attention to a subject of some importance to the art life of the nation. The case mentioned by him is not an isolated one. It is, in fact, notorious that the men who design the most reputable works produced in our principal workshops are unknown even to the purchasers of the works themselves. Some men appear to be content to remain in such matters in obscurity; others are more ambitious, and would like to have their names linked with their productions. We are conscious in mooting this question that we tread on delicate, and, in some respects, difficult ground. The present is to all intents and purposes a money-making age. Men sell the workmanship of their hands and the best thoughts of their brain. The highest artistic capabilities are marketable commodities. The capitalist is the master of the age. He wants a design in carpets, in paper hangings, in furniture, or in churches, and there are many ready to supply the want. Who can blame the man of money for buying, or the designer for selling? It is a matter of mutual arrangement between buyer and seller. There is no legislative enactment to compel a man to sell his ideas, or the fruits of his genius. He may attach what conditions to the sale he may think proper. One of the conditions may be that his name may be associated with the thing done, so that he may participate in the credit of doing it. On the other hand, the man of money may sturdily object to this; and as men of brains cannot live as long without food as capital can live without brains, the capitalist being master of the situation, makes his own terms. Much, however, will depend on the custom which prevails in any particular kind of workmanship, and the nature of the work done. A great singer cannot sell the use of his voice without enjoying any popularity which may pertain to its exercise. A great writer or a great artist may, however, sell the use of his pen or his pencil, and remain altogether unknown. In most instances, however, the great writer or artist does make his name known, and his popularity becomes a thing of great value. In fact, almost all writers, whether great or small, attach their names to their works. In the absence of the real name, in some instances a *nom de plume* is substituted; and sometimes, when an author has written more than one book, the second or third book is stated on the title page to be the author of so and so. In this way, some authors, though unknown to fame, enjoy a wide popularity and the marketable value that popularity produces. The same thing applies to the painter, the sculptor, and the musical composer. Why, then, it may be asked, should not a man who designs a buffet or a vase enjoy a similar advantage? He may produce an art gem, but having sold his design to the manufacturer, he is lost sight of. He complains, therefore, and with some justice, that he has not altogether had his deserts. He cannot make a name, and trade on it, as the poet, the dramatist, or the lecturer can. Having gained no vantage ground beyond experience by his preceding efforts, he has got to begin, as it were, anew with every fresh work, and he feels himself placed at a disadvantage. We are not, therefore, surprised at his occasionally grumbling at his lot. Compared with other craftsmen, it cannot be denied that there is just ground for his complaint. Compare him, for instance, to the class of inventors in this country. Inventors labour with their brains and their fingers like designers and artists, and in some instances they sell their inventions to manufacturers. But it will be found that almost invariably the name of the inventor is associated with the invention for many years, and sometimes for ages afterwards. Nothing is more familiar in the manufacturing world than seeing A, the manufacturer, advertising B's invention for making buttons, or pistons, or ploughs, and it is known in the trade as B's piston or plough. B by this means has obtained an advantage. His next patented invention is worth more in the market, by virtue of his name being known. The question then arises why should not the same principle prevail in art productions as well as in scientific productions?

We now come to the most important part of the subject. It is notorious, at all events within the limits of the profession, that architects are not always the designers of the works which go by their names. It frequently happens that an architect has scarcely anything to do with the designing of a church or a font, or the elevation for a warehouse, than merely giving instructions to Green, Brown, or Robinson, to produce such and such a design. How often is it stated that Mr. A. prepared the designs for a competition which Mr. B., the architect, has sent in; or that Mr. C. supplied the drawings for a mansion built under the architectural superintendence of Mr. D. Statements like this are so commonly made, and the members of the profession are so familiar with them, that they are merely repeated as ordinary gossip. It is well to note that architects, more than any other class, have recently, in obedience to the teachings of Mr. Ruskin in particular, set their faces against shams. In fact, the word "sham" is more frequently heard at a meeting of the Institute or Association than at any other meeting of Englishmen. Enough has been said against shams and falsehoods in architectural circles to make the living race of architects not only the purest minded but the most ardent believers in and actors of truth and reality. If the practices of architects amongst *themselves* had been in harmony with this commendable anti-sham teaching, then might architects be regarded as the salt of the earth.

But what a falling off is there, Horatio.

Instead of embodying their teachings in their practices, we maintain, fearless of successful contradiction, that many of them trample their own precepts in the dust. This is a bold assertion, but no more bold than true. The architect frequently sails under false colours. He frequently wears honours which rightfully belong to others. He has credit for designs which he never made, and is supposed to be the embodier of ideas which he never conceived. This is not true of very many of our best architects, who are really a glory to the profession. We could name many who prepare all their drawings, and others who, if they do not make all their drawings, sketch all their designs—men who would scorn to let their names appear to works which were not the products of their thoughtful industry. He who acts otherwise should for ever close his lips as far as shams are concerned. He who fixes his name to designs which are not his own, who wears credit which he never won, is a sham to all intents and purposes. Let no one think we are speaking too severely, or that we are complaining without a cause. We could point to instances in which certain architects have professed to supply drawings, and who have superintended the erection of works which they never planned. Some one may say, this may be the

case, but is it wise to moot such a question and so throw something like a shadow of discredit on an honourable profession. It is because the profession is so honourable that we mention these things, in order that its honour may be maintained. We cannot diminish a sore by hiding it. It is said that a knowledge of the disease is half its cure. The best way to conquer a disagreeable fact is not to run away from it but to look it square in the face with a strong will, and it will immediately begin to melt away.

In the elucidation of this point let us compare architecture to painting, sculpture, oratory, or literature. Architects will, no doubt, say that architecture is inferior to neither of these. To become an orator, a man must himself perform every particle of the work which makes his reputation. He must collect his materials with immense care and thought, and stamp his own image on every sentence he utters. All history and literature are open to him; he is at liberty to use all figures of speech, and he may appeal to the passions, the imagination, and the judgment of his hearers; he may use gesture, and quote from the classics, but what he says must be *his*. It must pass through the alembic of his own mind. Ought it not to be the same with the architect? How often, though, does the architect borrow a bit from one building, a bit from another, and a portion from a third, and just tack them together, and then call the design his own. What, for instance, if the literary man did this, or something like it? What if a novelist borrowed his plot from one source, two or three of his characters from an Italian play, and two or three other characters from a French story, and just threaded them together with some commonplace observations of his own? Why, the trick would be detected, exposed, and denounced. What is sauce for the goose is sauce for the gander. Why should the architect enjoy an immunity not allowed to the orator or the novelist? If it would be dishonest for the painter who enjoys a reputation to employ men to paint his pictures, or the major portions of them, and then exhibit them as his own, why should it not be considered dishonest for an architect to do a similar thing? The great painter must do the whole of the work himself, or forfeit his reputation. If he find other men to cover his canvas, even supposing he suggested the subject and sketched the outline, and then parade the picture as his own, he would assuredly be condemned. If such a thing were tolerated, any man with a few thousand guineas to speculate with would be able to buy an artistic reputation. But it would not be tolerated for a moment. Why cannot a similar standard be erected in the architectural profession? If architecture is destined to assume its rightful position in the world it must be a vital, living thing, and architects must not only declaim against shams in materials and design, but set their face against shams in their practice. We have recently seen an instance of a joint literary production in "No Thoroughfare," by Charles Dickens and Wilkie Collins. The joint workmanship was announced, and no one thinks less of either of these gentlemen for performing merely a part of the work. But had either employed the pen of an unknown literary man, and published a tale, or even a part of it, in his own name, which he had never written, he would, if it became known, be pelted with invective. How different in the domain of architecture! There frequently one man does the work, and another man gets the credit and pockets the profits. Let us hope and wish for better things.

VISIT TO THE TWICKENHAM ECONOMIC MUSEUM.

SECOND ARTICLE.

IN our article last week we described the drawings, models, building materials, and furniture, as exhibited in the Twickenham Enconium. We will now notice the remainder of its contents.

Our guide next introduces us to another long aisle, occupied on both sides by Class IV.—Clothing, &c. Here are the materials of our textile fabrics in their native state, flax, hemp, and a variety of fibrous grasses, cotton, wool, hair, silk, &c. These are all shown in various stages of preparation for the loom. In the department of dyeing we have a case showing the various kinds of bleachers, for the different tissues have to be cleaned and whitened as their first step on the way to our backs, mordants which dispose the tissue to receive the dye, and, lastly, the dyeing materials themselves of all the colours of the rainbow. One very interesting series is a complete set of dyes obtained from the rather unpromising substance of coal tar. By way of practical application of this we have specimens of what the linendraper calls fast colours, and of those that "run" when washed. Our better half once bought a blue woollen dress, which the shopkeeper assured her was dyed with fast colours, but which, in the first wash, became of a dirty disagreeable whitey brown; standing here, we could not help wishing that everyone's better half possessed the knowledge which a comparison of the examples exhibited would undoubtedly afford. Further on are seen processes of tanning, all illustrated with specimens of various kinds of leather and furs. Examples of the elastic gums, india-rubber and gutta-percha, and their substitutes, conclude the series of raw materials. That of textile fabrics begins with the coarsest of all, viz., common matting, both British and foreign; next come specimens of carpets sufficient to illustrate the chief differences in value and durability. Then follows a variety of small matters, to specify the half of which would be to write a catalogue, but all necessary to the proper clothing of our bodies, and which, as we have to expend our means upon, it is only fit that we should know something about. It is intended, as far as possible, to show the processes of manufacture, and, as a beginning, we already see the progress of a pearl button from the oyster shell to the card on which it is sold; respecting all, means are given enabling us to tell the good from the bad. On the opposite side is an interesting and instructive exhibition of the costumes of various nations, illustrated by means of the actual articles, where possible, and a very complete set of pictorial representations showing their adaptability to climate and to occupations. There is also a series, specially prepared by a firm of great experience in the matter of clothing, required by emigrants to our colonies; and another set showing the most approved and healthy dress for infants, a point on which great ignorance prevails, causing sickness and death to the frail innocents.

Turning up the next aisle, we pass into Class V.—Food. We have visited the food department at South Kensington, and venturing upon an allusion to that place, we are informed that this portion of Mr. Twining's collection, which was exhibited in embryo at South Kensington, in 1857, the gave rise to Dr. Playfair's food museum. That is, of course, developed upon a scale of national magnitude, while this, like every other portion of the Twickenham Museum, is intended for an example upon a medium scale of what may elsewhere be enlarged or diminished according to circumstances. We begin with some instruction in the chemical constituents of food, and a table, calculated to teach us to distinguish its varying qualities on genuine scientific principles, while the different methods of preservation are duly illustrated. The animal kingdom is represented by drawings of the food-producing animals of various countries—beasts, birds with their eggs, and fishes—with information as to their degrees of value, and, where possible, specimens of their products. In the vegetable kingdom we see how omnivorous man makes most kinds of corn plants, leguminous seeds or pulse, roots, bulbs, and fruits, contribute to his sustenance. Among the sweetmeats, we learn how injudicious folks promote the injury of their children's health by allowing them to indulge in the cheap trash, often mixed with gaudy but poisonous colouring, of which they are so fond. In the region of spices we are taught the right use of condiments, and reminded of the danger of using food too highly seasoned, like the Emperor Charles V., who habituated himself to dishes seasoned beyond ordinary human endurance, till his taste became so blunted that he complained of his cook for making nothing but wooden dishes, upon which the cook retorted, and truly, that his master had a wooden palate. The plants and their products, of which are made coffee, tea, and other refreshing beverages, are shown, and, likewise, the fermented and distilled liquors and the tobacco plant, neither of which, however much they are to be avoided, can be possibly ignored. Our bane and antidote are both before us. In every section of this food department are some deleterious articles, the existence of which is well known to our grocer and our baker, who, by mixing them in good company, manage to pass them undetected into our very bodies. We allude to adulterations. Here they all are, side by side with the genuine articles, but in solitary confinement, each delinquent shut up by himself in a bottle, with his name of disgrace exhibited for the identification of the world. We take a good look at them: we hope we should know them again; at all events, we know of their existence, and shall be on the watch for them. Respecting the next department—that of household stores for fuel, lighting, and cleaning—we have only time to notice that the collections of oils and fats used for lighting, which are superseding the tallow and wax candle of our fathers, the palm, the cocoa nut, the paraffin, and many others, is very complete.

Class VI., the Sanitary Department, contains so much that is useful, that to describe it properly within our limits is quite impossible. We have illustrations pointing out much that would improve the physical training of our infants. The diffusion of information of this kind would be of incalculable benefit. It is a sad fact that one-fourth of all the infants born die before they reach the age of five years. How many of these untimely deaths are attributable to ignorance? There are also exhibited means for alleviating defective sight and hearing, of occupying the blind, samples of dentistry, and a very complete cabinet of drugs, arranged according to Dr. Royle's Materia Medica, which serves as a text book for their study. Some selected examples of adulterations of drugs, and a set of pictorial illustrations of plants from which drugs are derived, help to enliven an otherwise dry subject. A number of poisonous articles, which might be ignorantly mistaken for the genuine drugs, are shown. The distinction is pointed out between poisonous and edible mushrooms, and the visitor is placed on his guard against a number of poisonous fish. We notice appliances for saving life, life-belts, rafts, and fire-escapes. And here are two chemical substances, tungstate of soda and sulphate of ammonia, either of which, when mixed with the starch, would render muslin, or other light fabrics, comparatively uninflammable, and, if generally adopted, would have saved many a life from destruction by fire.

Passing over many most instructive items, we go on to Class VII.—Home Education, Self Instruction, &c. The education school life is by no means all that is required. That which we give to ourselves or get at home is far more useful and important. This truth is not sufficiently recognized, and many who do acknowledge it are not aware of the facilities available. As far as possible, they are shown here, those for public or school education not being included. They are arranged in three stages, the first showing the parent how much

may be done at home in teaching the infant, next how the boy may supplement his school information in his home leisure, and how, after his school-days are past, he may carry on and perfect the knowledge he has gained, choosing either the ever widening fields of science, or cultivating and developing a taste for the arts of design, drawing, painting, or music.

Class VIII.—Miscellaneous. This is a kind of classified *omnium gatherum* of articles which could not well be put elsewhere, and which yet ought to be shown. We see a collection of every-day scientific instruments, once exclusively used by the rich, now finding their way to every house. Watches and clocks, enabling us to measure our time, and which no one need be without. Thermometers and barometers, instruments which ought to be, and are being popularized, enabling the labouring man to gauge and forecast the weather, not by his often deceitful bodily sensations, but by the most certain indications at present within scientific reach. Weights and scales, with means for comparing the differing measures of various countries. We have illustrations of the various kinds of paper and other stationery, with some of the processes of manufacture. We see various sets of tools for emigrants and articles for use in their new country, and hear with great srtisfaction that this highly useful part is likely very soon to receive special development. We know of few things more likely to be useful in our great centres of emigration than a place which the intending emigrant might visit, where, apart from the influence of interested dealers, he might fully and freely inspect, compare, and judge for himself of the value of various articles required on his voyage or in the country of his adoption. The last thing we notice is a set of "make shifts" and means for lightening labour, the former being contrivances that may be used when better means are not at hand. We remember a passage in the "Missionary Journal" of John Williams, in which he regrets that before his journey to the South Seas, while he was shown all kinds of elaborate instruments, and supplied with treatises describing all manner of scientific processes, no one had thought of the necessity he might be under of wanting to know how to do common things with rude materials, and though in a rude yet in a useful manner. His account of several unsuccessful experiments in the art of making a common pair of bellows is a warning to those who might be inclined to depreciate instruction in "make shifts and means for lightening labour." We think, on the whole, that some such title as this last would not inappropriately describe the whole of the Museum. Were the knowledge attainable here generally diffused, its tendency would infallibly be to soften the care and lighten the labour of us all.

There is still, however, another department to visit, and that is Class IX.—The Library, to which we adjourn. This contains books and documents relating to the various subjects treated of in the Museum, in the order in which they come to social, educational, and charitable economy. We are presented with a printed catalogue, giving us not only a classified list of the most important portion of the books, but also brief indications and criticisms of the nature of their contents, forming a valuable guide to domestic and sanitary literature. Here we seat ourselves, and in a short conversation learn many particulars respecting the history and objects of the place. Experience as a member of the Committee of the Labourers' Friend Society had taught the benevolent projector that much of the privation and suffering of the poor was traceable to ignorance of how to utilize the resources actually at their disposal—an ignorance which many of their would-be instructors shared with the poor themselves. This naturally raised in his mind the idea of endeavouring to remove this ignorance by getting together and explaining the objects upon which instruction was needed. The simple suggestion of a museum would not, however, have been enough. A practical example was wanted. One characteristic of ignorance is that it mistakes itself for knowledge, and this applies especially to our ignorance of common things. We all think at the first blush that we need no instruction about them. We ourselves must confess that we thought we knew much more than we actually did before we walked up and down the aisles of this place, and it is with something like a humiliating sense of our want of knowledge, induced by the visit, with which we sit before our friend in this library. In 1852, the official sanction of the Society of Arts was given to the general scheme of Economic Exhibitions, but it was at the great Paris Exhibition of 1855 that the idea was for the first time realized, a department of Domestic Economy being annexed after the other portions had been opened. A temporary exhibition of the same nature was held at Brussels, under M. Ducpetiaux, in 1856; and two have been held at Vienna, at the instance of Dr. Carl Helm. Domestic economy also formed a part of the national exhibition at Florence, and the requirements of the working classes have not been overlooked in the great Exhibition at Paris in 1867. The first classified display of articles, forming the nucleus of what has since become the Twickenham Museum, was made at the house of the Society of Arts in 1856. Thence it was removed to the South Kensington Museum, where, as we have said, it gave rise to the Food Department. In 1858, it was transferred for a time to the Polytechnic Institution in Regent-street; and in 1860, finding that it needed an amount of care and supervision which his health did not allow him to bestow upon it away from home, Mr. Twining erected the present building near his own house, and removed the Museum there. He, however, hopes some day when, duly completed and arranged, to see it placed in some public position in the metropolis, where it may be better known and receive many more visitors. We cannot held noticing with regret the fewness of names in the visitor's book, accounted for solely by the present unavoidable necessity of the location being at Twickenham. However, there are some of all sorts—foreigners, clergy, medical, and literary men, missionaries to our poor, and the working men themselves. We are happy to hear that the institution has already gained very high appreciation abroad and at home. The Emperor of the French has conferred upon its projector the Cross of the Legion of Honour; the King of Italy recently sent to him the Order of St. Maurice and St. Lazarus; and medals have been conferred upon him by the authorities at Brussels and Vienna. It is not the practice of our Government to confer such distinctions, but the institution is really deserving of every encouragement. It is meant by its proprietor to be the parent of many others in all parts of the country. This part of its mission it has already began to be accomplished, a sanitary museum being at the present moment in course of formation at Brighton, aided by advice and assistance from Twickenham; and we hope we may live to see the time when the name of an economic museum shall be like its contents, "familiar in men's mouths as household words."

THE LABOURERS' DWELLINGS QUESTION.

THIS question, simple as it may appear to some minds, is fraught in almost every direction with difficulties. We therefore hail any suggestion, from whatever quarter it may come, which may tend to smooth away those difficulties, preparatory to the promotion of the work so much desired. We have recently commented at length on the efforts made by the corporation of Liverpool to provide better house accommodation for the labourers of that great town. We have just received an able pamphlet on the question, written by Mr. John J. Stevenson, architect. The author appears to understand the matter in hand. The principal object of the pamphlet is to show that municipal regulations in general actually prevent instead of providing for the erection of labourers' dwellings in large towns. We will let Mr. Stevenson speak for himself. Alluding to the Liverpool Corporation competition, he says:—"The main facts of the case are these:—A year or two ago the Liverpool Corporation secured a piece of land between Sylvester-street and Ashfield-street, intending to devote it, with some other pieces, to the erection of labourers' dwellings, which should serve as a model of what such houses should be, and, from the success expected of them, might induce others to better the dwellings of the poor, at the same time that they made a good investment. The bill lately passed, which enabled the Government to lend money at a lower rate of interest on the security of such houses, seemed to render the scheme easy and practical. The Health Committee was instructed to carry it out, and the borough engineer, Mr. Newlands, received orders to prepare plans. These were estimated, and the buildings might have been commenced, when an objection was started that they contravened the municipal building regulations. These plans are exhibited along with those sent in competition, and, for good and sensible planning, for attention to sanitary matters, and general suitableness for their purpose, compare favourably with any in the room. But, for the corporation to contravene its own laws, even on the promptings of strong common sense, would be an act of impropriety; and it was resolved, in a meeting of the whole council, that these plans should be superseded. But something must be done—the corporation must not admit that their own laws rendered such a scheme impossible; and a competition was decided on. With the liberality characteristic of Liverpool, a premium of £200 was offered for the best design, and it must be admitted that, in the plans sent in, they have got their money's worth. They are between fifty and sixty in number, from all parts of the kingdom, and probably contain among them the result of all our practical experience in building houses of the kind—for the plans are not, as is often the case in competitions, merely the crude conceptions of young men, but many of them by well-known architects of large experience. If of these the plan which best conforms to the by-laws can be shown palpably deficient and faulty, it must surely raise a question as to the wisdom of the by-laws. It may at least be instructive to point out what arrangements of the houses on the ground the by-laws allow, and whether these are not worse than some they condemn.

"The ground is a rectangle of about 250 feet by 120, bounded on the long sides by Sylvester and Ashfield-streets, and at the ends by blocks of houses. It was dear ground for its purpose: costing 18s. a square yard, and it was consequently necessary to arrange a large number of houses on it to get an adequate return. The problem to be solved consequently was, how to get the greatest number of houses on the ground without infringing the by-laws, and it has been stated, on apparently reliable authority, that almost all have infringed them in some point. Along the two already-existing streets, the height of the houses was unrestricted, but if a house entered otherwise than from these streets, or from any new street, it was considered as entering from a court, and the height consequently became restricted to three storeys.

"There is in the competitive plans great variety in the mode of disposing the houses on the ground but—with some exceptions, which though clever and suitable enough on the whole, in some point or other contravene the regulations—they are reducible to two or three general types. The most simple, taking advantage of the height along the streets being unrestricted, is to range the houses in a long block, generally five storeys high, along each (see Fig. A). This leaves a large and airy court in

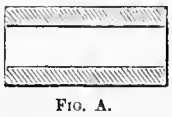


FIG. A.

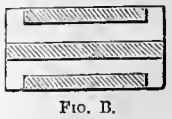


FIG. B.

the centre, and by building five storeys high a sufficient number of houses could be got to make the scheme remunerative. Some designs to this arrangement add a row of houses between the two outside rows, to which access is got by leaving blanks at the end of the rows on the street (Fig. B), or by a street across the centre, as in Fig. C. In this case the centre block, as it enters from a court, can be only three storeys high, so that the houses

to the street, being unrestricted in height, will completely shut out the sun from the central block.

FIG. C.

FIG. D.

To the arrangement C there is also the objection that, as there is nothing to prevent the block being closed up at these ends by buildings on the adjoining properties, these courts may become mere airless *culs de sac*. So that this plan does not secure either sun or a current of air from the houses. And yet this is the plan which the committee find best solves the problem—which gives most houses without contravening the by-laws!

"Compared with this arrangement how much better in every way is that of Mr. Newlands (Fig. D), rejected for non-conformity to the by-laws; securing sun and pleasantness for the houses, and thorough ventilation in every part; giving about as many dwellings on the ground, and disposing the blocks of houses, instead of in dreary rows, in a good architectural group. Its principle is large open spaces connected by narrow openings, but these openings, which are really the salvation of the plan as regards ventilation, condemned it according to the by-laws. Against these it sins, besides, in having houses of more than three storeys entering off courts, a provision which, as we have seen, does not secure light or ventilation or open space, but only that the houses can have cabs brought to their door; which, considering the rate of cab fares in Liverpool, seems an unnecessary attention to the comfort of labourers. No doubt, in old properties, courts are often neither airy nor healthy; but it is an error to suppose that streets for traffic, with their mud and manure, are better than courts, as in reality they can be more easily kept clean and wholesome, if properly planned and arranged.

"Some of the designs get over the difficulty of the narrow openings by closing them altogether, building the block all round (Fig. E), securing

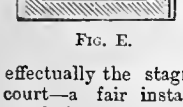


FIG. E.

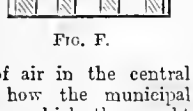


FIG. F.

effectually the stagnation of air in the central court—a fair instance of how the municipal regulations defeat the purpose which they ought to aim at. Some of those on this principle have the houses entering from galleries round the interior of the court, which condemns them to three storeys in height, and consequently prevents a sufficient number of houses on the ground. Why, in the nature of things, apart from municipal regulations, the door being at one side, instead of another, of the house, should affect the number of its storeys, it is hard to see.

"A very favourite arrangement among the competitors is to place rows of buildings across the ground (Fig. F),* but it is impossible by it to get a sufficient number of dwellings on the ground, as these cross streets, though they have ample air and sun, are considered as courts, and the houses in them can only be three storeys high. It is nevertheless the arrangement which most effectually secures ventilation, and is a far more wholesome mode of building than that now practised universally in the new buildings in cities here and on the Continent, of lighting the back-rooms of houses by what are called wells, often only a few feet in width—stagnant pools of air in the centre of the buildings. Any passage, however narrow, would at least secure ventilation; but as building acts everywhere forbid narrow openings, and as the most must be made of expensive land, the difficulty is got over by having none!

From these few instances it may be seen how the municipal building regulations have hampered the designs, and that, when they have been complied with, the result is exactly what it is desirable such regulations should condemn."

After showing the advantages of building houses for the labouring classes in the suburbs of towns, Mr. Stevenson says:—"It is, therefore, not less desirable to get good workmen's houses within the towns; but municipal regulations, not in Liverpool only, but in every town in the kingdom, throw obstacles almost insuperable in the way of this, while they do not prevent bad building, bad arrangements, and bad ventilation—in fact, render these essential to make the scheme pay, for it is only the 'jerry' builders who seem to be able to build at a profit. But it is, as has been already said, much easier to find fault with present regulations than to suggest better; and it would be presumptuous to do more than indicate the direction in which they should aim. At present they insist on a certain width of street in proportion to the height of the houses. This has given us a town like Manchester, with acres of streets in dreary sameness with stagnant air. Would it not be better to encourage variety in planning, narrower streets, opening out into wider spaces and squares, where the difference in temperature between the wider spaces exposed to the sun might draw the air from the narrower streets, causing drafts and movements of the atmosphere? It is clear that streets might be built closer and higher, if their ends opened out on parks and greens, without harming their ventilation, than if they were extended for square miles of regularly disposed street, and court, and house, though only two storeys high. This might be accomplished by fixing the proportion of space left open to ground built on, permitting builders to arrange their blocks as they liked, subject to conditions, of which the most important would be one which present building acts ignore, that there should be no stop gaps to the circulation of the air, no dwelling-rooms opening out into wells or small courts, in which there is no through current. Such an arrangement might be difficult to adjust to work fairly. It would have a tendency to raise the value of property near public open spaces, which, however, is not unreasonable; and it might necessitate power on the part of the corporation to decide how streets should be laid off on private property, so that where one man had commenced a street it should not be blocked up by his neighbour, as happens in some of our English towns. But we doubt not legal acumen could frame a regulation which would secure the desired result directly, instead of the present roundabout attempt at it, which provides streets of a certain width at every part, and yards of a certain size attached to every house, which does not always secure ventilation; and, though a good thing in some circumstances, is often unjustifiable waste. Again, it is obvious that in a short street, if it opens into wider streets, the house may be made high, and the width confined, without the injury to its ventilation which would ensue if it were longer. So that there would be more reason in municipal regulations if they made the height of the houses depeudent on the length of the streets, instead, as at present, only on the width. Had narrow openings, provided they were short, been permitted, several of the most skilfully-arranged among the plans exhibited, including, we believe, Mr. Newlands', would have been within the law, instead of being set aside for contravening it."

Mr. Stevenson gives other instances wherein municipal building regulations interfere with the development of the movement for providing improved house accommodation for the people. The pamphlet is published by Messrs. Webb, Hunt, and Ridings, but as there is no price affixed, we suppose it is printed for private circulation. Mr. Stevenson has, however, won the thanks of the public for his pointed and timely little publication.

* This is the plan which has obtained the competition premium

MANCHESTER SCHOOL OF ART.

THE annual meeting and distribution of prizes, in connection with the Manchester School of Art, took place on the 19th ult. The report stated that the total receipts for the year had been £1,019 2s. 9d., and the expenditure £989 4s. 7d. Mr. Muckley, the head master, read an elaborate report on the state of the school. Regret was expressed that the students were with great difficulty induced to undertake those studies which pertained to the decorative art. It was deemed advisable to withhold the award of the Primrose Silver Medal this year for decorative design, as the works now in preparation for that prize were not yet complete. At the Government examination held here in March last, 40 passed, and 7 gained third grade prizes; and at the national competition, one gold medal, two silver medals, three bronze medals, and a book prize were awarded. Five valuable original drawings by Mulready, had been presented to the school by Messrs. Agnew. The sum of £20 had been presented to the school by Mrs. Goadsby, for prizes to the students, to be awarded next year. She had also announced her intention of making a donation of £500 to the school, to be invested, and the interest to be devoted to such prizes as might hereafter be determined upon by the managers. The annual distribution of prizes awarded to pupils in the Leeds School of Art took place in the Mechanics' Institution in that town on Monday night, under the presidency of Mr. Baines, M.P. In addressing the audience, the chairman spoke upon the comparative deficiency of technical education, and advocated the establishment of schools for art and scientific instruction, with a view to their application to manufactures in the large centres of population, and the provision of a central college in the metropolis. The Report of the Reading School of Art, which was read at a meeting of the school the other day, stated that out of the 73 pupils attending, 37 were successful, 10 taking prizes, the remainder cards of merit. Fifty-eight works were sent to South Kensington for national competition, six of which were selected. One national medallion was awarded, and 10 third grade prizes. The report of the Stourbridge School of Art states that 26 students passed satisfactorily in the second or higher grade, 6 passed, and their papers were marked "excellent," and 6 received prizes. Fifteen out of the thirty works submitted for national competition were passed as satisfactorily executed, and awarded prizes. The Bradford School is also in a satisfactory condition. There are now 89 students on the books, 75 evening classes, and 14 ladies' classes.

BAD MASONRY.

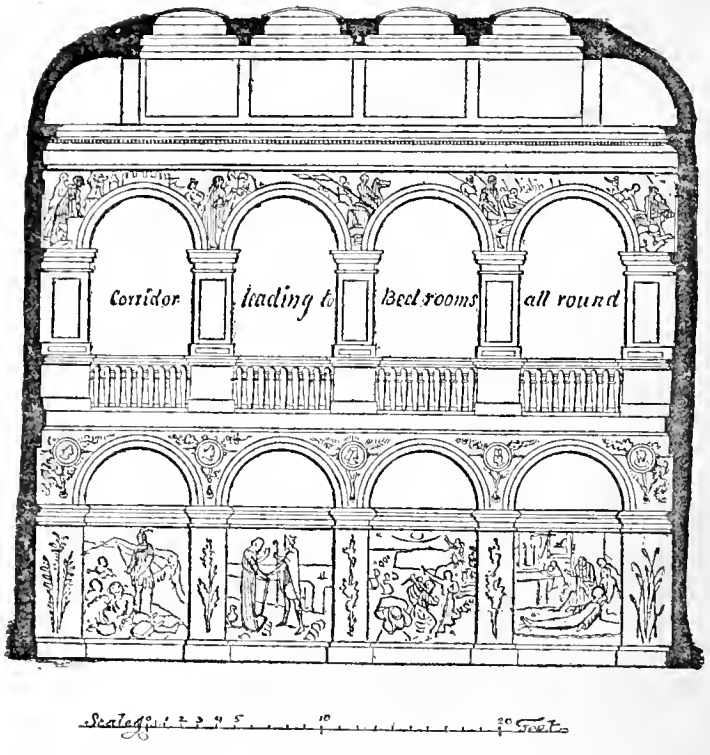
A PRACTICAL builder has sent us ("Pall Mall Gazette") the particulars of an examination of the wall of Clerkenwell House of Detention, which has led him to the conclusion that a very slight pressure was required to effect a breach in it. At the bottom the wall is two and a half bricks thick, that is, allowing for mortar, more than 22½in. About 10ft. higher up, the thickness of the wall diminishes to 18in., and the upper part of it, under the coping stone, is only 14in. thick. The wall is strengthened at intervals of 14ft. by counterforts or buttresses which are 26ft. 6in. broad "in the face," and project 9in. from the wall; these are strong enough to support what builders call a "dead pressure." The bricks (hard burned "slacks") are of good quality. So far there is nothing to complain of. But upon examining the way in which the bricks are put together our informant found serious cause for dissatisfaction. "At some distance from the blown-in gap," he writes, "I saw lines of vertical cracking, which immediately suggested to me an idea of the character of the 'bonding.' Bonding, in building phraseology, signifies in walls the tying of the materials by some other article, built course by course, into the work as it proceeds. In brick walls the bonding mostly consists of hoop iron, varying in width from 1½in. to 3in, being laid along the brickwork in double strips, let us say, every two courses or so, from one end of the wall to the other. When this is of good iron, and properly laid in, it may readily be supposed how it tends to stiffen and strengthen a wall. Judge of my surprise, then, when in this structure, at the House of Detention, not a bit of bonding of any kind was to be seen. I next turned my attention to the mortar. It had a suspicious, chalky look, and was not blue enough for my liking. I placed some good-sized lumps under my heel, and they slowly crumbled away whilst I balanced myself on one leg. I then stood upon lump after lump, swinging myself round half a turn, so as to exert moving pressure, and the stuff went to powder in an instant. As I weighed at the time, clothing, rain, and all, about 200lb., this was a very poor result to get out of prison wall mortar. I filled my pockets with some selected specimens, which I have now on the table before me. I have examined them carefully and leisurely, and the absence of silica, fine, well-washed river sand, is very marked; the substance has a porous, pumice stone look."

It is rumoured that the Liverpool Corporation are about to abandon in despair the scheme of erecting working men's dwellings, and resell the land.

PAINTED DECORATIONS.

THE DUTY OF THE PAINTER IN RELATION TO THE ARCHITECT.

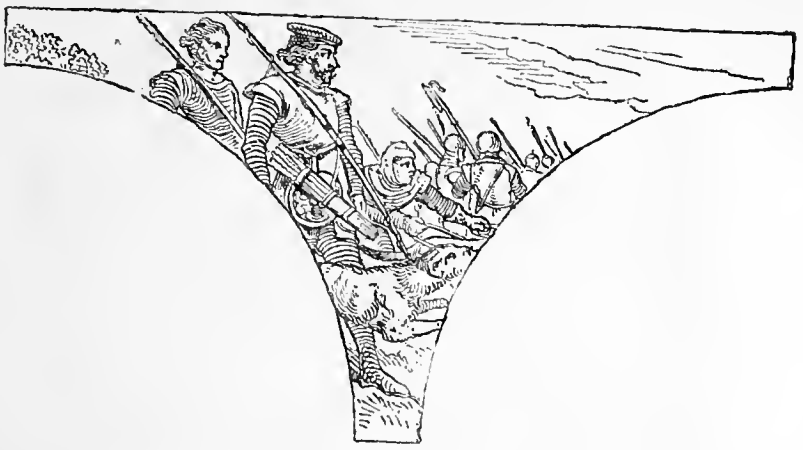
THE division of labour which is necessarily characteristic of dense population, has made painting and architecture markedly distinct professions, and compels us to speak of architect and painter not only as separate individuals, but as separate classes. It is pleasant to dwell sometimes on thoughts of those past days, when the arts were so closely blended, so intimately associated, that the distinctiveness now so unhappily patent was scarcely felt even when it existed. That there was such distinctiveness is very clear from documentary evidence, but such was the interest which one artist took in the work of his brother craftsman that at certain intervals there appeared exceptionally powerful men, able to practise more than one art, and who at last came to be regarded as representative men, when in reality they were purely exceptional. Thus it is that the public, as a rule, know nothing of such names as Ictinus and Callicrates, in connection with the Parthenon, and thus it is that such names as Phidias (B.C. 490—432), Giotto (A.D. 1276—1336), Michael Angelo (A.D. 1474—1564), are in the mouths of every one, serving as arguments to those who desire to show that a great architect must be a great painter or sculptor. That an architect should know somewhat of those sister arts which are so all-important to the proper development of his; that he should be able to set out or plan the whole scheme of the painted and sculptured decoration of his building; that he should know where to place his jewels and his lights; that the proper place for a candle is not under a bushel; and that the proper place for a ruby is not in a pig's snout; that he should be able even to give some idea with his pencil of figure and figure composition; and that he should be master of conventional ornament, by which I do not mean a collection of many patterns, but a director of a few well-designed forms, knowing where to use one, and where to use the other, and thoroughly alive to the important question of scale:—that every architect should at least be thus far able has been urged in former articles. On the other hand, the duty of the painter towards the architect is not less important. For years past it has been constantly urged that the first desideratum in all wall painting is that it shall not be in effect independent of the wall. This is manifestly the first duty of the painter towards the architect, viz., to recognize the important fact that his—the painter's—work is to decorate by means of colour the constructional work provided by the architect. To ignore, or to try to ignore, this constructional ground—to endeavour by all the powers of perspective and *chiaro 'scuro* to conceal the construction—to depart from the lines of the architecture—to set at nought arch and pier, wall and ceiling—to turn our vaults into cloudy heavens; to melt our solids into voids by painting landscapes on wall and pier—the idea of the solidity of these parts being almost as necessary as the real solidity; and to paint subjects so regardless of the architectural forms as to make the latter appear in the way, are, to speak mildly, fundamental errors, for which no amount of good painting *per se* can ever atone. Wall painting is, and must be, a relative art, and cannot stand alone. The question should not be, is it good painting? but, is it good decoration? Some say (I think most unwisely), that if the architecture be thoroughly good your painter must work in relation to it, and subject more or less to certain conventional laws; if the architecture be bad or indifferent, the painter may do just what he likes, and attract as much attention as he can solely to his work as painting. It is the danger of this last doctrine which chiefly besets us now, as it has more or less for five centuries past. I shall not now pause to show the subtle and gradual development



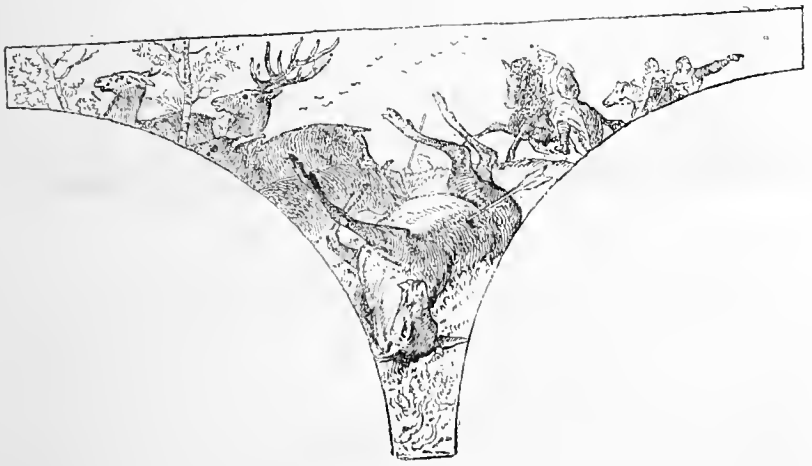
No. 1.—SECTION THROUGH CORRIDORS AT SIR W. TREVELYAN'S MANSION, WALLINGTON.

No. 2.—EARL PERCY PARTING FROM HIS WIFE.

No. 3.—THE KNIGHTS' RETAINERS TROTTING AWAY—HERON, LOVELL, WITHERINGTON, &c.

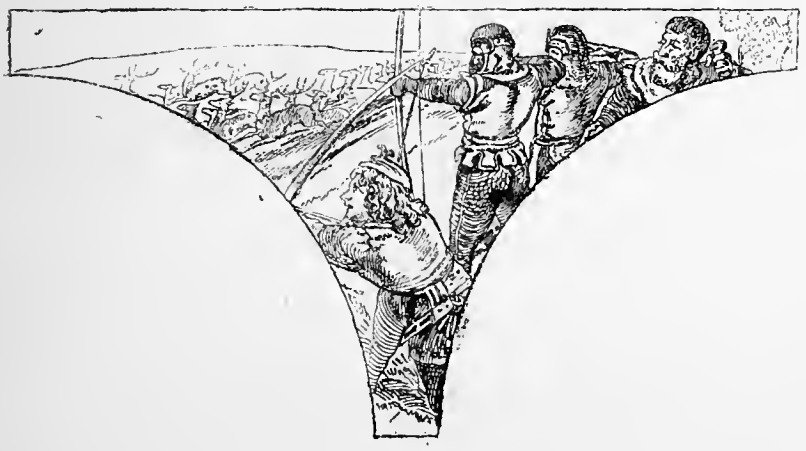


No. 4.—THE FOOTMEN AND BOWMEN—DOGS IN LEASH.



No. 5.—THE REAR OF THE HERD—DRIVERS FOLLOWING.

No. 6.—THE HUNTING—THE LEADER OF THE HERD, A STAG OF TEN.



No. 7.—THE BATTUE—ARCHERS POSTED FOR SHOOTING.

of painting as distinct from decoration, how the bad seed sown in the conventional perspective of the early throne budded in Giotto's architectural backgrounds, and blossomed in the exuberant fancy—almost wildness—of Benozzo Gozzoli, the staginess of Ghirlandajo, and the long vistas of Raphael. The easel painter of to-day is not altogether to blame because he has lost sight of one of the most, if not the most, important aspect of his art. Painters are of all artists most impatient of control. The painters of the nineteenth century, however, are, as far as I can judge, not a jot worse in this respect than many mediæval artists, for from the fourteenth century to the present time there are examples enough to show how completely they defied the laws they should have obeyed, and forgot the building they were called on to decorate, which they failed to do, in the picture they were actually painting. Of course it is very easy to say "so much the better for your art of painting." Whether it was or was not the better course it was certainly the worse for the art of architecture. Directly the essentially decorative arts of sculpture or painting became isolated in the popular mind, the art of architecture suffered, and the more you isolate the painter's art, the more will architecture pass into forgetfulness. A notable instance of this has lately been brought before the Institute of British Architects. Sir Walter Trevelyan's house, at Wallington, was built in the first half of the last century, and it preserved the old tradition of English country houses so far that you entered from the drive directly into the principal room, *i.e.*, the hall, without any intervening corridor, lobby, ante-room, or any other Renaissance luxury. In the centre of the house was the usual open quadrangle, surrounded by two storeys on three sides, and principal staircase on the fourth side. To change this plan and convert the open quad into a saloon with corridors round it was a problem which the late Mr. John Dobson was called on to solve. The architect having reconstructed the walls of the quadrangle, and produced two storeys of arcades, sometimes open and sometimes blocked, Mr. W. B. Scott was commissioned to decorate the same. It is to the upper series of paintings that I wish to call attention, and as illustrations of these are given in the current number of the sessional papers of the Institute, I shall take the liberty of referring to them. The constructional or architectural field selected for the paintings are the spandril spaces between the arches, and a few inches above the arches between the apex of the outer arch moulding and the lowest moulding of the entablature. Mr. Scott says "the house being a Border mansion, the decoration, which was put into my hands as a pictorial rather than an ornamental undertaking, was treated with reference to Border history." He also says that Mr. Dobson was "the able architect of Newcastle." It will be here observed that the painter admits the architect to be an "able" man, and that his commission was to decorate the architecture by figure subjects from Border history. The old ballad of Chevy Chase is the story illustrated. The entire height of the wall space between the capital of the arch piers and the entablature over the arches is 4½ft. or thereabouts, and the arches nearly meet. There are ten double and eight single or angle spandrils. The foreground figures are the full height of the space. It is scarcely necessary to describe any more; the word "foreground" explains at once the pictorial character of the paintings; and if it be added that the painting is continued over the arches, without any sensible break; that two spandrils sometimes form one scene; and that there are but a very few figures which are not, so to speak, cut into by the arches, it will be seen that the work has not merely no relation whatever to the architecture, but actually places the latter at such a disadvantage as to appear an impertinence, the arches looking not as if the painting had been executed to fit them, but as if they had been

ruthlessly cut through the painting. Thus in spandril No. 2 we have the head and shoulders of a page on one side, and the head and shoulders of a horse on the other. In No. 3, the hind quarters of a horse, but no legs; in No. 4, a one-legged archer, bisected by a two-legged dog; in No. 7, the trunk of an archer, and so on. No. 6, "The Leader of the Herd—A Stag of Ten," and No. 5, "The Rear of the Herd," are saved from any decided mutilation, but foreshortening and scenic backgrounds are not conducive to the maintenance of architectural laws. That Mr. Scott has told the story well and poetically, and that Sir Walter Trevelyan's desire to unite the three sister arts was in every way praiseworthy, are beyond dispute; but if these paintings are examples of what "painters of eminence," as Mr. Seddon calls them, would do with our architecture, I see no reason to regret that it should be "a rare occurrence." To return, however, to the notion that, when the architecture is unsatisfactory, the painter has only to regard his own department. Now, I cannot help thinking that such a view as this, enunciated by "one of the greatest of living artists,"* retards very much the consummation we desire to see, viz., the proper union, and, therefore, equal balance of the sister arts. If a building be radically bad, why paint it? Why enrich it to such a degree that the hope of rebuilding would be a vain thought? Why place your jewel in the swine's snout, or mend your old garments with new cloth? Besides, who is to determine the amount of unsatisfactoriness in a building which secures to the painter of it a licence to work independent of all architectural laws? Is the painter to be the judge? If not, to whom must we look? To say that because a wall is a plain wall, with no mouldings or constructional lines about it except its boundaries, therefore a painter is at liberty to do as he likes, and treat it as if it were not a wall, and that the addition to it of one or two stringcourses and half a dozen pilasters or niches, under thoroughly good architectural judgment, should change the whole conduct of the painter, and subject him to mural laws which he before ignored, is simply to say that practically we know nothing worth knowing about the subject. The first duty of the painter who accepts a commission to decorate or paint a wall is the same whether the wall belongs to a railway shed or a cathedral, a suburban villa or a palace; and that duty is to preserve intact the flatness and, consequently, the solidity of the construction. Anything gained at the expense of this is a loss to that art unity for which we are striving. It matters not whether the painting be or be not the most glorious work ever painted, whether the figures are life-like or not, whether the artist has thrown into it his whole soul or only half a soul; if the coronet crushes the brow, if the form of the dress fails to suggest the body, away with them both to a museum; they may be very lovely in sheen of priceless gem and waviness of broidered pattern, but they have not fulfilled the work they were required to do. Mr. Herbert, Mr. Leighton, and Mr. W. B. Scott, may be able to paint pictures on walls, but neither of them has yet shown that he is at all capable of decorating architecture, or that he has the faintest idea of wherein lies the duty of the painter towards the architect.

EDWARD W. GODWIN.

* See Professor Westwood's advertisement in the "Athenæum" of last week.

CENTRAL CREDIT AND DISCOUNT COMPANY'S OFFICES, LOTHBURY.

THE new building of the General Credit and Discount Company stands upon the site of the former house, No. 7, Lothbury, with the addition of the ground of No. 27, Tokenhouse-yard incorporated with it, making a block of 81 × 28 and 72ft. high to cornice, and has been erected from the designs of Mr. G. Somers Clarke, the company's architect. In common with all City buildings where ground space is as valuable as it is near the Bank of England, the accommodation can only be obtained by a number of storeys, which in this case, including a basement, amounts to six in all. The basement has the registrar's department, the strong rooms, washing rooms, &c., and heating apparatus by Perkins. The ground floor—the general office, discount department, and discount manager. The first floor—general manager's room, his clerks, two waiting rooms, and the board room, having a stone balcony in the Lothbury front. The second and upper floor are devoted to the secretariat, the solicitor's, and other departments of the business of the company, with the housekeeper's and porter's accommodation on topmost floor. The materials used are Portland, red and yellow Mansfield, with selected Serpentine shafts to the uppermost stage and to the shafts of the principal door. The fittings and finishings of the interior are all carried out and designed in harmony with the style of the exterior. Messrs. Lucas Brothers were the builders; Mr. Atley and Mr. Clamp, clerks of the works; Mr. T. Carter executed the carving; Mr. Redfern the bas-reliefs; and Mr. Steel was the contractors' foreman.

OLD DOORWAY, STEETLY ABBEY.

WE furnish our readers this week with an illustration of a most interesting doorway at Steetly Abbey, Derbyshire—a very fine example of Anglo-Norman work, and though much time-worn, still retains sufficient of its pristine beauty to render it an object of interest alike to the architectural and archæological student. There still remains enough of the carving on the shafts to show that it must have originally been of a most elaborate character. The capitals appear to have been worked to the desired form by the mason, and the design then carved upon them in bas-relief. The arch-mold is bold and deeply recessed, as may be seen by the depth of the shadow. Our view is drawn from a photograph taken by Mr. Theophilus Smith, of Sheffield.

SOUTH KENSINGTON MUSEUM.

IN addition to the attractions offered to visitors during the Christmas holidays by the collections at the South Kensington Museum, the Committee of Council on Education have, says the "Society of Arts' Journal," pushed forward the arrangements for the exhibition of the purchases made at the Paris Exhibition, which have recently arrived in England. These latter, as well as some valuable loans, have been temporarily placed in glass cases, and opportunities during the holidays will be thus afforded to the public to view these treasures. The loans acquired from the gallery of the "Histoire du Travail" at the Paris Exhibition, although not numerous, are of a highly interesting character, not only from their being extremely curious and rare as works of art, but chiefly from the fact that they are the property of foreign governments. A most admirable system of international intercourse with foreign powers in relation to works of art may be thus said to have commenced. In the Loan Court are to be found the Crystals lent by the Austrian Government. They consist of five pieces; one piece, standing about 3ft. high, is handsomely carved, and for size is the most important. The enamelled gold work which surmounts the crystal is a delicate piece of execution; and the vase with two handles, richly cut, is a marvel of skilful and dexterous workmanship. Without the evidence of the presence of this vase it would be hard to conceive that any workman could have, out of a simple rock crystal, produced so charming a result. In the case next to the crystals are shown curious specimens of very ancient gold work, discovered at Petrossa, in 1837, and lent to the museum by the Roumanian Government. The date assigned to their origin is about 450 A.D. The work is considered as probably that of Gothic tribes, and the style of the design is called Byzantine. The shapes of the objects, the setting of the stones, and the remarkable pierced work, should be carefully inspected. The largest piece is a salver, about 2ft. 3in. in diameter, with a somewhat rudely stamped ornament round the circumference. A patera is in a good state of conservation, and is, apparently, a capital illustration of the style of art employed at that period for gold work. Adjoining the Loan Court is a portion of the museum assigned to purchases, and here, under glass cases, at the north end of the court, may be found the purchases made from the Paris Exhibition. Of the principal purchase, exquisitely carved and inlaid with precious stones, the spinette by Annibalii de Roxis, Milan, 1577, standing by itself. As a work of art it is unrivalled in the museum. Next to it, but of a totally different genre and date, is the famous inlaid and sculptured wooden cabinet by M Fourdinois, which elicited so much admiration from visitors to the Paris Exhibition. The Italian peasant jewellery, bought from Signor Castellani (through whose means the spinette referred to was likewise acquired), occupies four cases, and has much interest for our jewellers, who would do well to adopt many of the elegant designs to be found in this collection. There is a small assemblage of musical instruments of foreign countries. This, however, is but a part of what was purchased at Paris. The instruments from Japan and China are very eccentric. Beyond this case are specimens of Turkish popular jewellery, and a Norwegian marriage crown. The form of the Danish silver parcel-gilt drinking-vessel is curious, but seems awkward. It is of modern execution but of ancient design. The artistic fans, from the atelier of M. Alexandre, are well represented by eight elegant examples, of which the more noticeable ones are by Messrs. Alexandre, Froment, Frossoy, and Regina. Opposite the inlaid cabinets from Copenhagen stands a very fine vase, of French manufacture, in modern enamelled earthenware, of Persian design, by M. Collinot. The style of this piece of pottery is excellent. A collection, comprising chiefly modern French porcelain, German glass, Austrian ormolu, and French bronzes, complete the artistic purchases from the Paris Exhibition. In the north great court some very accurately working models of mechanical contrivances, cog-wheels, pistons, &c., &c., by Von Schröeder, of Darmstadt, are exhibited temporarily.

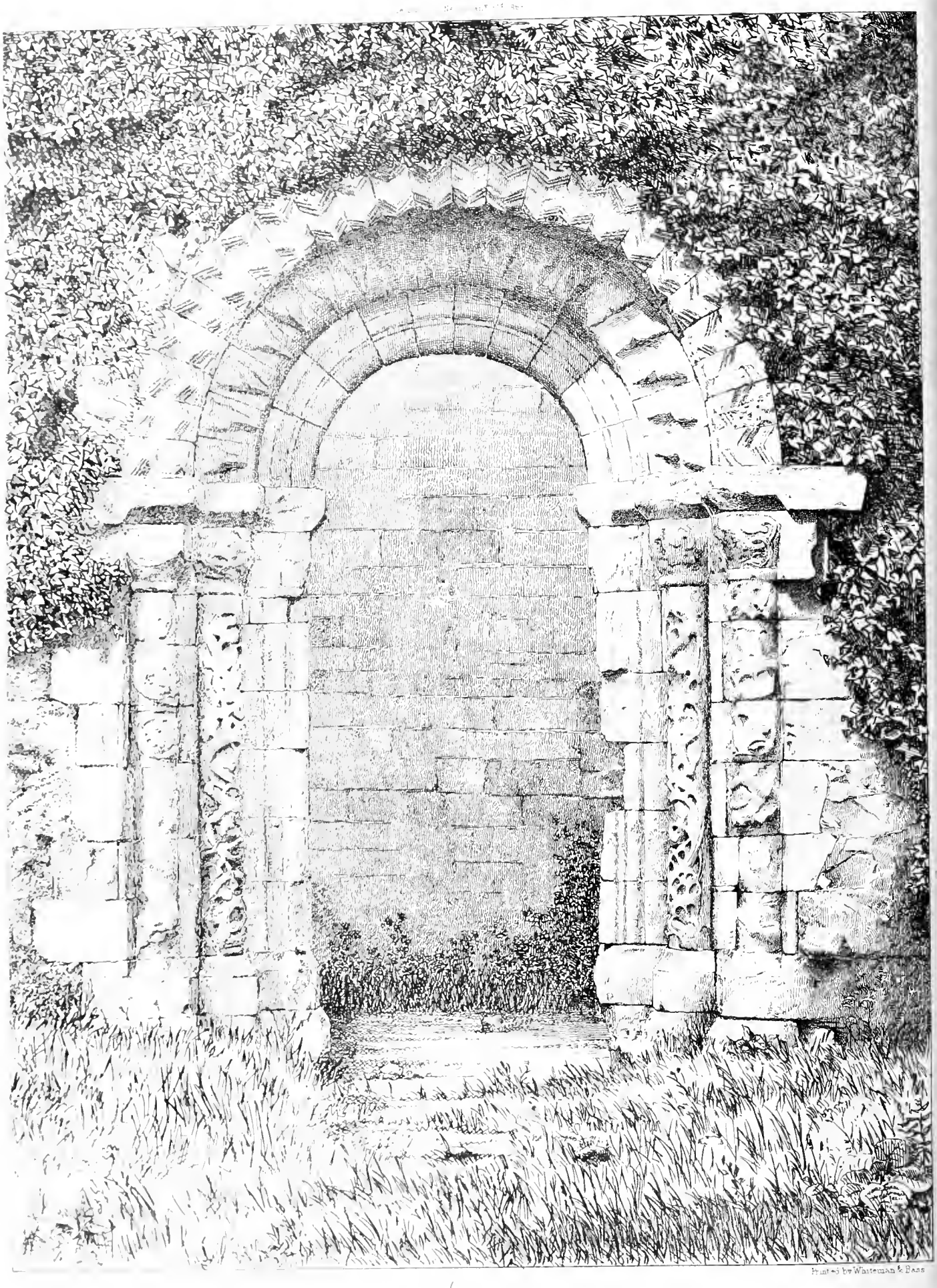
DIRECTIONS FOR POLISHING WOOD.

THE following directions for polishing wood are taken from "A. F. B.'s" work on wood carving, noticed by us a short time since. The materials required are a little of the best French polish, a little sweet oil, and a small bottle of spirits of wine; glass paper, some old linen, and a little cotton wool. Use leather gloves, as the polish stains, and might be troublesome to get off your hands. Before beginning to polish your wood, you must rub it, not up and down, but with a circular motion, with glass paper, till its surface assumes a soft satin appearance; the wood should be close in grain for successful polish; it will sometimes require hours of rubbing before it is perfectly free from rough particles.

Make a dabber of the cotton wool, wrapped in linen, and tied firmly at the top; moisten it with the French polish, and one drop of sweet oil (the oil is only for the purpose of diminishing friction), and rub the wood with an even, but not hard pressure, in circles, all over the surface; the only point is that the polish should be distributed evenly over the surface, and the same amount of rubbing given to each part. Continue rubbing until the wood begins to reflect; it may be an hour or so before you see this glassy appearance. Then put the wood by for four and twenty hours, that it may dry perfectly; the next day the polish may be almost entirely absorbed. Repeat the process, with the intervals for absorption, until the reflection is as perfect as glass; twice is generally sufficient, but I have repeated it five or six times on very absorbent woods.

When you are satisfied with the reflection, take a fresh clean dabber, damp it very slightly with the spirits of wine, and rub very softly and evenly over the polished wood; it will bring out the polish beautifully, and fix it permanently on the surface. I never knew this process fail, though it requires patience. Be careful to put sufficient polish on your wood before using the spirits of wine, as you cannot add any afterwards. Should it be desirable to stain the wood, use a little dragon's blood (a beautiful scarlet powder) with the polish, and the wood assumes a deep orange colour.

Mr. G. G. Scott will deliver his lectures on Architecture at the Royal Academy on Thursday evenings, Jan. 23 and 30, and Feb. 6, 1868.



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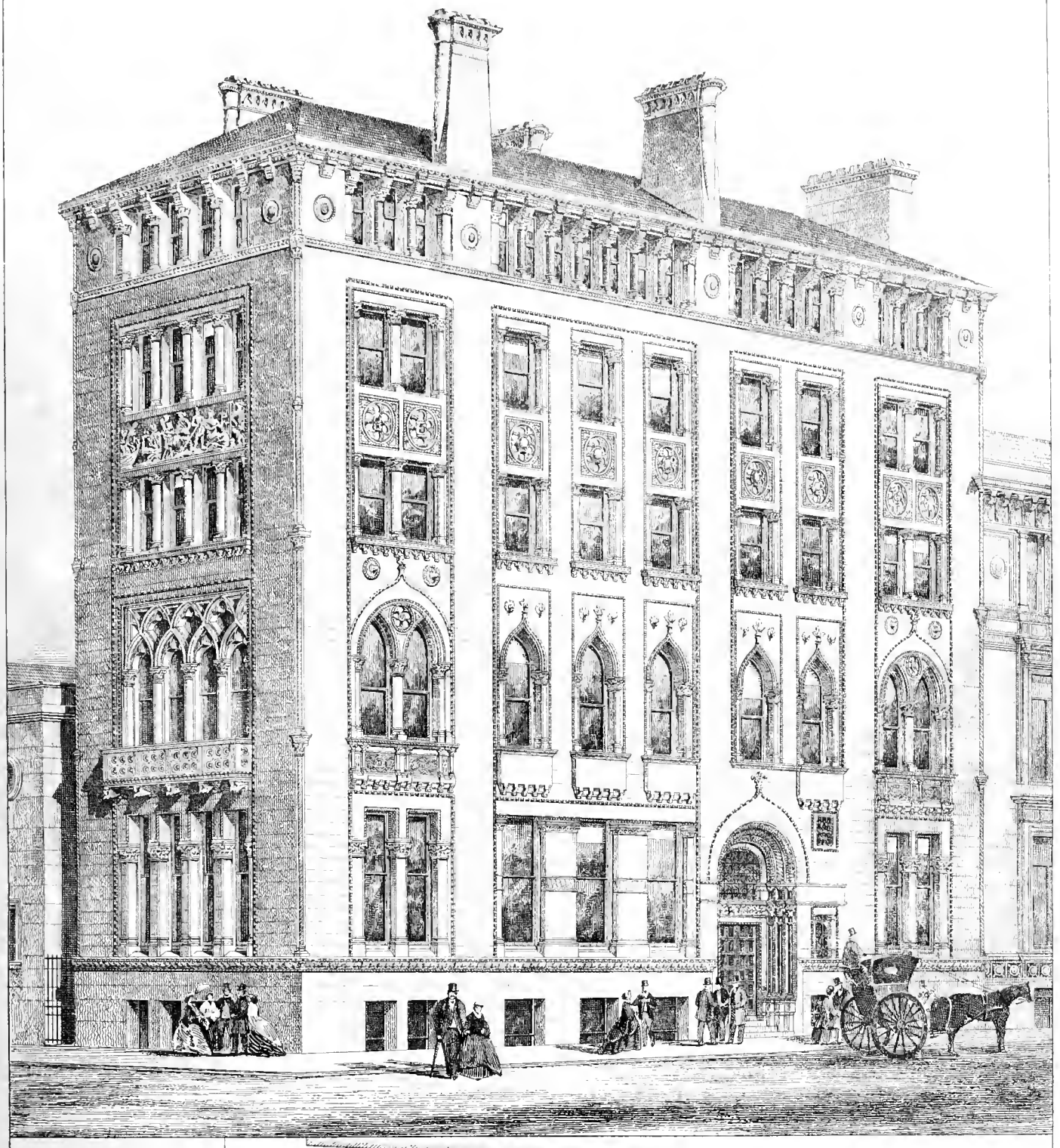
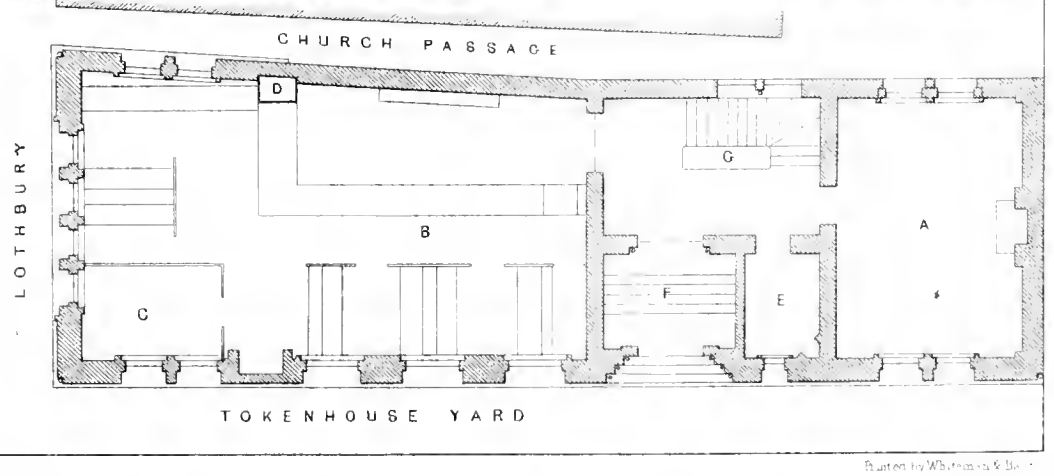


Reference.

A . *Discount Managers Room.*
B . *Discount Department.*
C . *Head Clerks Office.*
D . *Lift.*
E . *Porter.*
F . *Lobby.*
G . *Staircase.*



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G. SOMERS CLARKE, ARCHT.

PROPOSED VICTORIA PARK, PORTSMOUTH.

PUBLIC parks in populous towns have been called the breathing places of the people, and we think with equal propriety higher functions may be assigned them in a social and moral aspect. The public parks of London have produced incalculable good. As part and parcel of that world of thought and industry, they have materially aided to make it what it is, and the beneficial results that have been derived from their use have been none the less felt, though perhaps unseen. Town life is a stifled life. Business-worn men rush out of town at Christmas time, at the long summer vacation, and even at the close of their day's labour, to seek enjoyment amid the refreshing elements of country life and the gladdening associations of Nature. They learn to associate their vocation and business with pent-up offices and streets, and smoke-laden atmospheres and crowded thoroughfares, and the very wear and tear of life itself.

Sumptuous architecture may line the streets, and sanitary science may have accomplished all that the laws of health can demand, but even all these things do not compensate for a clear blue sky and fresh air. The denizens of the east end of London have felt the want, as they now recognize the inestimable advantages, of a large park in their midst; and no one can deny the benefits that flow from a large unrestricted area of grass-sown land, even though thinly planted with trees, when such a boon is within walking distance of the doors of the poorer and more closely confined masses of the population. The successful appeal of one gentleman on behalf of the working classes of one of the densest of our seaport towns to obtain for them about fifty acres of land belonging to Government, hitherto principally used for sheep pasturage, and to utilize the same for the higher object of the people's recreation, cannot be too highly eulogized. By a happy thought of Mr. Francis Fuller, of Westminster, the people of Portsmouth have at length acquired what they have so long vainly sought for. Mr. Fuller, with his usual ability and foresight, applied directly to the head of these realms for the object he had in view. Our excellent Queen Victoria, whose name the projected park is to bear, with her wonted condescension and regard for her people's welfare and enjoyment, at once communicated with Mr. Fuller upon the subject, and in the course of one month—through the facilities afforded by General Grey and Sir John Pakington—the consent of the War Department and the Lords Commissioners of Her Majesty's Treasury was obtained, and a great boon to the people of Portsmouth consummated.

The inhabitants of Portsmouth, Portsea, and Landport number upwards of 100,000; the streets are narrow and densely crowded; criminal statistics have in this locality shown a higher average than those of other towns, mainly attributable to the want of those essentials for physical and mental enjoyment afforded by open spaces or grounds for recreation. Socially, these benefits have in all instances tended to elevate the moral tone of all classes of the neighbouring community. The advantages to be derived from parks and open spaces may be somewhat estimated by the results experienced in other towns; and to take an example within the same county, namely, Southampton—also, like Portsmouth, a seaport town—has, since the formation of its public park, indicated a marked diminution in the statistics of crime, as well as in its rate of mortality, and in this latter respect we believe ranks second only to one other town in the kingdom. Like that of Southampton, the land to be appropriated for the recreation of the Portsmouth people is centrally situated, near the railway terminus at Landport; and if judiciously laid out, with a pleasing admixture of deciduous and evergreen shrubs, combined with well-formed walks, and other accompaniments of a public resort, the proposed Victoria Park, under well regulated by-laws and a proper municipal control, will prove one of the greatest blessings ever conferred on this densely populated seaport. The mayor, Mr. Emanuel, has, we understand, been active in advancing this project, by eliciting information preparatory to laying out the ground; and we heartily congratulate Portsmouth on the prospect of an early acquisition of a people's park, and hope that her Majesty, whose good word has begun the desirable work, will also honour its opening with her presence.

WASTE HEAT IN OPEN FIREPLACES.

THE utilization of waste heat from open fireplaces is a subject which, it will readily be admitted, could not be more opportunely discussed than at the present season of the year. It is just now that we are feeling the full force of the fact that, in the mass of our dwellings, there are serious defects in construction, and a vast amount of heat is wasted in consequence. Few things are more cheerful to look upon than the bright open fire of the English hearth, to say nothing of the poetry of the fireside. As compared with it, the close stove of the continent is a very gloomy affair, besides being a less healthy method of heating, and could never find favour for domestic purposes in this country. And yet, with all the superior advantages which we possess in the open fireplace, we seldom—if, indeed, ever—get the full benefit of the coal we consume. Our grates burn a maximum of coal and give a minimum of heat. As Mr. F. Edwards, in his new work on ventilation and waste heat, remarks—"We allow a large body of warm air to escape by every chimney in which there is a fire, but, from the labourer who rents a cottage with a bed-room over his sitting-room to the South Kensington mansion, rented at £500 a-year, not the slightest attempt is made to turn the heated products to account for the purposes of warming." During the late outcry about the exhaustion of our coal mines, almost every writer on the subject insisted upon it as the chief duty of every consumer that the quantity of coals used for household purposes ought to be reduced to something like a fractional part of the present rate of his consumption. By this means, it was argued, would the great national supply be economized. Very likely; but it would be at the sacrifice of personal comfort, or, rather, with an increase of the discomforts already experienced. It is not with poor Bob Cratchet's "one coal" fire that we can expect well-warmed and well-ventilated houses. No doubt the economization of our coal is a very important consideration; and of the thirty million tons which are used annually for domestic purposes alone, a large quantity is unquestionably lost through sheer waste. Moreover, it seems evident that, since the consumption of coal must increase with the increase of the population and the diffusion of wealth, so also will the waste increase, in spite of Mr. Mill's doctrine—beautiful and true as it is—of our duty to posterity in regard to this very matter of fuel. But while we do not believe in the desirableness or the practicability of introducing into our dining-rooms close stoves which consume only twelve pounds of coal in twenty-four hours, as Dr. Arnott would have us do even in winter, we think that any reasonable hints, calculated either to avoid the wasteful expenditure of so valuable an article, or to extend the utility of whatever is consumed, deserve the most serious attention. In our article on ventilation in dwellings last week, we noted some of the schemes which have been proposed with a view to effect this end. The same able authority already quoted furnishes us with others of an equally practical kind. One thing may be taken for granted, that in many fireplaces, when a fire is burning, a quantity of air is discharged up the chimney, in the course of a few minutes, equal to the whole contents of the room. This evil would be removed, or at least diminished, by the use of a proper regulator, such as we formerly described, to control the opening of the chimney. And an additional remedy would be the introduction of a special supply of air in proximity to the fire by means of a tube, in order to check the draught over the floor. Much, also, might be gained, in the opinion of Mr. Edwards, in the way of reducing the consumption of coal, and at the same time in obtaining greater heat by the use of proper materials in constructing a fireplace, by attention to the laws of radiation and reflection, and by such means as promote good combustion, and insure that, at the same time, a fire shall burn with steadiness, and, as far as possible, with regularity. He advocates a smoke flue of cast iron, instead of fireclay or brick, because, though overheated iron injures the air, it is possible to prevent it from being over-heated, and its power of conducting heat renders it, under some circumstances, the best material that can be used. It is not the best material at the back of a fire, because it allows the heat to pass away. Brick is preferable, since it retains the heat, and radiates it powerfully. For the admission of warm air to rooms, apertures capable of regulation, near the floor, instead of near the ceiling, because a low level is always the proper position for introducing a current of warm air, and care must be taken that the total amount of apertures in the various rooms do not exceed the horizontal area of the warm air channel, or there may be a liability of the warm air passing by one room and ascending to another. For the escape of air, the fireplace may be supplemented by ventilating flues of proper area in the partition walls opposite the windows, or in the party wall. The windows, also, might be made available, to a very important extent, in rendering our houses more comfortable. Among the suggestions made by the Commissioners on warming and ventilation, was one recommending the general use of double panes of glass in the same window sash, for small rooms, and double sashes for large rooms. The latter were to be placed not less than 5in. or 6in. apart; and in the case of the double panes, it was recommended that the glass should be separated only a ¼in., in order that the existing fittings might be the more readily adapted to the new arrangement. Mr. Edwards suggests that if the space were ½in. instead of a ¼in. the result would be still better, and, of course, he is right, but this plan would be attended with much greater expense. However, there can be no question as to the immense benefit that we might confer upon ourselves by adopting the simple expedient of interposing a second sheet of glass in our windows. Besides, double panes, like a good wall, are useful both in summer and winter. Like all non-conducting materials, they keep out the rays of the sun at one time and retain the heat of the fire at another, and their utility is so unquestionable; they entail so little outlay, and that only in first cost, that we may hope, some day, to see the system sufficiently recommended, or insisted upon, to ensure its very general introduction. We have, probably, in the matter of dwellings, run quite sufficiently on the career of the greatest possible display for the money for it to be time that attention should be more carefully given to the promotion of health and convenience.

SCULPTURE.

MR. WESTMACOTT, in a lecture recently delivered at the Society of Arts, on this subject said, in urging upon those who really take an interest in art, the value and importance of education in its principles and position, he had, on the last occasion, referred to it as a means of increasing their enjoyment in looking at works of art, and of giving them self-reliance in forming a judgment on the merits of a picture or a piece of sculpture. He should endeavour to place before them the various

recommendations that a study of art possesses beyond its charm as an exponent of sentiment or of beauty, whether in form or colour. The public was not only generally uneducated in practical art, but it was equally uninformed in its history and the important functions it fulfilled, as a contemporary record of the state of nations and of their civilization, when the more ancient works were produced. As illustrations of the condition and habits of the people amongst whom it was in its first ages practised, the remains of old time had an interest far beyond what any modern art could offer. Monuments of sculpture, especially, were, at one time, the only records of memorable events. They pourtrayed the great acts of kings, heroes, and conquerors. They marked important historical incidents; and from them we had acquired an insight into the mythology and the poetry of the ancients. In these representations we had most curious and reliable authority for the costume and habits of remote nations of whom there was no written or other recorded account. Here, then, they stood out with an interest entirely their own, and independent of any recommendation, as regarded art excellence. There could be few present who had not seen the sculptures from Egypt, Spain, Hindustan, and from early Greece and Asia Minor, now collected in our British Museum. Some of these were of extraordinary antiquity, and we felt grateful for their preservation, while we stood with a feeling akin to veneration before works executed long prior to any written history. The monuments of Egypt probably mounted up to not less than 2,000 years before the Christian era. The sculptures brought from Nineveh and its neighbourhood exhibited a comparative perfection of workmanship that showed long practice; yet we know that the wonderful city from whose ruins they were exhumed, was utterly destroyed above 600 years before Christ. This comprehended a period of nearly 2500 years, and many of the sculptures must have been executed long before this event. Incidentally, the peculiar symbolic treatment of these monuments was explained, in the union of intelligence, force, and motion or activity, in the colossal and other figures where the human head appeared joined to the powerful muscular body and legs of the lion or bull, while enormous wings expressed the capability of rapid motion. The sculptures of the Parthenon from Athens, though not amongst the earliest works of Greece that might be referred to, had also that extra interest which was afforded by the certainty that from the age of Pericles all the greatest men of ancient classical times—generals, poets, historians, philosophers—had contemplated and doubtless admired those very productions. In the larger number of the older works of Assyria and Egypt, there were the most minute representations, both in painting and sculpture, of the everyday habits of the different nations; their wars and conquests, their amusements, their occupations in handicraft, their building, boating, in short, all the various business of life. Here, surely, was sufficient to give an absorbing interest to representative art, simply in its function of illustrating human life and progress.

The lecturer then proceeded to give a rapid review of the different schools of sculpture from the most ancient period. At about 450 years before Christ, sculpture, hitherto treated without reference to and art-excellence, began to be practised on a new basis. It was then not only used to illustrate the religious myths and heroic deeds of the Greeks, in the rude style of the earlier time, but the principle was introduced that these noble subjects should have their expression in the most perfect forms. Then began an entirely new phase of art, most important in its practice. The school which ranked highest in this noble achievement was that under Phidias and his contemporaries, when the most sublime subjects were represented under the most majestic and dignified forms. To this succeeded the school of Praxiteles, who, departing from the more severe and pure treatment of the previous artists, made beauty itself the object and end of art. This, though the subjects were still religious, introduced a sensuous style, in works of exquisite and attractive execution. It was a downward step in art, because it made its appeal to the eye and sense alone, and not to the purer and more noble sentiments. After this came the school of Lysippus, which still further deteriorated from the high standard of the greatest masters. He was the favourite sculptor of Alexander the Great, and it was under that ambitious, self-glorifying monarch that portrait sculpture was first introduced. Here individual character and details were studied, instead of the larger general type of form seen in the most perfect works of nature; and, although productions of great merit were supplied by the sculptors of the period, and for some short time after the death of Alexander, the most perfect style of art ceased to be the object of study. The time during which sculpture in its finest form flourished was comprehended in the comparatively short period of 200 or 250 years. The lecturer then traced what he called its downward course to later times—to its existence among the Romans, where, owing to the peculiar character of the nation, what was termed fine art, as it had been practised in Greece, excited little or no sympathy. The lecturer took occasion, after still further extending his survey, to return to the proposition with which he set out—namely, that there were many grounds of interest to recommend art to the attention of thoughtful and cultivated persons beyond its attractions as a means of mere representation or imitation, and as the outward expression of sentiment and beauty. He concluded by hoping that he had succeeded in impressing this fact upon many present who, probably considering painting and sculpture only in an objective point of view, had not carried their interest in it beyond the pleasure it was capable of affording them as material art. This, of course, in these days was a great purpose of painting and sculpture; but the earlier function it fulfilled gave a dignity and character to its history which deserve the recognition of all persons of reflection and education. The higher the estimation in which any object was held the greater its interest and the reason of its attractiveness to all persons of sensibility and of cultivated minds. The lecturer said his purpose in dwelling on the uses and application of art in the earlier ages, its history and progress, independently of its material charm, was to incite this extra interest.

In a subsequent lecture, Professor Westmacott said the earlier painting and sculpture employed in the Gothic period scarcely deserves the name of fine art, wanting as it is generally in almost all art qualities. It is true it was only used for decoration; but still it professed to imitate something, and this should have been Nature. Wells cathedral is one of the oldest edifices in England which is richly ornamented in this way, and it exhibits crowds of statues on its exterior. These are of the most primitive character—out of proportion, and, in execution, rude in the extreme. The contrast, as regards the accessorial art connected with Gothic architecture, is remarkable when compared with that employed by the great Greek artists—in the Parthenon, for instance. Here the most perfect architecture of its kind was enriched with expressive sculpture of the most perfect forms in nature; and it is this combination or union that constitutes the highest form of art. The short duration of Gothic architecture, and the constant changes it underwent, may account, in some measure, for the incompleteness of the imitative arts in connection with it. It must be borne in mind that in the short space of about three hundred years it passed through many phases—from the Romanesque to the Pointed or early English style—from that to the florid or Decorated, and then to the Perpendicular, when it may be said to have collapsed altogether. So unstable and unfixed in its own principles, it scarcely allowed of perfection in the arts associated with it, though those arts had a fixed standard, had that standard been followed. No person of sensibility, or who has any genuine feeling for the beautiful and picturesque, can deny the charm, or altogether resist the fascination that is found in the best examples of true Gothic architecture. Much of this may be owing to religious association; much to the imagination, which is pleased to conjure up anew, and picture to itself visions of the olden time. But there is, unquestionably, also a positive claim to admiration, in the originality, the bold fancy, the variety and play of parts, the contrivance of scenic effects in the perspective views, and in the striking contrasts in *chiaro 'scuro*, which are so remarkable in the monuments of this peculiar style of art. Still, with all these admissions, the lecturer said he was bound to protest against the outrages committed against truth and fitness, and, indeed, common sense, which were so constantly seen in the Gothic use of accessorial imiative art. This fault was the more to be regretted, because there were many redeeming indications of grace and feeling in the sculpture, especially in drapery and in the sentiment of monumental design. But how the fitness of nature was abused is seen when human faces, of saints, kings, nuns, and ecclesiastics, are found employed as corbels and brackets to bear weights, or as terminations to dripstones, or as gurgoyles or draining pipes; or when entire or truncated figures, angels or others, are seen suddenly starting from walls, their drapery clinging to them in stiff horizontal folds instead of falling by any law of gravitation; or standing figures thrust into arched hollow mouldings; or others dislocated and distorted to accommodate them to fill up spandrils of arches or other spaces. These incongruities are the more curious and striking because it has been seriously asserted by the admirers and advocates of mediævalism that these were the days when religious art was practised with a devotion, and a feeling of truth, purity, and of pious impulse, unknown at present. It is a mistake. Students of Gothic art must know instances enough which contradict this theory, not only as regards truth in imitation, but in the scandalous and even indecent sculpture still to be met with in screens, stall seats, and other parts of some of the most admired Gothic churches. These exhibit proofs of a licence, in this respect, which certainly would not be thought of in these degenerate days, and more especially as decoration in places devoted to religious worship. Still, there was a promise of excellence in this Christian art. There often was much gracefulness in composition, and, in the draperies especially, elegance and beauty. Some places showed very superior art to others, as, for example, Lincoln; and there were signs of improvement of the most encouraging kind. Unhappily, a revolution, fatal, as it turned out, to the progress of art, changed the character of the age. This was occasioned by the passion created for classical studies, by the discovery of manuscripts and remains of Greek and Latin literature, in the 15th and 16th centuries. The educated and influential classes devoted themselves to this new attraction, insisting that everything should be done to establish a pseudo-classical taste. The Italian language had to give way, in polite correspondence, to the Latin; and in this ill-directed enthusiasm the philosophy, faith, and, at last, even the morals of the ancients were accepted with all their consequences. The Medici family, the great patron of this movement, and the infidelity and dissoluteness of the courts of Florence under Lorenzo, and of Rome under the Popes Leo X., Clement VII. (Medicis), and others, were, as is well known, the scandal of Europe. Art, and more especially sculpture, was influenced by this fashion, and became conventional and academic. From Michael Angelo and Giovanni di Bologna, to Bernini and Roubiliac—all men of undoubted genius—each artist but added contributions of a false and spurious style, neither purely classical nor, on the other hand, appealing to modern feeling. Some of the works of the leading sculptors were here described, and the genius and versatility of Bernini in particular, dwelt upon. As is usual, the imitators of these greater men only copied their faults, and by the end of the eighteenth century all true art-sentiment seemed extinct. This was the state of art when Flaxman and Canova stepped in to stem the torrent of false and bad taste. Canova was deservedly eminent in a certain class of art; and he suppressed the extreme flutter and mere executive display of the Bernini and Roubiliac schools. But his own style was somewhat mannered and meretricious. Flaxman founded his works more on the examples of the school of sentiment and simplicity inaugurated by the Pisani and their scholars; and showed the value of those qualities, contrasted with the academical pretension and the mere workshop merit that had so long prevailed.

DECORATING A WORKHOUSE CHAPEL.

SOME weeks since, Mr. J. L. Foster, says the "Yorkshire Gazette," and one of the guardians of the York Union, applied to the Board for permission to undertake the decoration of the large room in this workhouse, which is used for the purposes of a chapel, and also as a dining hall, and the walls of which have been heretofore covered with whitewash. The requisite leave was given by the guardians, and the funds being provided by a private subscription among a few gentlemen who take an interest in such matters, Mr. J. W. Knowles, of this city, mural decorator, was commissioned to carry out the work, which he has done to the entire satisfaction of all who have seen it—converting a mean-looking apartment into as comfortable a place of worship as could well be conceived. The chapel is in the

form of a T, the pulpit and reading desk occupying the place where the cross unites. The central portion extending directly in front of the pulpit, being more definite in form than the two ends, by the introduction of a pillar between each window, more decoration has been bestowed upon it. The ceiling, which is divided in certain places with beams (the pillars above named being for their support), has been coloured a warm buff, and thrown into panels by an ornament of a darker shade. The walls from the ceiling to the window heads is coloured the same buff as the ceiling; from thence, down to the dado, they are a sage green, having ornamented bands of a deep yellow and red running across horizontally, the intermediate spaces being filled with fleur-de-lis of a darker green. On the face of each pillar, which is coloured grey and deep yellow alternately, is a fret in Indian red, banded by a style of sage green. A fret is also stencilled under each beam. On the face of the beams, and over the windows, are lettered appropriate Scripture texts. The two ends of the building alluded to previously are treated in a similar manner to the central portion, excepting that in the place of the fleur-de-lis and bands a diaper colour in red, black, and green has been substituted, with a border in deep yellow at the top and bottom. The doors and pulpit are painted two dull greens, with an ornament in red on each panel. The dado is Indian red. The seats have also been stained and varnished. The effect of the whole is to give an air of warmth and comfort to the apartment, which was used, for the first time after its completion on Sunday last, for Divine worship. The chapel will hold about 150 persons.

WORKMEN'S COLLEGE.

A WORKING Men's College has just been established in Blackfriars-road. It is intended to offer to working men in South London an education of a sound and efficient character, by means of classes in languages, mathematics, physical science, moral and social science, together with lectures on history, politics, &c. There will be also, in connection with the college, a night school (for men only), a day school for boys and girls, and afternoon classes for women. The college, which is based on the principles of the Working Men's College, will consist of five classes of members:—1. Ordinary students. 2. Certificated students: those who have gained at least one certificate in some subject, as algebra, Latin, &c. 3. Scholars: those who have passed a satisfactory examination in one branch of study, as mathematics, physics, &c. 4. Associates: those who have gained two certificates, and also passed a satisfactory examination in Bible history, English history, arithmetic, and English grammar. 5. The council, or governing body of the college. It is hoped that every alternate vacancy in the council may be filled by the election of an associate. Professor Huxley, the principal of the college, will deliver the inaugural address to-morrow evening.

ASSESSMENT OF GAS AND WATER-WORKS.

THE important question of the proper rateable value of gas and waterworks has recently arisen with respect to the works at Nottingham. Notwithstanding the extension of the two establishments in this town from time to time, the amounts at which they have been assessed to the poor rate have for several years remained stationary, the companies maintaining that they were assessed at their full value, whilst the parochial authorities believed them to be considerably underrated. Mr. J. S. Norris, of Nottingham, was therefore directed on behalf of the parish (St. Mary's) to value the works of the respective companies, and the result was that he returned the rateable value of the gasworks as £4,286 instead of £2,700, the old amount, and that of the waterworks as £4,927 instead of the old amount of £1,550, the valuations being made under considerable difficulty, owing to the companies refusing the parochial authorities access to and information concerning any of their works other than those in the respondent parish. Against the new assessment the two companies appealed to the Court of Quarter Sessions, but eventually both parties agreed to refer the matter to and abide the decision of Mr. Serjeant Hayes, of the Midland Circuit. The two cases accordingly came on for hearing before that gentleman in London, when Mr. Field, Q.C., and Mr. Cave, of the Midland Circuit, instructed by Messrs. Hunt and Son, of Nottingham, solicitors to the Gas Company, and by Messrs. Freeth, Browne, and Rawson, of Nottingham, solicitors to the Water Company, appeared for the appellants; and Mr. Keane, Q.C., of the Norfolk Circuit, and Mr. Guise, of the Oxford Circuit, instructed by Mr. Cann, solicitor of Nottingham, appeared for the respondents. Evidence was given in support of the companies by Mr. T. Hawksley, C.E., Mr. T. G. Barlow, C.E., and Mr. H. A. Hunt, surveyor, all of Westminster; and Mr. Norris's valuation was supported by Mr. H. J. Castle, surveyor, of Chancery-lane, London, Mr. Jno. Higginbottom, surveyor, of Longton, Staffordshire, and Mr. Westcott, accountant, of Coleman-street, London. After several protracted hearings and repeated adjournments, the learned arbitrator has at length made his award, fixing the rateable value of the gasworks in the parish at £3,020, and that of the waterworks at £3,740, being an increase upon the old rateable values, in the gas case of £320, and in the water case of £2,190. The cases were strongly contested throughout, but the chief points of contention were the proper per centages to be allowed to the hypothetical tenant in respect of the three items of interest on tenant's capital, trade profits, and risks and casualties, the companies claiming under the three heads respectively, 5, 25, and 2½ per cent., whilst the parish admitted only 5 and 10 per cent. under the two first-named items, and ignored the last. Reference was made in the course of the arguments to various leading cases, particularly that of the parish of Lee *v.* the Phœnix Gas Company, decided by the Court of Queen's Bench in the early part of the present year.

CORK SCHOOL OF ART.

A VERY favourable report was presented at the annual meeting of the Cork School of Art, held the other day. The total number of students who have received instruction was 364, being an increase of 22 on the preceding year. Of this number, 182 students attended the classes at the central school, the remainder, consisting of national school and other children taught either in the evening classes at the central school, or in their own schools, by pupil teachers under the supervision of the Institution. At the Government examinations in freehand drawing, geometry, perspective, model, and mechanical drawing, twenty students were successful, and four, having passed in all the subjects, received certificates of the second grade. At the last examination of drawings sent up by the school to South Kensington, the works of eleven students were marked satisfactory, six students received prizes, two received honorable mention, eleven students had their works selected for national competition, and one student received a Queen's Prize for art.

A NEW STYLE.

MR. ANDREW DEWAR read a paper before the Edinburgh Architectural Association, on the 26th ult., on "The Degeneracy of Architecture in Britain, and What Ought to be Done by Architects to Obtain a True British Style." After glancing at many matters connected with the history of architecture, he gave his opinion on a new style.

Having said he had shown that the styles practised in Great Britain are not national, and that they are altogether unworthy of the high position which our country occupies in the other arts and sciences, I now proceed to consider what ought to be the British style. For the sake of clearness I will divide it into three parts.

1st. Ought it to be a new style?

2nd. Ought it to be Gothic or Pointed architecture?

3rd. What ought it to be?

Firstly. Ought it to be a new style? In the same respect as Grecian, Roman, and Gothic are distinct styles, and as each in their day were new styles, I emphatically say that British architecture ought to be a new style. In a strict sense no style is absolutely new, because every style has copied and borrowed from those that preceded it; and no style could be invented with absolutely new forms. All styles that have ever existed in any age or in any country are all branches of the one great tree, or reversed tributaries of the one great river of architecture, which, flowing through all countries and climes for hundreds and thousands of years, had its source and spring in mythological Egypt. If, then, new and distinct styles have been developed from the Egyptian and others that followed it, I see no grounds for supposing that these styles are now so barren that others may not be developed from them, and no reason why in the lapse of ages, when the new British style has run its course and been perfected like the others, that another new and entirely distinct style may not by succeeding generations ever be developed from it. "No nation," says Mr. Ferguson, "in any age or in any part of the globe, has failed to invent for itself a true and appropriate style of architecture, whenever it chose to set about it in the right way, and there certainly can be no great difficulty in our doing what has been so often done before, if we only set to work in a proper spirit, and are prepared to follow the same process which others have followed to obtain this result."

Secondly. Ought it to be Gothic or Pointed architecture? Although it may be unnecessary to answer this in the negative, seeing that I have so fully expressed my opinion in the former part of my paper, yet I desire to fathom it thoroughly, and to give the opinions of others than myself, because on it all objections will principally be based.

Do we require those large cathedrals in which Pointed architecture reached its perfection? No. As Mr. Christie said, in a lecture before the Architectural Institute in 1863, "Our religion has ceased to be processional, and the long-drawn aisles, with their attendant naves and transepts, are no longer required. What is wanted is a place where all may hear and see, so that they may unite without difficulty in the sung and spoken prayers and thanksgivings, and hear perfectly the words of exhortation addressed to them by the preacher." If, then, we cannot erect those forms in which Gothic reached perfection, and in which only it is seen to the greatest advantage, and if the distinctive feature of vaulting has been almost entirely done away with, and the other distinctive feature of buttresses must also die with it, why should not we, as the mediæval builders did, invent new construction for every new requirement, and as these requirements necessitate a different shape and appearance of building, why should not we, in the spirit also of our ancestors, develope a new style altogether, which in its completed form would be a worthy rival to the Gothic, instead of erecting buildings in the old style, which, even in the grandest efforts, could never be anything more than mere shadows of the old cathedrals.

It is admitted, by some upholders of Gothic, that it is not suited for churches of the Presbyterian form of worship, and that it would be debasing it to use it for such forms and buildings that it was never intended for; and, certainly, the interior of not a few United Presbyterian churches in Edinburgh testify that this statement is correct. It is also admitted, that, although no style is better suited for a church standing alone in an open space of ground, where all the attention is confined to the building, and there is nothing in the surroundings to distract it, where the arches and leading forms are all pointed and aspiring, leading the eye gradually upwards from the doors to the windows, from the windows to the gables, from the gables to the pinnacles, from the pinnacles to the tower, and the tower to the spire, till at last the eye is lifted far beyond the earthly tabernacle below to Him in whose honour it has been raised in the deep blue zenith above; yet, it is not so well suited for street architecture as the Roman, where the eye is not wanted to be led upwards, but onwards, along the vast panorama of houses and shops, leading the eye pleasantly along the continually diminishing lines of cornices and windows, till they all hazily converge in a point of dreamy infinitude. If it is, then, admitted that the generally received opinion of Gothic, promulgated by Ruskin and others, that it is the best suited for every kind of building, is untrue—that it is not the best suited for Presbyterian churches or for streets—then, if we can introduce a style of architecture that is better suited for these, all opposition to that style must necessarily vanish. Mr. Ferguson, in his "Handbook of Architecture," says that we pulled down old London-bridge without regret, because we knew we could replace it by a better; and if we were making the same progress in church building as we are making in bridge building, then we would "pull down a Gothic cathedral with the same indifference, content to know that we could replace it by one far nobler and more worthy of our age and intelligence."

The question then remains, in the third place, what is this British style, or what ought it to be? We hear some people say, show us a specimen of your British architecture that we may judge of its superiority. Now, such a question at the present time is absurd, and shows a narrow mind. When the Gothic was forming, if the same question had been asked regarding it, it would not have given a fair idea of what Gothic was to develope itself to, if such a building as the iron church had been cited as an example. Comparison cannot be formed between a style existing and thoroughly developed and one that is merely growing. We cannot compare the Parthenon with the Iron Church, but the Parthenon with Cologne Cathedral. So, also, we cannot compare a Gothic cathedral to any building in the British style that might be designed at present. Enough it is for us to show that there was once a time when there were no Gothic cathedrals, and that it would be no absurdity to infer, that, with the greater skill, science, knowledge, and examples which we possess, another style could be perfected equal in every respect to the Gothic. No man ever did and no man ever will invent and perfect a style, for it must grow and develope with the nation's growth and development, till they both reach perfection. What I throw out are merely suggestions to be added and improved upon by others. My own opinion is that it should be a development of our own Saxon and Norman styles, a kind of Romanesque, yet I would decidedly refrain from calling it Romanesque, but stamp it at once as British. Then, even as our language began with Saxon and went on increasing in power and force, now borrowing from the melodious Greek, the sounding Latin, the refined French, and the expressive German, till in the lapse of centuries it has reached that perfection which it has now attained to, a language as rich, as powerful, as melodious, and as expressive as any in the world. So, also, I have no fear that our architecture would be as complete a success, if we go back to the same early days, and take the same early Saxon and Norman architecture, if we avoid their faults and develope only their good parts, if we go on growing and increasing, now borrowing from the massive and impressive Egyptian, the simple and symmetrical Grecian, the grand and noble Roman, and the aspiring and magnificent Gothic, not leaving all we borrow as we find it, but thoroughly engrafting it and suiting it to our climate, our tastes, and our wants, until it becomes an unmistakable part of British architecture. In order to satisfy those who must have a specimen of British architecture, I cite Dalmeny Church as surpassing by far any similar building of its size in Pointed architecture, for homely simplicity and quiet impressiveness; and I have no doubt that a church in the British style, in its most perfected form, will surpass by far any British or Continental Gothic cathedral, if not in beauty and loveliness, at least in that which is the characteristic of our own Highland hills and scenery—sublimity and grandeur.

DEATH OF BARON MAROCHETTI.

THE "Pall Mall Gazette" of last night announces the death or Baron Marochetti, which, it appears, took place in Paris on Saturday last. The deceased sculptor was in his sixty-third year, having been born at Turin in 1805. He received his education in Paris at the Lycée Napoleon, after leaving which he was placed with Bosio, a Parisian sculptor of some eminence. While studying in his atelier he obtained honourable mention from the Ecole des Beaux Arts, but was not awarded any other distinction, and his journey to Italy to complete his studies was undertaken at his own expense. In the year 1827, he returned to France, and in the same year exhibited a group, "A Girl Playing with a Dog," for which a medal was awarded him. This group he presented to the King of Sardinia. In 1831, he exhibited his "Fallen Angel," and somewhat later he executed for the Academy of Arts at Turin a statue of Monsignor Mossi. He presented to the capital of Sardinia an equestrian statue of Emanuel Philibert, which was his sole contribution to the French Exposition of 1855. Shortly after the revolution of February, 1848, Marochetti came to England, where he soon became known. In 1851, he contributed the model of a colossal equestrian statue of Richard Cœur de Lion to the Great Exhibition, but dissatisfied with the position allotted to it inside the building, he set it up at some distance from the western entrance to the great palace of glass. The position of the figure and its spirited attitude attracted no small share of public attention, and this model was the means of bringing the sculptor into very general notice. The statue was afterwards executed in bronze, and placed close to the Palace at Westminster, the cost being defrayed by a public subscription. The people of Glasgow commissioned him to execute for them an equestrian statue of the Queen, which was "inaugurated" in 1854. In 1856, he executed the granite monument to the memory of the English soldiers slain in the Crimea, and a year later the mausoleum of the Princess Elizabeth, daughter of Charles I. He also executed a statue of the Duke of Wellington, which now surmounts a huge monolith erected to his memory not many months since at Strathfeldsaye. One of his most recent works has been the monument to Lord Clyde, which stands in Waterloo-place. He was also engaged on a monument to the Duke of Wellington, to be erected in St. Paul's Cathedral. He was made a Chevalier of the Legion of Honour in 1839.

Building Intelligence.

CHURCHES AND CHAPELS.

On the 17th ult., the little church of Latimer, near Chesham, was reopened by the Lord Bishop of Oxford. Built about twenty-five years ago by Mr. Blore, it had become altogether insufficient for its purpose, and it has been accordingly greatly enlarged, under the direction of Mr. G. Gilbert Scott.

On Sunday last, Bishop Wordsworth opened St. James's New Episcopal Church at Cupar. The space occupied by the old church has been divided transversely into a nave and aisle, and a chancel has been erected on ground to the back. The nave measures 54ft. by 21ft. 6in., and is divided into three bays by moulded stone semicircular arches, and pillars with floriated capitals. The aisle is 10ft. wide, and the chancel 17ft. by 23ft. The church will accommodate 190 seated in open deal benches, exclusive of the choir. Mr. Anderson, of Edinburgh, was the architect.

A new font for the parish church of Louth has just been designed by Mr. S. F. Bodley, architect, and executed in alabaster by Messrs. Riley and M'Dougald, of that town. Its forms is an octagon. On each angle under the font is an angel bearing a scroll. On four of the panels of the font itself is a subject taken from Scripture, having reference to the Sacrament of Baptism, the Temptation, the Ark on the Flood, the Baptism of Jesus in Jordan by St. John the Baptist, and the Crucifixion. In the intermediate panels are typical subjects.

The foundation stone of the new church of St. Paul, Old Brentford, was laid on Monday by the Princess Mary of Teck. The church is designed to meet the requirements of a large and increasing neighbourhood.

The old church of St. Mary Arches, Exeter, is in course of restoration, under the direction of Mr. Hayward, architect, of that city. The building dates from the eleventh century, and the columns separating the aisles from the nave are pure Norman. The present walls and windows are much more modern, being Perpendicular. There are several fine monuments in the church. A heavy reredos of the seventeenth and eighteenth century is to remain, though somewhat out of keeping with the general character of the building.

A new Roman Catholic church has been opened at Preston, dedicated to the English Martyrs. Mr. E. W. Pugin is the architect. The church measures 120ft. long and 60ft. wide, and the height of the nave is 30ft. It seats 850 persons, at a cost of £8,000. The altar carving was executed by Mr. Earp, of London.

The Wesleyan chapel, Keighley, Yorkshire, has been thoroughly painted and decorated, and it is said that the effect has been heightened by the introduction of very handsome inner windows of ground glass, transmitting a soft diffused light over the whole, which assists in producing a peculiar bloom or haze of colour, aimed at in this scheme of decoration. Messrs. Forster and Andrews, of Hull, have just erected a magnificent organ in the chapel. The whole of the decorations have been carried out by Messrs. S. Bottomley and Sons, of Crosshills.

St. Alexander's Roman Catholic Church has been opened at Bootle. The style is Gothic. Mr. E. W. Pugin is the architect, and Mr. W. Glasser the contractor. The length of the building is 108ft. by 50ft. wide, and 53ft. high. The decoration of the roof and ceilings is very good.

The church of St. Bartholomew, Dublin, which has been erected from the designs of T. H. Wyatt, Esq., was consecrated on Monday, December 23, by the Archbishop of Dublin. It is somewhat original in plan, having double transepts to the nave, and a tower rising over the chancel, the lean-to aisles of which form the organ chamber and vestry. There is accommodation for nearly 600, all the sittings being entirely free and unappropriated. The church has cost about £6,000, but it will need £1,000 more to complete the spire, purchase the organ, &c.

All Saints' Church, Hoole, was opened on Tuesday week. The style is Transitional—that immediately preceding the Decorated. It is built of the red sandstone of the district. Mr. Dankes, of Whitehall-place, is the architect, and Mr. Hughes, of Aldford, the builder. The church will seat 600 persons at a cost of £3,235. A spire has yet to be added.

BUILDINGS.

A handsome fountain has been ordered by Her Majesty's Government for the public gardens at Hong Kong. The ground basin is a quarterfoil with square projections. All the ornaments are designed from water plants. The middle basin is also a quarterfoil supported on four columns ranging around a central pier. The shaft is a pointed quarterfoil with tufts of ferns at its base, and the cap is composed of a collection of water plants, and the under side of the upper basin of shells and leaves. The ground basin is 18ft. in diameter, and the height of the fountain 18ft. The design is by Mr. Thomas Blashill, and has been executed in Ransome's patent concrete stone.

A portion of the Corporation buildings in Sauchiehall-street, Glasgow, has been converted into picture galleries by Mr. Heath Wilson and Mr. David Thomson. There is a handsome entrance hall for sculpture, a gallery 80ft. in length, two square halls, and two smaller rooms—all suited for the exhibition of pictures, and lighted from the top. The Corporation intends to inaugurate the new galleries by a portrait exhibition, limited to portraits of Lanarkshire people who have been eminent in connection with the county during the last century and a-half.

On Thursday week the new infirmary and general hospital recently erected in Sunderland was opened by Earl Vane. The new building has been rendered necessary in consequence of the limited character of the old hospital, which is capable of containing only thirty-three beds, while the present one has been constructed to hold one hundred beds. The new institution is built on the pavilion principle, in the form of the letter H. Each ward will contain twelve beds. The rooms are 52ft. long, 23ft. wide, and 16ft. high. In the planning of the building, the architects, Messrs. Potts and Son, were assisted by the medical gentlemen of the town, and visited the most recently erected hospitals in the kingdom, for the purpose of introducing every improvement in hospital construction. The building is plain in appearance, but most commodious. The total cost will be nearly £20,000.

Baron Ferdinand de Rothschild laid, on Tuesday last week, the foundation stone of an edifice that will, when completed, be known as the North London Synagogue. The site of the new building is one of the unbuilt-on pieces of ground in Barnsbury, Islington. The building is roofed and far advanced towards completion. It will be in the Italian style. The dimensions of the synagogue proper is 65ft. by 45ft., and 35ft. high. It will be approached from a portico, which will be ascended by a wide flight of three steps. A large stone staircase adjoins the vestibule, and leads to the ladies' galleries, retiring rooms, and lavatories. Accommodation will be provided for 700 persons. The cost, it is anticipated, will be about £5,000. The architect is Mr. H. H. Collins, and Mr. W. Henshaw is the builder.

A new rectory house has been built, and other improvements effected at Sandford Orcas, Somerset, from the design and under the superintendence of Mr. J. H. Colson, architect, Shorborne, Dorset. The cost was partly defrayed by a loan from the Bounty Office.

On Thursday last week the new General Hospital, Sunderland, was formally opened by the Hooourable Earl Vane, assisted by the Mayor, members for the borough, and other gentlemen. A fancy fair or bazaar was held on the occasion; also the show of the Ornithological Society, in which about 1500 birds were exhibited; the whole of the proceeds is intended for the building fund. The architects for the new erection is Joseph Cotts and Son, under whose immediate superintendence the works have been carried out. The contract has been let for the boundary enclosure walls, gate piers, entrance lodge, and dead house to Walter Scott, contractor, for £1,204; and the contract for gates and iron railings to Messrs. Glaholme and Robson, of the Phoenix Foundry. The building will be opened for the reception of patients in April next.

The plans of Mr. Bates for a Sessions House, Town Hall, Magistrates' Court, and Public Offices at Wolverhampton have been formally voted in the town council, and tenders will be advertised for. The estimate of Mr. Bates that his plans could be carried out for £17,000, was, it is said, guaranteed by Messrs. Warburton, builders and contractors, at Manchester.

The new town hall at Guisley was opened on Thursday week. The building stands on a site of 1,200 yards of land. The arrangement in the building for the local government offices consists of a board room, clerks' offices, fire engine room, lamp room, &c. The public lecture room is is 65ft. long, 36ft. wide, 27ft. high, and will accommodate upwards of 800 persons seated. The building has cost about £3,000.

WATER SUPPLY AND SANITARY MATTERS.

The works for brioging the waters of the Vannes to Paris are to be immediately commenced. The estimated cost is £800,000.

The works for bringing the waters of the Vannes to Paris are about to be commenced. The course is through the department of the Yonne, and the great reservoirs are at Montrouge, whence they will be distributed in Paris, on the left bank of the Seine. The cost of the undertaking is estimated at 20,000,000f.

DUNDEE.—The new waterworks at Dundee are nearly completed. The reservoir is situated in the valley of Crombie Den. The embankment is about 550ft. long, and is of a most satisfactory character. The great pond at Monikie holds 280,000,000 gallons; the north pond 175,000,000 gallons; the clear water basin 42,000,000 gallons; and the Stobswell reservoir at Dundee 5,600,000 gallons; and the new reservoir in Crombie Den will hold 200,000,000 gallons—or three months' supply of water for the town of Dundee. The engineer of the new works is Mr. Leslie, of Edinburgh, Mr. W. Gibb being resident engineer. The contractors for the construction of the reservoir are Messrs. Alexander Wilson and Son, Granton.

STAINED GLASS.

Mr. T. Dury, of Warwick, has just placed a stained glass window in Mr. Dugdale's mansion, near Wroxhall Abbey, illustrative of Hugh de Hatton, as described in Dugdale.—A three-light window, representing the good deeds of Dorcas, and subscribed for principally by mites of the poor, has been placed in the west end of All Sainte' Church, Embscote, Warwickshire, by Mr. Dury, of Warwickshire.—The principal west window of the fine old church, West Tanfield, has just been furnished with stained glass by Mr. H. M. Barnett, of the Victoria Stained Glass Works, Newcastle-upon-Tyne. The subjects represented are the "Resurrection," "St. Paul and Elijah the Prophet."—In the late storms in the North Sea four painted windows for Glasgow Cathedral have been lost. Considerable progress has been made in the erection of painted windows since we last noticed the state of these works. Two windows for the crypt were also on board the "Vienna," and as they have been for a considerable period in the hands of the artist, the loss will be much felt. The drawings, however, exist, and the windows will be re-commenced.

The Edinburgh Improvement trustees have resolved to borrow £50,000 in such sums as may be found convenient, to enable them to carry on the improvements during the present year.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any o our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p m on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—H. and Co.—R. P.—W. H. L—L. B. and Sons.—J. W. and Co.—W. C. I. B.—P. E. M.—B. N.—G. R. T.—T. A. P.—I.O.—W. S.—W. B. S. and Co.—C. W—J. S. G.—W. S. J.—E. W. P.—It is better not to open a correspondence.—R. P.—T. S (yes).—W. P. and Son, send the drawing.—J. H.—W. J. M.—J. W. and Co.—A.P.—R. W. Edis, £6.

AMATEURS question, though short, requires several columns of space for an adequate answer.

W. S.—Consult advertisements as to price books.

Correspondence.

FIRE AT HER MAJESTY'S THEATRE.

To the Editor of the BUILDING NEWS.

SIR,—Since the fire which destroyed Her Majesty's Theatre there has been much discussion as to the means to be employed to meet such disasters. Most of the suggestions made apply simply to the treatment of a fire after it has broken out, and pass by all measures of prevention. It seems now to be the fate of a theatre once to be burnt down, but this I think need not be, if the ordinary resources of modern science and skill were applied as a preventive machinery. I will trouble you, as the subject is of great importance, and has a relation to all public buildings of whatever kind, with a few remarks dictated by my own experience.

I happened to be on the jury summoned to inquire into the fire which last destroyed Covent Garden Theatre. It will be recollected that there were some vague suspicions of foul play, and that the churchwardens of the parish of St. Paul's Coveut Garden, took advantage of a statute which remains in force, but which has grown into disuetude, to make the matter one of judicial iuquiry, by bringiug it before a coroner's jury. The jury met several times, and every exertion was made to trace the cause of the fire, but the mire was so complete that the inquiry was defeated, and they were compelled to bring in a verdict to the effect that the fire arose from accident, but how originating they could not ascertain. This is the case almost universally, as in such buildings the progress of destruction is so rapid, and the flames soon became so ungovernable, that access to any part of the premises is impossible. During the investigation it was suggested that the jury should visit the neighbouring theatre, Drury Lane, during the hours of performance. We were assured that the two theatres were managed in much the same way in all respects, and especially in the precautions taken in case of fire. Very little was elicited by this visit beyond the opinion that if a fire broke out in Drury Lane the devastation would be as rapid and complete as it had been in Covent Garden, and that little or nothing could be done to meet the progress. The quantity of gas consumed dries the scenery and woodwork almost to a state of tinder, and as the carpenters' shops and scene painters' studios contain a quantity of combustible and inflammable matter, the building is always very hazardous.

In reference to Covent Garden the probable conjecture was that the intense heat arising from the performances being continued for a day and throughout a night had ignited a quantity of waste matter, which spread with such fierceness and quickness as to leave the spectators barely time to escape. Very probably if the fire had burst out a few hours before there might have been a serious loss of life added to the loss of property.

What struck me the most during the inspection of Drury Lane was the want of a preventive service. After the destruction of the Surrey Theatre and of the Edinburgh Theatre, both of which followed in a comparatively short space of time, I made it my business, on a visit to Paris, to make myself acquainted with the means adopted in that city in similar cases, and I found that although their fire brigade, and all the machinery used by the brigade, are not superior, and, in many cases, not equal to our own, that in one point they greatly excel us, and that is in the means of prevention adopted. They seem to have arrived at the conclusion that it is of little use to make attempts to stay a fire in one of these buildings, but that it is easy to prevent it breaking out. A preventive policy in relation to any evil is one that in this country we are slow to learn, but I submit that if carefully considered plans were adopted we might make our theatres as safe as any other class of public buildings.

In Paris all the theatres are compelled as a condition of licence to maintain a small fire brigade within the theatre, under the control and direction of the central office. The strength of such brigade varies from three or four men to seven or eight, according to the size of the theatre and the requirements of the case. It is the business of these men to perambulate the theatre both day and night, especially during the hours of performance. Their visits at the appointed places and hours are registered by tell-tales. They have every appliance, in the shape of sponges affixed to poles, wet blankets, buckets, and syringes, in case of accident; and in the larger theatres a fireproof room, from which they can play upon the fire, if such should break out; and the system of alarums makes known to the men in what part of the building their services are required. These men have dormitories in which they sleep; but, beyond all this, it is their business in their daily rounds to see that no useless matter of any kind is allowed to remain—that all waste be destroyed or removed, and that combustibles of all kinds be secured, so as not to be exposed to the action of heat or light. Nothing is permitted to remain but what is absolutely necessary and safely guarded.

I would suggest to all whom it may concern that they should become thoroughly acquainted with what our Parisian neighbours are doing in this respect. I believe that a few men, disciplined as our firemen are, and under the direction of Captain Shaw, placed in the large theatres of the metropolis, with special instructions that their business is first to take care that fire does not break out; and, secondly, in case the insidious enemy escapes their vigilance, to be armed with all the appliances necessary, would have prevented the destruction of Her Majesty's Theatre. There is a period in the history of every fire where a bucket of water properly applied would extinguish it, and the true policy is to adopt such arrangements as will prevent the flames from becoming unmanageable, if care and watchfulness do not prevent their breaking out.—I am, &c.,

B.

HONOUR TO WHOM HONOUR IS DUE.

SIR,—In the criticisms of works in the Paris Exhibition, which appeared in your last week's journal, mention is made of Fourdinois' celebrated oak cabinet as "one of the most perfect objects, combining art with manufacture, which the Exhibition contains." In my estimation it is of unrivalled excellence. But who is the author? Has anyone heard the name of the artist who executed this lovely work? To the credit it is of manufacturers that they employ first-rate talent, and doubtless they find their advantage in it. But justice requires the claims of the artist should have recognition. He it is should have the glory. I hope in future exhibitions this will be borne in mind. A commencement of better things has been made in the case of M. Morel, whose genius reflects so much lustre on the firm of Elkington.—I am, &c., P. E. M.

It is well known that, under the influence both of the hammer and of constant use, the particles of iron gradually assume, by repeated vibration, a different texture from that they had when the piece was new. The metal becomes crystalline, loses its tenacity, and gets brittle. The sudden breaking of old iron axle-trees on railways is exclusively owing to this cause. Now, it would be of the utmost importance to find some means of ascertaining whether or not this alteration in the texture has taken place; but up to this time every attempt in this direction has been a failure. We now learn that this problem has been solved by Mr. Sarboy, an Englishman, who has thought of employing the magnetic needle for this purpose. It appears that when an iron bar is homogeneous, the needle will not be suddenly displaced from its position on being slowly moved to and fro in a direction perpendicular to the magnetic meridian of the locality; but if there be in the bar any unsound place, a fault or flaw, the oscillations of the needle will become very intense as it passes over these defective points

Intercommunication.

QUESTIONS.

[702.]—GREENHOUSES.—Can any one inform me of the best way to heat and ventilate a small greenhouse?—A. B.

[703.]—CRACKED BOILER.—I have a cast iron oval flue boiler with which I heat a small greenhouse. The boiler is cracked at the bottom, next to the fire. Can any one help me by suggesting a remedy? I should also like to know what is the best kind of cement for the joints of hot-water pipes.—A. B.

[704.]—COMPOSITION FOR FLOORS.—Could you kindly suggest what you think the best composition for malt barn floors, that is, of a kind to be durable under the constant turning up by the shovel of the grain, not liable to crack, or scale up in layers or patches, but of a homogeneous character and of a kind to promote the ripening or growth of the grain, suitable for malting purposes? Perhaps the matter is fully better understood in England than Scotland.—G.

[705.]—POSITION OF THE FONT IN A CHURCH.—In the small church of Milverton, near Leamington, Warwickshire, the font is placed inside the communion rails. I should like to know if this is the case in any other church. I have never seen it elsewhere. Milverton Church is also remarkable for its wooden tower, and very low-ceiled roof.—E. GUIS.

[706.]—HOROLOGICAL.—I see in your list of meetings for the week you mention, amongst other societies, the Horological Society. I should esteem it a favour if you would give me some information about it.—A BEGINNER.

[The Institute was established to promote the science of horology, by making known to the whole trade the laws on which the present methods of manufacture depend, and the direction in which invention must run in pursuit of increased perfection.

It consists of members who pay an annual subscription of 12s., or a half yearly subscription of 6s. Annual or half-yearly members residing beyond the twelve miles circle, one-third less. The apprentices of members are admitted to the reading room and the use of the library, and also to the meetings, at the rate of 3s. per annum.

It offers to its members—1. The use of a library in course of formation, and a reading room supplied with periodicals and papers. 2. Periodical meetings for conversation and discussion on all subjects having reference to the art of horology. 3. The reading and hearing original papers and lectures on horological and scientific subjects. 4. The use of a collection of models, drawings, &c., also in course of formation. 5. A monthly illustrated journal, delivered free to each member, containing matter interesting to those engaged in watch and clock making, and to which all are invited to contribute either letters, extracts, or original papers. 6. Country members, in addition to the journal and the free use of the library, reading room, models, &c., during office hours when in town, have the privilege of addressing their correspondence to the office of the Institute, to be kept for them or transmitted. 7. The exhibition of specimens of workmanship, tools, or instruments connected with the art.

The hours of attendance are—Museum, library, and reading room open from 7 to 10 p.m., except on Saturdays. Office hours, from 3 till 8 p.m., on Saturdays from 3 till 5. Further information may be had of John Moore, resident secretary, 35, Northampton square, Clerkenwell, E.C.]

[707.]—MILDEW IN ROOMS.—I shall be glad if you, or some of your correspondents, can give me some effectual remedy for the cure of mildew in rooms. In damp situations the consequences are, I believe, serious, and I am anxious to avoid them.—L. S.

[708.]—GOOD GOTHIC.—An interesting discussion appeared in "Intercommunication" a short time ago on periods of Gothic architecture: I should like to see a similar controversy on the best kinds of Gothic, and its distinguishing characteristics.—W. R.

[709.]—WROUGHT IRON ROOFS FOR WORKSHOPS, SHEDS, &c.—A few weeks since you gave some illustrations of wrought-iron roofs for workshops, sheds, station buildings, &c., and you gave some information about "galvanized corrugated iron, of from No. 16 to 20 gauge, the sheets to run from purlin to purlin, &c." A little more detailed practical information on the different gauges and the manner of laying will oblige.—A COUNTRY BUILDER.

REPLIES.

[688.]—FLOW OF WATER IN PIPES.—

$$v = 110\sqrt{RS} - 11\sqrt[3]{RS} \text{ (Nevill's formulæ)}$$

$$R = \text{hydraulic radius (for pipes)} = \frac{\text{diameter}}{4}$$

$$S = \text{sine of the inclination of pipe} = \frac{\text{total fall}}{\text{total length.}}$$

Then for an 18in. pipe, with a fall of 9½ft. and the length of the pipe 1 mile or 5,280ft., we have

$$v = 110\sqrt{\frac{1\cdot5}{4} \times \frac{9\cdot5}{5280}} - 11\sqrt[3]{\frac{1\cdot5}{4} \times \frac{9\cdot5}{5280}} =$$

$$110\sqrt{\cdot375 \times \cdot001799} - 11\sqrt[3]{\cdot375 \times \cdot001799} = 2\cdot6711 \text{ feet}$$

per second velocity.

This multiplied by the sectional area of the pipe will give a discharge of 4·72 cube feet per second, which being multiplied by 60 will give a discharge of

283·2 cube feet per minute.

The above formulæ is for long straight pipes.

Where pipes are less than 1,000 diameters in length, a correction must be made for loss of head due to friction and form of orifice at the junction of the pipe with the reservoir—

$$h = C\,v^2$$

h = loss of head in feet.
v = velocity in feet per second.
C = ·0234 for round orifices.
= ·0155 do. when bell mouthed.
= ·0303 do. when the pipe projects into the cistern.

FRICTION OF BENDS.—Where there are any bends a correction must be made for loss of head due to their resistance—

$$h = V^2 \times \text{sine}^2 \times \text{No. of bends} \times \cdot0003.$$

h = loss of head in inches.
V = velocity in inches per second.

The value of h for loss by bends and for loss by friction in short pipes must be deducted from the total head, and the velocity and discharge calculated from the reduced slope.

Beardmore, in his Hydrology, gives the following formulæ for the discharge of water through pipes:—

$$q = 2356\,\frac{\sqrt{d^5}}{\sqrt{\frac{l}{h}}}$$

d = diameter of pipe in feet.
l = length do.
h = head do.
q = discharge in cubic feet per minute.

Taking the length, fall, and diameter of the pipe as before, we have—

$$q = 2356\,\frac{\sqrt{1\cdot5^5}}{\sqrt{\frac{5280}{9\cdot5}}} =$$

275¾ cube feet per minute.

—A. SCARGILL, Sheffield, Dec. 26.

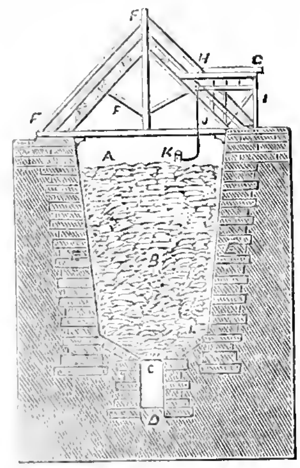
[690.]—GAUGING WATER.—

$5 \cdot 1\sqrt{h^3}$ = the cube feet per minute of water flowing over a notch or weir of thin iron, 12in. wide.

h = the depth of water in inches flowing over the weir.

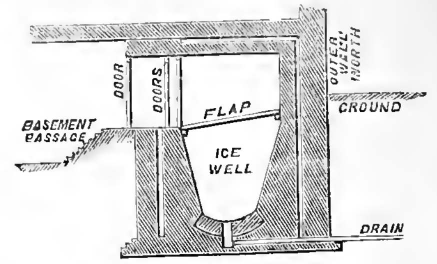
For farther information on the subject consult a work ("Treatise on Waterworks") by Samuel Hughes, published by Weale.—A. SCARGILL, Sheffield.

[698.]—ICEHOUSES.—Considering how easily and cheaply icehouses may be constructed, I have often wondered that one is not attached to every respectable country house. According to Dr. Ure's Dictionary of Art and Manufactures, the simplest and most scientific form is a double cone, that is, two cones joined base to base, the one sunk underground being of stone or brick, and the upper one of carpentry, thatched and pointed at the top. Select a dry and, if possible, a sandy soil, and dig a hole about 16ft. in diameter, terminating below like the point of a sugarloaf. About 24ft. is a moderate depth, but the lower it is the longer it will keep the ice if it is well filled. Slope the ground progressively towards the axis of the cone to prevent the earth falling in. At the bottom excavate a well about 2ft. wide and 4ft. deep, covered at the top with an iron grating to support the ice and let the water drain away. The conical slope must be faced with brick or stonework, about 1ft. thick and jointed with Roman or some other air and water-tight cement. The upper cone may be, as I said, of carpentry or of brick; the latter is, of course, the most durable. An oblong passage into the interior must be constructed. This should face the north, and be at least 8ft. long by 2½ft. wide, and perfectly closed by well-fitting doors, one at each end. A gutter to carry off the rain to a distance from the icehouse should be placed all round the bottom of the conical cover and prevent the ground from getting soaked with moisture. The icehouse should have no window, but be, as it were, hermetically sealed at every point except its cesspool, which may terminate in a water trap to prevent circulation of air. The annexed illustration shows the section of an icehouse constructed according to these directions. Under



the ice chamber A the ice is rammed into the space B. C is the grade of the drain sink D. The portion E E is built in brick or stone. The base L slopes inwards towards the centre of C. The upper part of the brickwork F F is a little way below the level of the ground. The wooden framework F F F F forms the roof, and is covered with thick thatch. G H is the woodwork of the door I. At K is shown the bucket for lifting ice by means of the cord J passing over the pulley M, which enables it to be raised easily.—I. H.

[698.]—An icehouse may be contrived either as a cellar attached to a house or as a separate building. It is generally, though not necessarily, circular, and should be at the north end of the building. The diameter at the top should be from 6 to 10ft., tapering to 3 or 4ft. at the bottom, and the depth about equal to the top diameter. The well should be surrounded by double walls with a space of 6in. between them, and the ceiling should also be similarly constructed. A flap may be provided to cover the top of the well. The entrance should be small and provided with double doors. A trapped drain must be laid to carry off the melted water at the bottom of the well. It should all along be remembered that damp is to be dreaded even more than warmth. The ceiling should be covered with 3ft. or 4ft. of earth, and the connection with the house should be made by an underground passage about 5ft. in length, with double walls and doors. All the double walling should be of brick, as stone is a conductor

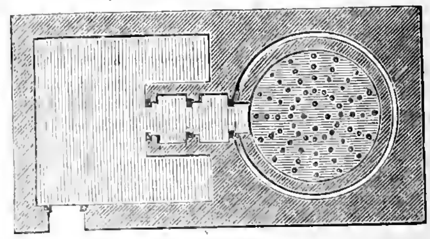


of damp. A coating of asphalte may be used either in addition or to render single walls impervious to damp.—C. E. I.

[698.]—In reply to "W. W.," I send plan and section of an icehouse proposed to be erected in basement floor of a building, inaccessible to light or air, and to be built of brick, rendered in cement.

Fig. 1 shows plan of icehouse, with double wall and

FIG. 1.



opening between to keep it dry. The three doors to entrance are made as close as possible, the space between them being filled with straw, so as to exclude the air.

Fig. 2 shows section of ditto; the floor perforated with

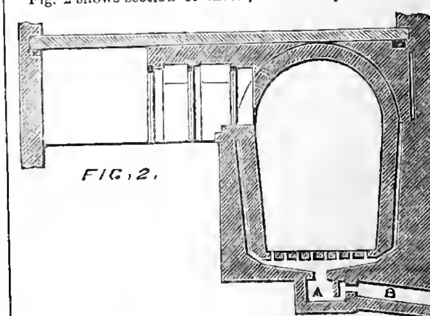


FIG. 2.

holes to let off the water from the ice. A, air-trap from ditto, rendered air and water-tight by a lining of White's cement, or by a metal air-trap; B, drain from ditto. A short ladder to be used to obtain access to ice when low.—L. C. BRIDGMAN, Barum.

[700.]—ASPHALTE PAVEMENT.—In reply to "C.B.O.," the asphalte in Manchester is prepared by melting pitch and adding a sufficient quantity of creosote oil, and boiling both well together in portable boilers until a suitable consistency is obtained, and then poured on while hot, the joints of the sets being previously filled in with clean washed pebbles or shingle and beaten with a beater.—H.R.

[700.]—Your correspondent "C. B. O." wishes to know the mode adopted in laying the asphalte pavement in Paris. The method adopted at the Place de la Concorde was this. The ground was made uniformly smooth, either in a horizontal plane or in a gentle slope, to carry off the water; the curbstones were then laid round the margin by the mason, more than four inches above the level of the ground. This hollow space was filled to a depth of three inches with concrete, containing about a sixth part of hydraulic lime well pressed upon its bed. The surface was smoothed with a thin coat of mortar. When the mass had become dry, the mosaic pattern was set out on the surface, the moulds being formed of flat iron bars, rings, &c., about ½in. thick, into which the fluid mastic was poured by ladles from a cauldron and spread evenly over. The asphalte rock is first of all roasted in an oven to render it friable, so as to be easily reduced to powder and passed through a sieve ¼in. square in the meshes. The asphalte is rendered fusible and plastic by bitumen, which is melted in small quantities, and then the asphalte in powder is stirred in to the amount of about twelve times the amount of bitumen. About a bucketful of small gravel, previously heated apart, is next stirred in, and the asphalte is fit for use. It only requires to be poured into the moulds.—W. S. P.

[700.]—In reply to the inquiry of "C. B. O.," in the BUILDING NEWS of December 27, as to the process of forming bituminous roadways in Paris, I beg to inform him that the first essential is a good foundation of concrete. The asphalte employed is a natural rock brought from the Val de Travers, containing a large percentage of the oil of petroleum, and, in consequence, not so valuable an asphalte for ordinary purposes as the quality known as Pyrimont. The asphalte rock having been calcined is in that state, and while hot brought to the work and laid upon the concrete to a depth of 4in., workmen during the process using iron beaters to consolidate it. Finally, an iron roller is passed over the surface to make a perfectly even one, and when quite cold it becomes again the compact rock. It is found slippery during a humid condition of the atmosphere, and on that account, besides the extraordinary general traffic and speed of cabs in London, is not considered a system applicable to the paving authorities to adopt.—A. B., Dec. 30.

STATUES, MEMORIALS, ETC.

The statue proposed to be erected to the restorer of the ancient cathedral of St Patrick, Sir Benjamin Lee Guinness, Bart. (and for which Mr. Foley's model has been approved), is to be placed in front of the southern transept of that venerable pile. The statue will be in bronze.

The "New York Tribune"—perhaps somewhat sneeringly—writes thus of Story's new statue of Edward Everett:—'The statue of Edward Everett, by Mr. William Story, has reached Boston, and been set up in the Public Garden. It is in gold bronze—an exceedingly ugly material, at least when it is new—and of a size considerably larger than life. The Boston people, who ought to know, say that it is no likeness; and all the Boston boys are making fun of the attitude."

LEGAL INTELLIGENCE.

A question of some importance as to the liability of building societies is just now occupying the attention of those interested in their prosperity. Mr. Tidd Pratt has given his opinion on the subject. Being asked:—"Whether members of a society enrolled and certified pursuant to 6 & 7 William IV., cap. 32, can be held or made liable, as shareholders therein, for any debts or engagements of the society," that gentleman said, "I am of opinion that the members of a benefit building society cannot be held or made liable as shareholders for any debt or engagement of the society." If this be true, asks a correspondent, then where is the guarantee or security for depositors who place their money at a certain rate of interest in a building society; and, secondly, what becomes of Mr. Tidd Pratt's legal capacity to give an opinion whereby thousands upon thousands of working men are led into a trap of unlimited liability. When Vice-Chancellor Wood has decided in "*Re* the Doncaster Permanent Building and Investment Society," wound up in Chancery, not only the shareholders who had not borrowed, but also those who had borrowed, had each to pay their quota, and did pay their quota, of the whole debts and liabilities of the society, besides the money borrowed and shares paid up. This society was enrolled under William IV., 6 & 7, cap. 32, and certified by Mr. Tidd Pratt.

Our Office Table.

Mr. Beresford Hope proposes, on the reassembling of Parliament, to call the attention of the House of Commons to the state of buildings possessing archæological or historical interest, in the custody of public departments.

A new alloy of aluminium has been made known in Paris. It consists of one-third silver and two-thirds aluminium, and is said to be harder than silver, and more easily engraved. The new metal is being supplied to commerce at the rate of 38s. per lb.

M. Charles Garnier, architect of the new Paris Opera, has just been elected an honorary member of the Royal Institute of British Architects, which only comprises five or six French members, among whom are MM. Baltard and Dauban.

The demand for local museums of industry and fine arts, which is now so active throughout Europe, has extended to India. The Lieutenant-Governor of the north-western provinces has organized a committee of action for his district, and has laid down the principle that a museum should be established at the head-quarters of each revenue division, and that the chief museum for the north-western provinces should be at the seat of Government. Collections of diagrams and drawings illustrating processes and works on decorative art have been ordered to be sent from England. The main objects of local museums are defined to be—first, the improvement of manufactures; and second, the preservation of ancient and improvement of modern art. An official memorandum states that in order to prevent natives from thinking that European designs were desirable as copies for ornamentation, it would be necessary to procure many modes of illustration from different parts of India and the East generally, and that, "it is not, however, in the modern art manufactures of India that the means can be found to give new life to the native designer. It is in the architecture of the country that power and more original ideas can be found."

Now that Bunhill-fields burying ground has come into the possession of the Corporation, by an act passed last session, we understand that the Corporation will at once set about planting the ground, laying out walks, and preserving the tombstones. The ground will then be thrown open to the public under proper regulations.

The ingenuity and perseverance displayed by some criminals in order to dispel the gloom of their prison life, to some extent at least, are well known. In a new work "Black and White," occurs an interesting account of an American model prison, in which it is stated that a prisoner who was practising the trade of a weaver, had arabesqued the walls of his cell with considerable taste in imitation of Raphael's "Loggia." His colours he had obtained by extracting the dyes from the yarns given him to work with. The decoration of the cell was only half completed when he came out at the expiration of his sentence; but unfortunately before long he committed another offence, was caught, and convicted. He was confined in the same cell, and completed his design. The warder said mournfully it was beautiful, but the colours are fading now. The writer adds that the artist can hardly be expected to come in again to restore its freshness. This prison is built in galleries, mostly of two storeys, radiating from a centre, and covers ten acres. It contained 571 prisoners, each prisoner being in a separate cell.

Several new streets in Paris have been baptized by the names of old masters of French and foreign schools. For instance, two new streets running close to the Pare Monceaux are styled Rue Rembrandt and Rue Murillo; and we have the names of Veronese, Primatrice, Pn. de Champaigne, Mignord, and Isabey scattered in different directions of the town.

There is a likelihood of a strike taking place in the building trades at Chesterfield. Joiners, masons, and bricklayers now work 53½ hours per week. In Sheffield and (the men say) other towns the hours are 55½. They therefore demand a concession of the three hours which make the difference between them and their fellow-craftsmen in Sheffield. They have given notice of their demand, and asked that a compliance with it shall take place on the first week in April next. The masters refuse to make the concession.

A bust, supposed to be of the fifteenth century, and which excited great attention among art connoisseurs in Paris in 1865, was recently purchased at great cost for the Louvre Museum. It now transpires that it is the work of a living artist, and one of those sham antiquities which abound in Europe.

Nitro-glycerine has of late been the cause of so much awful destruction to life and property, that there is a kind of satisfaction in recording the annihilation of so destructive an agent. At all events a quantity of nitro-glycerine reported from Usworth Colliery was destroyed the other day by order of the Gateshead magistrates. The liquid was contained in a wicker covered canister, and was conveyed to a field and a lighted patent fuse was placed in the bung. The spot chosen was away from any human habitation. When the compound fired, a light blue smoke was wafted into the air, followed by a report like the roar of artillery. The ground where the explosion took place was torn and ragged for many yards around, while the top of an adjoining hedge was neatly clipped.

We understand that a gold medal in Class 93, for examples of dwellings characterized by cheapness combined with the conditions necessary to health and comfort, has been awarded to the Metropolitan Association for Improving the Dwellings of the Industrious Classes (Incorporated by Royal charter). An average rate of mortality of 17 per 1,000 has been maintained in the dwellings of the Association for seven successive years, while the average rate of mortality of the metropolis generally has been near 24 per 1,000. This Association has now provided accommodation for 682 families, and 362 single men.

The Californian papers announce new discoveries of asphaltum near Wilmington, Los Angelos county, some of which comprise many acres. A company has of course been organized, and they propose to make thorough tests of the new acquisition, relating to its value as a fuel.

The rapid increase during late years in the number of patents annually granted for new inventions in the United States is something astonishing. The report for the year ending October 1, shows that 2,500 more applications were made this year than last, and over 5,000 more than on any previous year. The whole number of applications was 16,547. Of these, 12,879 were allowed, and 11,655 have been issued—an increase of about 3,000 over last year's issue. During the same time, 3,486 caveats were filed, 96 applications for extensions were received, and 82 extensions were granted.

We have received the enclosed from an architect, who begs us to be so kind as to publish it. We leave out the names this time, but cannot always promise to do so in similar cases:—Sir,—We beg to call your attention to enclosed sample of our patent roofing, which is equally applicable to covering damp floors or walls, and lining temporary wooden buildings. A discount of 10 per cent. will be allowed to members of your profession.—We have the honour to be, your obedient servants, ——— Company.

It is said that one of the most valuable properties in London is likely to become the subject of a lawsuit. St. Katherine's Docks are claimed by an officer in the Indian army, the son of a former Governor of the West Coast of Africa. This officer and a brother were, if the claimant's statement is to be believed, entitled to the fee-simple of the land on which these docks now stand. The brother died during the Indian mutiny, and the survivor now contends that this enormously valuable estate, bringing in £90,000 a-year, is his.

The unfortunate stage carpenters employed at Her Majesty's Theatre at the time of the late calamitous fire by losing their tools lost the means of providing for their families. "We have applied," they say, "to the honorary secretary of the Employes' Relief Fund, and have been told that the sum collected is not ready yet for distribution, and that we must wait; but, Sir, we beg leave to say, what gentlemen call waiting is starving to us, and that could we only get part of our tools to go on with we should feel grateful."

A number of French gentlemen residing in London have conceived and gone far to carry into execution a plan for the formation of a hospital specially devoted to French, Belgians, Swiss, &c., but which will, in fact, be open to the whole resident foreign population. In order to carry out this design, a committee has undertaken to raise subscriptions, and to hire for the present a large building in the centre of the French quarter, which will be fitted up as a hospital. Dr. Genean de Mussy and other eminent French medical men have promised their services.

M. Lenormant, of Paris, has lately laid before the Academy of Sciences the results of his examination and study of a papyrus in the British Museum, hitherto undeciphered. He states it to be the fragment of a curious treatise on surveying. The areas of various regular and irregular figures are computed, as also the cubic contents of pyramids, &c. M. Lenormant conjectures that the papyrus belongs to that period of the twelfth dynasty which would connect it with Solomon's age.

The "Chronique des Arts" tells a curious story, which shows very strikingly to what perfection the art of manufacturing sham antiquities has attained in Italy. In 1864, M. de Nolivos, a French art-collector, bought at Florence a bust of Girolamo Benivieni. It was exhibited in the following year in Paris, where it was pronounced by connoisseurs to be the work of either Mino da Fiesole or Benedetto da Majano (1490—1510.) M. de Nolivos's collection was sold by auction in Paris last year, when the bust excited a lively competition, and was finally secured by the Government, at a large price, for the Louvre Museum.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1321. J. BALL. MANUFACTURE OF BRICKLAYERS' AND OTHER TROWELS. Dated May 6, 1867.

This invention consists in making trowels of cast, shear, or other steel, rolled and cut to pattern by a machine, and afterwards hammered out to a proper thickness. The plate is cut with the tang and blade in one piece; the tang is then pressed into a hollow or trough-like shape, and

filled in with a piece of malleable or forged iron, which is riveted thereto, and gives the necessary strength to the tang. *Patent completed.*

1326. W. R. LAKE. IMPROVEMENTS IN LOCKS. (A communication.) Dated May 6, 1867.

This invention relates to the construction of a lock which is more especially designed for securing the doors of dwelling houses, and which, by a simple adjustment of parts, will act either as a simple latch opening by a handle on both sides of the door, as a night latch, which can be opened from the outside of the door by the aid of a latch-key, or as a lock or fastening which can only be opened from the inside of the door. The said improvements consist, chiefly, in the peculiar construction of the lock bolt. This bolt is formed in two parts, which are connected or disconnected to effect the various changes in the effect and operation of the lock. One of these parts projects from the case of the locks, and forms the fastening, while the other part which is permanently in connection with the tumblers of the handle forms a retractor for drawing back the said fastening. Each of the two parts of the bolt is forced forward by a separate spring. The said improvements also consist in the combination of the said bolt with an adjustable connecting link or arm and with a cam for operating the same. The said link is pivoted to one part of the bolt, and is formed and arranged to connect and disconnect readily with the other part. The said improvements consists further, in constructing the connecting link with projections or ridges which are formed and arranged to slide through the wards of a split key. The said link may be divided into a number of thin plates or divisions, each of which may be raised independently of the others by differently formed keys. The said improvements further consist in the employment of a swivel, spindle or stem to connect the handles by which the bolt is operated on both sides of the door, and in the combination with the said spindle and bolt of a split tumbler, one leaf of which acts on the fastening or projecting part of the bolt, and the other on the retractor. In this arrangement of parts the rear end of the said fastening is extended and remains permanently in contact with the leaf of the split tumbler, which is operated by the inner handle, but can not be moved by the outer handle till the two parts of the bolt are connected. The said improvements consist, lastly, in the combination of the bolt, link, cam, handle and other parts of the mechanism for effecting the required changes and movements of the lock. *Patent completed.*

1354. H. R. COTTAM. IMPROVEMENTS IN ORNAMENTAL BALUSTERS AND BALUSTRADES, AND OTHER ORNAMENTAL RAILS. Dated May, 6, 1867.

This invention consists in forming ornamental balusters and balustrades of iron bars with grooves in them with overlapping flanges, and into each such groove the patentee slips lengths of ornamental tiles, so as to fill up the grooves from end to end, whereby a highly ornamental effect is inexpensively obtained. *Patent completed.*

1366. S. W. WORSSAM, JUN. IMPROVEMENTS IN MACHINERY OR APPARATUS FOR WORKING WOOD. Dated May 8, 1867.

This invention relates more particularly to that class of machine known as the "Universal Joiner," and consists, first, in the application to such machines of means of apparatus whereby tenons may be completely cut in one traverse of the wood. For this purpose the patentee employs, according to one arrangement, in addition to the ordinary saw or machine spindle, two vertical rotating spindles upon which suitable saws or cutters are fixed, the wood being fixed in a vertical position to a suitable clamp, and passed across a pair of saws on the main spindle of the machine, thereby producing two cuts or kerfs the length of the required tenon; then by continuing the traverse of the clamp, the material is passed between the saws or cutters on the two vertical spindles in such manner asto form the shoulders of the tenons, and allow the cheeks or waste pieces to fall away. The invention consists, secondly, in the application to such machines of means whereby they are rendered capable of producing larger and more perfect mouldings than has previously been the case. For this purpose he employs self acting feed rollers to feed the material up to the cutters, which he places on a cutter block on the end of the machine spindle, the material being fed beneath such cutters on a suitable table by the feed motion above described. The invention consists, thirdly, in the application to such class of machines of means for squaring out and completely finishing the ends of mortices, which are at present left of a semicircular form, on account of the form and action of the cutters by which they are produced, the squaring out (according to the ordinary plan) being afterwards effected by hand. For this purpose he fixes suitable chisels or cutters to the main standard, or other suitable part of the machine, in such manner that, when the revolving tool has done its work in producing the mortice, the material, without removing from its table, is pressed forward on to the chisels or cutters, so as to effect the completion of the mortice, such chisels or cutters being capable of adjustment to different sizes of mortice, and being capable of removal, or of being turned out of the way when not in action. *Patent completed.*

1371. J. BOWDEN. AN IMPROVED "BIB," "STOP," OR WATERCLOSET TAP OR COCK. Dated May 9, 1867.

According to this invention the water is received from the feed or supply pipe in a cup or socket thereon, in which the inventor places a ball of gutta percha or other buoyant material. The outer portion of the said cap or socket is chased or screwed so as to receive a cap or cover, projecting from the side of which is the discharge pipe. At the joint between the socket and the cover is formed a flange, such joint being made perfectly water-tight by means of a ring or washer of india rubber, which ring also forms the valve seating. In the direction of the axis of the feed pipe, and through the cover, is a piston rod, working in a stuffing (or through a second ring of india rubber), the internal end of the piston rod having an enlarged concave end, the other or external end of such rod terminating in a button or thumb piece. The action of the tap or cock is as follows:—On the water entering the feed pipe, the ball in the socket or enlarged end of such pipe is forced against the ring or washer forming the valve seating, the pressure of water on the ball retaining it firmly on its seating until water is to be discharged, when pressure by the thumb on the button of the piston (or by a crank and lever) will, by the other or concave end of piston) remove the ball from its seat, and allow escape of water by way of discharge pipe. Applied to water-closets the button end of the piston will be passed through the seat of the closet, or the seat may be hinged and rest on the button, so as to render the tap self acting: in the supply pipe near the tap or cock, he constructs a syphon to prevent passage of noxious gases to mains when empty. *Patent abandoned.*

Trade News.

TENDERS.

ALFRETON.—For enlargement and restoration of Alfreton Church. Messrs. Hine and Son, Nottingham, architects:—

Critchlow	£2,960
Gregory	2,700
Barker	2,680
Dennett	2,677
Chappell	2,497
Thompson	2,468
Johnson and Wright	1,344

BARNET.—For the erection of a detached villa at Barnet, for Mr C. J. Breese. Messrs. Tolley and Dale, architects:—

H and J. Johnston	£1,025
J. Langmead	950
Capps and Ritso	900
Fawcett	875
Ennor (accepted)	823

BISLEY (SURREY).—For the erection of the Boys' Industrial Home, at Bisley, Surrey. Messrs. E. Habersbon, Brock, and Webb, architects:—

Pattman and Fotheringham	£6,589 0
Haynes	6,450 0
Bird	6,380 0
Brass	6,270 0
Newman and Mann	6,237 0
Simpson	6,204 8
Higgs	5,830 0
Manley and Rogers	5,720 0
Carter and Son	5,599 0

CITY.—For alterations to No. 38, Great Tower-street, for Mr. R. S. Meggy. Mr. William Powell, architect:—

Turner	£310
Fisher	300
Wren	268

ELTHAM.—For the erection of four detached villas at Eltham, for Mr. A. F. Timothy. Messrs. Tolley and Dale, architects:—

Fawcett (accepted)	£5,600

HOLLOWAY.—For the completion of two carcases on the Tuffnell Park estate, for Mr. John Taylor. Messrs. Tolley and Dale, architects:—

Keetch and Ambrose (accepted)	£400

HAVERHILL (SUFFOLK).—For the drainage of the town. Mr. B. Fitch, engineer:—

Tinsley and Turner	£1,065 9
Harris	957 0
Moxon	950 0
Dewitt	930 0
Mason and Son	914 0
Faulkner and Cowley	849 0
Bloomfield	840 0
Garwood	795 0
Potter	780 0
Hall	759 0
Fell (accepted)	738 9

HARROW-ON-THE-HILL.—For two houses and shops, for Mr. Wm. Winkley. Mr. W. H. Woodman, architect. Quantities supplied by Mr. T. T. Green:—

Avery	£2,285
Woodbridge	1,920
Upchurch and Hanks	1,912
Taylor	1,910
Lander	1,900
King and Sons	1,860
Baker	1,852
Gibson, Brothers	1,847
Shurmer	1,793
Salter	1,644

LONDON.—For rebuilding Meriton's Wharf. Mr. Richard Bree, architect:—

Webb and Sons (accepted)	£25,000

OXTED (SURREY).—For alterations and additions to the North Lodge, Stone Hall, Oxted, Surrey, for Mr. G. Barker. Messrs. Tolley and Dale, architects:—

Labour and part materials.	
Galyard (accepted)	£52 10

OXTED (SURREY).—For the erection of horticultural buildings, engine house, mushroom house, and sheds adjoining, at Stone Hall, Oxted, Surrey, for Mr. G. Barker, Messrs. Tolley and Dale, architects:—

Weeks	£942 0 0
Knight	918 0 0
Capps and Ritso	833 15 0

SCARRINGTON (NOTTS.).—For building parsonage house and offices, at Scarrington, Notts. Messrs. Jackson and Heazel, architects:—

Gilbert	£1,670
Thompson	1,640
Mason	1,564
Marriott and Co.	1,490
Cooper	1,465
White	1,459
Wood and Sleight	1,450
White and Lamb	1,448
Slim	1,392
Barker	1,382

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Latham, Bedford place, Russell-square, engineer, January 16, at 2—George Lyon, Upper Kennington lane, dealer in building materials, January 16, at 11—John Tough, Downham-road, Kingsland, civil engineer, January 16, at 2—William Cooper Wilson, Claremont-terrace, Hackney, builder, January 29, at 12.

TO SURRENDER IN THE COUNTRY.

John Dyson, Rawcliffe, near Goole, bricklayer, January 8, at 12—Isaac Kirkbride, Carlisle, marble mason, January 10, at 11—Robert Marshall, Everton, builder, January 10, at 12—James Parsons, Plymouth, mason, January 11, at 11—John Clarke Teale, New Malton, contractor, January 6, at 11—Robert Bailey, Ipswich, paper hanger, January 7, at 11—Robert Bowden, Monkwearmouth Shore, painter, January 10, at 12—Edward Horrex, Bury St. Edmund's, builder, January 14, at 11—Richard Shortridge, Plymouth, plumber, January 13, at 12.30.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

February 6, J. Watkins, Battersea, builder—February 14, D. Brooks, New-inn yard, Shoreditch, builder—February 14, J. B. Shepherd, Bucklersbury, surveyor—February 6, J. Jowers, Silchester-road West Notting-hill, builder—February 11, W. Orrin, Colchester, builder—February 13, R. Chatfield, Croydon, bricklayer—January 20, H. F. Simmonds, Prospect place, Cambridge-heath, builder—January 22, J. Huntley, Acton, builder—January 24, J. Dunbar, Lower Norwood, engineer—January 24, H. Alvey, Teddington, builder—January 29, G. Cockrell, Melbourn-terrace, Notting-hill, carpenter—February 13, J. Hart, Exmouth, contractor—January 15, J. Farrar, St. Helen's, builder.

PARTNERSHIPS DISSOLVED.

Bury and Pollard, New Park-street, Southwark, engineers—Thompson and Co., Northowram, stone merchants—Simms and Marten, Lawrence Pountney-lane, builders—Crosly and Robertson, Liverpool, decorators—J. and J. Langton, Bush-lane, timber merchants.

DIVIDENDS.

January 22, C. E. Bennett and T. E. Hignett, Liverpool, timber merchants.

DECLARATION OF DIVIDEND.

T. Freeman, Spa-road, Bermondsey, timber merchant, div. 2s. 7½d.

SCOTCH SEQUESTRATION.

George Rattray, Glasgow, painter, January 3, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£9 0	£10 10	Archangel, yellow		£11 10	£13 0
Quebec, red pine		3 0	4 10	St. Petersburg, yel.		10 10	11 0
,, yellow pine		2 15	4 0	Finland		6 0	9 0
St. John N.B. yellow		0 0	0 0	Memel		0 0	0 0
Quebec Oak, white		3 5	5 10	Gothenburg, yellow		8 10	10 10
,, birch		3 10	4 10	,, white		6 0	9 0
,, elm		2 10	6 0	Gefle, yellow		9 0	11 0
Dantzic oak		3 0	3 0	Soderham		9 0	10 10
,, fir		3 0	3 10	Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir		2 10	3 0	yellow		16 0	22 0
Riga		3 0	3 5	Deck Plank, Dantzic, per 40 ft. 3 in.		0 15	1 4
Swedish		3 0	3 5	Pumice Stone pr ton		6 0	8 0
Masts, Quebec red pine		6 0	7 0	Oils, &c.			
,, yellow pine		3 0	6 0	Seal, pale	per tun	40 10	41 0
Lathwood, Dantzic, fm		4 10	5 0	Sperm body		110 0	112 0
,, St. Petersburg		6 10	7 10	Cod		36 0	36 10
Deals, pr C., 12 ft. by 8 by 9 in., duty 2s per load, drawback 2s.				Whale, 8th. Sea, pale		39 10	0 0
Quebec, white spruce		18 0	19 0	Olive, Gallipoli		67 10	68 0
St. John, white spruce		13 10	16 10	Cocoanut, Cochin, ton		56 0	57 0
Yellow pine, per reduced C.				Palm, fine		40 10	41 0
Canada, 1st quality.		17 0	18 10	Linseed		34 15	35 0
2nd ds		11 10	12 10	Rapeseed, Eng. pals		34 0	28 10
				Cottonseed		33 0	39 10

IRON:—					
Welsh Bars in London	per ton	6 7 6	6 10 0	3	
Nail Rod	do	7 10 0	7 15 0		
Hoops	do	8 10 0	9 0 0		2½
Sheets, Single	do	9 15 0	10 0 0		
Staffordshire Bars	do	7 10 0	7 15 0		
Bars, in Wales	do	5 15 0	6 0 0	5	
Rails	do	6 10 0	6 0 0	net	
Foundry Pigs, at Glasg. No 1	do	2 13 0	3 5 6	2½	
Swedish Bars	do	10 5 0	10 10 0	ne	
STEEL:—					
Swedish Keg, hammered	per ton	15 0 0	15 10 0	2	
Swedish Faggot	do	10 10 0	12 10 0	2	
COPPER:—					
Sheet & Sheathing, & Bolts	per ton	80 0 0	82 0 0		
Hammered Bottoms	do	92 0 0	0 0 0		
Flat Bottoms, not Hammered	do	85 0 0	0 0 0		
Oaks and Tough Ingot	do	71 0 0	72 0 0		
Best Selected	do	79 0 0	80 0 0		
Australian	do	83 0 0	84 0 0		
Y 1. Metal Sheathing & Rods	per lb	0 0 7	0 0 0		
ZINC:—					
English Sheet	per ton	26 10 0	27 0 0	2	
Devaux's V. M. Roofing Zinc	do	29 0 0	0 0 0		

* And 5 per cent. discount if laid upon the new system

TIN:—					
English Block	per ton	96 0 0	96 0 0		2½
do Bar	do	93 0 0	97 0 0		
do Refined	do	99 0 0	99 0 0		
Banca	do	94 0 0	95 0 0		cash
Straits	do	90 0 0	0 0 0		
LEAD:—					
Pig, English	per ton	21 10 0	0 0 0		2½
,, Spanish Soft	do	19 0 0	0 0 0		
Shot, Patent	do	22 10 0	0 0 0		
Sheet	do	24 10 0	0 0 0		
White	do	27 0 0	30 0 0	5	
SPELTRE:—					
On the Spot	per ton	21 0 0	21 2 6	net	
QUICKSILVER	per btl	6 17 0	0 0 0		
REGULUS OF ANTIMONY					
French	per ton	28 0		0	

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 10, 1868.

THE LIFE AND WORKS OF SIR CHARLES BARRY.*

IT is hardly necessary to remark that the appearance of this work has nothing to do with the recent controversy as to who was the architect of the New Houses of Parliament. That some such impression as this may prevail among a certain portion of the public is just possible; but it was very generally known that a life of the late Sir Charles Barry had been in preparation for some length of time, and its appearance was looked forward to with a considerable degree of interest by the members of the profession to which he belonged, and of which he was so distinguished an ornament. "The inevitable difficulties in the task of preparation," to quote the words of the preface, "the duty of wading through long official documents, and the necessity of seeking in many quarters information, have delayed the publication of the memoir to a period far later than that originally contemplated." That the Pugin-Barry controversy may have somewhat hastened its publication is very likely, but the discussion of the question itself forms no part of the work. Dr. Barry, we observe, has, this very week, published a separate answer to the claims advanced by Mr. E. W. Pugin, in favour of his father, in connection with the Houses of Parliament, and that answer we shall notice on another occasion. The only allusion to this subject contained in the life before us occurs in the shape of an addendum to the preface. It runs thus:—

> Since this work was printed the risk alluded to in page 195, as likely to arise from the employment of the late Mr. A. W. Pugin, on the New Palace at Westminster, has been unexpectedly realized, fifteen years after his death, by some extraordinary claims put forward by his son. These claims, referring as they do to a question raised and settled in the lifetime of those concerned, have not appeared to me to require any notice in these pages. I have, therefore, left the passage in pp. 194-198 precisely as it was originally written, without the alteration of a single word. It contains the exact account of the connection which existed between Mr. A. W. Pugin and my father, and which, I repeat, so far as Sir Charles Barry's knowledge and feeling were concerned, was never broken by any dispute or estrangement, from the day when Mr. Pugin (then a young man of twenty-three) was first employed on the drawings of the New Palace, until the day of his death, in 1852.

Apart from his professional labours, the career of Sir Charles Barry presents few incidents of interest. His was a working life, but it was not an eventful one. He was the fourth son of a respectable stationer, and was born in Bridge-street, Westminster, on May 23, 1795, "in a house which (until last year) lay under the shadow of the clock-tower of the New Palace at Westminster." Notwithstanding that his father was a man of some wealth, Charles Barry appears to have had little advantage of education, or perhaps he took little advantage of the opportunities presented to him, for we are told that he was not very studious, full of fun, and by no means averse to mischief. When he left school at the age of fifteen, he had attained, however, to a superficial knowledge of English, a good proficiency in arithmetic, and a remarkably beautiful handwriting. Possessing strong artistic tastes, he was articled to Messrs. Middleton and Bailey, architects and surveyors, of Paradise-row, Lambeth. There he remained for six years, attaining his majority in 1816. Young Barry was a regular exhibitor at the Royal Academy, in the department of architecture, during the greater portion of his apprenticeship, but it does not appear that he distinguished himself in any way. Like all young architects of spirit and ambition, Barry now longed for the advantages of foreign travel, and accordingly, shortly after his articles were completed, he set out on a great educational tour. He left England in June, 1817, and remained abroad for more than three years. He travelled through France and Italy, visited various parts of Greece and Turkey (in company with Mr., afterwards Sir C. Eastlake), made an interesting tour in Egypt, Palestine, and Syria, and returned home through Italy and France, in August, 1820. The Eastern tour, it would appear, did not form a part of Mr. Barry's original programme. He had got as far as Constantinople, and was preparing to turn homewards, when an offer was made to him which he glady accepted. A gentleman, on his way to the East, struck by the beauty of Mr. Barry's sketches, offered to take him at a salary of £200 a year, and to pay all his expenses, in consideration of retaining all the original sketches he might make, the artist being allowed to make copies for himself. This was the third period of his travels, and he was wont to regard it as more important to him than all that had gone before. For one thing, he was probably the first English architect who had explored this wonderful country, and the remains of its architecture, we are told, made a far deeper impression on his mind than all Italy and Greece combined. He travelled with Mr. Ballie for nearly a year, and during that time executed about 500 drawings for him. Mr. Barry kept a journal in which he recorded the impressions which the grand old temples, palaces, and tombs, produced upon him. Many of these are minutely examined and described, as regards their dimensions and details. His critical notes, without being very strikingly expressed, show the strength of his artistic taste, and the acuteness of his observation. His remarks on the two great buildings of St. Peter's at Rome, and the Pantheon, might be quoted as specimens of his critical judgment. They reveal some of the leading principles of his composition. Says his biographer, St. Peter's disappointed him greatly in its elevation. He thought it had "a confused appearance, and want of simple grandeur," that "the openings in the centre were too crowded," and that "the three-quarter columns, always objectionable, did not afford sufficient relief." The details he greatly disliked. He noticed especially the want of apparent size in a building, one of the largest in the world, and accounted for it by the presence of colossal figures on the top of the façade, without anything to give the true scale,* by the want of sufficient projection in the front, and the enormous size of the windows, and by the possibility of seeing any great part of the dome from the piazza, whence alone the whole substructure was visible. On the whole, he much preferred the exterior of St. Paul's, in spite of the "piling of order upon order," which was a departure from Wild's original design; he preferred its regularity of design to the complicated front and lofty attic of St. Peter's. He thought the circular peristyle of columns under the dome far finer than the corresponding substructure in the other case; and, if only the churchyard could be enlarged, he thought that its complete insulation, and the fine perspective view which it offers, gave it a decided advantage in position and apparent grandeur.

It was far otherwise with the general effect of the interior of St. Peter's. Its magnificent size, satisfying his love of spaciousness, its beautiful proportions, and simplicity of design, its richness and completeness of decoration, producing a sense of harmony and perfection, seized his imagination at once, and seemed to "leave nothing to be desired." Its details he thought unworthy of special notice, but not so its decoration. The decoration of the dome delighted him; but the gem in his eyes was the baptistry. There the arrangements of marbles and mosaics seemed perfect, both in colour and form; it constantly recurred to him in designing, and had much to do with fixing his taste for that gorgeous kind of decoration. He delighted also in the gilding of the vault. Being wholly gilt (either dead or burnished gold), it seemed not gilt, but golden. This was to him real magnificence; "parcel gilding" was gaudy, and he held it in contempt. This vault and the ceiling of Sta. Maria Maggiore were models which he would have gladly followed in his designs, and it was with reluctance that he gave up the idea of making the roof of his House of Lords all gold.

The portico of the Pantheon he thought perfect in plan, and magnificent in effect. He admired its great depth, the increase of this in the centre, and, above all, the disposition of the inner columns, which gave apparent stability and variety of effect, without confusing the eye or obstructing the approach. He never could endure a portico which was shallow, or which had no inner columns, or which hid the wall; the background of the columns broken up by windows. But the junction to the circular building appeared to him unhappy. In fact, he objected *in toto* to the treatment of a portico as a mere porch, thinking that in all cases the portico should be a continuation of the main building.* The interior he used to quote as the finest example in the world of the grandeur of a dome, when sufficently near the eye to be comprehended in one glance. Domes like that of St. Peter's, which could only be seen by a painful throwing back of the neck, seemed to him wrong in principle. For at all times he held, that interiors should be so contrived that a spectator on entering should see enough of the design to enable him to comprehend the whole, and that, when this was not the case, there was a distraction of thought, fatal to any striking effect.

Immediately on his return to England, in August, 1820, Mr. Charles Barry commenced the practice of his profession, in Ely-place, Holborn. He experienced the usual lot of young architects generally, particularly in the matter of public competition. Of struggles, failures, and disappointments, he had his share. At one time he seems to have taken his want of success so greatly to heart that he entertained serious thoughts of quitting England, and trying his fortune in the more open field of America. We cannot but look upon it as fortunate for English architecture that he did not carry his resolve into effect. By-and-bye brighter prospects began to dawn upon him. He received much encouragement from his old masters, Messrs. Middleton and Bailey; and the Marquis of Lansdowne, whose acquaintance he had made at Rome, became a warm patron and friend. Through this nobleman he was introduced to Lord and Lady Holland, and was a frequent visitor at Holland House—these visits led in time to substantial results of work. Mr. Barry's first works of any importance were Prestwich and Campfield (Manchester) churches, the foundation stones of which were laid within a few days of each other in the month of August, 1822. They were Gothic in style, but neither design was very successful; indeed, we are told that these first essays of the future architect of the Houses of Parliament served as a continual subject of laughter to his friend Mr. Pugin, and to himself in after years. In connection with the Prestwich Church, we have the following anecdote:—

> Soon after the opening of his church at Prestwich there came an express from Manchester, stating that one of the galleries had shown signs of falling during service, that the congregation had

* "The Life and Works of Sir Charles Barry, R.A., F.R.S., &c." By Rev. ALFRED BARRY, D.D., Principal of Cheltenham College. John Murray. 1867.

* He adds "the Egyptians, who made much use of colossal figures, being fully aware of their tendency to diminish the apparent size of the building, always placed at their feet other figures of the natural size, to give the true scale."

* In his only design for a grand portico, that of the Town Hall of Birmingham, this principle was fully carried out. This design, however, was not successful in competition.

rushed out in panic, and that many were seriously hurt. By the time the then tedious journey to Manchester was over, the report had grown into "Stand Church fallen, 300 killed and wounded." It turned out that a small hair crack had appeared in the plaster in consequence of too rapid drying. A man under the gallery perceived it, and fancied that it widened rapidly, whereupon he shouted out, "The church is falling!" The consequence of this sapient proceeding was a sudden rush to the doors, at one of which the steps had not yet been fixed. Down went the temporary steps, and the congregation over them. Happily but few were hurt, and those not seriously; so the architect's reputation escaped.

In the following year he erected a church at Oldham, similar in scale and style, and also competed for the new buildings at King's College, Cambridge, the design to be either Grecian or Gothic. Mr. Barry chose the former, but his design was not successful. Next year he built the Royal Institution of Fine Arts, at Manchester, a building of considerable size and importance, in the Græco-Roman style. Here he showed a marked advance, and the originality of his work was apparent. St. Peter's Church, Brighton, belongs to the same year. It was his first important Gothic design, and was the result of a severe competition. This church was thought highly of at the time, and secured to Mr. Barry a good position in the ranks of church architects. He was very proud of this victory, and felt that he had entered on a brilliant career. During the next half dozen years his pencil was actively employed. He built Brunswick Chapel at Brighton; rebuilt Petworth Church (1827) for Lord Egremont; and erected churches at Holloway, Bulls' Pond, and Cloudesley-square, Islington, all in one year. He also designed the Sussex County Hospital (1826), and a chapel and schools at Saffron-hill, and a villa, in the Italian style, for Mr. Attree, at Queen's-park, Brighton. About the same period he sent in designs for the Leeds Exchange, for a church at Kensington, another at Streatham, for a new concert-room at Manchester, and for the Law Institution. For the Pitt Press competition at Cambridge (1828) he prepared no fewer than four different designs. He was thus busily engaged, and rapidly making a name in his profession, when, in 1829, he entered into a select competition for the erection of the Travellers' Club in Pall-mall. The result is well known. This building not only holds a high place among his works, but it is universally admitted that it offers a model for imitation in the Italian style. We may here record our unqualified disapproval of the removal of the balustrade from the Carlton-gardens front of the club, and putting in its place a common iron railing, without rhyme or reason. The Travellers' Club was completed in 1831. "Since that time the great competition for the New Palace at Westminster had been decided, and his success had secured him a place in the first rank of British architects." The drawings for the Palace were sent in on the 1st December, 1835, the competitors numbering ninety-seven. On the 26th of February, in the following year, the award was published. In 1837 Mr. Charles Barry was invited to enter a select competition for the erection of the Reform Club. The other competitors were Messrs. Basevi, Blore, Burton, Cockerell, and Smirke, and Mr. Barry's design was chosen. Those critics who declared the Travellers' Club to be a mere copy of the Villa Pandolfini were now equally busy in instituting a comparison between the Farnese Palace and the Reform Club, preferring a charge of plagiarism against its architect. Such is the usual penalty that success has to pay. The Reform Club is the Travellers' Club on a more complete and grander scale. It has been described by Mr. Digby Wyatt as an example that "the most minute attention to comfort, and the satisfactory working of utilitarian necessities, are compatible with the exercise of the most delicate sense of refinement and the hardihood of genius." The other works of Mr. Barry in the same style were the Manchester Athenæum, Bridgewater House (built for the Earl of Ellesmere in 1847)—the last of his great Italian buildings in London, and Halifax Town Hall, the last Italian building which he designed. In these buildings, particularly the last, may be traced the change which Mr. Barry's architectural taste had gradually undergone, and which was in no small measure influenced by the Gothic work at the New Palace. The change, as has been said, is chiefly traceable in a tendency to greater freedom of treatment, and to a desire for greater richness of effect. It should be noted, with regard to the Town Hall of Halifax, that the building, though designed by Sir Charles Barry, was actually carried out by his son, Mr. E. M. Barry, A.R.A. In the conversion and alteration of existing buildings, public and private, Mr. Barry enjoyed a great reputation. His skill in this respect was beyond dispute. The College of Surgeons, and particularly the Board of Trade at Whitehall, both of which he remodelled, may be instanced. A large number of private mansions also came under his transforming hand. In 1837 he reconstructed Walton House for the Earl of Tankerville; and almost at the same period, on a more extensive scale, Highclere House, Hampshire, for the Earl of Carnarvon. He considered this one of his happiest works, and called it Anglo-Italian. He effected great alterations at Trentham Hall, the residence of the Duke of Sutherland, and carried out a scheme of architectural gardens, which, considering the difficulties he had to contend with, are eminently successful. Duncombe Park, the seat of Lord Feversham, and Harewood House, were conversions on a smaller scale. But perhaps his most successful labours in this direction were at Shrubland Park, Suffolk, for Sir W. Middleton, and at Chiefden House, Berkshire. He produced very striking effects here, and no better examples of Sir C. Barry's skill in reconstruction could be pointed to. We shall return to the consideration of this volume next week.

THE BRITISH WORKMEN IN THE PARIS EXHIBITION.

THE British workman has played a rather important part in the history of the past year. For his benefit, and in obedience to his demands, which could be no longer resisted, a Reform Bill almost revolutionary in its character has been passed. In the estimation of many thoughtful men, the bill will not only alter the complexion and the composition of parties, but it will introduce social energies which in their action will materially increase the force and raise the character of England. At all events, whether for weal or for woe, the British workman is destined to play a much more important part in the affairs of the nation than he has done hitherto. He has been seen during the year in several aspects. He has been seen at multitudinous political gatherings, before commissions to enquire into the nature and workings of trades' unions, and at the Paris Exhibition. Let us look at him for a moment or two at the latter place. Early last year, efforts were made in several directions to smooth away the difficulties in the way of the British artizan visiting the Exhibition. A working man's excursion committee was formed under the presidency of Mr. Layard, M.P., which, though it fell short of its intentions, did some good. The cheap trips which were organized by Mr. Cook, who deserves all honour, assisted some 20,000 Englishmen to visit the Exhibition, and the Society of Arts, which is ever ready to promote "the arts, manufactures, and commerce," of the country, passed a minute early in the year, to the effect, that at former international exhibitions held in this country, arrangements were made by the French Government to facilitate the visits of skilled artizans, and interesting reports were made by them to their government, and believing that such visits on the part of skilled workmen, not only exercised a beneficial influence upon the men themselves, but also on the industry of the country to which they belong, the society resolved to raise a fund to be employed in aiding a limited number of workmen to proceed to Paris for the purpose of studying the Exhibition. This minute was carried into operation. Subscriptions were invited and received. The Government looked on with a favourable eye, and the Committee of Council on Education decided to place at the disposal of the Society of Arts £500, provided that the society raised at least the same amount by voluntary subscription. The sum subscribed amounted to upwards of £1,000, which enabled the society to assist upwards of eighty skilled artizans, representing the principal industries of the country, to visit the Exhibition. The endeavour was to select men whose intelligence and knowledge of their particular trades, and whose position among their fellow workmen, were such that their reports on their respective branches of industry would command attention. Several great employers of labour and chambers of commerce co-operated in the work, and foremost must be mentioned the Birmingham Chamber of Commerce. The visit of the workmen from Birmingham was organized by Mr. W. C. Aitken, who, to all appearances, performed his work admirably. Mr. Aitken's introductory report to the reports from Birmingham artizans is a valuable document. Mr. Coningsby's report on the habits of the French working classes is very suggestive. In fact, there is not a report which will not more than repay perusal. The following are the subjects reported on, and the names of the writers.

PART I.

REPORTS BY ARTIZANS FROM LONDON, SHEFFIELD, COVENTRY, BRADFORD, NEWCASTLE-UNDER-LYNE, &c.

Cabinet-making	Charles Alfred Hooper
Ceramic decoration	Aaron Green
Saws and tools	William Brunhall
Cutlery	John Wilson
Chair-making	Benjamin Lucraft
Glass-painting	Francis Kirchhoff
Wood-carving	James Mackie and R. Baker
"	
Cabinet-work	Thomas Jacob
Wood cutting machinery	William Walker and Thomas J. Wilkie
The ribbon trade	L. S. Booth
Ribbon-weaving	Joseph Gutteridge
Lace	Edward Smith, Joseph Bird, and George Dexter
"	
"	
Hosiery	George Kendall and George Caunt
"	
Pottery	William Beardmore
Tiles and pavements	Samuel Cooper
Terra-cotta	Michael Angelo Pulham
Pottery and porcelain, with some notes on iron manufacture	John Randall
Bricklaying	George Howell and John Jeffery
"	
Plasterers' work	C. Bartlett
Carpenters' and joiners' work	T. W. Hughes and John D. Prior
Joiners' work	Alexander Kay
Masonry, &c.	George Broughton Forbes, John McEwen, and Thomas Connolley
"	
"	
"	
Coach-making	Thomas Magrath
Ship-building	E. F. Moody
Mining and metallurgy	Francis Oats
Silver-work	P. A. Rasmusson and George Page
"	
Silver-chasing	R. E. Barrett
Hammered iron	William Letheren
Ornamental wrought iron work	T. Winstanley
Ivory-carving	Joseph Bentley
Engraving	G. Berry
Die sinking, especially adapted to silversmiths and other metal trades	William Elliott
Watch making	John Gregory and Jas. Stringer
"	
The Horological Department	Hermann F. Jung
State of the watch trade	George Cook
Tailors' work	R. Sinclair
Bookbinding	Louis Genth
Leather work	Walter Blunt
The manufacture of counterbone	William Bourne
Figured shawls	Samuel Boast and John Appleton
"	
Machinery for worsted fabrics	John French
Worsted yarns and textile fabrics	George Spencer

Worsted and mixed textile fabrics.....	Daniel Illingworth
French horticulture	George Stanton
Mechanical engineering.....	John Evans and William Learmouth
The condition and habits of the French working classes (special report).....	Robert Coningsby and Richard Whiteing

PART II.

REPORTS BY ARTIZANS FROM BIRMINGHAM.

Introductory report	Mr. W. C. Aitken
Gas-fittings and chandeliers.....	James Taylor
Plumbers' brass foundry	Thomas Bayley
Cabinet brass foundry, &c.	William Gorman
General brass foundry	Henry Dry
Church bells.....	James Ansell
Tubes in all metals	John Fisher
Saddlery, &c.	John Clay
Leather, harness, saddlery, whips, portmanteaus, &c.	Frederick Thompson
Jewellery, with diamonds and precious stones	W. G. Deeley
Jewellery and gilt toys.....	James Plampin
Buttons	Thomas Johnson, S. W Richards, William Bridges
,,	
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Steel pens	J. L. Petit
Small arms, &c.....	Charles Hibbs
Papier mache.....	David Sarjant
Japanning in general.....	Thomas Archer
Needles and fish-hooks	William Gnise
Sheet and plate glass.....	Richard Pearsal
Table and fancy glass.....	Thomas C. Barnes, W. T. Swene, T. J. Wilkinson
,,	
Die-sinking.....	Charles Wm. Moore
Electro-plate	Henry J. Fellows
Tin-plate working...	Edwin Poole
Labour saving machines	Henry Fowler
Railway carriage and waggon building.....	Benjamin Whitehouse
Design.....	Frank J. Jackson

The volume has been edited by Mr. Charles Critchett, the assistant secretary of the Society of Arts, who has carefully preserved the integrity of the reports. Only a few trifling corrections have been made. The preface to the volume, signed by W. Hawes, chairman, and P. Le Neve Foster, secretary, concludes with the following sentence: "It is hoped the reports will be found interesting, not only to the writers' fellow-workmen, but to all interested in the progress of industry; and, considering that they are writen by men, most of whom have never before attempted to write a report on any subject, and all of whom are actually engaged in industrial occupations, they are, in most cases, highly creditable to their authors, and will, no doubt, be received with the consideration they deserve." After reading several of the reports, we heartily endorse this opinion. Here, then, the British workman appears in rather a new phase; not as an agitator demanding political rights, nor as a trades' unionist proposing strikes, but as an intelligent British observer; and we have no donbt that his observations and reflections, as recorded in this volume, will produce real good. Frequently exhibitions are described and criticised, and articles are written on art and industry, by men who possess only literary qualifications, and the result is that their criticisms are merely pleasant reading. They do not possess the technical education which entitles them to speak with authority on many things on which they have written. In this instance, it is different. Skilled workmen have criticised in their own language skilled workmanship, and passed their opinion on men and things. The result is a valuable body of practical information, which could not be obtained in any other way. We regard it as the most cheaply purchased information ever published. In future numbers we hope to give some extracts from the reports most interesting to architects, builders, and art students, and so leave our readers to judge of the contents of the volume for themselves.

MARKS ON DEALS AND QUALITY OF TIMBER.*

HAVING explained the broad principle upon which Swedish goods are branded, we may note a few exceptional matters. Although we are familiar with mixed thirds and fourths goods, we have many shipments of mixed and thirds only, *i.e.*, best and common. This is especially the case with white goods from Norway and the southern parts of Sweden. Thus, P D H, mixed; D × H, thirds, from Hernosand; A. T. and Co., mixed; C × S, thirds, from Fredrickstadt; B S, mixed; B T, thirds, from Nordvig, near Christiana; H.R.H., mixed; M. H. M., thirds, from Christiana. We may note the following amongst the eccentric form of brands. From Stockenvicken we have the letters STOCKEN branded in blue paint upon the mixed goods, and the same brand in red paint upon the thirds quality. A shipment of goods from near Gefle comes to hand with A and a broad arrow on the mixed goods, T and a broad arrow upon the thirds goods, and an arrow only upon the fourths. We have M between two crowns for the mixed of a Marma shipment, T between two crowns for the thirds goods, and a M B for the fourths. This brand is noticeable as having crowns upon the thirds goods. A shipper from Hernosand brands his mixed goods BERGERE in large letters, and his thirds goods ELB; some of these brands are drawn from very simple sources, being a mere transposition of letters, and the introduction of the never-failing crown. Thus, on a Sundswall shipment, we have S A S } as the brands for the three qua-
S A } lities of goods. In this case we
S } have small rings or circles placed over the points of the letters A, to distinguish them from a similar brand shipped from the same port. The latter shipment would bear a brand with the letters inclining thus, *S A S*, *S A*, and *S*. We have another illustration of this simple arrangement in a Soderhamn shipment, F crown G } for the various qualities. As the
F G } timber merchants have such a
F } number of brands to deal with, it naturally follows that confusion ensues. To obviate this, the shippers adopt signs by which to distinguish their goods from other makers, as in the above instance of Sundswall goods. This is also the case with large makers who ship goods from various ports. We have a Soderhamn firm whose best goods are branded B S S C. Other goods are in the market branded B S 1st S C (pronounced "B S firsts S C"), these are by the same makers, but are shipped from Bjorneborg, instead of Soderhamn. Enough has been said to give an outline of the principles adopted in branding Russian and Swedish goods, and, as this matter bears so closely upon "the qualities of timber," we shall refer to it again, when treating upon Baltic goods under the latter heading.

Goods from Canada, as a rule, are not branded; the qualities are distinguished by red marks upon the sides, thus (I) (II) (III). With Quebec goods we rarely see brands used. A single M or two letters in black paint may denote exceptionable shipments from makers very far up the country. Saguenay goods are often marked, but there seems no settled custom or colour of the brands. "Dobell's" shipments may come to hand branded R R D in black, red, or white paint. These white brands are scarcely distinguishable when the deals are new, but, as they become old and black at the ends, the letters are very conspicuous. Another maker will brand his best goods with a crown in black paint, and his seconds goods with a crown from the blow of a hammer, or, to use the trade term, "with a dry stamp," the thirds goods being unbranded. Gilmore, Rankin, and Co., the great merchant shippers, will brand their goods with dry stamps, G R I for best goods and G R 2 for seconds goods. The low ports, as they are called, very often ship branded goods. These ports include Richibucto, Meramichi, Shediac, &c., whose shipments are inferior in quality to those of Quebec. From these remarks it will be seen that brands upon timber is a great and important subject. It is one in the hands of a small community of our traders, and is, consequently, a class of knowledge over which they are strict conservators. It is a subject new to authors, and that portion of our tradesmen whose office it is to buy and consume timber. This is somewhat strange, as the meaning of brands are well known on other goods that people engaged in trade are called upon to purchase. With architects, clerks of works, and builders generally, brands upon timbers are looked upon with perfect indifference. The current remarks are "I can tell a bit of good wood when I see it," &c., and, as builders generally pursue the old-fashioned system of buying from inspection, the question carries but little importance. Why this state of things should exist is not easy to explain. Architects will specify a particular stone or brick, and even the name of the quarry owner or the maker. Such is the case in ironwork, slating, and every other department of the building trade; but with timber it is left an open question, or if goods from a particular port are mentioned there is rarely any supervision exercised over the qualities. The modern system of competition tends to the use of common materials, and in no branch of the building trade is this so patent as in timber. Goods of the best brands were common a few years ago in almost every timber yard of the country, and in the principal ports they were important features of trade. Competition has brought on a craving for common or inferior goods, and nearly the whole of the trade is now carried on in this branch. First-brands are rarely found in timber yards, and even with the largest importers one or two cargoes will see them through a season. London alone has kept up its standard in this respect. Whether they are consumed in the building trade is another matter; but one thing is certain, the great outcry of "deterioration of timber," rests more with the architects and the builders than it does with nature or the foreign makers. Wood goods are to be bought as good in quality to-day as they were fifty years ago, as far as the best brands of Petersburg and Archangel deals are concerned. Coach-builders, pianoforte makers, and numerous other trades, which are centred in London and Paris, consume the bulk of the best quality goods now manufactured. The explanation given by builders is "because they can afford to pay for them."

Were brands upon timber better known, architects would get better work and builders would obtain greater credit. The cheap builder would find his place, and what are termed "old-fashioned builders" would again occupy the position they so richly merit. Fifty years ago, when competition was in its infancy, estimates were only solicited from builders who kept large stocks of good dry timber, but now everything is reversed. Tenders are advertised for in the public papers, and the lowest (be he whom he may) is nine times out of ten accepted as the contractor. So long as this system exists so long will the demand for common goods increase to the exclusion of the better shipments. It is not saying too much to assert that builders have almost given up purchasing the old-fashioned best quality of timbers, and have allowed them to pass into other branches of trade where competition is not so fierce. As we have no published information upon the subject of marks on timber, it is not altogether a matter of regret. A work of this kind would bear comparison with "Builders' Price Books," a fresh edition being required every year. This would not be owing to fluctuations in the cost of labour, but to the fact that timber brands are constantly changing. New firms are shipping goods with strange brands, and old firms are

* Continued from page 399.

changing their devices or retiring from the trade; added to this we have whole shipments of goods marked with the English merchants' or importers' names, this being done to order and forming part of the contracts. A well-known firm in this country are now importing Gottenburg goods with the thirds quality branded R. W. S. This "branding to order" is becoming very common, and, as the ordinary business of importing timber requires a great deal of time, this may be readily done. Goods for the coming season will be purchased in January or February, or as soon as the makers can inform their brokers what goods they can produce for the season. As they cannot be shipped until March, April, or May, when the ice is broken up in the northern seas and rivers, ample time is afforded for the importers to obtain their goods "branded to order."

TIMBER FORESTS.

"Trees," those lords of the vegetable kingdom, are naturally produced throughout the whole of the temperate regions. Wherever sufficient soil and humidity exists vegetation will spontaneously follow. Indeed, in this respect, we cannot draw a severe line, for trees of important size are alike found in the arid swamps of Havannah, and far out in the Arctic regions. Generally speaking, trees of tropical climates are hard wooded, whereas those of the northern regions are soft. With us, in England, we have a happy medium, ranging from the hardness of the forest oaks, beech, or ash, to the softness of the pines, poplars, and the willows. Trees of temperate climates shed their leaves in winter, this is partially the case in tropical climates. The Ilex oak of Spain is an evergreen, as is also our English oak when grown in tropical climates. The forest trees of northern districts are mostly evergreens. Those of Russia and Sweden, which are principally the "pinus Sylvestris," the wood or Scotch fir, and the "abies Excelsa," the Norway spruce or white wood of commerce, retain their leaves in winter. This is a wise ordinance of Nature, as they thus form a shelter for animal and the lower orders of vegetable life during the long dreary winter seasons. The pines of Russia, Scandinavia, and Canada are truly indigenous. Where light and humidity exists they will spring up from a mere handful of soil. Whole forests in Sweden are growing upon hard granite rocks, with a covering of two feet of peaty soil derived from vegetable decomposition. Such is the hardness of the rocks that the trees cannot strike in their roots; they consequently spread out upon the surface and stand upon their own bottom, being upheld and guarded from the passing winds by their brethren. In tempestuous nights whole districts will be blown down, making broad tracks through the forests. In this case, and wherever timber has been felled by the woodman, the same class of trees will spontaneously spring up in countless numbers. The ground is literally covered with seeds season by season, where they perish for want of light. Trees so ushered into life will struggle manfully for existence, the stoutest overlopping the weakest, whose branches will languish in the shade. Thus are new forests created, their vast numbers preventing them from throwing out lateral branches. Such is the rapidity of their growth that they are straight and symmetrical without a branch for 50ft. or 60ft.—instance the young trees shipped from Christiana as scaffold poles for builders. This rapidity of growth in height causes the lateral branches to die before they have obtained any size; the ceaseless action of the surrounding trees speedily breaks off the dead branches, and in a few years they are covered over with clear new wood, only to again show themselves as dead knots in the centre of the wood when in the hands of our carpenters. Trees of all kinds will thus bury the records of their younger branches. This is noticeable in the Russian red timber brought to this country as lathwood. These trees, from 9in. to 12in. in diameter, are cut into lengths of 6ft. or 8ft., and split into segments. The heart wood is afterwards riven off and left in the forests as firewood, because it contains the dead knots or roots of the younger branches, and is thus too coarse to be riven into laths. It may perhaps appear strange to assert that the Baltic red wood laths used by our plasterers are nearly wholly riven from sap wood, the proportion of heart wood, owing to the above cause, being remarkably small. In this respect the laths of the present day contrast unfavourably with those of the last century, which were riven from true heart of English oak. Respecting the capabilities of Russia for producing timbers and keeping pace with the enormous demand, we may note that that empire is eighteen times as large as the British Isles, and nearly one-half of its area is covered with natural forests. Timber is not, like coal, subject to exhaustion, for its like will speedily be reproduced. In Southern Russia, the great granary of Europe, fir trees will attain a diameter of 2ft. in fifty years. Other situations not so favourable will produce 15in. trees in the same period. This may be taken as a rule for Stockholm timber, and the central districts of Sweden. Northwards, as we approach the White Sea, the average of growth is only half the above rate. Closeness of grain is a characteristic of Archangel, Onega, and the best shipments of Petersburg goods. As they are not so robust in size as the Memel and Dantzic timbers, they put out fewer branches, which are considerably smaller in size; the result is a clearer description of timber, though inferior in size. This statement of the comparative growth of trees will apply to white wood as well as red, although in the most favoured districts for rapid development it will not make such progress. It has been said that the fir and the spruce will not grow together. This is not the case, as they are frequently found intermixed, and growing so close together that a man cannot walk between them. It is true that districts are found where one class of tree wholly prevails. This may be explained by the constant struggle for existence which is exhibited throughout the whole of Nature. When once a particular tree-plant or animal obtains an undue preponderance or balance of power it is only a work of time for the weakest to become exterminated. It is thus that the fact of whole districts producing one particular class of timber can be explained. Scandinavia (Sweden and Norway) is of minor extent to its overgrown neighbour Russia, but throughout its area it contains a larger proportion of forest land, which composes four-fifths of its total acreage.

Since Baltic timber first became an article of export, rivers and lakes have been the main agents in transporting it to the shipping ports. Distance is a matter of very little moment, as the logs are cast upon the waters to be found after many days. The trees are felled throughout the autumn and winter months, and are sledged to the banks of the rivers, where they are marked and piled for transport. The snow of the preceding winter thaws in the spring, and the silent rivers are again in motion. As they rise with the swollen flood, the piles of timber stored on the banks are swept off through mountain ravines, over tall precipices, where they are lost in the seething foam, to be again found floating on the silent lakes in the neighbourhood of the shipping stations. Such are the numbers of trees and logs carried into these lakes in the summer months, that navigation is pursued with the greatest difficulty, and it is a common occurrence for steamers to be delayed for hours in their attempt to find a passage through these floating forests. To collect these trees and hand them over to their owners is a work of considerable importance. As may be supposed, numbers of trees are lost or entangled on the river-banks in their downward course; this is a matter of very little moment, as there is only the cost of felling and sledging to bring to their charge. The first cost of the trees themselves may be estimated at sixpence each—primeval trees of the finest timber that the country produces may be purchased in Sweden at sixpence each—and at this low rate the income derived from the sale of timber is sufficient to place the owners of the forests in the list of Swedish aristocracy, and make them the friends of kings. The cultivated lands of Sweden and Norway are mostly on the banks of the rivers, and represent districts cleared of timber. These cleared districts are extensive, and where the soil is of sufficient depth for cultivation the young trees are prevented from taking root, and it is added to the arable or cultivated land of the farms. This being the case, it naturally follows that timber has to be yearly sledged from greater distances to the banks of the rivers, or new forests must be broken into. Of late years, as railways have developed, new districts of primeval forest lands have been opened, and, as their working expenses are light compared with those of this country, timber is carried to the seaports at a low rate, and in superior condition. This will explain the great improvement of late years in some shipments of Swedish goods. The laws of Sweden are favourable to its development; labour, land, and produce are remarkably cheap; farms and estates are constantly in the English market for sale, and, as an example of their cost, we may note that a farm of three hundred acres, part cultivated and part forest, with the buildings and stock, may be purchased for £300. A saw-mill may be thrown into the bargain. These are not costly erections, being mostly of wood and propelled by water-power. The rate of labour is from eightpence to tenpence per day of eleven hours; added to this, the female servants attached to these farms or saw-mills do a great portion of the work solely in the hands of men in this country—instance the care and management of horses and stable routine.

This floating of timber may be specially applied to Canadian goods, but with this difference, the timber is rafted in a converted form, and receives considerable damage by immersion. Timber in Canada is wholly in the hands of British colonists, and the felling, hewing, sledging, and rafting down the rivers, is a work of great hardship and privation. The timbers of commerce that we shall principally notice is the pine (pinus Strobus) or Weymouth pine, and the spruce (abies Nigra) or black spruce. The best class of pine is that shipped from Quebec, and the best class of spruce is exported from St. John's. Rafted or floated deals are shipped from all the Canadian ports except St. John's, and it is the fact of St. John's spruce being bright or unwatered that creates a special value. With the other ports bright and floated deals are shipped together, but the difference in cost in no case is so great as with goods from Quebec. With last season's goods, the shippers were selling their bright deals at 25s., 20s., and 10s. per standard for the first, second, and third qualities, more than those of floated quality. Floated deals when dry, are somewhat dearer; in this case they are called "dry floated," being piled and dried at the ports before shipping. This floating of pine timber permanently damages the goods, owing to the absorbent nature of the wood. The effects are twofold; firstly, they are discoloured, especially on the sap; and, secondly, they are apt to dry ring and shell shaped—these two evils preclude their use for superior work. Bright deals, if shipped in good condition, will come to hand as clean as when first sawn, but floated deals, if afterwards dried, are discoloured and gritty upon the surface, and cannot be sold as new season's shipments.*

One of the oldest relics of Chaldean art has been recently acquired by the British Museum. This is the signet cylinder of Ilgi, who reigned over Lower Chaldea about 2050 B.C.

* To be continued.

EXCURSIONISTS TO THE PARIS EXHIBITION.

ON Monday evening last a soirée was held in the Cavendish Rooms, Mortimer-street, in honour of Mr. Hodgson Pratt, who worked so hard in promoting the visit of English workmen to the Paris Exhibition last year. Mr. Cole, in the absence of Mr. Layard, presided. From the report which was read, and the speeches which were made at the meeting, Mr. Pratt laboured indefatigably in forwarding the good work; and we are sorry that he should have been out of pocket, and that the preparations made were not more extensively appreciated and responded to. Whilst everybody at the small meeting thanked Mr. Pratt, and whilst almost everybody was thanking everybody else, we were surprised that no word of praise was given to Mr. Thomas Cook, who did more than anyone else, or all put together, to facilitate the visit of British workmen to the Exhibition. Of course he laboured from an interested motive, and we sincerely trust that he has been well rewarded for his industry, courage, and enterprize. We hear that nearly 20,000 Englishmen went to Paris through Mr. Cook's agency. It is very easy to be wise after the event; but we could not help thinking, while at the meeting on Monday evening, that it was a great pity that Mr. Pratt's committee had not solicited the co-operation of Mr. Cook, as no doubt, if he had done so, much needless labour and anxiety might have been spared, and much money saved. In this age of testimonials who will testimonialize Mr. Cook? At all events he deserved the thanks of the British public.

THE CATHEDRAL OF BURGOS.

A RECENT American tourist in Spain gives some interesting particulars regarding the Cathedral of Burgos, which may be of interest to our readers. Burgos is a dull decayed old city of less than twenty thousand inhabitants. The ancient cathedral, erected by King St. Ferdinand in the thirteenth century, is one of the most sublime Gothic structures to be found in Europe, and strikes the mind of every beholder with wonder and astonishment. The exterior effect of the building, we are informed, is much injured by its unfavourable situation, and the mean buildings which have been erected close to its side walls. Nevertheless the principal front is exceedingly fine, and the spires and pinnacles rise most beautifully in richly carved open work, so that on a clear night the stars may be seen glittering through them. The interior is in the form of a Latin cross, 300 feet long, 213 feet wide, and 193 feet high. Independent of the magnificent central nave, with its elaborate ornamentation and fine retalbo, or high altar, there are two lateral naves and fifteen distinct chapels, some of which are as large as an ordinary church; besides these there are also extensive cloisters, and other church appurtenances, the whole containing fine tombs, sculptures, and paintings of ancient date. There are a number of very curious relics in the cathedral, which are held in high veneration by the inhabitants of Burgos. For instance, they have the Christo de Burgos, a wooden image of Christ which was, according to their traditions, carved by Nicodemus, a ruler of the Jews, shortly after he and Joseph of Arimathea had buried our Lord. It was rescued from a box found floating in the sea. There is also an image of St. Cecilia, a recumbent figure, to which is ascribed the special virtue of curing aches and pains about the head. The devotees of this saint bring their tresses to the shrine under the belief that by so doing they will be cured of the headache. There is also to be seen the famous old trunk of Mio Cid, the legendary hero and poet of Spain, who, being short of money to prosecute his campaign against Valencia, resorted to the sharp financial dodge of filling the box with sand, and pledging it for so much, to the Jews for a liberal loan of hard cash. The bones of the Cid, and of his faithful heroic wife Iimena, are carefully preserved in a walnut case. The dust is corked up in a beer-bottle, and is shown to strangers in a room fitted up as a chapel in the old townhall. In this same building is also preserved the first throne of the kings of Castile, a very common old wooden arm-chair.

TOMBS IN OLD ABERDEEN CATHEDRAL.

A SHORT time since we received the following letter, with sketches of tombs as represented in one of our lithograph pages this week:—

SIR,—It has often occurred to me that it would be advantageous to the readers of your paper if a few drawings of monumental structures, such as tombs, memorials, &c. (mediæval), were introduced amongst the various illustrations. These structures were the gems of architecture. On them were lavished all the treasures of art, and the richest decorations of the age were freely bestowed on them. No pains were spared to render them beautiful, and the fact of their being the richest and best specimens of mediæval architecture, renders them particularly worthy of close investigation and the most diligent research. I would beg to suggest to those of your readers who can with convenience make drawings of these monuments, to do so. The time spent in a close investigation will be well rewarded by the knowledge of Gothic detail which will thus accrue to the sketcher, whilst the course of training he will have thus undergone will also be valuable.—C.

The largest engraving represents Bishop Dunbar's tomb, with a vault below, built and paved with hewn stone, with large stone covering. The tomb has been much defaced, the inscription obliterated, and the marble statue formerly lying there completely gone. The broken effigy at present there is supposed to be that of a nun, the head of which was found in said vault. Gavin Dunbar was bishop of Aberdeen from 1518 to 1532, and the tomb is supposed to have been erected during this period. The existing cornice is supposed to have been no part of the original design.

Near to this tomb is another, and the only description obtainable is in "Orem's" book, written about 1724. It says:—"In the same transept (south), under another round arch of oak branches, is another altar tomb with a bishop, *in pontificalibus*, headless, a lion at his feet, and under his head a pointed helmet for a cushion, &c." This figure is no longer there, but the space under the arch has been filled in with an inscription on polished granite to the memory of some of the late academical magnates. The tomb is in a very dilapidated state.

YORK IN MDCCCLXVII.

YORK has not been stationary in the way of architectural improvements. In the Guildhall two more of the series of historical stained-glass windows have been inserted; other two are, we believe, ready for fixing; and the designs for several more will shortly be completed by Mr. Doyle, the author of the "Chronicles of England," to whose able hands the arrangement of the various subjects has been consigned. The time we trust is not far distant when this fine old Gothic fabric will have all its windows filled with stained glass, descriptive of memorable events connected with the history of York from the Roman invasion to the present reign.

Our Cathedral continues to receive the diligent attention of the Dean and Chapter, and the year 1867 has seen various restorations of the fabric and improvements in the internal arrangements happily completed.

As to prospective improvements in our ancient city, the Yorkshire Club having completed the purchase of the house now occupied by the Rev. T. Richardson, in Lendal, and the adjacent land extending to the river front, this extensive and admirable site is to be devoted to the erection of a magnificent Club-House. We believe that, for extent and elegance, the new building will not be excelled, if equalled, by any similar erection in the provinces.

The building of the new Railway Station in this city has been deferred, probably to an indefinite period; and we would again offer the suggestion that for the excursion traffic a line of rails should be laid and a neat shed erected outside the walls, with an entrance into the city fronting Rougier-street. This would be a great improvement to the present practice of leaving excursionists at Holgate—a mile from the principal objects of attraction in the city

York has long been noted as a city of steeples, and within the last twenty-five years much has been done for the restoration of our many fine old churches. The year 1867 has contributed its share in the good work. The west front of St. Michael-le-Belfrey has been rebuilt; and the hideous side galleries in St. Saviour's church have been removed, and other internal improvements have been effected in that edifice. Some minor works have also been accomplished in other of our churches. The city has continued to stretch itself out into the suburbs, which are becoming more populous, and consequently increased church accommodation has been called for and provided at Dringhouses, and more recently at Clifton and Fulford. Another church is now in course of erection at Heworth.

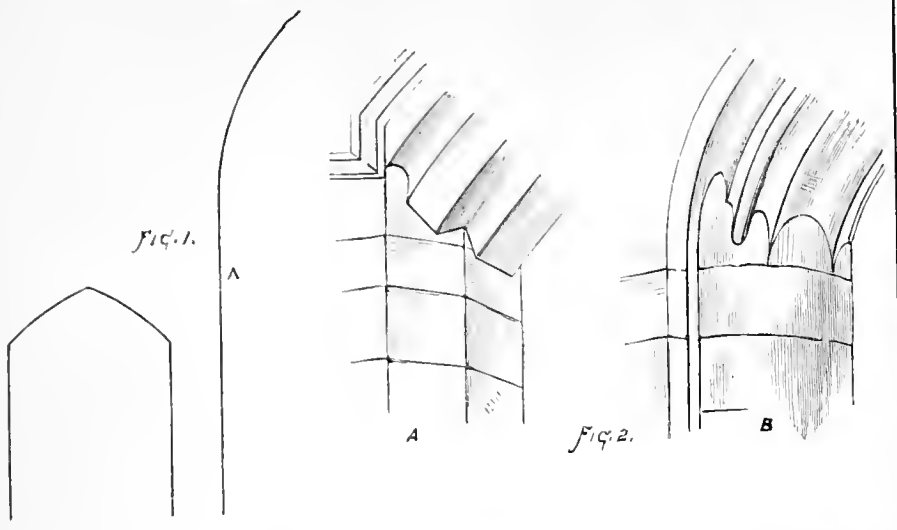
Something has also been done and is doing in providing parsonages for the clergy. St. Cuthbert has its new rectory-house; St. Mary Bishophill Junior has also had a capacious parsonage erected; its neighbour, St. Mary Bishophill Senior, is about to be provided with one; and the new district parish of St. Thomas has a substantial parsonage nearly completed. Four of our poorest livings have likewise been augmented; and altogether we hope that we are progressing as churchmen in material advantages. We hear of other contemplated works in reference to the Church in this city. There is one point on which we would venture a suggestion. It is that the Ecclesiastical Commissioners, in building new parsonages, should have some regard to the incomes of the benefices, and remember that houses unnecessarily large are a burthen rather than a benefit to the incumbents; further, we would say that it is well that the parsonages should be so placed that the incumbents should be with or as near as possible to the bulk of their people.

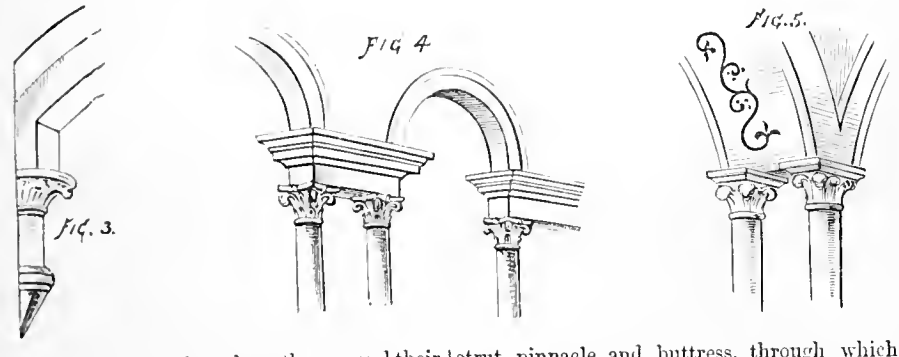
Among the members of the other religious communities there has been no lack of activity. The Baptists are building a very handsome church in Priory-street, and the Wesleyans have in course of construction a new school-chapel in the Groves district. The Independents (under the pastorate of the Rev. James Parsons) are building an organ gallery in their chapel, and are having a new organ constructed of great power and compass. These are all evidences that, with our increased prosperity in worldly affairs, our citizens are not indifferent to the advancement of the cause of religion.—*Yorkshire Gazette.*

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. X.

BEFORE leaving the constructive arch and vault, and their place in the mechanical structure, let us refer to their æsthetic value. It is interesting to trace the Roman development of the arch, the temerity displayed in dealing with it as a decorative feature; how it was first concealed, like we did a generation back, behind plaster; how it afterwards struggled into a visible, though subordinate, expression—at first becoming subservient to the horizontal lines, and gradually breaking through them in its full-growth, as in the Pantheon—till it reached, in the Basilican and Romanesque styles, its fullest power. The change from the continuous to the interrupted entablature effected a revolution in architectural design, and was a step towards that uninterrupted verticality of treatment which obtained such significant and beautiful prominence in the Pointed styles. Bit by bit the entablature was broken through, first by intercolumnar recessions, then these gave way to discontinuous imposts, till, at last, the arch sprang directly from the capitals, as noticed in the arcaded court of Diocletian's Palace of Spalatro. Horizontality thence became a secondary, rather than a primary, principle; all intermediate cornices and string-courses stopping against the vertical masses, instead of interrupting them. The architects of the Revival showed their pedantry, rather than taste, when they left disjointed bits of entablature over their columns, as seen in many of our metropolitan churches, the effect being more comic and "acrobatic" than judicious, but when the plan is resorted to now it becomes an unpardonable affectation. This leads me to notice the necessity of stilting our arches a little, so that their springing should be a trifle higher than the line of capitals, an obvious way of correcting the apparently abrupt springing otherwise resulting from the abacus cutting off an appreciable portion of the arch, besides the foreshortening of all

CONSTRUCTIVE AND ÆSTHETIC DESIGN.





vertical distances when above the eye, and their consequent visible depression. The degree of this correction (as, indeed, of all others) ought to be regulated by the distance from which the majority of spectators see the arch, but chiefly from the position the eye longest rests upon it, and generally the stilting should be rather overdone than deficiently. This remark applies with even greater force to elliptical arches, while to segmental ones, of course, a visible stilt over the impost mouldings is essential, good architecture abhorring acute angles of this sort, as I shall show hereafter.

The discordance between the mechanical structure and the decorative features ceased when the arch took its legitimate place in the visible structure. Rectangular forms were greatly superseded by circular forms, and this circularity became also noticeable in the plans of temples and tombs from the rotunda of the Pantheon, generally ascribed to the Augustan age,* to the smallest tomb or baptistry. The circular plan of tomb was perhaps derived from the Pelasgian form, though the Romans retained it in conjunction with polygonal forms, which met the necessities of doming better; and the decagonal temple of Minerva Medica combined perhaps all the beauties—scientific and æsthetic—to be found in the arch system of construction. Mr. Fergusson rightly imagines the Middle Age builders knew little besides the ideas involved in this building, and I think few better models of æsthetic design can be picked out. It combines economy of material with lightness and rigidity of structure, while an artistic effect is attained—qualities of building which it is the object of these papers to clearly lay down, in contradistinction to fashionable crudities and ridiculous excesses.

It was left to the Gothic builder, however, to perfectly reconcile the mechanical with the decorative structure. Diagonal lines and outward adjuncts boldly expressed the oblique pressures, and expressed them so entirely that we might imagine every bit of walling taken away, leaving a skeleton framework of rib and strut, pinnacle and buttress, through which the forces were transmitted and the fabric sustained.

I may here advert to the necessity of always showing sufficient abutments to arches. The beauty of the arch entirely rests on the apparent evidence, at least, of being sustained laterally, for an inadequate appearance of support at the springing is as detrimental to repose in design æsthetically, as actual insufficiency of abutment is to the statical structure; and this is a remark that more especially applies to the use of segmental two-centred arches, now so commonly introduced into Pointed design. No doubt the Middle Age freemasons always had this in mind, for we rarely see a segmental-pointed arch over any large apertures; generally, indeed, I have noticed them only over small doorways, &c., in the Early Pointed style. The four-centred or Tudor arch, and the semi-elliptical arch, show that our ancestors felt the difficulty of the abrupt springing, and avoided it, wherever a large opening had to be formed, by joining the flattened arch-curve to the springing by a sharper curve. A segmental arch, whether pointed or not, should be either counterbalanced by abutting side arches on the same level, or else have a sufficiently apparent abutment.

The writer has frequently noticed the weak and unsatisfactory effect an abruptly spring arch has when abutting against a slender pier, as, for example, the transept or aisle arches against the chancel piers—the latter always appearing weak, if not bent at their junction (fig. 1 A).

The manner in which arches spring from the vertical pier is more important than some architects appear to consider. Sometimes a very effective junction between the arch and pier is obtained by making the arch-mouldings stop or die against the pier, without the intervention of capital or impost mouldings, the sections of arch and pier being different. This form is common in English Gothic, and has been distinguished by Professor Willis,* in his suggestive nomenclature, as the "discontinuous" impost, though, I think, a more expressive term would be interpenetrated impost. The interscribing or profiled line produced in this way at the impost is sometimes of a most varied description, A being an exaggerated profile of the archivolt; and such an arrangement is better than continuing the same moulding to the ground, like the "continuous" and "banded" archway common in Italian Gothic, in which a weakness is manifested, it being far more consistent with constructive truth to make the pier of a plainer section than the arch-mould. A corbelled or shafted impost is often a very reasonable way of taking the under or intrados members of an archivolt. The elaborate profiling of mouldings and ribs upon square or cylindrical faces has sometimes been carried to an intricate extent. In the after-Gothics of Germany and France the substitution of angular or prismatic, for the plain upright, face has often sacrificed beauty to stone cutting.

In a series of arches like an arcade, where single supports are preferable to wide spans or large piers, a combination of arched entablature has, I think, a happy effect, giving a more varied and pleasing series of intercolumns and uprights than the customary mode of equal-spaced intercolumniation; indeed, it is a wonder the plan is so rarely adopted. Even arches may be substituted for the discontinuous and alternate entablature; the greater superincumbent weight over the minor arches being equivalent to the greater tendency of the wider ones to spread. There is a sort of rhythmical cadence in such a disposition akin to that in a pleasing melody, in which the isochronal in sound is distasteful. Where the thickness of wall will admit of it, coupled columns transversely placed is another variation, possessing, I think, a good effect; and, being less obstructive to sound and sight than heavy piers, has something to recommend it. The arched soffits could be incised or decorated with a running or other pattern, depth of moulding in such a case not being easily obtainable.

Where simplicity is an object, few types of arched construction are comparable to the Romanesque or our own Norman for breadth or gradation—I mean in shafted arcading; and these forms are more safe to follow or develope than the elaborate grouping of rounds and hollows seen in the complex arch and pier systems of the Pointed styles. What can surpass, for example, the rectangularly recessed jamb and arch-mould—really the elemental form of all subsequent elaboration; and what can be more suitable for our modern brickwork? The introduction of angular shafts and the splaying of the angles give us all that the eye and sense demand, and is infinitely more satisfying to the mind than the saw-like notching that modern brick art so revels in just now. Fig. 6 shows an Italian

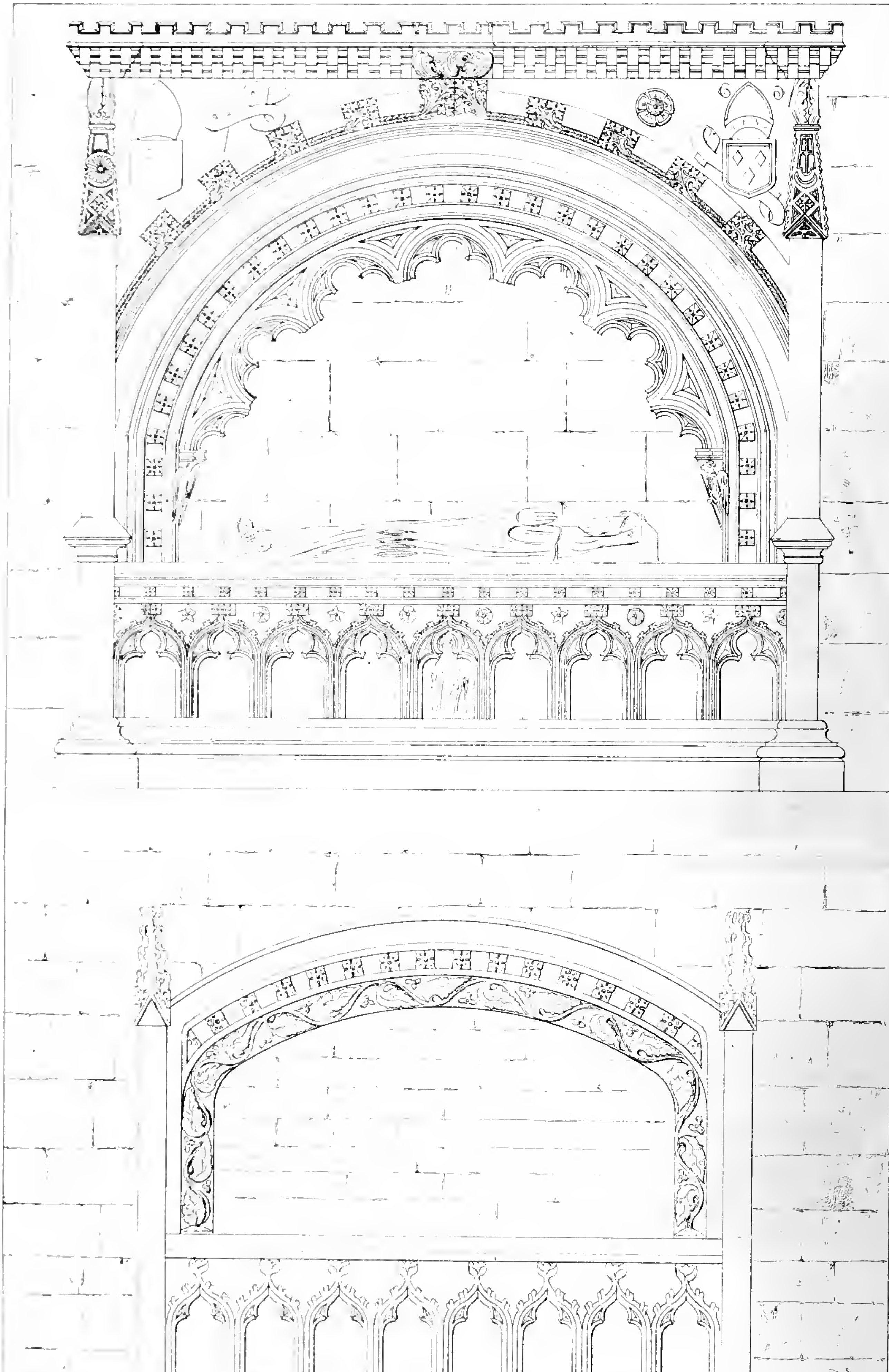
FIG. 6

modification of the recessed pier of the rectangular class alluded to above, and it will be at once seen what a breadth and richness of effect can be attained by its use in any style.

All kinds of soft porous stone become hard by whitewashing them with fresh slacked lime. The lime absorbs the carbonic acid from the atmosphere, and is converted into carbonate of lime. A portion of this remains in the pores of the stone and ultimately becomes very hard.

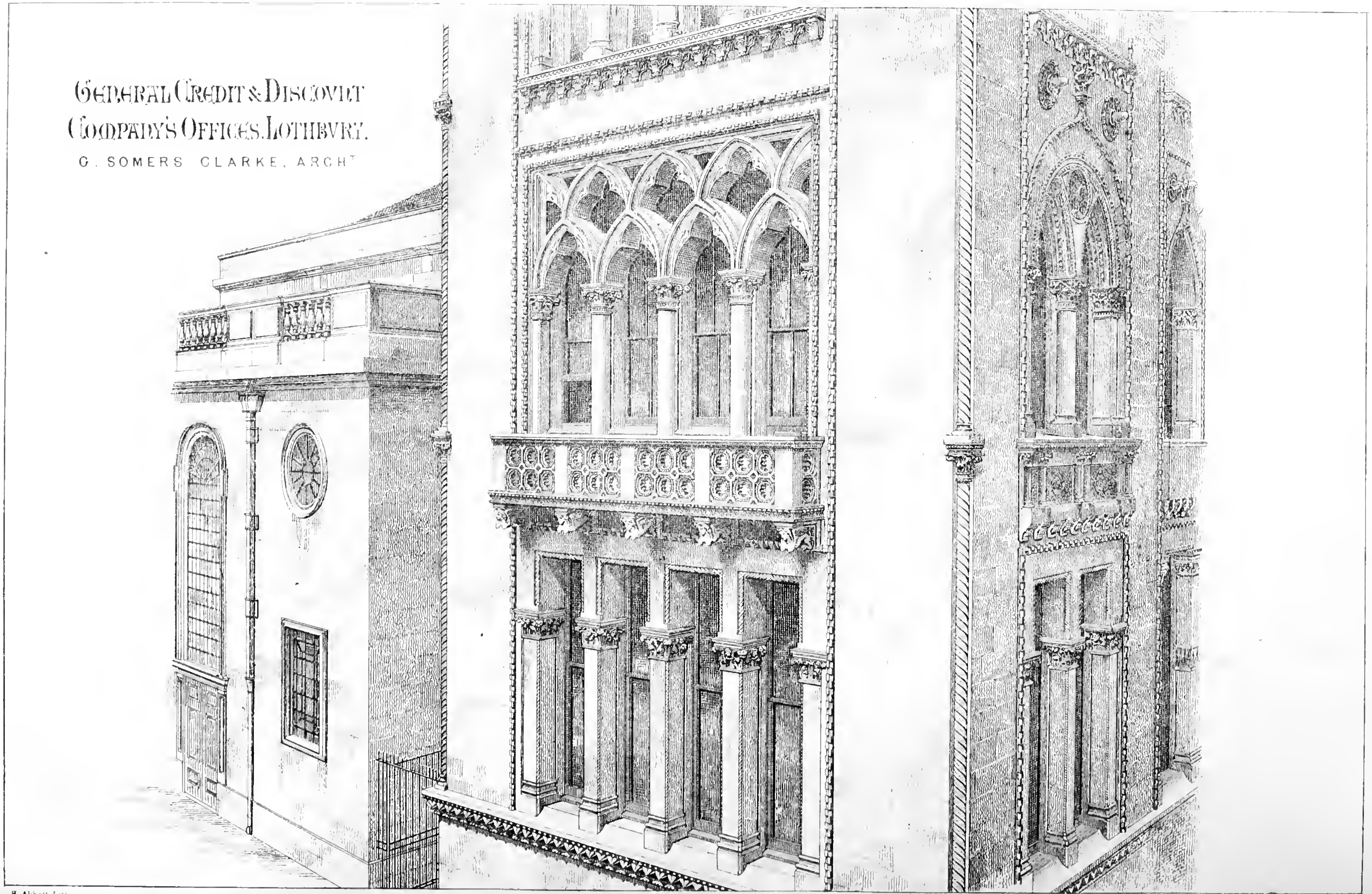
* Mr. Fergusson thinks, with more probability, the rotunda to belong to a period nearer Constantine's age.

* Remarks on the Architecture of Middle Ages.



Tombs in Aberdeen Cathedral:

Printed by Whiteman & Bass



B. Abbott, Lith.

THE LATE M. DIDRON.

TO write the biography of a departed friend can hardly be accounted either a pleasant or desirable occupation, and it is with no small grief in the present case that I am called upon to record the acts of one to whom both architecture and archæology owe so much, and who was so comparatively little known in this country. Yet there were some few of our countrymen to whom a visit to the Rue St. Dominique and an interview with M. Didron, were as much a duty (whenever they found themselves in Paris) as an inspection of the last treasures added to the Louvre or to the Hotel de Cluny.

The following particulars have been supplied by the family, and appear from internal evidence to have been written by M. Didron himself. Under the circumstances, therefore, I give as literal a translation as possible :—

"Notice of the principal facts in the life of M. Didron—

Didron (Adolphe Napoleon), born in 1806 at Hautvillers, department of the Marne. My father was "précepteur de la commune ;" my mother, daughter of a notary of the same place. I studied Latin and Greek at Rheims, and finished my education at Paris.

In 1828 taught history in a school, also studied law, medicine, and natural history.

In 1830 I competed for a prize offered by the "Revue de Paris" upon this question—"Influence de la Charte sur les mœurs et des mœurs sur la Charte." I obtained the second prize ; my paper had for its epigraph, "La liberté est bonne à tout."

From 1829 acquainted with Victor Hugo, Charles Nodier, Sainte-Beuve, Théophile Gautier, Barye, Auguste Preault, Paul Huet, Eugene Devéria, and all the "romantiques."

Since 1829 uninterrupted studies on the national archæology. These studies were encouraged by Victor Hugo, and were due to the study of his "Notre Dame de Paris."

At the end of 1830 an archæological journey on foot through the whole of Normandy.

In 1831-1833 articles upon the "Archæology of the Middle Ages," written for "l'Européen," founded by M. Buchez.

With Jeanron, Barye, Barre the elder (medallist), Paul Huet, Gigoux, Wattier, Laviron, &c., I founded "La Liberté," an art journal, of which I wrote the prospectus, and a part of the first number. I wrote successively archæological articles in the "Revue de Paris," the "Revue du Progrès Social," "Revue Française," and "L'Artiste."

In 1832 licencié-es-lettres.

In 1834 report to M. Guizot, Ministre de l'Instruction Publique, upon the study of national archæology, published in the "Revue Française."

1835. Appointed secretary to the "Comité Historique des Arts et Monuments" which M. Guizot had just established, and which had for members, MM. Vitet, Victor Hugo, Montalembert, Sainte-Beuve, Ampère, &c.

1835. Description of the sculptures of the Cathedral of Paris, in the "Revue de Paris."

In 1836 archæological journey in the centre and south of France.

1837. Studies on the Cathedral of Chartres, by order of the Ministre de l'Instruction Publique ; report published in the "Moniteur." I found among the thirteenth century sculptures at Chartres the statue of Liberty.

1838. A course of lectures upon the national archæology given at the "Bibliothèque Royale." The course was free and public.

1839. Nominated to post of sub-librarian to the "Bibliothèque Royale." The Conservatoire refused to execute the commands of the minister, M. Salvandy, and I was, therefore, never installed.

1839-1840. Archæological journey at my own expense to Greece, to Thessaly, to the Météores,* to Macedonia, Mount Athos, and Constantinople. An account of this journey will be found in the "Annales Archæologiques."

1840-1847. "Bulletin Archæologique du Comité Historique des Arts et Monuments." 4 vols. octavo, entirely edited by me.

1841-1843. Other courses of lectures on the national archæology, given at the "Bibliothèque Royale." These, like the former, were free and open to everybody.

In 1843 publication of the "Histoire de Dieu," one vol. quarto, with wood engravings. This was the first work published upon Christian iconography.

1843. Archæological journey in Germany—Munich, Nuremburg, Ratisbon, and the banks of the Rhine. This journey was published in the "Univers."

1844. Commencement of the "Annales Archæologiques," which I wholly edit. I have had the assistance of the principal archæologists, both French and foreign. The "Annales" are au encyclopædia of the arts of the Middle Ages, viz., architecture, painting, sculpture, music, poetry, drama, ritual, metal work, &c.

In 1845 establishment of the Archæological Library, at first conducted by my brother Victor Didron, and *now* by me.

1845. Publication of the "Manual d'Iconographie Chrétienne," 1 vol. octavo.—Nominated Knight of the Legion of Honour by M. Salvandy, Ministre de l'Instruction Publique.

1846. Archæological journey in England, published in the "Annales."

1848. Ditto in Spain, partly published in the "Annales."

1848-1858. Ditto in France, Belgium, Germany, England, Holland, Switzerland, and Italy, all more or less published in the "Annales."

1849. Establishment of a manufactory of stained glass.

1849-1859. Sundry windows in the mediæval, renaissance, and modern styles for the cathedrals of Langres, Soissons, Nantes, Aix-en-Provence, Paris, Aire sur l'Adour, Digne, Lisieux, St. Omer, and for churches at Dunkerque, Lille, Abbeville, Rheims, St. Quintin, Luneville, &c. For the Duc de Noailles at Maintenon, and for the Comtes de Mérode, Colbert, Daru, d'Harcourt ; commissions were also executed for Westphalia, Holland, and England, and at Rome for the Cardinal Antonelli.

In 1852 I was deprived of my place of secretary to the "Comité Historique." At the same time Victor Hugo, Montalembert, and the Duc de Luynes were also turned out.

In 1854 I was named member of the jury of the competition for the new Cathedral at Lille. I obtained that all the designs should be made in the French style of the thirteenth century. The church is now being built in that style.

1854. Named Knight of the Order of St. Gregory the Great.

1855. Exposition Universelle ; a silver medal of the second class for stained glass.

1857. Named honorary member of the Royal Institute of British Architects.

1856-1857. Agent for the Arundel Society ; addition to the library of their casts.

1858. Addition to the library of the photographs of the pictures of the old masters before Raphael.

1858. Establishment of the bronze foundry.

1859-1867. Execution of sundry objects in bronze for ecclesiastical purposes.

1862. Medal for stained glass at the London Exhibition.

1867. Silver medal at the Paris Exhibition ; this was the highest prize that was given for stained glass."

Here ends the autobiography. It only remains to add that M. Didron died of consumption on November 13.

It is rarely that we find so succinct and so lucid an autobiography as the one we have just been reading. What an example does it afford us of untiring industry and energy, not only in obtaining a position in life (for many of us do that), but also in acquiring a reputation both scientific and literary. It would be well for all of us if, at the end of our career, we could point to a life as well and as usefully spent as that of M. Didron.

M. Didron was never married, but adopted his nephew and niece. The former, M. Edouard Didron, accompanied him in several of his journeys, and, having had a regular artistic education, the cartoons for the glass (and, I believe, most of them were due to him) were rather better than what we obtain in a general way in England. He began a history of stained glass in the "Annales," and still carries on the manufacture.

The archæological world will be glad to hear that it is proposed to continue the "Annales Archæologiques," M. Alfred Darcel and M. de Guilhermy, both frequent contributors, having offered their assistance.

A few words may be added concerning M. Didron's three works—"L'Histoire de Dieu," the "Manual d'Iconographie Chrétienne," and "Les Annales Archæologiques."

"L'Histoire de Dieu." Paris, Imprimerie Royale, 1843. This is perhaps the best known of M. Didron's works, having been translated and published in Bohn's illustrated library. The introduction contains the somewhat contestable assertion that the Miroir Universelle of Vincent de Beauvais is to be found sculptured, with more or less omissions, in the statuary of the Cathedral of Chartres. The author then defines the "glory," the "nimbus," and the "aureole," and gives their history. He tells us that the nimbus goes round the head, the aureole round the body, and that when both nimbus and aureole occur together, they become the "glory." The next divisions treat of the various representations of God the Father, God the Son, and God the Holy Ghost, also, lastly, of the Most Holy Trinity. The woodcuts, of which there are no less than 150, are drawn by M. Paul Durand.

It was M. Didron's intention to have completed the work in a second volume, which would have contained "L'Histoire de l'Ange" and "L'Histoire du Diable." A few chapters of "L'Histoire de l'Ange" appeared at a subsequent period in the "Annales," but the scheme was never completed.

"Manual d'Iconographie Chrétienne, avec une Introduction, et des Notes." Par M. Didron. Paris, Imprimerie Royale, 1845. The origin of this book is very curious. When M. Didron was travelling in Greece, he was astonished to find that all the paintings and figures with which the churches were filled exactly resembled one another. At last he got hold of a painter at work, who showed him a book which told the reader how to mix his colours and prepare his grounds, how to paint certain stories, how to arrange these stories in their proper places in the church, and, lastly, how Our Lord and the Blessed Virgin were to be represented. It turned out that the work itself was ancient, but had been enlarged and corrected—the manuscript that M. Didron was shown was about 300 years old. The painter very naturally refused to cede his book, and, after many delays, a copy was taken from another MS., from which a translation was made by M. Durand, the companion of M. Didron. It is this translation, with very copious notes by M. Didron, which forms the "Manual d'Iconographie." The text of the Greek MS. is exceedingly curious, especially the description of the paintings representing the parables of Our Lord ; but the chief value consists in the notes, to which, unfortunately, there is no index. No architect who goes in for the art portion of his profession should neglect to study this book most attentively, for it will give him the key to the whole science of Christian Iconography. It has been published so long ago that I am afraid that it is but little known to the younger members of the profession.

The "Annales Archæologiques," commenced in 1844, have now reached their twenty-fifth volume. As M. Didron says in his memoir,

*These are monasteries perched on almost inaccessible rocks.

they form an encyclopædia of the arts of the Middle Ages. It would be perfectly impossible to give in this notice names of the contributors, comprising, as they do, all the most distinguished archæologists of Europe. M. Didron was a frequent contributor of original articles, and every number contains sundry small notices from his pen. On one point it certainly puts to shame all our English archæological and architectural publications, and that is in the beauty of the engravings with which the "Annales" are illustrated. There is scarcely one bad plate to be found in the whole series. M. Didron indeed judged truly of the "Annales" when he said to the writer of this notice, "I have done something in this life: when I die, the five-and-twenty volumes of the 'Annales' will be my monument."

W. BURGES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary meeting of the members of this Institute was held on Monday evening 1st, Mr. Daniel Brandon, vice-president, in the chair. M. Weale, of Belgium, author of various works on architecture, was unanimously elected as honorary and corresponding member. Mr. Charles Innes, of Whitehall, was elected a fellow: and Mr. John Hebb, of Tollington Park, and E. H. Bowi, of Harrogate, were elected as associates.

Professor Donaldson announced a donation of £500 from Mr. Tite, M.P., president, to the Library Fund, for the purchase of selected works on architecture by English and foreign authors, of which the library is at present deficient. A special vote of thanks was passed to Mr. Tite for his munificent gift, and it was referred to the council to consider an appropriate form of recognition of the president's liberality and warm interest towards the institute.

MR. W. B. SCOTT read a paper "On Mural Paintings for Pevkill Castle, Ayrshire." The subject of the pictures, of which the cartoons or preliminary drawings necessarily made, when the artist has to paint on the wall itself, were exhibited, is taken from "The King's Quair," or King's Book, by the first King James of Scotland, being already partly executed as the decoration of the walls of a circular staircase, leading to the present drawing room of Pevkill Castle, and the method employed is a kind of tempera. The author could not call it encaustic, since heat is not applied to fuse the colours into the plaster. The medium used is a solution of wax in turpentine, and the use of this medium has been an experiment, the results of which Mr. Scott thought might be worth a few minutes' attention. Having given a general description of this old peel-house or castle, as it existed up to the beginning of the seventeenth century, Mr. Scott went on to state, that this interesting old place was left to go to ruin at the end of the last century, and when the late Mr. Spencer Boyd repaired and inhabited it a few years ago, he had to build an entirely new staircase more commodious than the old, although retaining the novel form proper to the date of the house. It was for the decoration of this circular staircase these cartoons were drawn, and in carrying out the commission, the artist being allowed to choose his own subject, selected an early Scottish poem, written by the first James of Scotland when a prisoner at Windsor in 1420, on his love for Jane, grand-daughter of John of Gaunt—a poem in six cantos in imitation of Chaucer, and one of the most perfect and beautiful productions of that epoch, although very little known. The pictures, six in number, illustrated the several cantos, which Mr. Scott described. The first and second of these pictures were painted in the summer of 1865, the medium used being, as already stated, wax dissolved in turpentine, a medium frequently used in Italy for the common decoration of which one sees so much there, and adapted by Mr. Parris in going over the pictures in the cupola of St. Paul's. This medium Mr. Scott tried on one of the figures of artists for the museum at South Kensington, and, as he was expressly required at Pevkill to paint on the wall itself, he determined to try it on a larger scale. The effect was all that could be wished. He explained that when employed on a surface not previously touched the turpentine is absorbed with a portion of the colour and the oil in which the colours were originally ground, while the wax retains a great amount of luminosity in the tints with the uniformly dull surface absolutely necessary in wall-painting. The unity of surface is attained, a characteristic of fresco and the simplest tempera painting, with greater brightness in the colours. The pigments used were not restricted to earths, as in fresco, but embrace nearly all the wide range now furnished by the colourmen, without any perceptible chemical change resulting, the medium employed penetrating the plaster sufficiently to protect the colouring matter on the surface from contact with the lime. Notwithstanding this, it was added that the part of the wall which is exposed to the south wind, the wet wind in that locality, has, in the course of the two last severe winters and wet springs, shown symptoms of decay. The great enemy of painting in this country is damp, and it appears that no external wall, without stoothing or other ventilation, is a safe surface for the artist. Whether the wall in question had never been allowed to become dry during the four years from its construction to the time of the artist commencing his operations, or whether the wet soaked through from without in spite of the Portland cement with which it was painted, from the first was a question no one seemed able to solve. The remaining portion of this exposed south side has been lined with sheets of zinc, on which the future pictures will be painted, with what result has yet to be seen. With regard to the remarks on a former occasion, relating to fresco, by a gentleman who urged the superiority and desirability of that method, he was afraid that his assertion that it would never be practised again in this country, or perhaps anywhere else, might be construed as an effort at self-defence, the work he then submitted to the members being rather easel pictures than wall decorations, having comparatively little of the simplicity induced by tempera painting and necessitated by fresco. Such, however, was not the case, but a deliberate opinion, the result of many years' consideration. He did not mean that we should never see little pieces of fresco on lath and plaster frames, as we may see books illuminated by hand, or imitations of ancient enamels; perhaps we might even see fresco on a small scale applied to some purpose by some one who persists in conjuring by an old form of incantation, and if the artist abstains from all colours but those composed of earths—if he has ten years to prepare his lime, if his wall is thoroughly protected and ventilated, if the weather is every day favourable, and if the artist has had a lifetime of practice—perhaps once more we might have a good result. But this is certain, fresco has had a revival of twenty years in England and forty in Germany, and all the best artists in both countries who have practised it—Kaulbach in Germany and Maclise in England—have gladly resigned it for the newly invented silica medium. In Italy itself, continued Mr. Scott, the reign of fresco was little more than a century. All the earlier works remaining are tempera. Not many years ago it was not unusual to hear people talk of all Italian wall-paintings as fresco, but it is quite certain no such thing exists. When the commission was appointed to consider the application of painting to the new Houses of Parliament, in 1841, Cornelius, a German artist residing in Rome, was called over in November of that year, and Prince Albert, who was at the head of that commission, seconded the views of his compatriot, and fresco was determined upon. Tempera and the early works were scarcely ever alluded to, and, while the Munich frescoes, all the open-air ones at all events, were begining to peel off, English artists, who had never painted anything but genre pictures in oil, produced those examples now going to pieces in the so-called Poets' Hall. Fortunately, the silica process was shortly after discovered, so that Maclise, the greatest of English historical painters, and one of the greatest European artists, has been freed from the waste of energy and danger of premature decay in painting his two great works, "The Field of Waterloo" and "The Death of Nelson"; but the last years of Mr. Dyce were embittered by the difficulties, delays, and repaintings involved in this primitive process, fitted only for a dry climate and a summer of continuous equable temperature.

PROFESSOR DONALDSON, in proposing a vote of thanks to Mr. Scott for his communication, referred to the unsatisfactory results which had attended fresco painting in this country, notwithstanding the most elegant researches on the part of the late president of the Royal Academy, as to the processes of preparation, both of the surface of the walls and of the colours to be used, in the case of the decoration of the corridors, &c., of the new Houses of Parliament. It seemed that all the endeavours of artists to conjure the difficulties of fresco painting, so as to render it imperishable, were always frustrated. He thought we might look with greater hopes to the new process of water-glass painting; but even when that process was adopted there was a damp which covered the surface, which, though not chemically affecting the picture itself, was prejudicial to the just appreciation of it as a work of art. Under these circumstances it was gratifying to find that a gentleman like Mr. Scott, with his large practical experience and knowledge of his art, had adopted a process which he thought was calculated to be successful in this country.

MR. SCOTT remarked that the effect upon the surface of the pictures in water-glass, mentioned by Professor Donaldson, arose from the accidental circumstance of too great a quantity of silica having been dashed upon the surface with a large brush, instead of by the more careful method of using a syringe for the purpose, and that tended to give a whitish bloom to the surface of the picture. He believed the opinion of Mr. Maclise was, that that effect could be removed without injury to the painting.

PROFESSOR KERR remarked that the practical question of damp in walls was one which ought not to be passed over by a body like this without some consideration. They all knew very well that a stone wall, even when built of granite, will draw the wet through several feet thickness. It seemed to him the best advice, with regard to walls on which these kind of paintings were to be placed, was, in his opinion, so far as he had paid any attention to the subject, to treat them with one or other of the recognized stone preservative processes—probably that of Ransome's was the best for the purpose. If that were not successful, it would be desirable, for the sake of the paintings, to coat the outside walls with some material which was impervious to wet, as paintings of this description should not be allowed to go to ruin from the unfavourable state of the stone wall on the outside. With regard to the water-glass pictures in the Houses of Parliament, he thought it would turn out eventually a mistake to have used that material at all, because silicate of potash has a very strong attraction for the moisture of the atmosphere, which might produce a damaging effect upon the pictures, because when the water-glass was treated with chloride of lime there was a large quantity of salt thrown off, and until that was got rid of there was a strong tendency to absorb water. With regard to the material Mr. Scott was employing in the execution of these pictures he had no opinion to offer, but he strongly advised him to reconsider the idea he had formed of painting any portion of them upon plates of zinc. It would, in his opinion, be preferable to remove the portion of wall which showed appearances of dampness to a sufficient depth and replace it with a composition of a more satisfactory kind.

MR. CHARLES BARRY complimented Mr. Scott upon the successful treatment of his subject in the disposition of his pictures, in this, as in the former case, which he brought before the Institute. Looking at the instance now before them, he hoped Mr. Scott would be able to find some means of protecting the inside surface of the walls from damp, without depriving the external wall of its original stout character, and not sacrifice the glory of the exterior by coating it over with a foreign material. There were two ways of meeting the difficulty; the most obvious was, if they had any apprehension from the porosity of the material that moisture would get through, it was not a difficult thing when the walls were to be covered with works of art, to make an inner wall with interstices of space between it and the outer wall. He agreed with Professor Kerr in the caution he had given as to the contemplated use of zinc plates.

MR. W. WHITE, after some general remarks on the treatment of mural paintings, observed that he had seen several of the pictures of Mr. Gambier Parry, which he understood to be a sort of tempera, and he did not know of an instance in which they had failed. In reference to the use of zinc plates, he had been informed by decorators in painting that, by thoroughly scrubbing the surface of the metal, and either gilding or silvering it over before the paint was applied, a very excellent and durable surface for painting was obtained. A further suggestion was that zinc paint should be used instead of lead paint, inasmuch as the latter would set up a galvanic action which deteriorated

REVOLVING GAS AND AIR WASHER.

Fig. 1

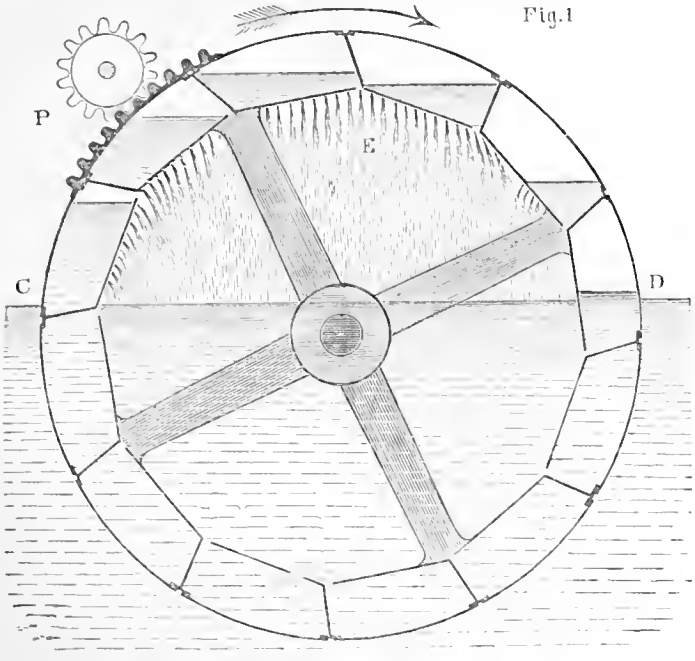
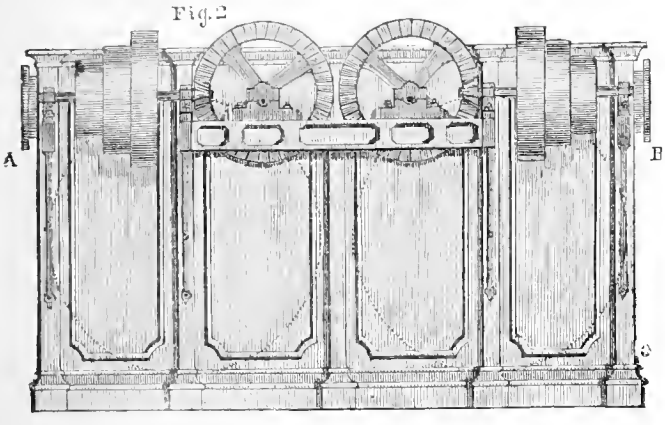


Fig. 2



the surface. He agreed that the most efficacious way of keeping damp from mural pictures of this kind was the plan of double walls, in which case any dampness that penetrated the outer wall dropped down and left the interior wall, ventilation being duly attended to, perfectly dry.

MR. BARRY hoped the notion would not be endorsed by the meeting that gilding or silvering the zinc plate would prevent destruction of the surface by galvanic action, as a greater amount of galvanic action was set up between metals of different degrees of oxydation.

After some further conversation, the vote of thanks to Mr. Scott was unanimously passed.

A communication from Mr. J. McLean, descriptive of the old roof recently discovered over the nave at West Church, Stirling, N.B., which had been obtained upon the application of Professor Donaldson to that gentleman for any information he possessed on the subject, was then read and thanks voted to the author, after which the meeting adjourned.

REVOLVING GAS AND AIR WASHER.

WE very recently [BUILDING NEWS, No. 674] gave a general description of a new revolving washer for removing impurities from gas in the process of manufacture, and also applicable to the purification of air, the invention of Mr. John Reid, Engineer, and Manager of the Edinburgh and Leith Gas Company. We now give two illustrations of this highly valuable contrivance, for which we are indebted to the courtsey of the inventor. "The leading idea of my improved washer," says Mr. Reid in his pamphlet, "is to substitute a horizontal, instead of a vertical passage for the gas while being submitted to the action of the shower of water, whereby it should undergo a thorough shower-bath from a copious stream of water jets, falling some 20in. in an elongated horizontal chamber, instead of 30ft. in height; and that this should be effected without in any way presenting obstruction to its free passage, or throwing any back pressure on the retorts. The apparatus consists of a cast-iron close cistern, with some external panelling and architectural ornament, measuring about 14ft. long, 12ft. wide, and 6ft. in depth, having a longitudinal vertical partition dividing its interior into two equal sized chambers, 14ft. long, 6ft. wide, and 6ft. deep. In each chamber is fitted a revolving hollow cylinder, some 10ft. long, and 5ft. external diameter, with strong wrought-iron axles, and lignumvitæ bearings fitted inside the principal chest. The periphery of each cylinder is built all round with cast-iron buckets, twelve in number, in the manner of a water-wheel, with this difference, that, with the exception of air-slits in the outside of each bucket, they are close all round the outside circumference. The interior surface of the buckets, about 10in. less in diameter, is closed in with thin cast-iron plates, perforated with holes an inch apart, and one quarter inch diameter. Each cylinder is mounted at the front end with a spur wheel, actuated by pinions within the chest, for giving to each a slow rotary motion, at about one and a half revolutions per minute. The pinion shafts pass by a stuffing-box to the outside, and are mounted with wheel gearing and driving pulleys, which are driven by engine power. The chests being charged with water to the height of a few inches above the centre of the axles, and the cylinders being set in motion, in the direction of the arrow, fig. 1, which represents an end section of the cylinders, each bucket emerging from the water line CD discharges a copious shower of water through the internal perforated plates into the interior vacant space of each cylinder, and each bucket thus discharging its contents is nearly emptied by the time it reaches the surface of the water on the opposite side, as shown on fig. 1. Fig. 2 is a front elevation of the machine, showing the outer driving gearing, and the inlet and outlet passages for the gas, AB. Fig. 4 is a cast-iron plate or screen, closely fitting the sides and top of the chest, and with a semicircular cavity accurately fitting the periphery of the front end of each cylinder, which is turned truly for this purpose. The two lower points of this plate dipping a few inches into the water compels the stream of gas entering at A to pass only through the interior of each revolving cylinder. On discharging at the back end of the first cylinder, a suitable aperture allows the gas to cross the middle partition of the chest, and enter the interior of the second cylinder, and after passing forward through its interior it escapes by the outlet at B. The volume of water thus brought up from the lower depths of the vessel amounts to 225 gallons per revolution for each cylinder, being 450 gallons for the two, and the speed making 1½ revolutions per minute. There are 675 gallons, or three tuns, of water per minute showered by this apparatus upon the gas passing through it in that period of time. To provide this copious shower in the ordinary washer would require appliances of a formidable character, in the way of pumps and other tackle. Here nothing of this kind is required; while the motive power requisite to lift the water about 18 or 20in. in this machine is less than one-twelfth of that required to lift the water 30ft. in the old form of washer. When the water is charged, it is only done partially, and the ammoniacal saturation is never allowed to fall lower than 4 deg. to 5 deg. in strength, and it is usually worked up to 10 deg. or 12 deg. before it is run off; and in this condition it is sent to the chemical manufacturer for the production of sulphate of ammonia, its relative value being measured by its strength. The highest strength of this liquor attainable with advantage by the old washing apparatus rarely exceeds 5deg. or 6 deg."

SCARBRO' CLIFF.

THE shareholders of the Scarbro' Cliff Bridge Company held a meeting the other day, the mayor presiding, to discuss a project for forming a subway under the face of the cliff, which is the property of the company, at the south end of the Spa, to connect the Spa and the Esplanade. The proposition was made by Messrs. Shelford and Robinson, engineers, Westminster, who submitted plans to the meeting. The proposed subway would consist of a tunnel, up and down which a train of carriages would pass, propelled by hydraulic power. The train would be capable of conveying forty persons at once, and could be worked so as to take 600 passengers per hour. The cost was not stated. However, the proposition, after a long discussion, was rejected on the motion of the Rev. Dr. Evans. One or two of the shareholders warmly advocated the scheme, while Mr. Hunt (of the Prince of Wales Hotel) spoke to the desirableness of some means of easy communication between the Spa and South Cliff, and contended for the superiority of certain plans of his own, viz., a surface road, which he was prepared to guarantee could be formed in three months, and the cost of which he was also prepared to raise. It seems to be generally felt that some such undertaking is desirable, and would be highly advantageous in a public point of view. Both proposals, however, have been abandoned for the present.

THE CO-OPERATIVE MOVEMENT IN THE BUILDING TRADES.

ON Tuesday evening a general meeting of operative house painters was held at the Grafton Hall, Grafton-street, Fitzroy-square, for the purpose of hearing from Mr. A. Walton his plan for the formation of a co-operative building society amongst the different branches of the building trades. There was a numerous attendance. Mr. J. W. Carter, of the Painters' Central Society, occupied the chair, and briefly introduced Mr. Walton to the meeting. Mr. Walton then proceeded to detail his plan at some length, dwelling upon the superior advantages to the trades of the co-operative system over the simple trades' unions, however necessary those unions were under the present competitive system. He pointed out how easy it was for operatives in the building trades, by uniting together, to establish a building company on a scale that would enable them to undertake on their own account any contracts, however large. He thought the present time especially suitable for making the attempt, when the principles of co-operation were taking root in the public mind. He contended the objections urged against trades' unions could not exist against co-operation, which would find many

supporters amongst the middle and higher classes of society. He proposed that the shares should be £1 each, and when 500 men had taken up shares, business could be at once commenced After some discussion, Mr. Walton's plan was endorsed by the meeting, upwards of 50 members subscribing for shares, and a committee of five was appointed to act with similar committees to be appointed by the other branches of the building trades. A vote of thanks to the chairman and Mr. Walton concluded the proceedings.

ARCHITECTURAL ASSOCIATION.

CONCRETE CONSTRUCTION.

THE discussion on Mr. J. Tall's paper on Concrete Construction delivered before the Association on the 6th inst., took place at a meeting of the Association on Wednesday evening, Mr. R. Phené Spiers, the President, in the chair.

The CHAIRMAN remarked that, since the delivery of Mr. Tall's paper, a number of gentlemen connected with the Association had, at the invitation of Mr. Tall, paid a visit to one of the concrete buildings now in course of construction at East Sheen, from designs by Mr. Bloomfield. He regretted that the day was not so favourable as they could have wished. However, the party had an opportunity of going carefully over the building, and he might say that, on the whole, they were well pleased with the result. He called upon Mr. J. D. Mathews to open the discussion.

MR. MATHEWS said that he did not think they were called upon to discuss the merits of concrete as a material, about which everybody was agreed, but rather the adaptability of the material for the purposes of house construction. There were various methods of constructing with concrete. Some were good but expensive, and others were good but intricate. The great point, he conceived, was with regard to the cost. If Mr. Tall can prove that his mode of construction was cheaper than brick, then there was a likelihood of its superseding brickwork. Another great point was getting the foundation fixed, and he would like to ask Mr. Tall, suppose a sinking was to take place in one part of the trench, what would be the result? Again, there was the mixing of the concrete, which was a very important matter. What guarantee had the architect that the material would be mixed in proper proportions. If it were not properly mixed, the responsibility would be thrown upon the architect, and any defects laid to him. The cost of the apparatus was very considerable, and, if it had to be added to the cost of the building, would give us a very expensive house. How was this to be got over? Mr. Mathews admitted that the method had many advantages: there was, for instance, greater warmth in concrete than in brick, and the walls are both damp and fire-proof. He thought we were coming to solid floors—they were very desirable. He therefore approved of concrete floors. In France even bed-room floors were solid, and it was found that they were quite as warm as those here. Then came the question of the artistic treatment of concrete. This was a very difficult point; but he had no doubt that architects would in time find their way to adapting concrete to ornamentation. With concrete we lose the colour which we obtain with stone and brick. This would have to be supplied in some way. The material, if left rough, would present a very uncomfortable and cheerless appearance. The walls, however, might be made in geometrical forms, or in various devices. Terra-cotta might also be used for ornament. He strongly objected to facing with brick, and would rather cement the front. In conclusion, from what he had seen of Mr. Tall's apparatus, he had very little fear of using it when opportunity offered.

MR. BLASHILL said that he had taken considerable interest in this subject, though he had not been able to go down to East Sheen. We had stone and timber and iron as building materials, and concrete might be regarded as a fourth material. He could not, however, accept Mr. Tall's statement that the cost of concrete was one half the cost of brick. In some places stone was the cheapest material that could be used, in others timber, and in others, where clay was abundant, brick was the cheapest. Of course where there was plenty of gravel and nothing else, there concrete would be the cheapest. Still he thought that concrete work might be done at considerably less cost than other materials. But Mr. Tall had given no figures on this point Nor could he agree with Mr. Tall that concrete was ten times the strength of brick. In no sense that would be valuable to the architect. Was this so? The apparatus was very ingenious, but we could not make the rooms of our houses all one size, and what was to be done in this case? He also felt the difficulty of getting workmen to exactly follow out the instructions as to mixing the material. He would not trust to a contractor to do this. The matter of keeping out damp, the getting rid of woodwork, the power of increasing the walls to any thickness, instead of having to jump down from 9in. to 14in., and the greater cheapness of the labour, were all very great advantages.

MR. W. F. POTTER said he was an advocate of concrete, and denied that it was open to the charge of being sham building. He would like, however, to know what was the cost of the apparatus. He had recently received two estimates for the construction of some houses—one estimate was for concrete, the other for brick, and he was surprised to find that the concrete was much dearer than the other. He believed the estimate emanated from Mr. Tall, and he was told that the reason of the greater cost was the expense of Mr. Tall's apparatus, which was about £100.

A number of other questions were put to Mr. Tall by various gentlemen present. Several of the speakers reiterated that the scaffolding machine was only serviceable when 20, 30, or 40 cottages had to be constructed, but cottages generally went in pairs or so, especially in the country, and in these cases the apparatus would be no advantage, owing to its cost. Another point repeatedly mooted was the difficulty of knowing when the material had been properly mixed. There was nothing better than good concrete, remarked one speaker, but bad concrete was worse than rubbish.

MR. TALL, in answer to these and other questions, remarked that most, if not all, of the objections mooted had, he thought, been completely answered in the paper which he read before the Association. He observed that his apparatus was not made to build one, or two, or three houses merely, but 20, or 30, or more. Like all models, the expense was in the first instance. But he would guarantee, that, with 20 or 30 houses to construct, his apparatus would save its cost in the first two houses built. As to the relative cost of brick and concrete, there was no part of England where he would not find the material for concrete construction; where he could not get gravel he would find stone, which he would crush with proper machinery, at one half the cost of brick. He repeated that those who had only a couple of houses to erect would derive no advantage from his apparatus in the matter of cost. The walls could be extended to any length that might be required by adapting the panels of the apparatus. He was ready to prove that concrete was not only ten times, but fifty times, the strength of brickwork. He did not recommend concrete roofs, nor would he make concrete floors for small cottages, because it could not be done so cheaply, unless the material was close at hand. He thought there was no difficulty about the mixing. The walls could not be carried up unless the cement was good, and of the proper mixture, and then a common labourer could do the work perfectly. It had been remarked that the houses at East Sheen presented a very rough and honeycombed appearance. The reason was that the material should have been passed through a finer screen; concrete may be made rough or fine just as it is passed through a rough or a fine screen. For the rest, he referred to his recent paper, and also to the pamphlet which he had published on the subject.

The CHAIRMAN said that, as to the durability of the concrete, the proper proportions in mixing, and other points, had been satisfactorily settled by tests. It appeared to him that the most serious objection to the use of concrete was the fact that it admitted of no alterations being made afterwards. The material was so hard that it turned the chisel. As to decoration, some material would require to be used, but he hoped it would not be stucco. The difference in appearance of the surface, often on the same beds, at East Sheen he noticed as serious defects, though Mr. Tall had explained this by stating that the concrete should have been passed through a finer screen. The chairman concluded by moving a vote of thanks to Mr. Tall for the trouble he had taken to give the members every information on the subject of his patent.

HOUSE PAINT.

A NEW preparation of house paint has been invented by M. Hugoulin, principal chemist to the French Navy, by which one can prepare, in a few hours, as much paint as is required, without any other utensils than simple small tubs of metal or wood of sufficient capacity. The best paints usually employed in house painting, and which preserve best the wood, have for bases white lead, minium, oxides of zinc, and lamp black. They are not, as in other paints, simple mixtures of drying oil and mineral substances in powder, but intimately blended compounds, in which the elements are combined without chemical double decomposition.

To demonstrate this, the inventor forms, in any vessel, a liquid paste, perfectly homogeneous, with water and a certain quantity in powder of the substances indicated in the following table:—

For 1000 grammes of zinc white we can employ	300 or 352 or even 400	grammes
,,	grey oxide of zinc 150 to 180	,,
,,	white lead 150 to 180	,,
,,	red lead 50 to 60	,,
,,	lamp black 1000 (thereabouts)	

In this mixture the necessary quantity of linseed oil is added, in order to form a body colour worked up by the ordinary means.

OBITUARY.

The death of M. Claudet, the eminent photographer of Regent Street, is announced. The deceased first introduced into this country the old daguerreotype process, in the year 1839. He was the inventor of several instruments, and made various useful discoveries in connection with his art, and brought the stereoscopic pictures to great perfection. He was elected a Fellow of the Royal Society in the year 1853, and so recently as 1865 was decorated a Chevalier of the Legion of Honour.—Theodore Rousseau, one of the most celebrated landscape-painters in France, and a constant exhibitor, is dead. The event took place at his house at Barbizou, on the skirts of the forest of Fontainebleau, whence he drew his inspiration. M. Rousseau was only fifty-five years of age.

Mr. Doyle, better known as "H.B.," celebrated as a political caricaturist, died on Thursday, the 2nd inst. His likenesses of Sir Robert Peel, the Duke of Wellington, Sir Francis Burdett, Disraeli, and other public characters, have never been equalled. His works caused an extraordinary amount of public interest from 1829 to the appearance of "Punch." It was his son who designed the inimitable and familiar frontispiece of that periodical, the well known "Dicky Doyle," of "Pips his Diary," and "Brown, Jones, and Robinson" celebrity.

Mr. Adam Stark, the well-known antiquary of Gainsborough, died in that town, on the 31st ult., at the age of eighty-five. He was the author of "The History and Antiquities of Gainsborough," "History of the Bishopric of Lincoln," "Observations on Stonehenge," &c. Mr. Stark was for many years postmaster and a bookseller at Gainsborough.

The annual meeting of the Bath School of Art was held on Wednesday evening, when the prizes awarded by the Science and Art Department in connection with the South Kensington Museum were distributed to the pupils. The Mayor (Mr. W. Hunt) presided, and briefly introduced the business by expressing his regret that Bath did not possess a public library and a gallery of paintings. He thought there would be no difficulty in establishing the former, though he was afraid that the cost of the latter would be somewhat beyond what a provincial city could be expected to afford. In the absence of these, the next best thing was a School of Art, such as the city possessed, and he was glad it was in such a satisfactory state.—Major Allen, the president of the institution, presented the financial statement, stating that the most satisfactory feature in the school was the fact of the great interest taken in it by the artizan class, who formed the mainstay of the institution. At the same time he regretted that there was a debt owing of £145, occasioned by the purchase of the new premises, and the alteration of the same. The Mayor then distributed the prizes to the pupils, and the meeting was brought to a close.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Russian church, built by the liberality of various members of Russian nobility, has just been consecrated at Pau. The interior is very handsomely decorated. The paintings, on cedar, on a gold ground, framed in the iconostasis, were executed by a celebrated artist of St. Petersburg.

The little church of Scarrington-with-Aslockton has lately been restored. A south aisle has been added, and the interior generally renovated. The church will now seat 200. Mr. J. H. Fakewell is the architect, and Messrs. Marriott, Wartnaby, and Scott, of Nottingham, have carried out the works.

A new Independent chapel has been opened at Blandford, Dorset. It is in the Gothic style. The architect was Mr. Stent, of Warminster, and the builder Mr. Walden, of Christchurch.

The parish church of Ashton-under-Hill has been re-opened after restoration. The alteration consisted in clearing away the schoolroom, and lengthening the aisle to the extent of two bays in the arcade, and repewing the church. The space within the altar rails has been paved with Maw's encaustic tiles. Mr. Baker, of Birmingham, was the architect, and Mr. C. Ancill, of Overbury, the builder.

The new church has been commenced at Dinnington, Yorkshire. Mr. R. Charles Sutton, of Bromley-house, Nottingham, is the architect; Mr. Cawthorne, of Retford, the builder.

On the 29th ult. the first stone of a domestic chapel attached to Exton-house, the seat of the Earl of Gainsborough, was laid by the Bishop of Nottingham, with the prescribed ritual of the Catholic Church. The new chapel includes a spacious crypt, which will form the family burial place. The architect is Mr. Buckler, of Hereford-square, London.

The memorial church at Constantinople, as designed by Mr. Street, is rapidly approaching completion.

The foundation stone of a new Primitive Methodist Chapel has been laid at Old Shildon, Durham. The chapel will be 60ft. long, and 40ft. wide, and will accommodate 800 persons at a cost of £1,500. Mr. Herbert Fippard, of York, is the architect.

The new church of St. Clement, Wrinston, Lancashire, was consecrated on Saturday, by the Bishop of Manchester. It is in the Geometrical Decorated style, and will seat 300 persons. Mr. J. M. Taylor, of Manchester, was the architect, and Mr. M. Foggett, the builder. The building at present consists of a chancel, nave, and south aisle, with arrangement for a future north aisle to seat 200 more persons.

On Tuesday week the Bishop of Salisbury consecrated a new church for the hamlet of Milton, and the adjacent district. The style is thirteenth century Gothic, and the building is 84ft. long by 40ft. wide, consisting of chancel, nave, and aisles. The building is all built of local stone, and the architectural features are of Tisbury stone. The font, which is the gift of Mr. Lilly, is also of Tisbury stone. The church will seat 360 persons, and will cost over £2,500. Messrs. Slater and Carpenter were the architects. Mr. A. Meade, of Gillingham, did the general masonry, Mr. E. Churchill the roofing, and Mr. C. Lydford the carpentry.

The first quarterly meeting of the Salisbury Diocesan Church Building Association Committee for the present year was held on Thursday week. £225 was voted in January, 1866, towards an extensive restoration of the parish church of Heytesbury. £100 was voted in January, 1867, towards the restoration and re-arrangement of the seats in the parish church of Aldbourne. £150 was voted in January, 1866, towards the erection of a new district church at Milton, in the parish of Gillingham.

A movement is on foot for the erection of a new church at Windhill, near Shipley. A design for the church in the geometric Gothic style has been prepared by Messrs. Andrews, Son, and Pepper, of Bradford. The interior will consist of a nave, aisles, and long circular chancel, and will be fitted with open benches of stained wood. The church will be constructed of stone obtained in the neighbourhood. The total cost is estimated at £4,000, and the church will seat about 600 persons.

ST. PETER'S, THANET.—A reredos has lately been set up in the parish church. It consists of a retabulum in stone, in which are sunk a central niche flanked by two quatrefoils, each filled with mosaics. The former bears a white marble cross, and the latter contain angels carrying shields, charged with the sacred monograms I H C and X P C respectively. Wheat and vine are carved on either jamb of the central niche, and the whole is surmounted by a cornice of leaves, severe in form. The wall at the sides, up to the height of this cornice, is lined with slate slabs, with a rough face, and having the Creed, Lord's Prayer, Commandments, and Apostolic Emblems painted on them in oil; below them is a dado of marble and alabaster inlay. This and the stone work was executed by Mr. Thomas Earp, the painting and mosaics by Messrs. Heaton, Butler, and Bayne, from the designs of Edward J. Tarver, architect. The whole was put up by a subscription amongst the parishioners, raised by Thomas Gray, Esq., of Orlibar-house, whose family have long dwelt at St. Peter's.

BUILDINGS.

St. Martin's New Schools, Lincoln, were opened last week. The plan of the schools is somewhat in the form of the letter H, and they comprise a boys' and an infants' school-room, each 50ft. by 19ft. with a girls' room between them, 40ft by 19ft., and two class-rooms to the north of the girls' room, each 16ft. by 14ft. The exterior of the building is faced with red bricks with black bricks introduced in bands, and in the arches over the windows. On the south-east gable is a stone bell-turret, surmounted by an ornamental iron cross. The whole of the works were designed by, and carried out out under the superintendence of Messrs. Goddard and Son, architects, Lincoln.

The New National Schools in connection with the parish church, Doncaster, were opened on Sunday last by the Archbishop of York. They have been built from designs of Mr. J. F. Teale, architect, Doncaster, at a total cost of £5,000.

The new national schools in connection with the parish church of Doncaster were opened on Sunday last by his Grace the Archbishop of York. They have been built from designs of Mr. J. F. Teale, architect, Doncaster, at a cost of nearly £5,000.

New parochial schools were formally opened at Rhayader last week, with accommodation for 120 children. Brick is the material used for the walls, and Major's dun-coloured angular tiles cover the open timber roofs. The general style of the building is Gothic, somewhat freely treated, a picturesque group harmonizing with its surroundings having been obtained. A wood framed bell cot, covered with plain tiles, and standing 10ft. above the ridge of roof, forms a prominent object in the view, and assists in giving a character to the work. Moule's patent dry-earth closets have been adopted. The architect was Mr. E. H. Lingen Barker, of London and Hereford; and the builder, Mr. William Evans, of Rhayader.

The buildings of the junior school, Uppingham, are so far completed as to insure the opening of this supplement to the main school at Easter. The carrying out of the designs of Mr. G. E. Street for the finishing the west end of the school chapel are contracted for.

WATER SUPPLY AND SANITARY MATTERS.

The Leeds Corporation Waterworks produced last year a profit of £14,367.

An experiment of some importance is now being carried on at Asnières, near Paris, on a field of about two acres and a-half in extent, and situated about 300 yards distance from the mouth of the great "egout collecteur." Two portable engines are employed daily in pumping 500 cubic metres of sewage-water into a receptacle at one end of the field. A part of this water is applied to various crops—vegetable and eereal—and the remainder is treated with chemical agents for its purification. The former application is considered as fully confirming the opinion that sewage-water may be advantageously applied either to crops or to the direct fertilization of the soil itself, without communicating any bad taste to the vegetable produets, or in any way vitiating the surrounding atmosphere. Some fine specimens of beetroot, yellow turnips, artichokes, and other vegetables thus irrigated were shown at the late exhibition on the Champ de Mars. These products were grown at Clichy, but they were not accompanied by sufficient data to render them scientifically and practically useful, and therefore the authorities of the city of Paris have set on foot the experiments already referred to, in order to obtain definite results connected with this important question. There is no question of the immense importance of the subject, and it is to be hoped that the experiments now being made will at any rate assist in bringing about some advantageous application of such precipitated matter, and thus prevent the pollution of rivers and the extermination of the fish which inhabit them. The Seine at Paris is now relieved of the sewage-water of the metropolis, which is thrown into it below the city, but, on the other hand, it still receives the impurities which are poured into it by all the sewers between Paris and the source of the river.

MALTA.—The late prolonged drought has induced the government to make extensive explorations for water in different parts of the island, especially in the sandstone at the Marsa Valley, and in the marly districts beyond the ancient city of Medina, now called Civita Vecchia. These experiments have been attended with a very considerable amount of success. Numerous shafts have been sunk at the Marsa, which already yield upwards of 400,000 gallons a day, and it is calculated that the whole supply from these sources will be upwards of 900,000 gallons a day, or more than double that given by the two principal aqueducts upon which the cities before chiefly depended. For the purpose of boring through the rock, and exploring laterally from the sides of the shafts, a boring apparatus, which will cost £240, has been ordered from England.

STAINED GLASS.

Four stained-glass windows have been placed in the restored church of Scarrington-with-Aslockton by Messrs. Ward and Hughes, two in the chancel, representing the Ascension, and the other two the Annunciation, the Adoration, and the Circumcision.

During the Christmas week two windows in the parish church of Hawley, Hants, have been filled in with stained glass by Messrs. Ward and Hughes. The east window represents the Nativity, Crucifixion, and Resurreetion of the Saviour, and the north window St. John writing in the island of Patmos.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED—R.M.—H.C.—W. H.—S. and Son.—W.O.L.—P. and B.—R. C.S.—M. and M.—J. M. (junr.—J. B.—A. W. M.—E. J. T.—I. F. and Co.—G. W. L.—I D.—W. O. C.—T. P. L.—R. D. W.—I. W. and Co.—T. H.—I. T.—T. H. B.—I. B.—I. T. B.—I. O.—W. S.—E. W. P.—A. C. W and J. R.—C. C.—H. D. thanks for photograph. It is too small to engrave.—F. H. and Co.—I. M.—E. W. P.

NOTICE.—The BUILDING NEWS index for 1867 will appear next week.

I.D.W.—The lectures at the Royal Academy are open to students only.

H.N.—We do not bind the BUILDING NEWS, but will issue covers for last year's volume in a few days.

E. W. PUGIN.—Next week.

Correspondence.

STEETLY CHURCH.

To the Editor of the BUILDING NEWS.

SIR,—Observing in your impression of January 3rd, that you have lithographed another of the photographs from my published work on "The Architecture and Sculptured Details of Steetly Church," I thought that a few notes respecting that building might probably be acceptable to your readers, it being an extremely good example of a small Norman *church* (not "abbey"), and is rendered additionally interesting from the fact that it has almost entirely escaped alterations in succeeding periods. It is situated on the northern extremity of Derbyshire, and in close proximity

with the boundaries of Yorkshire and Nottinghamshire; but, owing to its secluded position, is comparatively unknown. The assumed date of the building is A.D. 1120, or somewhat later, and consists of a nave and chancel, 56ft. long, divided from each other by a massive arch, lately illustrated in the BUILDING NEWS. The latter terminates in a semicircular apse, separated from the remainder of the chancel by a second arch lower than the first, and also by the elevation of its floor, and which is lighted by three semicircular headed windows. It has long been unroofed; but probably once presented an appearance very similar to the little church of Dalmeny, in Linlithgowshire, the plan of which it greatly resembles. It may also be compared with that of Kilpeck, in Herefordshire.

The details of the door which you illustrated last week are exceedingly interesting. The outer arch, ornamented by the chevron moulding, rests upon two semi-detached shafts, composed of six stones each, on which are carved the twelve signs of the zodiac.

It also affords an example of the curious mermaid capital, seldom found in England, but sometimes to be met with (I believe) in the south of France. The shafts of the second arch are detached and formed of elaborate interlaced ornament, far superior in design to the celebrated pillar in Shobden church; indeed, it would be difficult to find a sample of Norman detail in which is displayed so much artistic treatment as there is in the careful arrangement of the ornamentation of the pillar on the left side of this doorway

The church, though small, is rich in carving, the most interesting being a double capital, representing the conflict of St. George and the Dragon, which is treated with considerable skill. The capitals in the interior of the apse are all good in design, the most curious being one representing the temptation of Adam and Eve, given in your issue of March 2, 1866. There are several traces of polychrome work to be found in the apse, the prevailing colours being red and blue. The enriched string which surrounds the apse externally is in remarkably good preservation, considering that the stone employed was the soft limestone still obtainable hard by. It is much to be regretted that this church has suffered damage by wanton mutilations. In the apse the corners and base mouldings of the pillars have been ruthlessly knocked off, and the reason assigned for this act of Vandalism is that, previous to the building passing into the hands of its present noble owner (the Duke of Newcastle), a man who formerly rented the adjoining farm used the church as a sheepfold, and cut off all angles and projections, to prevent the animals from injuring themselves. I regret to add that the inner keystone of the door that you have illustrated has been removed by the man working the adjacent quarry, who carried it off as a trophy of the durability of the stone he had to vend, and of which this interesting building is constructed.—I am, &c., THEOPHILUS SMITH.

Sheffield, January 6.

[We engraved the illustrations from a photograph which was provided us. We were not aware that Mr. Smith had published a work on the subject.]

DURHAM UNION WORKHOUSE COMPETITION.

SIR,—Being a subscriber to your journal, I take the liberty of asking your advice in reference to the following competition:—I, along with other architects, sent in designs for proposed additions and alterations to the Durham Union Workhouse. The competition was public, and the guardians provided a code of instructions for the guidance of competitors. They appointed a special committee to enquire into, and report upon, the several designs, and they recommended my design for the first premium. The committee consisted of ten members of the board, and there were only two who dissented from the recommendation of the committee. I leave you to form your own opinion of their motives in dissenting from the committee's recommendation (see report enclosed).

The land objected to by one of the committee was the result of straightening the present crooked fence, and when I made the proposal in the design to straighten the boundary, it was with the intention of improving the site, more than for any improvement it made in the design, there being nothing mentioned in the instructions to architects that the boundary had not to be exceeded, in fact, the ground to be worked on is not mentioned in any way whatever, and no plan of the site was supplied. I was not aware, till I saw the report that the adjoining ground was not property belonging to the workhouse.

Now, Sir, do you think it would be fair to throw my plans out for the reason stated above, that being the only objection one of the committee have to the design, it being so arranged that there would not be required the slightest alteration in any of the buildings, and if carried out on the ground belonging to the workhouse, the only difference would be that it would make the mews yard a little smaller, and still leave a yard of sufficient size for their requirements. Your advice upon the above, in your next impression, would greatly oblige.—I am, &c., COMPETITOR.

[In looking over the report, we can come to no other conclusion than that the committee decided on having a competition without maturely considering the matter. That is a misfortune for "Competitor," and particularly as there was no pledge given that any design should be carried out.]

CORPORATION BUILDING REGULATIONS.

SIR,—It is stated in your paper of the 4th inst. that the Liverpool Corporation have been obliged to abandon the best plan (an admirable one) for workmen's dwellings (to be built by the Corporation itself), because it cannot be reconciled with their own bye-laws. I hope this case will draw the attention of the profession to the often despotic and tyrannical nature of such bye-laws, not only in Liverpool but in other towns. These laws often manifest little practical acquaintance with buildings, and surveyors and local boards of health, who, one might suppose, would consider each plan on its merits, too often avail themselves of the letter of the law to oppose the projects of individuals who may be personally distasteful to them. Clauses more or less objectionable creep into these bye-laws at every new edition—the boards of health are even constituted arbiters of taste as well as in the matters of health. If time permitted, I could give instances of this nature, but many of your professional readers will be able to call to mind cases which bear out this statement. Can anything be done to counteract this evil, which is a growing one?

A PROVINCIAL ARCHITECT.

Intercommunication.

QUESTIONS.

[710.]—ZINCING OF IRON.—I am anxious to zinc some iron, but am in doubt as to what strength the solution ought to be. If some of your readers will describe the process it will oblige.—DONCASTER.

[Iron may be conveniently coated, in the humid way, by a solution of sulphate of zinc, or one of the double salts of chloride of zinc and sal-ammoniac, as now used in soldering, and welding, to secure success. The zinc solution should be weak, and only a weak galvanic current should be used, otherwise the zinc precipitated will again separate from the iron in scales. With proper precautions the deposit may be made as thick as strong paper. The article must be well cleansed before undergoing the operation.]

REPLIES.

[688.]—FLOW OF WATER IN PIPES.—I propose to answer the question of "Inquirer" by using the following general formulæ for the quantity of water discharged by a circular pipe running full, when the gradient and diameter of pipe are known. The proof of the formulæ is long, but if required it will be given on another occasion:—

Let Q = quantity of water in cubic feet discharged per minute by any pipe.

$\frac{h}{l}$ = gradient or ratio of height to length in feet.

D = diameter of pipe in feet.

Then $Q = 2356 \sqrt{\frac{h}{l}} \times D^5$

In this case $h = 9{\cdot}5$ feet; $l = 5280$; $D = \frac{18}{12}$ feet.

$$\therefore \quad Q = 2356 \sqrt{\frac{9{\cdot}5}{5280}} \times \left(\frac{18}{12}\right)^5$$

Using logarithms as best adapted to this calculation—

Log. Q = log. 2356 + ½ log. 9·5 + $\frac{5}{2}$ log. 18 − (½ log. 5280 + ½ log. 12)

log. 2356 = 3·37218
½ log. 9·5 = 0·48886
$\frac{5}{2}$ log. 18 = 3·13817
0·99921
6·99921
4·55926
2·43995 = log. Q.
½ log. 5280 = 1·86131
$\frac{5}{2}$ log. 12 = 2·69795
4·55926 ∴ Q = 275·4 cubic feet.

Answer—Q, or quantity discharged per minute = 275·4 ubic feet, or 1721¼ gallons.—L. A. B.

[702.]—GREENHOUSES.—Hot water is the most satisfactory and economical way of heating a greenhouse, small or large. Bottom ventilation is obtained by small sliding ventilators built in the wall at convenient distances from each other, say four in a 20ft. house; and also by the upright sashes (if any) having on the top, to open outwards, top ventilation, by means of small wooden sashes, also being on the top at convenient distances apart, or (which is more satisfactory) by raising the top square, the whole length of roof, 5in. above and overlapping the under 4in. to prevent the rain driving in, and small trap doors inside to open or shut at pleasure.

The above top ventilation refers to a roof composed of rafters not made with long sashes.—J. G. G.

Suggestions.

The process of galvanizing iron, as practised in one of the leading establishments of Philadelphia, is as follows:—Selected sheets of iron, after being trimmed to requisite size and cleaned by a weak solution, are rolled smooth, then dried in an oven, and each sheet placed in contact with zinc. Both metals are raised to an equal heat, and thus fusion is effected. The regulation of the heat necessary to metallic combination is a point of nicety and care.

Although chimneys are essential to argand gas burners and globes, also in many places where fish-tail burners are used, and the ornamental effect is pleasant, still they are detrimental to the diffusion of the light of gas. A clean glass globe obstructs about 12 per cent.; a clean globe engraved with flowers about 24 per cent.; a globe ground all over 40 per cent.; an opal globe 60 per cent. Hence is apparent the folly of using elaborately engraved and ground globes or shades where it is desirable to economise. If engraved at all, the upper portion should be embellished, while the lower part should be left clear for the free passage of light.

STATUES, MEMORIALS, ETC.

The Committee of the O'Connell National Monument have unanimously adopted Mr. Foley's model. £10,000 is already subscribed towards the cost of erection of the work, which will be in bronze and granite, and 40ft. high.

The Scotch artist, Alexander Monro, has just completed a marble bust of the late Monsieur Cousin, which, by order of the French Government, is placed in the Palais de L'Institut. It is pronounced to be a fine work of art and an excellent likeness.

It is in contemplation to erect a splendid fountain in Glasgow commemorative of the projection and completion of the Loch-Katrine water scheme. At the meeting of the Commissioners on Monday the Committee appointed to report recommended St. Enoch-square as the most appropriate site.

The operation of casting the Palmerston statue for Romsey was performed the other day by Messrs. Prince and Co., of Southwark. It is in bronze, is 8ft. 6in. in height, and will be placed upon a granite pilaster, about 8ft. high. Those friends and parliamentary admirers of the deceased statesman who saw the model in Mr. Noble's studio admit the likeness to be admirable.

LEGAL INTELLIGENCE.

IMPORTANT TO SPECULATIVE BUILDERS.—Joseph Neale, Benjamin Cooper, and Neale Saunders, all builders and contractors at South Norwood and Croydon, were indicted on Friday last at the Surrey quarter sessions, for maliciously damaging property to the injury of Mr. John Jones to the amount of £200. Mr. Sleigh, in opening the case, said the defendants had committed an offence of vast importance to owners of land and the public generally. It appeared that Mr. Jones, a retired tradesman, had purchased some land at South Norwood, and that in July or August last the defendant Neale took a plot of land from him for 72 years, called the "Drive," for the purpose of building thereon. Saunders and Cooper also leased plots for similar purposes. Mr. Jones agreed to advance them money at certain times to assist them, and had advanced Neale certain sums on account of dwelling-houses he was erecting, but for some reason refused to advance any more. Neale then threatened that, if he did not advance more money, he would pull the buildings down, and on the morning of November 18 he, with the other two defendants, carried out that threat, and left the buildings a mass of ruins. They threatened to serve some other buildings the same, but were taken into custody. Dr. Kenealy, on behalf of Neale, contended that it was a most unjust and spiteful prosecution. The prosecutor, by his own showing, had agreed to advance three-fourths of the money on the buildings proceeded with, and had only advanced £125, when he should have advanced £175 10s. He had also written a letter complaining of there being no basements, and requiring them to be added. This letter, until shown his own handwriting, Mr. Jones had denied sending. The chairman summed up the evidence which was called by the prosecution, and, after retiring for an hour and a-half, the jury acquitted the defendants on all the counts.

Our Office Table.

The following gentlemen have recently been elected members of the Architectural Association:—Mr. S. Wall, Duke-street, Adelphi; Mr. C. E. Burt; Mr. F. W. Gritten, St. George's-road; Mr. A. Lockwood, Tooting; Mr. R. Raikes, Gloucester-street, Pimlico; Mr. T. W. Cutler, Winchester-street, Pimlico; Mr. E. E. Smith, Parliament-street; Mr. W. Oakley, Charles-street, St. James's; Mr. F. Miller, Engineer's Office, London and North-Western Railway, Euston Station; Mr. E. G. G. Lowe, Marylebone-street; Mr. R. E. Howard, Clapham-Park-road; and Mr. R. E. Smales, Denbigh-street, Pimlico.

Dr. Chadwick, formerly of Bolton, intends to offer the sum of £10,000, to be applied to the erection in that town of working men's model cottages, the rentals from which are to be devoted to the maintenance of an orphanage which he proposes to erect. In the first instance, the orphanage will be for the admission of girls, but it will ultimately be extended so as to receive boys; and to carry out this benevolent design a sum of about £17,000 will be necessary.

There is a story going the round, on the authority of the "Court Journal," to the effect that, during the recent restoration of a church in Brighton occupied by the advanced Ritualists, one of the workmen employed, ascending the pulpit, exclaimed "I publish the banns of matrimony between this church and the Church of Rome." "And I," said another artizan, turning towards the first speaker, "forbid the banns." "On what grounds?" ioquired he of the pulpit. "'Cos the parties is too near akin," was the reply.

A French chemist recommends the use of an essence of petroleum for cleaning type, which appears to be a decided improvement on the usual practice. A French printer, after eighteen months' experience, reports that, the petroleum volatizing rapidly, does not gum up the type, in fact, leaves nothing on the face of the metal but a little white powder, which is easily removed by means of a soft brush; that it does not injure blocks; has no effect in opening the pores of the wood, but, on the contrary, hardens the surface, renders the face of the wood peculiarly smooth, and consequently increases the fineness of the work produced; lastly, the cost of the petroleum is less than half that of turpentine, and the rapidity with which it dries allows the formes to be washed without removing them from the press or machine.

Great dissatisfaction is expressed in military engineering circles at the report that the Directorship of Works, and Chief Inspectorship of Engineers, is to be conferred on General Frome, of whose qualifications and merits nothing can be said, for the simple reason that they are quite unknown. After the long series of blunders in military architecture, and the waste of public money at Portsdown and elsewhere in recent years, it was universally hoped that, whenever any change took place, some man of acknowledged ability, and possessed of the highest scientific skill, would be selected to retrieve past blunders, and now we have General Frome chosen by the authorities, because he is a "safe" man, and unlikely to prove a nuisance to an official and unreformed Horse-Guards.

A French paper, speaking of the works executed at Metz by the military engineers, remarks that the fortress is excessively strong, and that more than 100,000 men would be required to lay siege to it. At the present moment more than fifty powder magazines are situated on the whole line of fortifications, and casemated so as to be bomb-proof. All the ramparts have been heightened according to the necessities of the defence. Rumours of war urged on the completion of these works, which are being carried on under the direction of Colonel de Riviere.

Mr. George Smith, surveyor of the borough of Hanley, died suddenly last week while inspecting some street works. The bursting of a blood-vessel was the cause of death.

The guardians of Nottingham are likely to find themselves in a dilemma. They have incurred £973 expenditure in works for which they had not previously received the authorization of the Poor-Law Board, and they now find that the board refuse to sanction the payment. This may serve as a hint to guardians elsewhere to look before they leap.

Building operations in Paris are completely suspended by the frost. The Seine is completely frozen over, and can be crossed without going over the bridges. At Lyons, notwithstanding its more southern latitude, the cold last week was two degrees greater than in the French capital. Navigation is entirely impeded in the "rapid" Rhone, and the Saone is quite frozen over.

A "Poor Clerk" writes to ask if, while so much is being done for the manual working classes in the erection of model lodging houses, cheap cottages, and similar buildings, whether something cannot be done for the working classes immediately above them, consisting of men with incomes varying from £150 to £400 per annum. Suburban villas come in for a large share of abuse from their occupants and Mr. Ruskin, but no practical architect or builder comes forward to take advantage of the opportunity of erecting houses for the class most interested in them. Most men are anxious to possess a house, and many join the numerous existing building societies with that object in view. But, in the majority of cases, what sort of a house do they obtain? a shapeless mass of brick and mortar, with its imperfections concealed beneath a coating of stucco. £300 ought to cover the cost of building a semi-detached brick residence, with three bedrooms, two living rooms, a kitchen, two waterclosets, closet, &c. The Society of Arts might take this matter up, and do for the clerk what they have done for the "working man." Designs and estimates should be invited, and a prize awarded to the best; the cost of the prize could be defrayed by lithographing the prize designs and selling copies of them at a small profit.

"We are poor frozen out labouring men, and we've got no work to do." It is to be hoped that this cry, which may now be heard in any of our streets and squares, will not fail to convey a significant hint to certain vestry boards, who rather bungled matters this time last year. We may remind local boards that already a considerable quantity of snow lies on the streets, with more to come, that there is a large quantity of unemployed labour at hand, and that it will be much more easy, economical, and convenient to keep the thoroughfares clear now than it will be after an accumulation of fresh storms of snow. We do not want to see the streets all but impassable, as too many of them were last winter. A spade in time will save nine.

Mr. Holmes, F. S. A., of the manuscript department of the British Museum, has left London, to join the Abyssinian expedition as archæologist on account of the museum. Mr. Emanuel Deutsch, who had been selected by the trustees for the service, it is understood declined the mission.

The importation of timber for the last year shows a considerable decrease on that of its immediate predecessors. In 1865 and 1866 we were overtrading in wood to a large extent. The supply for the seven years preceding 1860 had given an annual average of about 2½ millions of loads. For the three following years it became 3 millions, and in 1863 and 1864 it rose to 3½ millions, and then the greater imports of 3¾ millions in 1865 and 1866 left a large unconsumed surplus. Yet, although the importation of little more than 3,000,000 loads in 1867 takes us back five or six years for a parallel quantity, it has supplied all demands, besides leaving a very considerable surplus.

The First Commissioner of Her Majesty's Works, &c., has, it is said, decided on increasing the bathing lake in Victoria Park to nearly double its present size. The works will be commenced immediately, and, following the best precedents of the public works carried on in Lancashire during the cotton distress, will be done by task work. In this way employment will be given to many in the East of London, willing, but at this time unable, to find work.

The little fishing village of Schwarzort, situated on the shore of the Baltic, between Memel and Dantzic, has, within the last three years, acquired a certain importance, owing to the discovery of a large bed of amber. The amber is found almost uniformly in separate nodules, with lignite disseminated in the sands at a depth of from 10 to 12ft. The dredging is carried on day and night, by shifts of eight hours each. About 400 persons are employed at this work, and their wages are on the average 22 silver groschen (2s. 2d.) per shift. The quantity of amber collected is considerable, amounting to about 288 lbs. per shift, and for six days' work 5,184lbs.

One of the churchwardens at Preston has been creating quite a sensation by his energetic opposition to the Ritualistic movement. It appears that, for the recent festive season, St. Peter's church was decorated, and, in addition to the evergreens, &c., seven crosses were put up, four at the altar, two near the reading-desk, and a very large one in front of the organ. These "Popish Emblems," as he regarded them, gave great offence to the churchwarden aforesaid. He sought out the incumbent and the curate, before whom he laid his grievance, and, after much parley, the incumbent offered to cover up some of the crosses, by way of compromise. This offer did not satisfy the orthodox warden, who (having some time previously got possession of the keys, which he was accused by the incumbent of having stolen) proceeded to the church and hauled down the crosses. He coloured the four at the altar with ultramarine blue (previously they were gilded, with a blue base), and finally deposited the emblems at one of the doors of the church. And so ends, for the present, this indignant crusade against crosses. It is expected, however, that the matter will not be allowed to rest here.

"Hints on Household Taste," in reference to the design of furniture, &c., &c., by Charles L. Eastlake, architect, will shortly be published by Messrs. Longman.

MEETINGS FOR THE WEEK.

TUES.—Institute of Civil Engineers, inaugural address of Mr. C. H. Gregory, president, and time permitting, renewed discussion upon the papers on the "Victoria Bridge," and on "New railways at Battersea, &c." 8.

THURS.—Inventors' Institute—"On Promoting the Improvements of our Arts and Manufactures by Reviving the Action of Trade Guilds," by F. W. Camper, Esq. 7·30.

SAT.—Associated Arts Institute—"On Education and Art," paper by L. H. Michael, Esq.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1418. M. D. ROGERS AND J. WILSON. AN IMPROVED FIRE ESCAPE. Dated May 13, 1867.

This invention consists in constructing a fire-escape in the following manner, that is to say:—To the upper windows, by preference, and to the brickwork at each side thereof, and outside of the building, the inventors hinge a bar or "davit" by its lower end, and to the upper end of each bar or davit aforesaid they connect one end of a chain or fireproof rope, the other end whereof is connected to a counterbalance weight sufficiently heavy to balance a cage or balcony slung by its ends, or suspended from the upper ends of the aforesaid bars or davits. They propose to pass a tube or tubes through the several floors of a house or other building, and allow the counterbalance weights before mentioned to pass freely up and down the said tubes, so that, supposing the fire-escape to be in use, and persons to have entered the cage or balcony, they can lower themselves down by means of a chain, or other suitable contrivance, and when they get out, the cage or balcony will be lifted up by the counterbalance weights before mentioned, thus rendering the fire-escape self-acting. The tubes containing the counterbalance weights the inventors propose to connect by their lower ends with a water main, fitted with cocks for establishing a communication with the main, when it is required to use the aforesaid tubes for extinguishing fire in a house or other building, and they perforate the said tubes for the escape of water into the rooms of a house, the said perforations being made near the ceiling by preference; by these means a large body of water may be discharged inside a house. The aforesaid tubes when not charged with water serve to carry off the vitiated air from rooms, the air entering the tubes by the perforations therein, and passing off through the upper ends thereof into the open air.—Patent abandoned.

1426. J. G. JENNINGS. IMPROVEMENTS IN WATER-CLOSETS AND SINKS. Dated May 14, 1867.

According to this invention the patentee arranges water-closets in such manner that, whilst the excrementitious matters which the basin may receive, together with the small quantity of water which the basin holds, are discharged into a receiver, so as to be applicable for use as a manure; the comparatively large quantities of water which are used to scour the basin are kept out of this receiver, and directed away into a sewer or otherwise, as may be desired, but without mixing with and diluting the excrementitious matter, which is consequently discharged almost in an undiluted state into the receiver, whatever be the quantity of water used to cleanse the pan. For this purpose the patentee employs a pan with a valve at the bottom, and when this valve is opened the matters in the pan press into the manure receiver. The same act of opening the valve of the pan also in the usual way open a valve for the supply of the scouring water, and the water supply valve is so arranged, as is well understood, as to remain open for a regulated time. The scouring water is, however, prevented from passing into the receiver as long as the valve of the pan is closed; the scouring water is admitted and the excess passes away by a side opening from the pan, leaving therein only a small quantity of water, say a depth of half an inch, but more or less as may be desired, and sufficient to prevent the adhesion of the soil.—Patent completed.

Trade News.

TENDERS.

ALFRETON.—In last week's BUILDING NEWS Johnson and Wright's tender was stated to be £1,344. It should have been £2,344.

LONDON.—For offices and stabling, Grosvenor-road, Pimlico, for Mr. D Radford. Mr. W. G. Wallis, architect. Quantities supplied:—

Copp and Son	£1,320
Charles Fish	1,195
James West	1,169
Adamson and Sons	1,122
Hoare and Postlethwaite	1,057
Wm. Beeton	1,050
A. Ager	995

MAIDENHEAD (BERKS).—For villa residence, Birchett's-green, near Maidenhead, Berks, for Mr. A. Lawrence, Great Marlow. Mr. Charles Carter, architect:—

Silver	£1,990 0
Revel	1,959 0
Woodbridge	1,924 10
Matthews	1,777 0
Simmonds	1,687 0
Allaway	1,650 0
Corby	1,[illegible] 0
Smith	1,[illegible] 0

WESTBOURNE PARK.—For constructing sewers and temporary roadways on an estate near Westbourne Park, for the Land and House Investment Society (Limited). Mr. Josiah Houle, surveyor:—

Lacy and Freeman	£3,700 0
R. Hubbard	3,486 0
T. Emor	3,284 0
Adamson and Taylor	3,125 0
W. T. Williamson	2,944 15
R. Moxon	2,930 0
H. Potter	2,885 0
J. Bloomfield	2,867 0
G. George	2,842 18
W. H. Goodlar	2,817 0
J. H. Turner	2,800 0
J. Porter	2,220 0
P. Porter	2,250 0
T. Floyd	1,902 0
J. Nicholson	1,896 0
J. Radley	1,807 0

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots; also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Joseph Henry Lack, Battersea, house decorator, January 23, at 2—William Udy Willcock, Dalston, builder, January 23, at 1—Thomas Lucas, Barnes, builder, January 23, at 1.

TO SURRENDER IN THE COUNTRY.

Gregory Cope, Oldhill, near Dudley, builder, January 15, at 12—Edward Cribb, jun., Neath, builder, January 15, at 11—Henry Evans, Everton, near Liverpool, painter, January 15, at 3—William Matthews, Smethwick, plumber, January 15, at 11—William Verrier, Bishop's Lydiard, Somersetshire, carpenter, January 18, at 11—John Calverley, Woodhouse, near Leeds, stonemason, January 20, at 12—James Edmonds, Worcester, builder, January 22, at 11—Thomas Johnson, Towcester, bricklayer, February 3, at 10—Robert McLean, Manchester, builder, January 24, at 12—Richard Piper, Brighton, builder, January 13, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

February 11, R. R. Bishop, Norfolk-villas, Broadway, South Hackney, builder—February 18, J. Dines, Forest hill, builder—Jan. 24, J. Meredith, Fres cign, lime dealer—January 24, W. Bulcock, Everton, builder—January 23, J. Jennings, Ventnor, painter January 21, I. Jones, Talywain, mason—January 20, C. Trail, Shrewsbury, civil engineer—January 28, W. Dalby, Atwick in Holderness, joiner—January 1, W. Roberts, Portmadoc, painter—January 15, T. Williams, Festiniog, engineer—January 16, G. Hitchcock, Ilkeston, stonemason January 16, R. J. Barnes, Denbigh, mining engineer—January 29, L. Robinson, Darlington, joiner—January 24, R. Coppen, Grimstone, Norfolk, carpenter—February 11, G. Stinchcomb, Usk, carpenter—February 6, R. Burgess, Rottingdean, near Brighton, bricklayer.

PARTNERSHIPS DISSOLVED.

Brown and Bourne, Liverpool, decorators and painters—Moon and Son, Guildford, builders—The Birmingham Cut Nail Company—Jameson and Co., Newcastle upon-Tyne, engineers—Bell and Davison, Sunderland, joiners—J. and J. A. Hayes, Bristol, carpenters—Palliser and Son, Northallerton, brickmakers—Dillon and Quick, Southsea, builders—G. and J. Curtis, Poole, builders—Davison and Pawson, Jarrow, brickmakers.

BANKRUPTCY ANNULLED.

Charles Nichols, West green, builder, Dec. 31

DIVIDENDS.

January 22, W. Tadgell, Balham, builder—January 20, W. H. Hartley, Leeds, timber merchant.

DECLARATION OF DIVIDEND.

J. P. Baragwanath, Upper Thames street, engineer, div 2s. 5d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

IRON:—

Bars in London	per ton	6 10 0		6 15 0		3
	do	7 7 6		7 10 0		
	do	8 5 0		8 11 0		
Single	do	9 15 0		10 0 0		2½
Hoop Bars	do	7 7 6		7 10 0		
Wales	do	5 15 0		6 0 0		2
	do	5 10 0		6 0 0		net
Pigs, at Glasg. No 1	do	2 15 0		3 5 6		2½
Bars	do	10 5 0		10 10 0		no

STEEL:—

Swedish Keg, hammered	per ton	15 5 0		15 10 0		2
Swedish Faggot	do	10 10 0		12 10 0		2

COPPER:—

Sheet & Sheathing, & Bolts	per ton	80 0 0		82 0 0		
Hammered Bottoms	do	92 0 0		0 0 0		
Flat Bottoms, not Hammered	do	85 0 0		0 0 0		
Cake and Tough Ingot	do	71 0 0		72 0 0		
Best Selected	do	79 0 0		80 0 0		
Australian	do	83 0 0		84 0 0		
Y. M. Metal Sheathing & Rods	per lb	0 0 7		0 0 0		

ZINC:—

English Sheet	per ton	26 10 0		27 0 0		2
Devaux & V. M. Roofing Zinc	do	29 0 0		0 0 0		

* And 5 per cent. discount if laid upon the new system

TIN:—

English Block	per ton	94 0 0		96 0 0		
do Bar	do	95 0 0		97 0 0		3½
do Refined	do	97 0 0		99 0 0		
Banca	do	92 0 0		95 0 0		nett
Straits	do	87 0 0		0 0 0		

LEAD:—

Pig, English	per ton	21 0 0		0 0 0		
,, Spanish Soft	do	19 0 0		0 0 0		2½
Sheet, Patent	do	22 10 0		0 0 0		
Sheet	do	20 5 0		0 0 0		
White	do	27 10 0		30 0 0		5

SPELTER:—

On the Spot	per ton	21 0 0		21 2 6		net
QUICKSILVER	per bdl	6 17 0		0 0 0		

REGULUS OF ANTIMONY

French	per ton	28 0		0		

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£14 0	£11 10	Archangel, yellow	£11	10 £13 0
Quebec, red pine		3 0	4 10	St. Petersburg, yel.	10	10 11 0
,, yellow pine		2 15	4 0	Finland	8	0 8 0
St. John, N.B., yellow		0 0	0 0	Memel	0	0 0 0
Quebec Oak, white		5 5	5 10	Gothenburg, yellow	8	10 10 10
,, birch		3 10	4 10	,, white	8	0 9 0
,, elm		3 10	5 0	Gefle, yellow	9	0 11 0
Dantzic oak		3 10	6 0	Soderham	9	0 10 10
,, fir		2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir		3 0	3 10			
Riga		3 0	3 5	yellow	16	0 23 0
Swedish		2 0	2 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15 1 4
Masts, Quebec red pine		6 0	7 0	PUMICE STONE per ton	5	0 8 0
,, yellow pine		5 0	6 0	OILS, &c.		
Lathwood, Dantzic, fm		4 10	5 0	Seal, pale	per tun	40 10 41 0
,, St. Petersburg		6 10	7 10	Sperm body		110 0 112 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Cod		36 0 36 10
				Whale, Sth. Sea, pale		39 10 0 0
Quebec, white spruce		13 0	19 0	Olive, Gallipoli		67 10 68 0
St. John, white spruce		13 10	15 10	Cocoanut, Cochin, ton		56 0 57 0
Yellow pine, per reduced C.				Palm, fine		40 10 41 0
				Linseed		34 15 35 0
Canada, 1st quality.		17 0	18 10	Rapeseed, Eng. pale		38 0 38 10
2nd do		11 10	12 10	Cottonseed		35 0 39 10

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 17, 1868.

WHAT THE FRENCH CAN TEACH US.

THE Paris Exhibition of last year has engraven one idea deeply in the minds of Englishmen, and that is that we have much to learn from our neighbours. Nations, like men, differ from each other. Every nation possesses some distinctive quality, is characterized by some distinctive institutions or habits, and is, therefore, enabled to teach all other nations a lesson. These national differences arise from origin, climate, geographical position, history, and education. The English have certain qualities which it would be well for all other nations to imitate. The same may be said of the French, the Italians, the Germans, and the Russians. What immediately concerns us is wherein and in what degree can the French teach us. It appears to be the almost universal impression of those who visited the late Exhibition that they can teach us a great deal. Many have gone so far as to say that England is already beaten in the national race, and that the climax of our prosperity has passed. Not so, however, think a majority of those skilled artizans whose volume of reports we noticed last week. We promised to recur to its pages, in order to glean therefrom a few suggestions for our future guidance. The book is, in fact, full of suggestive information. Almost every writer speaks of our comparative backwardness in matters of taste, and they almost all agree in giving France in such matters the foremost place. Mr. Thomas Connolly, stonemason, says, "It is impossible to estimate the loss which is entailed in England through the neglect of art-culture in every department of our industry." "The foundation of French excellence," says Mr. James Plampin, "is education. Their superiority is in taste, and taste is essentially a matter of education. Owing to the extent of this kind of education, the taste of the whole nation is higher than that of the English." Mr. F. J. Jackson, of Birmingham, says, "One noticeable feature in French industry is the universal application of art, no object being too mean for adornment, and every article capable of being turned into a thing of beauty, receives its share of attention at the hands of the artist." The same writer, when speaking of the Americans, says: "While other exhibits rest principally upon rare and costly works, elaborated to the highest degree, the little display of the Americans rests upon humble works, proving that ordinary articles may be exalted and invested with a dignity that will entitle them to rank with the proudest achievements of industrial art." Our attention, however, is not now devoted to the Americans, but to the French. If they are so superior to us in matters of taste, there must be some cause for it. Now, what is that cause? Some people have sought for it in the incapacity of the English, or rather in the superior aptitude of the French. French ladies say that English ladies are all left-handed, or they work as if they were. There is no doubt that, if an ordinary French woman were to simply hang a curtain, she would do it much better than an ordinary English woman. Still, we will not for a moment admit that the natural capabilities of the French are superior to those of the English. We agree with Mr. Jackson, the gentleman last quoted, who says, "The contrast presented is the result of difference of aim, and not of the want of capacity. While we have devoted ourselves to the perfecting of material processes of manufacture, and the substantial character of our utilities, the French have brought their energies to bear on decoration." And they have made this a part and parcel of their educational system. They have regarded it as a national necessity and acted accordingly. "While, perhaps," says Mr. Plampin, "there are scarcely more than four out of two hundred English jewellers who can draw, from inquiries made there are scarcely four out of two hundred in France who cannot. Nor is this surprising, when we learn that drawing is regarded and taught more as an essential than an accomplishment. As children they are taught at their day-school, and that not occasionally, but as part of the usual routine." With regard to the great question of general education, it may be said that we are not far off from its solution. We have been talking about education for many years, and there have not been wanting eminent leaders in the House of Commons who have regarded it as a necessity and a right; but the jog-trot instincts of that House, constituted as heretofore, have defeated almost all attempts at useful legislation on the subject. Now, the prospect brightens. It is not only heard, but almost felt, in every direction, that one of the first things the reformed Parliament will address itself to is the universal, and, if necessary, the compulsory, education of the people. Whatever else an extended suffrage may have in store for us, it is certain that the great cause of education will not suffer thereby. There can be little doubt that this nation is on the eve of great, if not beneficent, changes. In the course of a short time energies will be loosened which have hitherto been fettered, and forces will operate which have hitherto been inactive. We, however, do not fear the result. The educated nation must be stronger and more productive than the ignorant nation. France, however, is not so much in advance of us in general educational matters as Germany, Belgium, and Switzerland; and has, therefore, not so much to teach us on this question as on the cultivation of taste. The two things must, however, go hand in hand. Whilst insisting that every English child shall be educated, facilities for fostering a love of the beautiful may be multiplied. In fact, the words "technical education" are now on almost every one's lips, and in this work we have much to learn from the French. They possess many more schools of practical art than we do, and the system of drawing in those schools is different to that pursued in this country. Mr. F. J. Jackson says, "There seems to be no over-anxiety for fineness of outline, while in shading the readiest method is generally adopted, more importance being attached to the realization of form, and less to mere manipulation. Great stress seems to be laid upon drawing from the human figure and from natural flowers." Mr. Jackson thinks we begin at the wrong end, as fineness and neatness of line are the results of much practice, and in early training are of much less importance than the acquisition of correct notions of size, proportion, and forms. In this country too much of the student's time is spent in making copies from the "flat," instead of drawing from objects. "Art education," says Mr. W. G. Deeley, "is carried on in France quite on a different plan to what it is in this country. Youths at an early age are not kept at outlining for a couple of years; but the instant they can do a little drawing they commence shading, which is not half so sickening to the young minds, and at the same time more gratifying." Mr. Andrew Stevenson, of the Leeds School of Art, amplified this point in an article which appeared in the BUILDING NEWS, No. 673. So, also, did Mr. John S. Rawle, in his suggestive article on the French and English Systems of Art Education, in the BUILDING NEWS, No. 672. There appears to be a general concurrence of testimony that our method of art education is essentially defective, particularly on two points—first, in not drawing from the human figure, natural objects, antique works, machinery, &c.; and, secondly, in aiming at mechanical accuracy and finish, instead of encouraging a bolder and more general study of light, shade, and form.

One of the chief things spoken of in these "Artizans' Reports" is the superiority of Paris to London. Mr. Thomas C. Barnes says "the daily life of the Frenchman is surrounded with associations of beauty, hence his superiority in design. All that the Englishman can do with the means at his disposal he has done—that is, the workmanship is superior, but he lacks the education and knowledge of classic art which the Frenchman possesses. This, in my opinion, is at the root of all the differences which exist between the glass trade of England and that of France and the Continent generally." That London will ever be as beautiful as Paris cannot be expected; but that it may be improved and is improving must be admitted. Though we cannot control the sun, the wind, and the clouds, we can multiply museums of art, and facilities for art education equal to what they have in France. What we want is not one great museum, like that at Kensington, which is so far away from the mass of Londoners, and which absorbs so much money, but museums within easy reach of our great industrial populations. Every great city should have its art museum, and then arises the question whether these museums should be opened on Sundays. Most of the writers of these reports think that they should, and give excellent reasons for their opinions. Possibly this question will also assume a bolder aspect in future Parliaments. There are many other things which we can learn from Frenchmen in relation to trade matters, trade unions, strikes, courts of conciliation, dining halls, sobriety, politeness, good feeling between employers, the apprenticeship system, hours of labour, wages, &c., which we will glance at on a future occasion.

LONDON ORPHAN ASYLUM COMPETITION.

ONCE more the competitive system presents itself to us in a disagreeable light. If fairly and honestly conducted, competitions are calculated to improve architecture, promote merit, and benefit the public; if dishonestly conducted, they must have a contrary influence and tendency. Plato said that a republic would be the best form of government, provided every citizen were a philosopher; and we say competitions would entail incalculable benefits, provided they were justly conducted. But, as justice is the exception, instead of being the rule, in their conduct, we are surprised that respectable architects enter on them so frequently. Let us take a case in illustration. The board of management of the London Orphan Asylum lately invited a limited number of architects, whom they thought most likely to carry out such a work, to enter into competition for a new asylum about to be erected for charitable purposes near Watford. The gentlemen invited were Mr. Fred. Peck, Mr. Dawson, Mr. Robins, Mr. Watson, and others. A printed set of instructions was handed to each of the competing architects; one of these instructions stated that the building, exclusive of fittings, should not exceed £65,000. In due time each of the competitors received a letter from the secretary stating that the board of managers had awarded the premiums in the following order:—1. Mr. Dawson, 2. Mr. Robins, 3. Mr. Webster. On inquiry being made to the secretary as to the amounts of the estimates given by the three architects to whom the premiums were awarded, it was stated that Mr. Dawson's estimate was £78,500, subject to a reduction of £10,000, should the infirmary and other arrangements be reduced to the stipulated provision; Mr. Robins's estimate was £71,500; and Mr. Watson's estimate was £66,587. Now it will be observed, that each estimate was beyond the sum specified in the instruc-

tions. It so happened, however, that the estimated cost of the design submitted by Mr. Fred. Peck was only £55,000. Now assuming that Mr. Peck's estimate was a correct one, we have no hesitation in saying that the board of management of the London Orphan Asylum are not the most economical and trustful persons to dispose of funds subscribed for charitable purposes. We make this charge advisedly and deliberately. Now we have every reason to believe that Mr. Peck's estimate was a correct one. Instead of being over the sum stipulated in the instructions, it was very much under; and Mr. Peck has given many instances of his ability to erect such works within the estimated cost. Let it not be supposed for a moment that we care anything about Mr. Peck personally. We would as soon that Mr. Dawson was the selected architect as Mr. Peck, or Mr. Watson as Mr. Dawson. We entertain no feeling of partiality in the matter, as we only look at it from a public point of view. And we ask what right has this board of guardians to select a design which shall cost £78,500, or even £10,000 less under certain conditions, when another competent competitor undertakes to do it for £55,000? Is it not, to say the least of it, an unnecessary expenditure of charitable funds? Is it not a misdirection of benevolent intentions? But why, it may be asked, could the board have so acted? We know no other reason than that Mr. Dawson is architect to the board; or so we have been informed. Here, then, is a question in which the subscribers should raise a voice, and in which the public are deeply interested. It is a question not only affecting the competitive system and the interests of architecture, but the tone of public morality, and the economic appropriation of money collected for sacred purposes. It is a question which demands further investigation.

In awarding premiums to architects who exceeded in their estimates the limits specified in the printed instructions, the board broke faith with the competing architects who obeyed these instructions. This is of vital importance, and we are not sure whether the board, in so acting, have not subjected themselves to an action for damages on the part of the architects who complied with the conditions. These architects, in obedience to an invitation, put themselves to considerable cost and labour, and they, by-and-bye, find that they are, as it were, punished for their fidelity. Whatever may be the legal bearing of the question, we feel no hesitation in saying that the architects who complied with the instructions are morally entitled to reasonable pay for the labour they were put to. We, however, call attention to this subject, not for the benefit of any single individual, but for the public considerations it involves, and with the hope that it may prevent injustice in future.

THE LIFE AND WORKS OF SIR CHARLES BARRY.*

SECOND NOTICE.

WHATEVER differences of opinion may exist as to the quality of some of the works executed by the late Sir Charles Barry, there can be no two opinions as to the vast amount of work he performed during his very busy life. To the list of buildings of a collegiate, ecclesiastical, and domestic character already enumerated which were either entirely built from his designs, or received reconstruction at his hands, might be added the following—In 1831 he erected a new wing to Dulwich College, and a small school, but these designs, which were of an unpretentious kind, were remodelled and expanded in carrying out the more extensive alterations of the college effected under the direction of his son, Mr. Charles Barry, in 1858. The Birmingham Grammar School has always been regarded as one of Barry's most successful Gothic works. It was begun in 1833, and completed in 1836, and it was during this period that he made the acquaintance of the elder Pugin, "whose assistance he secured in making out some of the drawings for details." In 1837 he designed a small Gothic Unitarian chapel at Manchester, of no particular merit. Two years afterwards, he added a wing to the University College, Oxford. Hurstpierpoint Church, erected in 1843, is a work of some importance, though it will not bear comparison with what has been done by many of his contemporaries, either in originality or effect. It was one of the characteristics of Sir Charles Barry, that he was apt in his designs and plans to lose sight of economy, in his love of the grand and extensive. Frequent mention is made in the Memoir of designs which had to be rejected, on account of the cost necessary to carry them into execution. In other cases—of reconstruction for example—often only a portion of his plans were carried out, for the same reason. His conceptions were on too enlarged a scale, and were too expensive to suit the means, if not the wishes, of his clients. With not a few of his private as well as his public works was this the case. It may indeed be said that comparatively few of his designs were carried out; the New Palace of Westminster itself might be cited as an instance. Among private buildings, Clumber House is a notable case in point. Of all Barry's designs for a grand private residence, this, we believe, was the largest and most comprehensive. Plans and illustrations are given in the Memoir to show the character of the design. But it will be sufficient to state, that the only part of the scheme as yet executed is the erection of the new church by the present Duke of Newcastle, in the position indicated by Sir Charles, but from the designs of Mr. Thomas C. Hine, of Nottingham. This was one of the last of Barry's efforts, the date being 1857. But, as his biographer remarks, the great majority of these unsuccessful, or at least unrealized designs, has reference to public buildings. "Of all Sir Charles Barry's works," says his son, "the one which is generally considered the least successful was the laying out of Trafalgar-square. On this subject he was consulted by Government in 1840, and his chief idea in the arrangements which he suggested was to improve the effect of the National Gallery." We have heard a great deal about what has been flatteringly called "the finest site in Europe," and there has been no end of sneers levelled at the Trafalgar-square fountains. A fountain is one of the things which they do manage better in France, and it would be idle to institute a comparison between the Grandes Eaux, of Paris, and the wretched squirts of London. We must acknowledge that they are a decided failure. It is only justice, however, to the reputation of their designer to state that his shortcomings at least admit of explanation. Sir C. Barry was thwarted in his scheme for the improvement of the square. At the time he was consulted, a plan was already under consideration which contemplated the raising the whole square to the level of the pavement in front of the new building, and finishing it with a terrace and balustrade towards Cockspur-street. To this he had a strong objection. He considered the National Gallery to be already greatly deficient in importance, and unworthy of its site. Such a terrace as was proposed, seen in the foreground on approaching from Whitehall, would throw it back into utter insignificance. He advised, therefore, that the level of the square should be kept down to that of Cockspur-street, instead of being raised to that of the base of the building, and the terrace thrown back, so as to make it appear a part of the building, thus increasing instead of diminishing its height. This plan was adopted, but greatly injured by the erection of the Nelson column, against which Mr. Barry protested in vain. Not only did it cut up the building, but it interfered with a grand flight of steps which he contemplated in the centre of his terrace, of the width of the whole portico of the Gallery, and appearing from a distance to be a part of it. Its own design would be no compensation, for to the use of columns or pedestals for statues he objected on principle. He would have had the Nelson and Wellington monuments (treated in a different style, as grand designs in sculpture) placed on either side, in the position of the present fountains. When this proved to be impossible, he introduced the fountains as a last resource. He intended them to be far larger; he wished them, indeed, to be of the scale of the grand fountains in front of St. Peter's, at Rome, but for this funds were not forthcoming, and an unexpected difficulty was found in obtaining a full supply of water. But, adds Dr. Barry, "though fully aware that they were too small, he never felt the justice of the severe criticism which has been so unsparingly lavished upon them." A chapter is devoted to the chief unexecuted designs of the architect. These embrace designs for New Law Courts, the National Gallery, the Horse Guards, the Royal Academy, the British Museum, the Crystal Palace, and the extension of the Houses of Parliament. As far back as the year 1840, he prepared, at the request of the Government, a design in the Greek style, "which he had long discarded," for the Law Courts, on the site which is now being prepared for them. He seems, however, to have had a strong leaning to the centre of Lincoln's Inn-Fields, as it "would involve no expense in the purchase of existing buildings,' and he yielded reluctantly to the outcry raised against the scheme. Another plan, submitted five years subsequently, involved the inclosure of New Palace Yard, and the extension of the palace itself. His idea, with respect to the National Gallery, was to extend it by building over the vacant space in front, and to advance the edifice to the line of the street. The elevation was to be raised, in order to overcome as much as possible what he considered the fatal effect of the Nelson column upon the façade. It is not improbable that this idea will be realized in any design that may ultimately be selected for the New Gallery. Again, as to the British Museum, it was apparent that the grand portico rendered it impossible to extend the building towards Great Russell-street, and there were difficulties in the way of its extension in other directions. He therefore proposed—and the notion has frequently been urged since—to remove the Natural History Collection elsewhere, and to devote the whole of the present building to literature and art. Certain internal alterations and re-arrangements were suggested; but Mr. Panizzi's great reading-room scheme was preferred by the Government, and here, as in other instances, Sir C. Barry's designs turned out fruitless. The necessity for the enlargement of this invaluable institution is greatly more felt now than it was ten or fifteen years ago, and by-and-bye it will be absolutely imperative for the authorities to make a decided move in the matter. If we may take the unsightly tarpauling excrescence which disfigures the front of the Museum as any evidence, the building is full to overflowing, and ready to burst its walls. We have heard it hinted that there is a considerable area of ground behind the Museum that might be utilized without much trouble. At all events, we see no reason why the two large buildings at present devoted to officers' residences should not be made available as receptacles for a portion of the overcrowded collection. These buildings, as we understand, give accommodation to about a dozen officers, and altogether to something like fifty persons, and they are kept up at very great expense. Now there is no necessity for having so large a staff lodged within the building, which is otherwise amply protected. There ought certainly to be a resident officer, with some assistance at his command in case of emergency, but at least one half of these officials might be dispensed with, so far as their

* "The Life and Works of Sir Charles Barry, R.A." By Rev. ALFRED BARRY, D.D., Principal of Cheltenham College. John Murray. 1867.

domiciliary presence within the precincts of the Museum is concerned. It would occupy more space than we have at command to describe in detail the extensive scheme which Sir Charles Barry had in contemplation for the general improvement of the metropolis, and more particularly of Westminster. Nor is it necessary that we should do so, since not a few of his suggestions have in part at least been followed, while, in other instances, improvements differing from those he had in view, but great improvements nevertheless, are in active progress at the present moment. Like Sir C. Wren, Barry's great ambition was to rebuild London after his own ideal. He formed a grand scheme of metropolitan improvements which he was desirous, as he himself said, of leaving as a legacy behind him. But, also like the great architect of St. Paul's, he was doomed to be disappointed; but the work proceeds, though others carry it on. A considerable portion of his plans for the completion of the approach to the Houses of Parliament has just been finished by his son, Mr. E. M. Barry, A.R.A., who succeeded his father as architect of the edifice. The story of Westminster Palace is naturally the principal feature of the book. The competition and its conditions, the difficulties with which Barry had to contend, and the annoyances to which he was subjected through the prejudice and ignorance of men in power, and the jealousy of professional brethren during the progress of the work, the doubts and fears of the architect as to the result of his labours, and the unpleasant dispute with the Board of Works on the question of remuneration, are all minutely described, and form a curiously interesting narrative. As was remarked in our former notice, Dr. Barry assumes that his father was the sole architect of the Houses, and does not recognize the claims that have been put forward on behalf of the late Mr. A. W. Pugin to be so considered. That question he reserves for discussion in a separate pamphlet which is now announced, and which we shall deal with when it appears. It is to be feared that his very onerous and harassing labours, and the extraneous annoyances to which we have alluded, in connection with the New Palace, continuing as they did for nearly a quarter of a century, had a very serious effect upon Sir C. Barry's health. Soon after the Houses were formally opened in 1852, he practically retired from his profession, though he continued to take the deepest interest in all architectural movements. His busy brain was planning and designing to the last, and it may indeed be said, that his pencil only dropped from his hand in the hour of death. He had had presentiments that his end was approaching. It came at last suddenly, on the 12th of May, 1860, but a few days before he had completed his sixty-fifth year. Sir C. Barry was not a great architect, in the same sense that Inigo Jones and Sir C. Wren, Michael Angelo and Palladio were great architects. He was rather a great worker; and for what he accomplished it cannot be said that he was not amply rewarded by the honours that were heaped upon him in his lifetime and after his death. His statue has a place within the walls of the greatest work with which his name is associated, and his mortal remains lie in Westminster Abbey. What greater honour could an Englishman desire? What greater honour could Englishmen confer? Of the manner in which Dr. Barry has performed his task, we will only say that it is hardly to be expected that a doctor of divinity would write a book on architecture that would satisfy the architectural profession. The work would have been more satisfactorily performed by a more practical, not to say a more disinterested pen. There are many evidences of this apparent throughout the Memoir. As a tribute of filial affection, rather than an impartial criticism, does it reflect credit on the biographer. The volume contains illustrations of the chief works of Sir Charles Barry, and is altogether handsomely got up.

CONTINUOUS BEAMS.

FIG. 1.

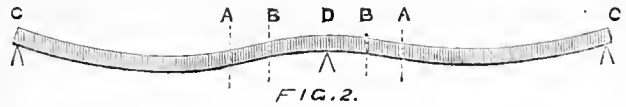


FIG. 2.

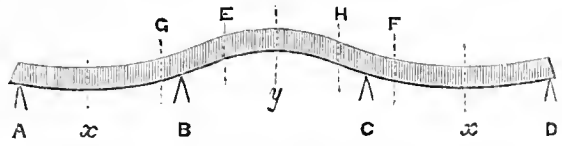


FIG. 3.

FIG. 4.

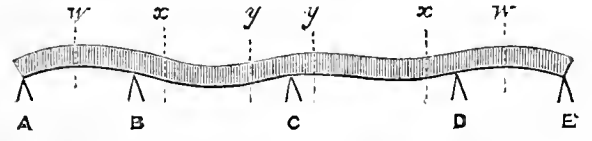
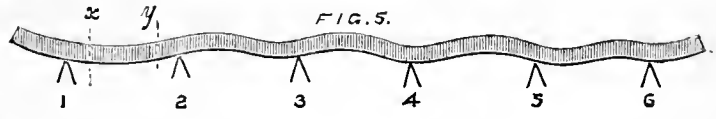


FIG. 5.



ELEMENTS OF ENGINEERING.

CONTINUOUS BEAMS. II.

THE simplest case presenting itself for solution, with respect to continuous beams, having been succinctly investigated, we may now direct the attention of our readers to those instances which are necessarily endowed with a greater amount of complexity. This complication, both of calculation and geometrical analysis, may proceed from one of two, or from a double cause. It may be due either to the inequality of loading in the respective spans, which may be equal, or to an inequality in the dimensions of the spans themselves. There is scarcely any necessity for pointing out, that the latter case with an unequal loading, would be virtually identical with the former. Moreover, not only the respective spans may be unequal, but their respective loadings also. Before proceeding to an investigation of the question of continuous beam of three spans, that is one supported at four separate points, let us briefly consider the conditions attendant upon that of two spans when these spans are unequally loaded.

We pointed out in our last, that all railway bridges constructed upon the continuous principle were subject to this state of loading during the passage of every train, and that the effect was to shift the position of the points of contrary flexure nearer to the middle pier, thus really increasing the span of the beam beyond the limit assumed. With a load supposed uniform, the span of the girder between the abutment and the point of contrary flexure is equal to $\frac{3 \times L}{4}$, putting L for the total span from the central pier to either abutment. This is represented in fig. 1, where C A $= \frac{3 \times L}{4}$ and C D $=$ L. If we now imagine a railway train to be *in transitu* upon one of the spans, the points of contrary flexure A A become shifted to B B, and the proper span to be assumed for the girder C B is no longer $\frac{3 \times L}{4}$, but has some other value to be determined before its strength and relative proportions can be arrived at. We may ascertain this value as follows: — Let W represent the weight of the unloaded span, and W^1 that of the loaded beam. Making L as before the total span from C to D, then the distance C B, or the altered span of the beam, will be C B $= \frac{7 \times L}{8}\left(1 - \frac{W}{7W^1}\right)$. The value of this equation will evidently be greater than $\frac{3 \times L}{4}$, and it will immediately occur to those following our investigation, that in proportion as the distance C A is increased to C B, so may that of A D be diminished to B D. In other words, accordingly as the span of the beam is increased, so may that of the cantilever portion be shortened. Paradoxical as it may seem, this is not the case. Although that portion of the beam lying between the points C and A is to be calculated when under the conditions already mentioned, as extending from C to B, yet the cantilever portion is always to be regarded as reaching from D to A. The reason is because, when both spans are fully loaded, which might and would occur during the transit of a long and luggage train, the extreme limit of the cantilever part of the beam extends to A upon either side of the central support, and the extreme limits of variation is what must be provided for in the calculations. It is this variation which practically curtails the advantages of continuity.

Advancing to the more complicated problems in relation to beams of this description, let us consider that represented in fig. 2, in which the beam is supported on four points, A, B, C, D, placed at regular distances apart. The points of contrary flexure will be at G, E, H, F, and their position determines the respective spans of the beams A G, E H, F D, and of the cantilevers G E, and H F. These dimensions are not equal to those found for the case represented in fig. 1, but have a particular value of their own. Assuming, as before, L to equal the total span between any two of the supports, the distance G B or C F will be equal to $\frac{L}{5}$. The distance B E, H C, upon the other side of the intermediate supports, will not have the same value as might be expected, but will be greater. Thus B E $=$ H C $= \frac{L}{3{\cdot}62}$. Having now found the accurate positions of the points of contrary flexure in fig. 2, the spans of the individual beams composing the whole con-

tinuous structure can be readily ascertained. The two end portions, or those lying between the abutments, and the points of contrary flexure nearest to them, are identical in every respect. Since A G = F D = (A B — B G) = (C D — C F), substituting their values we have A G = F D = $\left(L - \frac{L}{5}\right) = \frac{4 \times L}{5}$. It has already been demonstrated that B E and H C are greater than B G or C F, and consequently the effective span of the central beam E H will be less than that of its two neighbours. The span or the distance E H may be thus determined. From the fig. E H = (B C — 2 B E) since B E and H G are equal. But B E = $\frac{L}{3{\cdot}62}$, and B C = L. We thus have E H = $\left(L - \frac{2\,L}{3{\cdot}62}\right) = \frac{L}{2{\cdot}23}$. To render this instance quite clear, let us suppose each span to equal 100ft, and we shall have the following dimensions for the different portions of the whole continuous beam. The side beams A G = F D = 80ft., and the central one E H = 44·8ft. The lengths of the cantilever portions will be G B = C F = 20ft., and B E = H C = 27·2ft. These dimensions are those to be adopted in calculating the strains upon the different portions of the beam. Following the same arrangement adhered to in our last article upon this subject, it will be useful to compare the maximum strains acting upon the beam, represented in fig. 2, with those belonging to a single girder, having a span equal to A B. The point of greatest strain in the side spans will be at x, and that in the central one at y. Upon the assumption that the maximum strain in the beam A B, if an independent one, is 1, that at x is 0·64; that at y is 0·20, and that over the supports B and C is 0·80. There is, therefore, a saving of 20 per cent. in the extreme limits of strain in favour of the continuous beam when applied to bridges composed of three equal spans. A very usual example of a bridge constructed upon the continuous principle is shown in fig. 3, where the centre span is double either of the side ones. In testing a large railway structure similar to this design, it was found that when the central beam was heavily loaded with a train of locomotives, and the side beams kept unloaded, the ends of the beams resting upon the abutments A and D, were lifted clean off their bearings. In more than one instance also, there has been a very close coincidence observed between the calculated positions of the points of contrary flexure and the places where they actually occurred. It is hardly necessary to remark that this desirable agreement between practice and theory can only be obtained by a rigid adherence to scientific principles, and a strict attention to the nature of the workmanship and the fidelity of the material.

From the consideration of beams of three spans, the next example claiming our attention is that where they are divided into four, and consequently supported at five separate intervals. Of this particular case the Britannia Bridge is unquestionably the finest example, and accordingly we have selected it in fig. 4 to illustrate our text. It is divided into two large equal central spans and two smaller equal side ones, the two former being each respectively double either of the latter.* Making L equal to the larger spans and L^1 equal to either of the smaller ones, the points of contrary flexure, W W, of the side span, will be at a distance from A of $\frac{L^1}{2}$. The point x or the distance B x will equal $\frac{L}{6{\cdot}20}$, and the distance y C will equal $\frac{L}{4{\cdot}46}$. The points of contrary flexure, upon the other half of the whole beam will be similarly situated with respect to their supports. It remains now to see to what extent the central spans are reduced in their effective dimensions by the adoption of the continuous principle; in other words, what is the value of the distance xy, the absolute span of the girder between bearings being equal to B C. From the fig. we have $x\ y = \frac{1}{2}\{(B\,C - (Bx + Cy)\}$. In this instance B$x$ will not equal Cy. Substituting in the equation the corresponding value of the letters, we obtain $xy = \left\{\left(L - \left(\frac{L}{6{\cdot}20} + \frac{L}{4{\cdot}46}\right)\right)\right\} = \frac{L}{1{\cdot}64}$. A comparison of the strains acting upon the various portions of the whole beam with that upon an independent beam having the same span, as one of the central girders B C, will show, as in the other cases, a balance in favour of this particular type of construction. Putting unity to express the maximum strain at the centre of the beam B C, regarded as an independent girder, that of the same beam, as shown in the fig., will be represented by 0·375. The strain over the supports B and D will be equal to 0·50, and that over C to 0·75.

Having treated in detail of the separate cases most usually presenting themselves in the construction of bridges upon the continuous principle, we may now refer to the example in which a beam is imagined to be supported at any number of points placed at equal distances apart. This, it may be remarked, is the general problem to be solved theoretically, those particular examples already investigated being deductions from it. The actual mathematical treatment of this question is invested with too much complexity to be given here, but those of our readers who may wish to follow out the elucidation will find it ably treated in "Moseley's Engineering." What is practically required, in order to calculate the strength of the beam, is the position of the points of contrary flexure x and y. Making L, as before, to equal the length of the span, the distance of the point x, from support number 1, or of y from No. 2 will be given by the simple equation $\frac{L\,(\sqrt{3} - 1)}{\sqrt{3}}$. As an example, let the spans of the continuous beam in fig. 5 be each 100 feet, then the points x and y will be situated at distances of 21 feet from their nearest supports, and consequently the beam is reduced in effective span from 100 to 58 feet. Independently of the economy in material theoretically demonstrated, in the adoption of the continuous principle, the deflection of a continuous beam is much less than that of a similarly proportioned independent girder. On the supposition that the beam is made perfectly continuous, a condition not carried out in practice, from the impossibility of accomplishing such a result, the deflection of each span of the beam represented in fig. 5 would amount to only one-fifth of that of a detached beam of the same span and proportions. We may also compare the deflection of one of the central spans in fig. 4, with that of a similar discontinuous beam, and it will be found to be in the ratio of nearly one-fourth. It will be noticed that in continuous beams, there is an upward deflection as well a downward one, and the manner in which the loading is arranged, determines which spans deflect in one direction, and which in the other. If we conceive the load to be placed only upon every alternate span, than those upon which it is acting will deflect in a vertical direction downwards, and the remainder upwards. In constructing continuous bridges, it is essential to bear in mind that rollers must be provided for the girders to rest upon at their bearings upon all the intermediate piers, and one of the abutments. We shall not now enter upon the practical question, whether rollers or sliding blocks are the better adapted for the purpose. There is no question but that rollers have been known to stick, and not allow the proper degree of expansion to take place, and in one notable instance the movement of the girder actually drew the masonry of the abutment out of the plumb. But carelessness in not attending to the rollers, and seeing that they perform their duty effectually, was the real cause of this mishap, and carelessness in dealing with blocks would produce precisely the same result. While acknowledging the theoretical superiority of the principle of continuity, the English engineers, as a rule, do not find that that superiority is altogether borne out in practice, and consequently but comparatively few bridges are constructed upon the system. We may refer to the Charing Cross and Blackfriars railway bridges, which afforded every opportunity, so far as equality of span and loading were concerned, for the adoption of it, but they are both constructed upon the discontinuous principle, in preference to the more scientific system. Our continental friends, however, are strong advocates for the continuous type of design, and occasionally commit themselves to many *tours de force* to carry out their favourite views. It is probable that the principle of continuity does not apply to flanged girders in a manner so favourable as to solid beams, which are but little used now.

* For a full description of this magnificent structure, the reader is referred to the well-known work of Mr. Edwin Clark.

MASONRY IN PARIS.

ONE of the most amusing, and at the same time one of the most instructive papers contributed to the "Records of Artizans," at the Paris Exhibition, is from the pen of Mr. Thomas Connolly. This paper deals principally with masonry and the masons of Paris—a subject which must be interesting to builders in this country. Our readers may judge of the value of the paper from the following extracts:—

In the science of construction, says Mr. Connolly, and the judicious use of the materials—stone, wood, and iron—the French architects display great skill. The right material is generally used in the right place. Their buildings being constructed as much as possible fire-proof, we seldom read of a great fire in Paris. They are generally well built, for the builder and the architect have to insure their stability for ten years, and are held accountable during that period for the expense of any repairs arising from imperfect workmanship or from defective materials. The fronts are all built of large stones, bedded and jointed, which run the full thickness of the wall. They are laid dry on each other, and afterwards run with plaster. There are openings left for the doors and windows, and projections for the cornices, mouldings, and carving. When the walls are carried to their full height, the masons work at the front of the building, commencing at the top; they finish and take down their scaffolding as they descend. The back and end walls are built with small squared stones on the outside, and with unsquared or rubble on the inside. They are bedded in plaster; very little care is used in the bedding of this rubble, as the plaster sets soon after the stone is laid. The flues to carry off the smoke are constructed with earthenware pipes built into the walls; and as those walls settle unequally on the foundations, you observe on every gable-end exposed to view that open joints are left close to the quoins, so that each wall may settle of itself, without drawing the other with it, and causing rents in the building. Those open joints may be filled up when the work is seasoned. The floors are constructed with light wrought-iron girders of an I section, laid about 2ft. apart, and arched from one to the other with hollow bricks bedded in plaster. The arches are very slightly curved and their springers rest on the bottom flanges of the girders. The soffit is dubbed up and made level for the plaster of the ceiling, and a slight piece of wood is laid on the top of each girder, to which the floor-boards are screwed. The staircases are all built of hard stone, with iron balusters and handrails. The halls and corridors are generally floored with marble squares, of various colours, of a composition of cement and marble chips, which is often a good imitation of mosaic. Very little wood is used, except for the flooring-boards, doors, windows, and roof. In all the houses which I have seen, the sanitary arrangements appear to be of a very defective character. Water is used very sparingly; in fact, they never

think of letting it run through their closets, although, judging from the liberality with which it is used in flushing the kennels of the public streets, Paris must be abundantly supplied.

When the ground has been excavated for the basement of a building, the stonework of that portion is usually bedded in mortar composed of lime and sand, or in cement mixed with sand, but all above the surface is bedded in pure plaster, the extensive use of which enables them to erect their buildings in a very short space of time, and to use any small pieces of stone in the cross-walls. The gypsum of which this plaster is made is raised at the Hill of Montmartre, in the suburbs of Paris, the supply of which, I learn, is almost exhausted. It is prepared close to the quarries, and brought to the works in sacks, where it is sold for 17fr. the cubic metre. It is a good, strong, coarse material; the ashes of the fuel used in the burning being allowed to intermix with the gypsum, but when required for exportation, or for finishing and ornamental work, it is passed through a very fine hair-sieve.

The stones chiefly used in Paris are oolites, of which of the harder and finer sorts there are thirteen varieties brought from the south, south-east, east, and centre of France, and some are raised in the immediate neighbourhood of Paris. The price varies with the quality and size of the blocks. For first-class stone, delivered at the works in blocks not smaller than 2½ metres long and 1½ thick, the cost is 193fr. the cubic metre; for blocks of 5¼ metres long by 2½ metres thick, 415fr. the cubic metre; and for blocks 6 metres long by 2½ metres thick the price is 518fr. the cubic metre. These stones are durable, and many of them will take a good polish. They are of various colours, but chiefly white or reddish-speckled, and are used in fountains, parapets, and copings of bridges, balconies to windows, and other ornamental work much exposed to the influence of the weather. They are also used in steps, floors, staircases, and other places where there is much wear. By a municipal regulation, the first story of every building erected in any of the principal streets of Paris must be built with hard stone, but the builder is at liberty to use soft stone for the remaining stories if he desires to do so. The wisdom of this regulation must be apparent to any person who examines the restorations which are now being done at the Palace of the Louvre. For several feet above the surface, through the influence of the damp arising from it, the stonework is completely decayed, while the remainder of the building above that level is comparatively sound and good. The soft stone which is used above the first story is a fine, even, close oolite, easily worked. It is like the stone we get from Bath and its neighbourhood, but of a much better description. There are two qualities of it raised within a circuit of fifty miles of Paris, and several of the quarries are close to it. Stone from St. Just may be purchased, delivered at the works in blocks of any size, at 68fr. the cubic metre, and the smaller size blocks at 37fr. to 40fr. the cubic metre. The cheapest stone used in Paris is that from St. Denis, in the department of Seine-et-Oise, which can be purchased, delivered at the works, for 30fr. the cubic metre. Those prices are little less, if any, than the cost of stone in London, where good Portland stone is purchased for 2s. 6d. a cubic foot, and Bath stone for 2s. 1d. the cubic foot. When delivered at the works, the blocks are cut up into the sizes required for the masons, in the same manner as it is done in London,—the soft stone with a cross-cut, and the hard stone with a frame-saw and sand and water; the men employed at this work receive from £6 to £9 a month.

As in London, the building erected in Paris is chiefly done by contract, but with the important difference, that each description of work is let to a contractor of that trade alone, whereas in London the entire works are let to one person. The contractors in Paris are usually men who have been brought up to the trade in connection with the works. They contract for, and will necessarily have the skill to direct it themselves. The London contractor, in most cases, is not brought up to any of the building trades; he merely finds the capital, and some other persons supply the brains. It is clear that a better description of work is the result of the French system, where it is executed under the personal superintendence of a man who understands it, and who has a personal interest in its proper execution; and that there are greater facilities for a steady, industrious workman to advance himself and become a contractor some day. This method of contracting existed in London before the concentration of capital in the hands of a few; and it is still practised in many of our provincial towns, with the same beneficial result as at Paris.

The mason's contract, in addition to the stonework, includes the plastering and the brickwork. Of the latter there is very little done in Paris. I have only observed an odd house built of brick. I presume the cost, which is 60fr. per thousand for middling bricks, is some impediment to its more extensive use.

The bricklayer and the plasterer are not distinct trades, as in London, but are included in the mason's trade, the operatives of which are classified into limousins, poseurs, and ravaleurs. The limousins, or wallers, build the sewers, drains, and basement story of the building with rubble stone, and, as this description of work requires very little skill to execute it, the men employed being nothing more than handy labourers, they are paid from 4½ to 4¾fr. per day, which is only a fraction more than is paid to the navvies who get out the ground for the basement, and who receive from 4 to 4½fr. per day. The masons who fix the stones of which the fronts are built, are called poseurs; they generally confine themselves to this branch of the trade. Their method of fixing, as before stated, is to lay the stones dry into their places, and when the course is completed to run the joints with plaster. In large buildings, where the walls are raised to a great height and the stones press heavily on each other, to preserve them from flushing, the plaster is prevented from running to the front by placing thin pieces of wood, about 2½in. broad, in the joints, which are slipped out when the plaster sets, and when the walls settle those open joints are pointed up. Owing to this precaution of directing the weight on the centre of the stones, you will very rarely see the mouldings or other ornamental work on the face of a building flushed through pressure. Except in marble or polished work, the French masons use very little care with the beds and joint of the stonework; they are often ¾in. apart, but, as the plaster with which they are filled is almost as durable as the stone, and like it in colour, it does not affect the general appearance of the building. The skill of the poseur does not seem to be highly estimated, as his wages are only 5½fr. a day, or 1½fr. less than the ravaleur, which comprises two classes, viz., ravaleurs in plaster and ravaleurs in stone. The ravaleurs in plaster erect all the walls of the building above the basement, in which small squared or rubble stone is used. They build all the fire-places and flues, and turn the brick arches for the floors. When the house is covered in with slates or tiles, they coat all the walls with plaster, and form the ceiling and cornices. The plaster used for building the walls is mixed with water, in a wooden trough, the sides of which slope outwards towards the top. It is brought to the scaffold by the labourer, on his head, and when it sets a little the ravaleur spreads it on the wall with his trowel or hands—he is not particular which—and beds the stone; the stones are placed dry in the centre of the wall, and afterwards grouted with thin plaster. The ceilings and walls are all finished with one coat of whatever thickness may be required by the unevenness of the walls, which he ascertains by plumbing-screeds or narrow strips of plaster at each angle of the room, and at convenient distances from each other. Between the screeds he puts on wet plaster with a broom, his hands, or the trowel, and forms the surface of it level with the edge of a long, straight trowel, having teeth like a fine saw; a little thin plaster laid on and rubbed with the flat of a trowel makes it a fine, smooth surface. The cornices are made of pure plaster, and run with a mould; but when very large and ornamental, they are done by moulders, who make them of a composition of plaster, whitening, and glue, in which flax fibres are intermixed to add strength. It is hollowed at the back, and made so light and yet so strong, that it may be attached with plaster, or nailed to the walls and ceiling. The ravaleurs in plaster are a very useful and skilled class of workmen, and are paid 6fr. a day. The trowels and other tools used by them are very awkward and clumsily made, and, although those men execute some excellent work, they do it in a very unworkmanlike manner. You seldom see an English operative use plaster or mortar with his hand, while he has a tool to do it with.

The ravaleur in stone corresponds to the trade of a mason in London, but, as the principal part of the work in Paris is executed in soft stone, and after the walls are built, while in London it is done with hard stone, worked on the banker before it is fixed, the method of working in the two places is entirely different, and one would have some difficulty in using the tools of the other without considerable experience. The ravaleurs in stone are divided into two classes, namely, those who finish the fronts of the building, and those who work the beds and joints of the stones before they are fixed. This latter class are called "tailleurs de pierre." The blocks of stone for a building are generally deposited near its site if there is room, and, if not, on the next convenient open space; and when cut into the required sizes, those men work the beds and joints, and, if the stone is required for a moulding or cornice, they scribe on the mould and chamfer off the surplus. They seldom use a mallet and chisel, except to run a draft around the arris, but work the stone with a pick, a tooth-axe, and a diamond hammer. The mallet and chisel they use very imperfectly, but the pick and axe they use with great dexterity, and turn out a great quantity of that kind of work. They never banker a stone to work it, but merely lift it on a slant, and seldom turn it more than once before it is finished. They have no sheds to protect them from the weather, and are paid at the rate of 6fr. per day.

The ravaleurs who work the fronts of the buildings are the most skilful men in the trade, and are paid 7fr. a day when employed at day-work; but, as a gang of men generally do the work of a front by contract, they often earn more than day-wages; but when an architect requires to have his work well done, he will not allow it to be done by contract. Mons. Duc, the architect of the Palace of Justice, would have the front of that building done by day work, and it is plainly observable how superior the work is to that of the Tribunal of Commerce, which was executed by contract. For the ravaleurs to do their work, a scaffold is erected to the front, as the walls of most edifices are built overhand; then, commencing at the top cornice, they cut in the mould at each end, and, with a piece of twine, rubbed with red chalk, strained from end to end, they strike the horizontal lines, pitching off the waste from the front with a hammer and chisel; they then work it very close with a tooth-axe, and finish it off with a diamond hammer, or a plane, when the surface requires to be made smooth. Those planes are about 9 or 10 inches long, having two irons, one in the middle and one in the front, to enable it to cut into an angle. The irons are merely thin pieces of steel or saw-plate, slightly bevelled on the cutting edge. The ravaleurs have a number of those planes, of all shapes and sizes, with which they work the mouldings on stone, just as a joiner would make them on wood. They seldom use a mallet and chisel, and when they do, it is very awkwardly, but execute their work chiefly with the pick, axe, diamond hammer, and plane. It is astonishing with what celerity they finish off the front of a building, but everything is in their favour; the stone, being a nice fine quality, is not flushed at the joints or the ends by the working of the plane or axe, and the stones, being the full thickness of the wall, are not disturbed on their beds by the working. There is certainly something to say in favour of this system of working stone after the wall is built. In the first place, no time is wasted on the parts that are not exposed to view; and, in the next place, the lines will be more accurate, as they are struck the full length or the full height of the building; and, although much of their stone-work is not so perfectly masoned, and will not bear so minute an examination as stone-work in London, their buildings will look better, owing to that circumstance. However perfectly the stones may be worked on the banker, unless they are carefully fixed, you will not have the lines straight, and you cannot make them so without disfiguring the mouldings.

At the last meeting of the Institution of Civil Engineers, a report was brought up from the council stating that, under the provisions of Section IV. of the Bye-Laws, the following candidates had been admitted students of the institution:—Henry Adams, Charles Augustus Alberga, Robert William Peregrine Birch, John Montriou Campion, Lindsay Heath, Arthur Willoughby Hemans, Osbert Henry Howarth, William Henry King, Frank Howard Landon, Arthur Hemery Le Breton, Frederick Herbert Mollett, George Pullin Pocock, George Henry Roberts, Edward Lee Robertson, Dampier Seabrook Shaw, James Henry Waller, and Francis Wilton.

PRIZES FOR ART WORKMEN AT THE SOCIETY OF ARTS.

OF the numerous contrasts presented by the Middle Ages and modern civilization, none are more prominent than the free trade of the latter as compared with the protective legislation of the former. There can be but little doubt as to the advantages of free trade as regards commerce in general; but when we come to what in the present day is called art workmanship, or art applied to industry, we are much inclined to pause before giving a final decision. Thus, it is very true that anciently a master could only take a certain number of apprentices; that those apprentices served for five years, and, in some instances, longer; that the apprentice could not open shop and be received as master until he had presented a specimen of his work, which had to be passed by the authorities of his guild. When released from his apprenticeship, he engaged himself for a certain time, somewhat like the farm servant of the present day. When master, he was to confine himself strictly to his branch of the trade, he was not to work at night, except in certain cases, and he was to conform to the statutes of his corporation—*i. e.*, the trades' union of the day.

All this appears very hard to us of the present time, but thus much must be said for the mediæval trades' unions, which cannot be alleged on the part of their successors—viz., that their functions did not terminate with protecting the workmen; on the contrary, they went further, and protected the public. The production of the "chef d'œuvre," or masterpiece, which, in some cases, was required at several stages of the workman's career, was a guarantee that no one was admitted who was not up to the mark; and, again, the public was still more protected by the appointment of sundry officers taken from the corporation yearly, whose duty it was to go round and condemn such bad material and bad workmanship as they might chance to find, by subjecting the delinquent to a fine. We have changed all this system—whether wisely or not remains to be proved. Certain it is that, if an article has to be produced in large quantities by means of our subdivision of labour, we are enabled to do it tolerably perfect and much cheaper than it would have been done formerly, but when we come to exceptional things the difficulty of obtaining competent workmen is enormous, more especially when it becomes a question of the higher application of art to industry—such as the carving of figures in wood for ecclesiastical furniture. It is to stimulate such branches of industry that the Architectural Museum and Society of Arts have been accustomed to invite competition for certain definite works, and to give prizes for the objects sent in. It is almost needless to say that the effect of such efforts must fall very far short indeed of the system of the chef d'œuvre of the Middle Ages. Still it is the only substitute we have, and of such we must be thankful. The financial position of the Architectural Museum never allowed that institute to follow out the scheme to any extent, and last year no prizes at all were offered, owing to the funds being absorbed in the erection of the new building at Westminster. The Society of Arts has at present, therefore, the field to itself, though it is to be hoped this will not be the case for a very long time. The productions of the various workmen are now on view at the Society's rooms, and will remain so for about a month. This year the subjects appear to have been well chosen, and the rewards very fair. The consequence is that a very decent number of workmen have replied to the invitation.

The subjects are thus divided, viz., subjects sent in accordance with a prescribed design, and those sent in without any prescribed design. In the former case, a case and a photograph of the object to be copied were furnished to competitors upon payment of a small sum sufficient to cover the expenses.

It appears that the old trades' corporations are not altogether dissociated from the present scheme, for the Worshipful Company of Salters contribute £10 annually to the prize fund, so also does the Worshipful Company of Clothworkers, while the Goldsmiths' Company give £15 for the encouragement of workmen in the precious metals. Considering the funds at their disposal, and the very slight influence they have upon their respective crafts at the present time, it is to be regretted that the example of the Salters', Clothworkers', and Goldsmiths' Companies is not more followed. The Paperstainers used to have, I believe, an annual exhibition of their own—an example which might well be followed by so important a company as the Goldsmiths', for an apprentice or workman would doubtless value more a reward given to him by his own craft, than one by the Society of Arts. At the same time there would be no objection to the objects sent into the Goldsmiths' Hall, or to the hall of any other company which might see fit to have an exhibition of their own, being sent to swell the general exhibition at the Society of Arts.

I am afraid that it would be impossible, even if it were altogether desirable, to go back to the mediæval system of close corporations. Our only chance of progress is to work out the best points of the new system, and one of the best points is certainly these periodical exhibitions, such as we have now at the Society of Arts. What we have to do is to make these exhibitions as important as possible, so that, instead of some ninety-four articles being sent in as in the present case, we may count ten times the number. As before observed, the smaller and local exhibitions might send in their best objects to swell the great one at the Society of Arts. It only remains to say a few words upon the conditions imposed upon the competitors, and the various kinds of work demanded.

The conditions are as follows:—The works remain the property of the producers, but are subject to be retained for exhibition in London and elsewhere as long as the Society may decide. It is to be hoped that "elsewhere" may hereafter mean Manchester, Liverpool, Sheffield, and one or two more of our great centres of manufacture.

The exhibitors are required to put a selling price to every article, and, if sold previously to exhibition, to state the price of a copy. This is a most important and practical regulation, and would lead to most valuable results in the case of provincial exhibitions.

Clause 3 provides that the rewards will be paid, provided the works are of sufficient merit, *i. e.*, that the rewards will not be given to the best of bad work, but, on the other hand, additional sums and the Society's medal are the rewards of extraordinary merit.

The candidate must be prepared to execute some piece of work, if required, to prove his competency. Only *bona fide* workmen can receive prizes. No charge upon the sales of the articles. The prizes are open to both males and females, and there are, in addition, a certain class of prizes set apart for females alone. Article 9 is a very important one. Any producer can exhibit, either in his own name or that of his workman, provided that the name of the artizan or artizans be appended; and, if their work be sufficiently meritorious, extra prizes are given to the artizan, the producer, it is presumed, taking the original one.

Artizans may exhibit works executed after other designs than those prescribed, but they must be of a similar style and character. The works may be sent in either with the name of the artizan, or with a cipher, accompanied by a sealed envelope, &c. This latter is the only point in the instructions at all open to objection: no man ought to be ashamed of his work; if it be good, he should have all the credit; if bad, he will deserve all the blame; and it is more than probable that the strictures he incurs may determine him to do better the next time.

The prospectus of the Society finishes with the following very satisfactory statement:—

"The council are happy to announce that several of the works which received the first prizes in the competitions of 1863-64-65-66-67, have been purchased by the Department of Science and Art, to be exhibited in the South Kensington Museum, and the Art Schools in the United Kingdom."

It is to be hoped that the Society will go on in its good work, and that their exhibition will eventually become one of the great exhibitions of the season, and claim an equal amount of interest as those of the Academy, or the Water Colours; it will certainly be quite as useful to the manufactories of the kingdom as they are to Fine Arts.

Next week I propose to give an account of the various prescribed designs, and of the competitors who have responded to the Society's call.

W. BURGES.

THE UNION BANK OF LONDON.

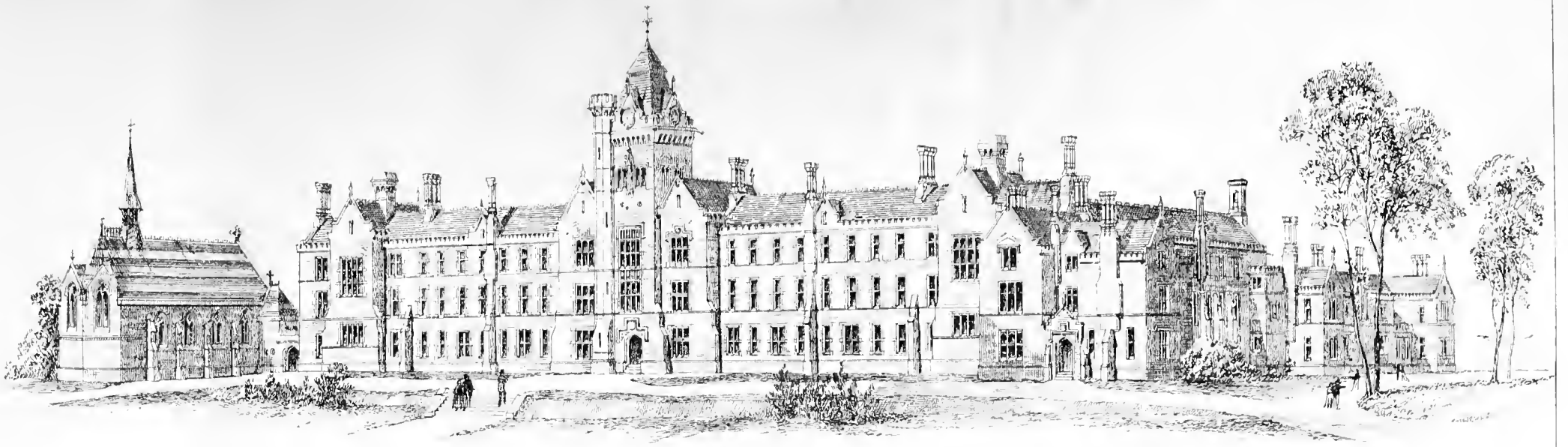
THIS building, of which we give an illustration this week, has recently been erected on one of the finest sites in the City, opposite the Mansion House, and will be a conspicuous object from the proposed new street which will lead from the Thames Embankment to Mansion House-street. The façade is as yet incomplete, the leases of the houses on the Princes-street side not having expired. The works were for some time delayed whilst arrangements were pending for the widening of the street; and eventually the building was set back 10ft., that space being given to the public thoroughfare. The foundations had to be made at the unusual depth of 30ft. (in consequence of the site having been that of the ancient river Walbrook), being a little below the old Roman level of the City. In the course of the work a few Roman coins and a very complete portion of a tile pavement were discovered, with timber piles and other remains. The present frontage in Mansion House-street is 89ft., which will hereafter be considerably extended, and in St. Mildred's-court the frontage is 70ft. The stone dormer windows break the balustrade, which is backed by a roof noticeable for its pitch, giving a sky line far more pleasing than is usually obtained by a hard line of the regulation balustrade, disguising roof and chimneys. The grouping of the windows has been well arranged to give relief to the façade, and the centre bays have been brought forward to suit an irregular line of frontage. The entrance in Mansion House-street (which has a bold polished red granite architrave) leads to suites of offices on the first, second, and third floors, the whole of the ground floor being used for the business of the bank, as are the basement and upper floors of the building in St. Mildred's-court, the entrance to the bank itself being in Princes-street, in the older portion of the building, which was erected by Mr. Philip Hardwick, R.A., as offices for the Great-Western Railway company.

Internally, the centre of the banking office is well lighted and ventilated from a dome 39ft. in diameter, intersected by arches springing from eight columns supporting it, round which and also carried by them is a gallery on the back of the first floor of the old building in Princes-street. The ornamental iron gallery front defines the octagonal form of the dome on plan, four of its sides being longer and four shorter. In the centre of a ring which stops the moulded ribs of the dome is a large sun-burner. The floors throughout are of fireproof construction, this part of the work being done by Mr. Barrett. Messrs. Cubitt and Co. are the contractors, Mr. Bridgman having been an efficient clerk of works.

The business of the bank has not been impeded during the progress of the works.

The announcement which has recently appeared in the daily papers to the effect that the reconstruction of Her Majesty's Theatre had been commenced, and that the new building, which it was said would cost £250,000, would eclipse in grandeur every other opera house in Europe, has received an authoritative contradiction. The ruins of the old edifice are being cleared away "to save time," but no decision has yet been arrived at as to the appointment of an architect, or the ultimate disposition of its site. In all probability there will be limited competition.

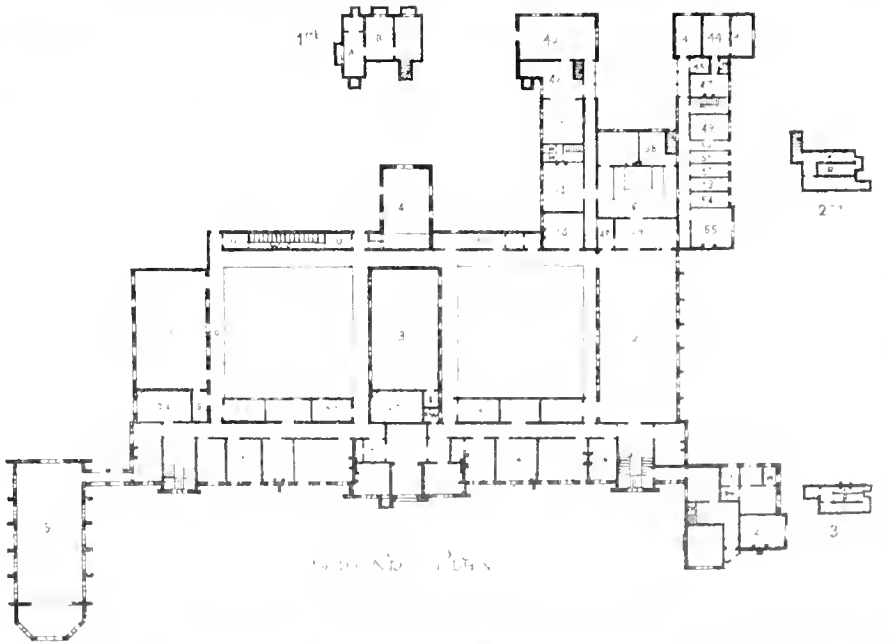

Union Bank of London.
P. C. HARDWICK. ARCH.



Middle-Class College,

BEDFORD.

Mr. FRED. PECK, ARCH.T.



DARLINGTON UNION WORKHOUSE COMPETITION.

(COMMUNICATED.)

EIGHTEEN designs or sets of drawings have been received for the Darlington Union New Workhouse, which are now on view (admission sixpence each) in the Central Hall.

Perhaps the sight is worth sixpence to some people; and non-resident competitors may be thankful that such a degree of publicity is granted. If the guardians would go further, and remove the prohibition they have imposed against the use of pencil in the room, it would be further advantageous to the spirit of fair-play which seems to actuate them, as giving to members of the press licence, or, at any rate, opportunity of fair criticism, and a due public canvassing of relative merits. It is to be hoped that they will remove this restriction, which the discontented might say was intended to stifle criticism. It is certainly undesirable that unscrupulous "persons" belonging to the "profession" should be allowed to sketch and take ideas from the works of their brethren so exhibited, and sketching is, therefore, very properly prohibited; and probably few persons capable of making good use of good ideas, would care to acquire them in such a way. Taking notes and observations on the spot, however, is very different. Owing to the restriction alluded to above, we cannot go through the drawings *seriatim*, as we have nothing but our memory to guide us. The "usual amount of rubbish"—the inalienable rubbish of a competition—however, remains indelibly impressed on our minds.

The first set on the left-hand side on entering, marked "Alpha," is ascribed to a local architect. It is certainly a juvenile production, drawn apparently without regard to scale—as to doors, windows, &c., at any rate. It is almost the only set in the room that offends in a glaring manner against the "instructions," which explicitly interdicted colour in the elevations—an interdict totally disregarded by "Alpha," who has coloured his bricks as red as colour can make them. The plan itself is very striking and original, as it presents four large quadrangles in the workhouse building, around which the various wards are arranged, two storeys in height. As no corridors are provided, and no covered ways, it is difficult to see how communication is to be effected in inclement weather without exposure or disturbance; or how the necessary surveillance by night, or attendance by day, can be managed properly. The kitchen is placed in the middle of the house, with nothing to intervene between the smells thereof, and without a scullery or other necessary adjuncts. It is figured 19ft. by 40ft.; and the next apartment, the matron's room, is lighted only by a borrowed light 23ft. from any window. The dining-hall is figured the same width, by 60ft. in length, and has bed-rooms over it. The whole involves hopeless confusion, and renders inspection possible only under the most inconvenient circumstances. The consequences of the bold idea of dispensing with corridors entirely, which has seduced the author of this design, are hereby plainly shown to be similar to cutting a man's legs off and bidding him walk. As to the elevations, we need only remark that they show a battlemented parapet in brickwork, all around every building, and a label moulding, which also forms part of the jambs and soffits of the windows. A bird's eye might well ache if it beheld such a view as is here presented to it, one executed to all appearance with a very stumpy quill pen, by a rival of Kit Nubbles, when that accomplished youth took lessons in writing in the "Old Curiosity Shop."

It is a relief to turn to the pleasant drawings marked "Suum Cuique," whose author, however, has made the mistake of providing more accommodation than is asked for. It is a modest and simple design, and the designer has very wisely placed his faith in a well-drawn plan.

"Palmam qui meruit ferat" contributes a very expensive plan, breaking up the several departments into a great number of separate buildings. Although there are considerable advantages attending this plan, we cannot help thinking that it would render the service expensive, and perhaps troublesome, whilst the effect of covering the whole site with small buildings is anything but pleasing. The general model resembles the Oxford Workhouse, and has a large chapel, with apsidal chancel and transepts, beyond the dining-hall, whilst the majority of the competitors agree in the advisability of using one room for both these purposes. The hall itself, too, is surrounded by a corridor, an arrangement which seems to entail a considerable loss of space, and to render the hall gloomy and its ventilation difficult. This error is shared by many of the competitors. The elevations are very suitably designed.

Another motto ("Palmam non sine pulvere") escapes the error of enclosing the dining-hall, and places the kitchen in a half basement. The view of this design looks cheerful and open; and the arrangement of the buildings gives easy access to the infirmary, which, in most of the designs, is placed in the rear. The author of this set favours us with the only interior view of a dining-hall contributed. The drawings are quiet in tone, and the plan seems to have been duly considered.

"Poverty is no sin" (except in design) is the signature attached to the largest set of drawings in the room—namely, eleven in number, several of them of large dimensions, and the whole boldly drawn. The plan has merits in its general arrangements, which impressed themselves on our mind, as did also some few awkward features; and we lament that the design is liable to be considered sinful on account of its poverty.

"Spero" has sent a very modest set of drawings, only four in number, if we remember rightly, which seemed to us inadequate to do justice to the evidently careful way in which the plan has been studied; and his modesty is all the more conspicuous by being located next to the large and pretentious drawings last described.

Of the remainder, which are now somewhat confused in our memory, those of any architectural pretensions are too architectural, one or two aiming at pure Greek; one giving to his infirmary building turrets joined by circular wings at the angles, which call to mind the plans of Blenheim or Kedlestone; another presenting a beautifully-lined and well-coloured Italian elevation with plenty of cut and moulded stone-work about it, and so on. The happy medium of architectural dignity, without costliness, on the one hand, or repulsive poverty on the other, is only touched by two or three in the room; and few of the competitors, obviously, have had little inducement, in the shape of previous study of poor-houses, to enter the lists.

Probably, however, the guardians will be able to find, amongst the designs exhibited, some approximation to their wants; and, as they propose to give £30 and £20 respectively to their second and third favourites, and to retain their drawings, they will be able to worry their chosen architect into embodying all the merits of these designs, for which they so liberally pay. Competitors who have entered into the contest with this condition before their eyes, have allowed the time for objection to go past, and to lookers-on, who like to see go past, and to lookers-on, who like to see measure for measure, there remains an arithmetical puzzle frequently matched on such occasions. Those unfortunate beings into whose hands the award of competition falls, feel in a peculiar degree the dilemma of the old man and his donkey; but there exist, in spite of all complaints, some sensible persons who can see when they are beaten, and who will recognize, let us hope with becoming gratitude, all efforts to secure the best place for the best man—to give the prize where it is deserved. To effect this object, it has been proposed to call in professional advice, a course which the guardians would do well to adopt. We would suggest that competitors, especially those who are well known in the town, should be excluded from the room after the first visit—if not by their own good sense and good feeling, by the prohibition of the powers that be. We saw several persons, who appeared to us to be competitors, discanting on the merits of their own, and pointing out the blemishes of others' works; and, as there are *seven* resident competitors, and the ownership of the designs seems to be no mystery, the practice alluded to is calculated to give them undue advantage.

BEDFORDSHIRE MIDDLE-CLASS COLLEGE.

THIS building is now being erected at Bedford. The college is arranged to accommodate 300 boys. It is a red brick building, with stone dressings to windows. The building faces the high road, and will be seen from all the railways entering Bedford. A separate residence for the head master is provided, and arrangements are made for the under-masters and domestic servants.

The college is supported by the Duke of Bedford, Lord Cowper, and other influential gentlemen of the county; and it is intended to board and educate the sons of the middle classes for the annual payment of £25.

The building has been designed by Mr. Frederick Peck, and is being erected by Mr. William Huddleston, of Lincoln. The cost of the college, exclusive of fittings, is £12,000. It should be added that a competition was invited, that about fifty competitors sent in designs, and that those of Mr. Peck were selected.

DEVONSHIRE ARCHÆOLOGICAL SOCIETY.

WE are glad to see that an attempt has at length been made to form an Archæological Society for the County of Devon. This is a want which has been long felt, particularly by those more immediately interested in the county's history and antiquities. Last week a meeting convened by circular was held in Exeter to consider the subject. Mr. Charles Tucker, F.S.A., one of the hon. secretaries of the Royal Archæological Institute, was voted to the chair, and there were also present—The Rev. Canon Cook Lieut.-Col. Harding, F.G.S., Dr. Scott, Messrs. Jno. Carew, W. R. Crabbe, W. Vicary, R. Sanders, E Ashworth, R. Dymond, T. J. Bremridge, E. Parfitt, and G. T. Donisthorpe.

The CHAIRMAN observed that Devonshire was rather late in taking steps to form an archæological society. Out of the Archæological Institute, which he joined twenty years ago, had grown eleven county societies, and he should be glad to see the dozen made up by the addition of Devonshire to the list. These had continued in correspondence with the Institute since their establishment, and a great deal had been done by them towards preserving objects of historical interest which would otherwise have been pulled down and destroyed. The Institute have even diverted a railroad from going through those wonderful mounds known as the Bastlow-hills, on the borders of Cambridgeshire and Essex, the railway directors, on representations being made to them, consenting to divert the line from the contemplated route. A little well directed energy sometimes did great public good, and in many instances could be better brought to bear by a society than by individuals separately. There were still in Exeter several ancient objects worthy of preservation, and in the county there was a large number of the earliest remains of human intelligence in the form of temples. A society would be serviceable in preventing the destruction of these relics of past ages. In connection with a society at Salisbury, one of the best of the provincial museums had been formed. There were suitable objects for investigation in Devon, the county contained its full share of intelligent people, and he had no doubt that an archæological society would be well supported.

MR. CRABBE said that objects deserving the attention of such an association could not be otherwise than numerous in the second largest county in England. Throughout its length and breadth were scattered remains of great interest. There were early Celtic remains on Dartmoor; numerous traces of that mysterious priesthood of Druids, whose dark rites were surrounded by the gloom

of centuries; and to Roman remains he need hardly refer, standing as he was close to the Roman forum of the ancient city of Exeter. Saxon, Danish, and Norman remains were to be met with in all parts of Devon, especially of the Danes, who, being pirates, clung to the seaboard and inhabited our Devonshire coasts. Little was known about the Hubba stone, and the many evidences of the Danish occupation—in fact the archæology of Devonshire down to the wars of the Charleses was a sealed book. The archæology of Devon had never been taken up by any society, but had been left to dwindle, and if it was to be revived, it must be through the medium of a society like that they proposed now to originate. He proposed that a society, composed of a president, two vice presidents, general district and local secretaries, a treasurer, and a committee, be established, for pursuing archæological researches in the county of Devon.

Lieutenant Colonel HARDING seconded the proposition, and expressed his gratification at the probable formation of such a society on a firm basis.

The motion was adopted, and, after some further conversation, the following appointments were made:—President, E. Smirke, F.S.A., Vice-Warden of the Stannaries. Vice Presidents, J. Carew, C. Tucker, F.S.A. Committee, Canon Cook, Dr. Blackall, Prebendary Barnes, J. E. C. Walkey, Dr. Scott, R. Dymond, Rev. W. Wills, E. Parfitt, W. Miles, Dr. Shapter, and W. Vicary, with power to add to their number. Treasurer, R. Sanders. Secretaries, Lieutenant-Colonel Harding, F.G.S., and W. R. Crabbe.

It was arranged that an adjourned meeting should be held in a month, to receive a report from the committee as to the constitution of the society.

IMPORTANT DISCOVERIES OF ROMAN REMAINS.

AT the last monthly meeting of the Newcastle Society of Antiquaries, an interesting paper was read on the recent excavations at the station of Cilurnum. The paper, which was from the pen of Mr. John Clayton, was, in the absence of that gentleman, read by Dr. Bruce, and tends to throw further light on the history of the Roman fortifications in the North. After noticing Julius Agricola's erection of the station of Cilurnum, and its connection with the great wall by Hadrian—the latter being the avowed object of the excavation—the report proceeded to state that the two structures are obviously distinct and separate works, and, though they touch each other, there is no intermixture of masonry. The station has six gates, like that of Amboglauna, and both were placed on the Roman roads formed anterior to the walls. The coins unearthed by these operations are altogether imperial, ranging from Trajan (A.D. 97) to Valerian (A.D. 375), and, with one or two exceptions, are made of brass. One of the coins of Trajan—found on the floor of the Agricola period—is a fine specimen of the produce of the Roman mints; it is of the 5th consulate of Trajan (A.D. 100), having on its reverse a figure of Victory placing a wreath of laurel on the head of the Emperor, who holds in his right hand a thunderbolt, and in his left a spear, with the legend:—

SENATVS POPVLVS que ROMANVS
OPTIMO PRINCIPI.

On the floor of the Hadrian period was found a tablet inscribed to his immediate successor, Antoninus Pius. The stone has been broken, but enough remains to render the whole legible, with the exception of the number and style of the legion, which are supplied with sufficient certainty from other sources. The letters stand thus:—

IMP - CÆS - TITO - ÆL
(I) - HADR - ANTONI
NO - AVG - PIO - PP
COS - LEG - II - AVG - P

which, being extended, read "Imperatori Cæsari Tito ÆLIO Hadriano Antonino Augusto Pio Patri Patriæ Consulari Legio Secunda Augusta Posuit." The stone commemorates no work, but is merely a complimentary tablet inscribed by the second legion to the Emperor Antoninus Pius on his accession. The minor antiquities disclosed were horns and bones of deer and cattle, oyster shells, Samian ware, two seals separated from their settings—the one a cornelian stone, on which is a figure of Mercury, and the other of jasper, containing the figure of a Roman soldier; while in the works of the Agricola period was dug up mineral coal, showing that the Romans had discovered, at an early period, that in Northumberland there was beneath the surface a material calculated to mollify its climate.

FIRES IN LONDON AND PARIS.

ON the subject of fires, the "Society of Arts Journal" remarks that few facts are more remarkable than the small amount of damage done by fire in Paris, yet the number of persons in each house, and consequently the number of fires, is very much larger than in London; and, although the number of firemen is three or four times larger in the former than in the latter city, the engines are mere garden toys compared with those of the London brigade, to say nothing of the steam fire-engines. The comparative immunity from fire may be accounted for, in part, by the very crowding of the houses which would seem to be a source of danger; each family occupies only one floor, and consequently there is little chance of a fire smouldering for hours without being discovered, but the grand difference in favour of modern French houses, as compared with those of London, arises from their superior construction. In the first place, timber is almost entirely banished; the beams, girders, and flooring-joists are all of iron, and the spaces between them filled in with brick arches and mortar; this arrangement not only renders the floors nearly fire-proof, but it excludes noise, and affords little shelter for vermin. Then again, the floors themselves are composed of thick oak parquet, instead of inflammable deal boards; while those of the kitchens, pantries, and offices are mostly of tile. The staircases, it is true, present some danger, but nothing compared to that which surrounds the flimsy constructions in London houses. It might be added that in a great many instances, not only are the stairs of houses made of stone (as is the case in many parts of Scotland), but the floors even of bedrooms are, to a large extent, constructed of concrete, thus rendering fire when it happens less destructive and dangerous.

ANTHRACITE COAL.

THE North London Railway Company are at present making an experiment which is likely to have a very beneficial effect upon the sanitary condition of London. For some months past they have used anthracite instead of bituminous coal, and the result is highly satisfactory. It would appear to be an easy matter to substitute one coal for another, but the change usually involves some trouble to the officials, and is not made until a necessity arises. In the case of the North London necessity came upon them in the shape of numerous actions or threatened actions for damages for the emission of "opaque smoke." By the use of anthracite coal the company not only avoid all ground of complaint, but they effect an actual saving it is said of several thousand pounds per annum. The coal is found to be 25 per cent. more effective than the bituminous coal previously used. We have thus another evidence that the emission of opaque smoke is an unnecessary evil, and one which ought under no circumstances to be allowed.

ACTION BY AN ARCHITECT.

A CURIOUS case was heard the other day in the Manchester Court of Record. Mr. Thomas Waddingham, jun., a Manchester architect, brought an action against the Rev. Joseph Steinthal, Minister of the German Evangelical Church, to recover £15 15s., for plans which he alleged he had drawn by order of the defendant. The plaintiff's case was briefly this. In February, 1866, the defendant called on him in reference to the erection of a church and school. They inspected the site of the proposed building in Park-street, Cheetham, and the defendant directed him to prepare plans, but not to go to much expense. It was arranged between them that the schoolroom should be in the rear of the church, and that the chancel wall should also be the wall of the schools. The defendant asked him what were his terms, and the plaintiff replied five per cent. upon the amount expended on the intended buildings. Plans were accordingly prepared, and all the work which the plaintiff did was done, he said, upon the faith of the defendant's representations that the building of the chapel would be carried ont. The plaintiff now claimed ten guineas for the plans which he had drawn for the church, which has not yet been built, and the breach of agreement was alleged to have been committed on June 15, when the defendant said that, in consequence of the German war affecting the amount of his contribution, he could not build his chapel, and that he must build his school-house as a detached building. Plaintiff also claimed five guineas for copies of plans, which he had made for the use of the defendant's committee. The defence was that the plaintiff was only engaged to draw the plan of the schoolroom, for which he had been paid, and he was told that as to the other buildings the defendant would have to wait until the money was obtained, and that as to them the plaintiff undertook the risk of being paid for his plans. As to the extra plans for the committee, the defendant alleged that Mr. Waddingham agreed to include these in his per centage remuneration. The recorder, in summing up the case to the jury, said, he could not help remarking that which he was constantly telling juries in Manchester, that it was a great pity that people did not, before they entered into such an agreement as was the basis of this action, put it into writing, because then there could be no difference between them as to its terms. However that fault seemed to have been committed by each party in this case, and it was one which people frequently committed. Everything being smooth and easy at the time, they thought such a state of things would continue; they did not foresee difficulties, and did not look forward to a time when they would have to rely on a very inefficient recollection of what took place. The jury retired, and, after a consultation of nearly half an hour, returned into court with a verdict for the defendant.

TECHNICAL EDUCATION.

THE second of a series of conferences on this subject was held on Thursday week, at the offices of the Working Men's Club and Institute Union, Mr. Hodgson Pratt in the chair, for the further consideration of the state of the present existing literature relative to the cabinet maker's trade. Only a small number was present. The chairman having read the minutes of the last meeting, invited any present to offer any remarks on the subject. Mr. Lucraft thought that books and manuals by themselves would never do any good, and advocated the establishment of a technical trade museum, with library, and courses of lectures on the various trades. He was, however, reminded by the chairman, that his suggestion was somewhat out of order, as the question before the meeting was trade literature, and its existence and possibilities of further development, and not whether it answered its purpose or not. He was, however, sure that Mr. Lucraft's scheme would meet with every attention, if propounded at the ensuing conference of the Society of Arts of the 23rd inst. Mr. Lucraft, Mr. Hall, and Mr. Paterson, were ultimately invited to draw up against the next meeting a series of the different heads or chapters of which a standard trade manual, which it is proposed to compile, should consist. This the two last-named gentlemen consented to do. It was then proposed and agreed that an advertisement should be inserted in the "Publishers' Circular," or some other similar periodical, for the purpose of obtaining all the present literature existing on the subject by the next meeting, which takes place on Friday the 24th inst.

OLD ENGLISH BUILDINGS AND THEIR RESTORATION.

THIS was the title of an interesting paper delivered before the Birmingham Architectural Society last week, by Mr. Allen E. Everitt. In the course of his remarks, Mr. Everitt said, I feel that one of the objects contemplated by the Society—viz., the cultivation of an artistic feeling for, and a true appreciation of, the value of our ancient remains—will be best served by briefly noticing what there is of especial interest near at hand, and also venturing to give an artist's thoughts on their present appearance and future prospects. For this purpose we will take our own town as the centre of a radius extending for about fourteen miles; and first and nearest comes Aston, with its grand old hall and highly interesting church, rich in monumental remains of the last four centuries. Then we have the moated hall of Perry, dating from 1579, the old parish church at Handsworth, with its tower placed at the east end of the south aisle; and the

towers of the old churches at Edgbaston, Harborne, and Moseley, where little else of ancient work remains. The old house at Camp Hill, dated 1601, and the Old Crown, and a few others in Deritend, and a few picturesque bits scattered here and there at the outskirts of the town, but which are fast being displaced by the business requirements of modern days, serve as a lingering relic of the artistic taste of our ancestors; and even St. Martin's Church, although disfigured by a churchwarden's brick great-coat, has still many points of interest, especially in its monuments of the old lords of Birmingham. Looking southwards, at a distance of about five miles, we have King's Norton, which, with its fine church and adjoining picturesque school, of early date, and numerous old gabled houses of Elizabethan and Stuart days, surrounding the village green, forms a most pleasant architectural group, and one that will repay a visit. In its close vicinity lies Northfield, with a church of interesting Early Pointed date, having a massive tower and other curious features; and Cofton Hackett, with its quaint bell turret, and adjoining Hall. The latter, although apparently a modern house, has still remaining a portion of a fine old hall, with open timbered roofs. We also have Barnt Green, where the highly-picturesque, half-timbered mansion, situated at the foot of the Lickey Hills, is well known to travellers on the Midland Railway. In this direction also is Alvechurch, with its old houses, and lately restored church, to be referred to further on; Beoley, with a curious church, containing some early Norman portions, and some admirable Elizabethan tombs, rich in decaying gold and colour; and the little town of Bromsgrove, full of interesting bits, both for the architect and artist. In a south-easterly direction we have Solihull, with a noble old cross church, worthy of attentive study; Knowle, with its Late Pointed church, once collegiate; and Temple Balsall, with its well-known church of the Knights Templar. Tanworth and Lapworth also have interesting features, the latter being especially noticeable for its almost detached tower and spire; and also Packwood and Baddesley Clinton, whose churches (more es pecially the towers) are similar in design, and are traditionally described as having been erected by Nicholas Bourne in the latter part of the fifteenth century; the said Nicholas Bourne being the proprietor of the old moated house at Baddesley Clinton, now remaining in its entirety, and perhaps one of the most interesting mediæval bits in this locality. The old mansion at Packwood, also, must not be omitted, as, although many of its best features are concealed under a coat of roughcast, yet it is a fine example of the half-timbered structures of the Stuart days; and its ancient garden, with the clipped yew trees and formal hedges, is quite unique. In the little town of Henley-in-Arden may be noticed the remains of a picturesque old market cross, and many other bits of the olden time. In an easterly direction we have, first, Yardley, with a spire church, having a chancel of Early Pointed date, and an excellent open timber porch; Sheldon, with a good 15th century tower, and portions of earlier work, lately restored (but which I have not visited since the same has been effected); Sheldon Hall, containing some good internal carving of sixteenth century work; and Castle Bromwich, with its fine hall, rich in old tapestry and quaint carvings, and with a garden laid out with the clipped hedges and trim walks of Dutch William's days, forming a truly charming spot, and one well cared for by the Earl of Bradford, in whose family it has remained for several generations. Then we have Bickenhill, with a spire church, in which are many interesting Norman portions; and Hampton-in-Arden, noticeable for old cottage bits, subjects for no end of pictures, and a church in which are progressive examples of the Norman and later styles of our English architecture. A little further in this direction is Berkswell, whose church has a fine Norman chancel, under which is a good crypt, now used as the burial vault of the Sir Eardley Wilmot family; and Packington, whose park comprises a relic of the once far-famed Forest of Arden, the grand old oaks in which have been immortalised on canvas by our worthy friend, Mr. F. H. Henshawe. In this park is the old house, built by Sir Thomas Fisher towards the end of the 17th century; and I may here mention that nearly all the old farm houses in this part of Warwickshire have been furnished with the protection of a moat, doubtless as a security required by the dense woodland tracts in which they were situate. In this neighbourhood also is Maxstoke, whose Priory ruins, with their close-adjoining village church, are worthy of a most careful investigation; and at a little distance the moated house, or rather Castle of Maxstoke, is the very picture of an old English feudal house. Near at hand, also, is Coleshill, with its restored church and Digby monuments, and other interesting relics of former days, including the pillory, a relic of old customs not often met with. In a north and north-easterly direction is Sutton Coldfield, where the good old Bishop Vesey must not be forgotten; and in its near vicinity is the moated house of New Hall, with embattled towers and quaint old work. There is Pipe Hayes, too, a timber mansion, now roughcast, but singular from having a number of little gablets, and some massive bay windows. Curdworth has a church, with a good Norman chancel arch; and Astley Church and Castle are well worth a summer's day journey. Kingsbury and Polesworth, the latter with its fine Conventional church, are also noticeable; and Tamworth, with its church and castle, the former rich in early monuments of the Ferrers and Neville families, must be well known to all. To the north-west there is not much of interest, the Black Country having gradually absorbed nearly the whole of the picturesque remains. The parish church of Walsall, however, has some chancel stalls of rather good character; and at the edge of the town there is an old seventeenth century house, of moulded brick, called Colmore Hall, worthy of inspection. At West Bromwich the old church of St. Clement has a few bits of good work almost buried under modern plaster; and in the neighbourhood are two old houses of timber construction. The one near the church, called Bromwich Hall, has been greatly altered; but the other, called the Oak House, and situated near Spon-lane, remains in a perfect state, but surrounded with modern houses and smoky chimneys. At Wednesbury, the old church, with its octagonal chancel, was sadly ill-used some thirty-five years since; and the Collegiate Church of Wolverhampton is too well known to be commented on. At Tipton was an old church containing much Early Norman work, some few years since quite in ruins, but I understand it has been rebuilt, but whether ill or well done I am uninformed. The Castle of Dudley is also one of the well-known objects of our neighbourhood; and in the vicinity of Stourbridge are, I believe, many old mansions of the Elizabethan and later periods, which should be carefully examined. To the west of Birmingham is Hales Owen, whose church has perhaps the largest amount of Norman work remaining of any in the neighbourhood, and the ruins of Hales Owen Abbey, close by, and the little chapel of St. Kenelm, on the Clent Hills, have much to render them interesting. The hall and restored church of Hagley, and the picturesque church of Clent, lying close under the shadow of the great hills, will, I think, complete the list of the most noticeable architectural and antiquarian features comprised within what may be called "our neighbourhood." Having thus shown that we have much surrounding us worthy of our care, permit me to say a few words upon "how they are cared for." And I only hope you will kindly bear with me if I give way to a little grumbling, as in all probability an artist sees more beauties in these old decaying places than a more matter-of-fact person; and if a bit of colour "comes out well," and a broken line is "highly picturesque," it is more satisfactory perhaps than the most perfect work. At all events, I can only say that I dread the word "restoration," as applied to an old church or hall. "Preservation" I can understand, where the architect, with an artist's eye and loving care, will save each mouldering stone where practicable, and insert as little as possible of modern work. But "restoration," in many cases where I have seen it, means a wholesale scraping, cleaning, varnishing, and general "doing up;" making the place look uncomfortably clean, but obliterating many beauties and much charm of colour, which, to me, would be a chief attraction. The fact is, I look upon an old church as a silent history, in which have been expressed in wood and stone men's thoughts and actions, through successive generations; and I do say that the wholesale clearing away of all relics of the Elizabethan and Stuart periods from our churches, in order as it is said to restore them to their pristine character, is most reprehensible, for we thus lose many things, which, although perhaps not exactly in accordance with the architecture of the edifice, yet are so expressive of the periods and so good in themselves, both in workmanship and design, that it seems like tearing a page from history to have them removed. In building our new churches, of course it is desirable that the whole should be in unison, but our old church is a chapter in our art history, and as such should be religiously preserved. I have been led into these remarks from having noticed with regret the loss or removal, in late years, of much that was good in many of the places which have been just referred to, and perhaps you will pardon me for taking up your time by mentioning a few instances, for I firmly believe that the present century has seen more ruthless destruction of old things, under the plea of enlargement and rebuilding, than has been accomplished during the past two centuries. The first grumble, therefore, shall be at Knowle, where the old collegiate church has been lately under repair. In this church a fine carved wood screen still remains in the chancel. There, however, were some good stalls in, of course, their usual position to the screen, and these have been removed most injudiciously to the east end of the south aisle, thus depriving them of their original signification as choir stalls, and replacing them by new stalls of poor design and execution, and much inferior in picturesque character to those removed. The next place where the restorer has been busy is Coleshill. I will freely admit that the church was blocked up with unsightly galleries and tall pews, the absence of which no one can regret; but I do regret the loss of a wrought-iron chancel screen, the date about 1700, and although the same may not have been in accordance with its surroundings, yet it was of good workmanship, and a memorial of some worthy churchmen of those days. The altar rails here had also the massive balustrade and broad flat top of the Caroline period, and formed three sides of a square round a carved altar table of that date. These have been removed to give place for a flimsy metal rail, which, though perhaps architecturally correct, has not, to me, one half the charm of the old balustrade, on which the sunlight seemed to fondly linger as it glanced through the chancel windows. In passing through the churchyard at Sutton Coldfield some short time since, a staring new porch first caught the eye, so stained and varnished up that, from its deep brown colour and plate-glass sides, it looked more like some new toy. In all probability it is intended as a restoration of the old one, but the charm of the old one's colour is wanted, and, though possibly of good design and correct execution, it seems harsh and out of place, and, compared with the time-stained walls of the church, resembles a new patch on an old garment. One more example, and I think your patience will be exhausted. This is the restored church at Alvechurch, where but little is left of ancient date: and why the Norman nave arches should have been entirely swept away is very questionable. The new church is most certainly much loftier and of grander proportions, but the old one seemed to me more suited to the locality, and possessed many curious features well worthy of being spared. The church at Bromsgrove has certainly met with greater care, the whole character having been well preserved; and at King's Norton the whole seats, containing much Jacobian carving, have been only judiciously lowered, thus saving many a bit of good art workmanship. I hope the foregoing remarks will not have left the impression on your minds that I am averse to all necessary restoration, as such is far from being the case; my object being only to draw attention to the indiscriminate removal of all objects in our churches of post-Reformation date, which our restorers are so fond of accomplishing, and I think, after a careful examination, it will be found that the deep galleries and heavy pews, windows deprived of their tracery, and such like abominations, are in most cases the work of churchwardenism during the period from 1760 to 1830, when true art in church work was at its lowest ebb; and, as I have before mentioned, I believe that our buildings suffered more then than at any previous time. In order to endeavour to "preserve," not restore, the remains of old art workmanship by which we are surrounded, might I venture to suggest that it is in the province of this society to take these matters under its especial care? And for this purpose could not an archæological branch or section of the society be formed, which, by means of an appeal to those in authority over the different structures entrusted to their care, would so interest them in the structures over which they have control that not a stone would be touched without the previous sanction of the society? And thus much would be preserved that otherwise would be ruthlessly swept away.

We have to remind our readers that the twentieth annual ball in aid of the funds of the Builders' Benevolent Institution will take place at Willis's Rooms on Thursday the 30th inst.

Building Intelligence.

CHURCHES AND CHAPELS.

The small but pretty ancient parish church of St. Mary, Lower Heyford, Oxford, has been reopened for divine service. The five bells have been rehung and the large tenor bell recast by Messrs. Myers and Stainbank, London. Mr. Buckeridge, of Oxford, is the architect, and Messrs. Jos. Castle and Co., of that city, the builders. The cost of the restoration was £1,240.

A general meeting of the Hereford Diocesan Church Building Society was held on Wednesday week. After the reading of the report and transaction of the general business, it was stated that the Lord Bishop had promised to issue a pastoral to his clergy, asking them to have collections in their churches on the ensuing Palm Sunday, to be divided equally between the parent and diocesan church building societies.

The corner stone of Christ Church was laid at Patricroft on Saturday. The plan comprises a nave, with side aisles, and is arranged so that if additional accommodation be required, transepts may be added at a future period. All the roofs are framed of red deal. The church will be faced externally with Peirepoint masonry, with dressings of Hallington stone, and the interior will be finished with brickwork of various colours, and the remainder plastered. There will be accommodation on the ground floor for 532 persons. One half of the seats will be free and unappropriated. The works have been undertaken by Mr. H. Southam, builder, of Salford, for £3,800, under the direction of Mr. J. Lowe, architect, Manchester.

On Tuesday, the Bishop of Lichfield consecrated at Bradley, near Bilston, a new church, dedicated to St. Martin. It is in the geometrical style of architecture, and will seat 850 persons. The plan of the church is cruciform: the length of nave 78ft., and width of nave and aisles 65ft. 6in. The tower and spire, 170ft. high, are at the south-east. The material used for the walling is Gornal stone, in coursed rock-faced ashlar, box-ground stone dressings; the nave, piers, caps, and bases of Hollington stone; the aisles, chancel, and communion are laid with Messrs. Maw's encaustic tiles. The builder is Mr. Nelson, of Dudley, and the architect, Mr. Bidlake, of Wolverhampton; the cost about £6,000.

Baron Triquetti has just completed the first portion of the series of inlaid marble tableaux for the decoration of the interior walls of the Albert Memorial Chapel at Windsor Castle, and they have been erected in the places assigned them within the chapel under the baron's personal supervision, and six in number cover a space of about 633 square feet upon the surface of the walls, the larger panels with their ornamental borders being each about 11ft. 2in. in length and 9ft. 6in. high.

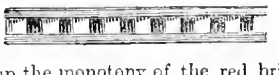
HEADINGLEY, LEEDS.—The consecration of St. Chad's Church at Headingley, Leeds, took place on Saturday by the Bishop of Ripon. The style and character of the church, which has cost about £10,000, is after the Early Fourteenth century, and in massiveness of detail and the geometrical forms of arches and tracery is in character with the Selby and Beverley Minsters. Mr. W. H. Crossland, of Leeds, is the architect, and the work has been executed from designs prepared by that gentleman and partly suggested by Mr. E. B. Denison. The plan comprises a nave of five bays, chancel of one bay, and a five-sided apse under one continuous roof, with aisles running round the apse, forming an ambulatory—the tower being at the west end, and the porch in the north-west bay. The church is seated to accommodate 600 persons, its entire length is 137ft., the width 61ft. 6in., the height to the roof ridge 57ft. The tower is 16ft square within the walls, and is surmounted by a spire, which rises to the height of 186ft. One great feature in the interior of the church is the stone carving, which, although not actually copied from old examples, is studiously after those in the Selby choir arcades and the Percy shrine at Beverley. Mr. Ruddock, of London, has carried out this portion of the work. The pulpit, placed against the north-west pillar of the chancel, is of stone, richly ornamented with Devonshire marble shafts. A stone screen, arcaded and richly carved, divides the chancel from the ambulatory. The font is also of stone, richly carved, and is situated under the tower. Local stone has been used throughout, with the exception of the reredos, pulpit, font, and all foliated capitals, for which a finer stone has been employed. The roofs and seats are of deal, slightly stained; and polished flags have been used for the floors, with the exception of the sacrarium, which is tiled.

BUILDINGS.

A new opera house, built by Mr. Pike, formerly of Cincinnati, is to be opened in New York. It has a frontage of 112ft. in Eighth-avenue, and of 120ft. in Twenty-third-street. The height of the auditorium from floor to ceiling is 70ft., and it has a dome of stained glass 30ft. in diameter; the depth of the stage is 70ft, width 80ft., height 50ft. In the auditorium, which can be easily transformed into a ball-room, 2600 persons can be seated. Exclusive of this house, there are now ten first-class or "west side" theatres in New York, besides several large concert rooms, music-halls, and conservatories.

The old Magdalen Hospital, which has been established very many years in the Blackfriars-road, for the reception of fallen women and the reclaiming of "unfortunates," is about to be removed from its present locality to Streatham, and the committee appointed to make the arrangements for the new institution have secured an eligible site of land, and rapid progress is being made for the erection of the new building.

SIR,—I send you a description of a house now being built for Mr. Wm. Chappell:—Although there is no architectural pretension about the building in question, it is considered a success, inasmuch as it provides considerable comfort, capacity, and thoroughly good and substantial work at small cost, and the most is made of the materials by employing the blue headers (picked out of the ordinary bricks) in bands (not projecting), with a red dog-tooth course between, thus—



to break up the monotony of the red brick; and the stone quoins, springers, sills and door dressings, which are of Chilmark stone, add to the relief. The house is built in the favourite neighbourhood of Ascot, or rather on the high road between Ascot and Bracknell, and contains on the ground floor, drawing-room about 24 × 24, billiard-room 24 × 18, dining-room 23 × 18, library 20 × 16, entrance-hall 8 ft. × 16, and inner hall and staircase 12 ft. wide × 24 ft. long, large conservatory heated with hot water, good servants' staircase, and a complete set of offices, arranged so that they are conveniently separated from the rest of the house, but easily accessible to the serving door of the dining-room. The basement contains the dairy larders, some beer and coal cellars, knife and shoe places, &c. The first floor consists of large and small bedrooms and dressing-rooms, bath-room, water-closet, &c., and a complete set of servants' rooms communicating directly with their staircase. The billiard-room, dining-room, hall staircase, and library, are all fitted up with pitch pine, and all the sashes, except the servants' department, are glazed with polished plate glass. Mr. James Pether, builder, of Sunninghill, has taken the contract for £2550, and so far has carried it out well, more particularly the joinery, which is not to be surpassed for the quality of the wood. One rather good feature of the design is the fire-places (and their chimneys add to the external effect), which are all arranged in the internal walls, so that none of the heat is lost to the house, which latter is a great desideratum in the country. The architect is Mr. Alfred Smith, of the Adelphi.—I am, &c., JAMES SKRINE, Clerk of Works, pro R. B.

Ascot, Berks, Jan. 10.

On Tuesday, the new national schools at Shirley were opened. They have been built at a cost of upwards of 2,000, the area occupied, including yards, playgrounds, &c., being about an acre in extent. The schools have been built by Mr. George Inder, under the management and inspection of Mr. Rowed, agent to Mr. Jeffreys, and present an elevation of red brick, having gable ends, finished with ornamental barge boards.

Several thousand pounds have already been raised towards the purchase of land for the erection of buildings for an infirmary and dispensary at Burton-on Trent. A site has been secured, and the building committee have selected the design of Mr. Edward Holmes, which was submitted in limited competition. The works are to be commenced forthwith.

St. Philip's Infant School, Alderley, was completed and opened last week. The school is 40ft. by 20ft., with two class rooms, library, &c. The roofs are open, the windows glazed with geometrical quarries. The works have been executed by Messrs. Royle and Meller, builders, Wilmslow, from the designs of Mr. John Lowe, Architect, Manchester.

DUBLIN.—A new masonic hall and club-house is now being erected on the north site of Molesworth-street. The front elevation (Italian style) is divided into three styles; the lower one is of the Doric order, the centre of the Ionic, and the upper of the Corinthian. It has been executed in Ancaster stone. The whole is surmounted by a pediment (the entire width of front), in the centre of which are the masonic emblems. The height of the building from ground line to top of pediment is about 73ft. The design is by Mr. Edward Holmes, of Birmingham and London, and was selected in a competition in the early part of 1866. Mr. Meade, of Great Brunswick-street, is the contractor. The cost will be about £8,000.

WATER SUPPLY AND SANITARY MATTERS.

The government of India has called upon the local governments for information to be obtained from the Executive Engineers of the Public Works Department, as to the most simple and practical method of purifying water supplied to troops. Objections, it appears, have been raised to the present systems of using earthen vessels, and filter stands.

During the past week nothing fresh has transpired with respect to the sequestration of Tunbridge Wells. It is the intention of Mr. Julian Goldsmid, M.P., to oppose the carrying into effect of the northern portion of the drainage scheme. It will, however, be for the Home Secretary to decide whether Mr. Goldsmid shall have the matter all his own way.

On Tuesday Mr. Rawlinson, C.B., Mr. J. T. Harrison, and Professor Way, Her Majesty's Commissioners appointed to inquire into the best means of preventing the pollution of rivers, commenced their investigation into the condition of the basins of the Mersey and the Ribble by holding a public meeting at St. George's Hall, Liverpool. The heads of inquiry, which is to be extended to the river Dee as well, are:—1. Pollution by town sewage. 2. Pollution by refuse from manufactories. 3. Pollution by refuse from mines. 4. Obstructions by solid refuse and manufactories. 5. Nature and extent of manufactories carried on upon the banks of the said rivers. 6. Cause and extent of flooding upon adjacent lands. 7. The general state of the water supply. The inquiry, which was continued on Wednesday, was unexpectedly brought to an abrupt termination. Mr. Rawlinson considered that some questions asked by Mr. Harrison on the local sewage were not warranted, and tended to exhibit ignorance; and therefore stated that he should not sit again with him, but would write at once to the Home Secretary, and explain matters, as he would rather resign than sit again with Mr. Harrison. Mr. Rawlinson's remarks created a most painful sensation in the court, and the general opinion of all present was that he should have expressed himself as he had done to Mr. Harrison in private.

A Belgravian thinks that "the dispute relative to Park-lane between the Office of Works, the Metropolitan Board, and the Vestry of St. George's, Hanover Square, is a very pretty quarrel among themselves, for which the public, as usual, have to suffer, and must grin and bear the inconvenience till it suits the dignity of these three boards to allow the work to be proceeded with. But this delay in Park-lane is no reason why the railings in Knightsbridge, from Hyde Park-corner towards Wilton-place, should not be restored. There is no widening in the road or footpath to be made; in fact there is nothing whatever to be done, except to put up the rails for the distance of about 200 yards at the utmost, and yet since July, 1866, not an attempt has been made to restore this side of the park to its original state. It really is time to inquire how long this shameful negligence is to continue, and to bring before the public, through the medium of the redresser of all just grievances, the idleness of the Office of Works in thus neglecting their duty."

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—S. E.—C. W. L.—R. D. and Co.—I. C.—G. L. A.—G. R.—I. R.—R. E.—B. W. W.—E. W. P.—E. M. N.—G. W.—I. P.—B. L. B.—H. A.—A. G. H.—C. L. E.—T. G.—T. C.—E. R. F. B. and F. T.—I. G.—H. A. G.—F. R. P.—W. H. B.—B. J. T.—D. L.—W. T. B., Send the Photos.

W. C. L.—If there is an agreement stamped or unstamped you can compel payment.

Correspondence.

THE LAW COURTS.

To the Editor of the BUILDING NEWS.

SIR,—I read last week in one of the daily papers an article giving an easy solution of the difficulty found in selecting an architect for the Law Courts. The proposition was that Mr. Street should do the front of the building, Mr. Scott one side, Mr. Waterhouse the other, and Mr. Burges the back, Mr. Barry having a general superintendence of the whole. The author of the article in question thought that, by employing varied talent, we should have great diversity in the architecture. We certainly should. I do not think he goes quite far enough. Mr. Abraham had a prominent place given to him at Lincoln's Inn, so should have something to do with it. Why not give him the foundations?

Mr. Seddon might look after the carving to see that no "importations from the squire's hothouse are introduced." He would no doubt give us instead some ferocious-looking lions, a pelican feeding its young, &c. A lawyer eating the oyster and giving the shells to his clients would do well for the principal entrance, and we might expect good treatment of such a subject from one so learned in oyster-culture. Professor Kerr might introduce a little of that "refinement which is characteristic of our neighbours' buildings across the channel." Mr J. Papworth might be there to see that the art workman does not misconduct himself. Mr. B. Keeling would soon make amends for any want of notching in the back elevation. Mr. B. Hope takes great interest in the success of the building; it would be only fair to let him manage the sky line, on condition that he would not object to Messrs. Banks and Barry introducing some of their unique terminals.

By adopting this course, we should unquestionably introduce "varied talent," and "produce a building worthy of the nation." Irrespective of that, Sir, only think what a treat there would be in store for the Architectural Association to be pioneered over by Messrs. S., S., B., B., &c., on its completion, and how it would augment the number of members of that useful institution. It would also give cause, twenty years hence, for the sons of the several gentlemen employed to render their rival claims as to "Who was the architect of the Law Courts?"—I am, &c.,

Jan. 13, 1868. J. S

WALL DECORATION.—LEEDS FINE ART EXHIBITION.

SIR,—A short time ago, passing through Leeds, I was induced to visit the New Infirmary to see "the decorations" now being carried out under the direction of the Committee for the Fine Art Exhibition soon to be held within its walls. If these so-called decorations are to be taken as a criterion of the state of art in this the metropolis of the West Riding of Yorkshire, the School of Design has not been established there a moment too soon, and its fruits must still be in embryo. In wall decoration precision is a most essential quality, and that stencilling should not appear stencilling is, I think, universally acknowledged. In this instance, shapeless gaps and rents of all imaginable widths, not joined by hand as good work ought to be, whilst it is applied to a ground of plaster wholly or very inadequately prepared, on which large maps or stains are painfully visible; panels with rails and stiles of varying widths; moulding lines not parallel; lines of intersection meeting at different levels, wavy where they should have been straight; and an entire disregard to harmony and contrast of colours, do indeed show as if some "prentice hand" had made its first and wholly unsuccessful essay. One must devoutly hope that hereafter no nervous patient having a correct eye may be confined to these wards, as I fear his recovery would be hopeless.—I am, &c. W.

Intercommunication.

QUESTIONS.

[711.]—UNDERGROUND TANK.—I beg to thank "Veritas" for his prompt reply to question 688, in the BUILDING NEWS of November 29 last. The plan which he recommends cannot be adopted, as the tank is in the middle of the house and is partly built upon and floored over, so that no external remedy can be applied. May I, therefore, ask him, or any one else who can oblige, to inform me of any effectual remedy which can be applied to the inside of the walls and bottom.—TANK.

[712.]—MARBLE STAINS.—Can any of your correspondents inform us the best method for removing shopworn stains from white vein or Sicilian marble without injury to the marble?—We are, &c., J. and E. G., Phœnix Steam Marble Works, Stonehouse, Plymouth.

[713.]—ASHPITS.—I have a quantity of ashpits to cover with doors and frames; the contents are very powerful. As I cannot ventilate the same, will any friendly correspondent give me an opinion whether wood or iron would be the best for the purpose? I am afraid the strong ammonia would destroy the iron. The pits are level with the ground.—J. M., Nottingham.

[714.]—ROOF CONSTRUCTION.—I will thank you to lay before your readers a difficulty which has occurred to me in the construction of the roof of a small church, the nave of which is 28ft. and the transepts 22ft. span. I wish to have the ridge of both in the same plane, and I should thank anyone who has erected such a roof to say how the principals should intersect at the top or how they can be securely tied without a formidable apparatus of ironwork. I also beg to be informed, what the minimum of scantling may be for rafter purlins when the trusses are 6ft. apart, the rafters or purlins being at 3ft. centres, and the pitch of roof being about 40 deg.—INQUIRER.

[715.]—ROYAL ARMS.—Can any of your readers inform me whether a builder incurs any penalty or liability by heading his card or advertisement with the Royal Arms, not having previously patented the article he advertises? I have just had cards printed, and merely added them for ornament, and am now told I dare not distribute them.—F. K.

REPLIES.

[707.]—MILDEW IN ROOMS.—If not of too long standing, mildew in rooms may be destroyed by washing the places affected with a weak solution of hypochlorate of lime. This almost always succeeds, and is, at any rate, worth trying.—A. S.

[708.]—GOOD GOTHIC.—Rickman, in describing the style to which he gives the name "Decorated," especially classes under that style the tracery in "the figures, such as circles, trefoils, quatrefoils, &c., which are all worked with the same moulding, and do not always regularly join each other, but touch only at points; this, he said, may be called geometrical tracery." It has been described as, perhaps, the most perfect of all the styles, "for its tracery has the completeness and precision of the Perpendicular, without its licence and exuberance; while its minor details partake of the boldness and sharpness of the Early English, which need not fear to be compared with the ornamental accessories of any subsequent style. Besides the intrinsic beauty of this style, it is important as affording the first full development of tracery and of casting, with all their power of enriching large windows, and of bringing together several lights as one whole."

[709.]—ROOFS FOR WORKSHOPS, SHEDS, &c.—The following information will answer some of the inquiries which are frequently made as to zinc roofing:—

1. Sheet zinc is always attainable in sheets 8ft., and 7ft. by 3ft., and 2ft. 8in., but it may be rolled of any length under 12ft. For especially rolled sheets, about a month's notice should be given, and for lengths over 10ft. an additional cost of about £2 per ton is incurred for rolling.

2. The sheets may be laid in three ways, viz., on boards, or corrugated with horizontal supports every 2ft., without boards, or in what is called Italian-formed zinc, in which a corrugation occurs every 10in., 1ft., or 1ft. 3in., and the corrugation lies upon a light rafter or bearer running lengthwise; in the two latter instances no boards are required, and the Italian forms an excellent roof, and one that looks also exceedingly well.

3. The strength allowed in large roofs for wind and snow will be always sufficient, without adding anything for the zinc covering.

4. The thicknesses to be used should be on boards not less than No. 14 gauge, weighing 21oz. 13drs. to the superficial foot,, and without boards not less than No. 15, weighing 24oz., or No. 16, weighing 26oz. 5drs. to the superficial foot. The zinc in common use, till within the last few years, and not by any means abandoned yet, is No. 9, weighing 10 oz. 13 drs. the superficial foot, which will not answer even if well laid, but laid in the ordinary way is sure to tear itself to pieces and to fail.

5. The metal should be laid so that each sheet is quite free to expand and contract. If engineers and architects will specify the gauge and weight per foot of the sheets they desire to use, and will add that it is all to be laid "quite free and unconfined, without soldering any joints," they will probably receive proper material and workmanship. Short-sighted workmen will of course object, if they can, to do the work in a way that they are not fully used to do, but it is quite certain a neglect of the precautions above-named will cause the work to fail.

6. In flat roofs, if possible, a fall of 6in. in the ordinary length of a sheet should be obtained, and drips should be 2½in. deep, to allow the rolls to pass well under the projecting upper sheet, with its rounded edge. The carpenter will do well to give the zinc-worker notice before he forms his roof, so that these matters may be pointed out.

7. No nail should ever pass through the outer surface of the sheets or roll caps; none is needed; and no system of washers will do—nothing but a cap soldered quite over the nail head, which is too troublesome and expensive ever to be done as a regular thing.

8. The price of sheet zinc varies with the price of spelter; it has ranged, during the last few years, from £21 to £28 a ton; £26 is an average price, and at this price zinc roofs, of a plain character, may be laid as follows, at per superficial foot:—No. 14 at 3d., on boards; No. 15, on boards or Italian, at 7½d.; No. 16 at 8½d.; but these prices are not measuring all the zinc used, but stretching a line from ridge to eaves, and from side to side, girting nothing, and adding nothing for rolls, caps, welts, &c.; thus, anyone, however in experienced, may, by so easy a measurement as this, obtain an estimate of the finished roof he wishes to put up. Flashings and gutters are to be added to the above.

9. If the roof has a fall of 12in. and upwards in the length of a sheet, no drip is required, only a fold at the junction of the sheets.

10. Lime destroys zinc; it will be well, therefore, that flashings should be pointed in cement.

11. The relaxing effect of a hot sun must be guarded against when the metal has no boards or other support beneath it; in such cases, No. 15, or higher gauges, should be used; eaves-gutters should be stayed across every 1ft. 6in.; they will do best if allowed to rest on a sailing course, on on the member of a cement cornice, and the underlap in roofing done on the system used at Victoria Station; must have a good hold on the rafter, and may be nailed with nails in large oval holes, so as to permit expansion lengthwise.—R. G. F.

STAINED GLASS.

A stained glass memorial window was recently fixed in the Catholic church of St. Mary, Kentish-town, executed by Mr. A. J. Mingaye, of London. The subjects are, The Raising of the Widow's Son and the Raising of Lazarus. The window is in memory of Mr. Edmund Kelly, architect, contributed by his mother. The chancel of the church was lately decorated by the same artist.

A three-light stained glass window has been inserted in the north chancel of Hereford Cathedral, to the memory of Captain Arkwright, who was lost in an avalanche on Mont Blanc. The subjects are St. Michael Subduing the Devil, David Slaying Goliath, the Appearance of the Angel to Cornelius, the Burial of Saul, and St. John Commanding the Soldiers to "Do Violence to no Man." The window is from the firm of Wales and Co., of Newcastle-on-Tyne.

STATUES, MEMORIALS, ETC.

The Pope is erecting at Monte Rotondo a monument to the Pontifical soldiers killed in that town and at Mentana, and has entrusted the work to Count Vespignani, one of the best architects in Rome.

The Plymouth Rock monument was completed on December 7, but the dedication will not take place until some time in the summer of 1868. In a leaden box, placed between the copestone and the dome, the bones of three of the pilgrims are deposited.

LEGAL INTELLIGENCE.

BUILDING SOCIETIES, LEASES.—An action for rent, Cruikshank and others *v.* Lefevre, was heard last week at the Bow County Court. The plaintiffs are trustees of the Temperance Benefit Building Society, and the defendant is lessee of premises of which the trustees and mortagees are in possession, and, the lease granted to the defendant being unstamped, the question was whether a stamp was requisite to make the lease admissable in evidence. The learned advocate for the society submitted that the lease was admissable, inasmuch as the provisions of the Friendly Societies' Act (10 Geo. 4, cap. 56) were, so far as applicable, extended to Building Societies by statute 6 and 7 Wm. 4, cap. 32; and section 37 of the Friendly Societies' Act provides that—"no bond or other security, nor any other instrument, or form of assurance, or document given in pursuance of the Act, shall be subject to any stamp duty whatsoever." He also cited various cases, to show that leases as well as mortages and other securities of Building Societies, are exempt from stamp duty. For the defendant, it was contended that, as the costs of a lease are paid by the lessee, it was not any benefit to the Society to have it granted free of stamp duty, and detrimental to the revenue, the interests of which the Court was bound to take judicial notice of. His Honour, having taken time to consider the question, said that "very much against his own inclination, he felt bound to follow the decisions of the Superior Courts cited, and to give judgment for the plaintiffs."

PIRATED PHOTOGRAPHS.—At the Birmingham police-court last week, Mr. Robson, wholesale photographer, Birmingham, was summoned by Messrs. Graves, of London, for selling pirated copies of registered photographs, of which the complainants were the owners. The complainant,

having reason to suspect that pirated copies of their property were being disposed of in a wholesale manner, sent a young man, named Catamole, in their employ, to Birmingham in June last. Catamole assumed the name of Milner and applied to Mr. Oldham, of the firm of Oldham and Cooper, photographers, New-street, Birmingham, to introduce him to some parties from whom he could buy photographs. Catamole professed to have been recommended to Mr. Oldham by a gentleman well known to the latter, who introduced Robson to him. At two different times photographs of "A piper and two nutcrackers," "The acquittal," "The first sermon," "The second sermon," and "Waiting for the verdict," all of which are the copyright of Messrs. Graves, were bought by Catamole from Robson for the sum of £8. The bench fined the defendant £5 each in thirteen cases, making a total fine of £65 and costs, or twenty-six months, imprisonment. The prosecution withdrew their claim for costs.

COMPENSATION.

Mr. Alderman Bennett, ironfounder, has obtained in arbitration, the sum of £1,900 as compensation for loss, damage, and inconvenience, in consequence of the Corporation of Liverpool requiring a portion of his premises in St. Thomas's-buildings for the purpose of town improvements. Mr. Bennett's original claim was about £10,000. The Corporation offered the claimant land of a more valuable character than that he possessed, in exchange for the portion which they required for the new street, and he now sought to be recouped the amount of expenses incurred by the removal of his premises to a new site. Mr. Isaac Holder, architect and surveyor of Manchester, was called. He estimated the cost of removal at £2807. John Mullin, builder, of Liverpool, estimated the cost, according to one plan which had been prepared, at £2823, and, according to a second scheme, which involved building upon a larger area, at £5505. Mr. Dagleish, mechanical engineer and ironfounder, of St. Helen's, estimated the cost of re-adapting the machinery, and of new premises at £1840. Five months would be occupied in making the required changes, and he thought that six months' loss of profit would result therefrom. It transpired that the net profits on Mr. Bennett's business were between £9000 and £10,000 a year.

Our Office Table.

The "Illustrated London News" gives in its last number "a sketch in Leicester Square," and appends a few facts connected with the history of this standing disgrace to the metropolis. The statue in the centre of the square has a strange eventful history, and seems to have "a divided duty." It is agreed that it was brought from Canons, the seat of the Duke of Buckingham and Chandos, which was dismantled in 1747. By some, Van Nort is said to have been the sculptor; by others, Buchard. Mr. Saarsfield Taylor, in his work on the Fine Arts, considers this statue superior to that of Charles I. at Charing Cross. There seems, however, considerable doubt as to the personage represented. Horace Walpole and his editor, Dalloway, say it is George I.; so do Mr. Taylor and Mr. John Thomas Smith. Mr. Cunningham describes it as George II., and Mr. Cowper in Parliament has more than once referred to it as representing that monarch.

The Belgian Academy of Sciences, Arts, and Literature has offered prizes of a thousand francs each for the year 1868:—First: An historical account of medal engraving in Belgium from the sixteenth century to the year 1794, embracing all the country at present belonging to Belgium, and including the biography of the artists as well as a criticism on their works. Second: An inquiry respecting the period at which the architecture in the Low Countries was affected by Italian influence, with indications of the persons to which such influence is attributable, and citations of works in illustration of the same.

At a meeting of the Exeter Albert Memorial Museum Committee on Wednesday, the tender of Mr. Rowe, South-street, for the construction of the wrought-iron entrance-gates and railings was accepted—the sum being £52. The design for the gates and railing is by Mr. John Hayward, architect.

The Royal Academicians will meet on Friday the 31st inst. for the election of two Associates and one Associate-Engraver.

Alexis Soyer's late secretary writes that the magnificent monument erected by the immortal "Chef" at Kensal-green Cemetery, to the memory of his talented wife, and under which he himself is interred, built at a cost of over £1,000, is from neglect rapidly falling into decay, and unless it is speedily repaired and renovated its entire destruction by the hand of time will soon be effected. An appeal is made for assistance to restore the resting place, and a committee is now being formed to carry out this object, with Mr Alfred Noel, 39, Oxford street, as hon. treasurer.

Some very interesting mural pictures, probably executed in distemper, have been discovered in the Church of S. Pierre-de-Chemillé. These comprise an Apocalyptic subject, the Redemption by the Saviour, the Evangelistic Emblems, the Crowned Elders, Rivers of Paradise, the Mystic Lamb, &c.

A large body of men have suddenly been thrown out of work by the abrupt discontinuance of the works at the Regent's-park lake, which have been carried on with the view of lessening the depth of the lake. On Saturday last the men were paid off without any apparent motive. The reason for the course adopted is still kept a mystery, the only one hinted at being that Lord John Manners, the First Commissioner of Works, has left town and omitted to give the instructions absolutely necessary for the continuance of the works.

The members of the Institution of Civil Engineers assembled on Tuesday evening at their rooms in Great George-street, Westminster, to hear the inaugural address of the new president, Mr. Charles Hutton Gregory. There was a very numerous attendance. The address referred principally to the application of engineering to the purposes of national defence.

For some time past several persons have been actively engaged in Guildford and other places within the county of Surrey, in endeavouring to palm off upon the uninitiated a number of spurious articles, which they allege to be of the highest archæological importance, and in every instance to have been dug up in the neighbourhood of the place visited.

Tunbridge Wells is now under sequestration, issued by Mr. Julian Goldsmid, M.P., who complains that the Improvement Commissioners have polluted a stream running though his estate at Summerhill.

The Paris correspondent of the "Morning Post" says that a new system of lighting the streets of Paris has been tried, with the most signal success. The light produced is described as of the purest white, like that of moonbeams. It allows one to read a newspaper at 25 paces from the projector, and admits of the most delicate shades being distinguished. The discovery was made by a chemist *preparateur*, who had no idea whatsoever of inventing anything new as to the lighting of cities. He was merely experimentalizing, with the hope of discovering some means of taking photographs at night. He, however, hit upon a new and magnificent light, which will evidently replace gas with great advantage, not only in an economical point of view, but likewise in quality and quantity of light obtained. So intense is the glare produced that it will probably be difficult to modify it sufficiently for use in theatres or in private dwellings, the more so as one of the shareholders confided to me the fact that *rouge*, *poudre de riz*, sepia tints laid on eyebrows, and every species of facial adornment, are made painfully visible. The combustion of ordinary gas by oxygen is the principal secret of the process. A small cylinder of magnesium interposed in the centre of a jet in combustion becomes luminous, and produces a quantity of light measured at sixty times that which would be produced by ordinary gas, and at less than one-sixth of the cost.

Petroleum oil has been used for fuel in a steam fire-engine in Boston, U. S. The occurring of an extensive conflagration afforded a practical test. In three minutes, or while the machine was being drawn to the fire, steam was raised to a pressure of 100lbs. Other fuel clogs the exhaust pipes of steam fire-engines, but petroleum does not. This was shown at the Boston fire, the engine gaining thirty per cent. of water pressure in excess of any other machine on the ground. There was little or no smoke from the funnel.

A very painful misgiving, writes a correspondent, has arisen recently with regard to the condition of the water glass frescoes in the Palace of Westminster. Indications have become perceptible, it is said, of an excrescence of the fungus type on the surface of more than one of the most remarkable works in that unequalled but unlucky edifice.

The adjourned conference of Birmingham manufacturers, held under the auspices of the Birmingham Chamber of Commerce, on technical education, was held on Friday. Mr. George Dixon, M.P., presided. Mr. Samuelson, M.P., explained the object of the mission that he had undertaken at the request of the Government. The entire money assistance given by Government to science schools was £5,874, not including cost of inspection, &c. The School of Mines in Jermyn-street had more than £7,000, and the South Kensington Museum £67,000. He thought the aids to Science Schools very inadequate. Every child should be taught geography, something of physics and drawing, and the Government should grant money according to results. After considerable discussion, the following resolution was carried:—"That the council be instructed to request the Associated Chambers of Commerce to inform Lord Robert Montagu that, in the opinion of the chamber, it is of the utmost importance that Government Schools of Science should be established in the great centres of industry, for the purpose of giving technical instruction both to the middle and working classes."

At the monthly ballot of the Institution of Civil Engineers, the following candidates were balloted for and duly elected:—As member—David Phillips; and as associates—Thomas Philip Sherrard Crosthwait, William Cooke Faber, George Farren, Major James George Roche Forlong, R.E., Thomas Ellis Owen, Middleton Rayne, Henry Yarker Richardson, Jagannath Sedasewjee, James Stewart, Captain Hector Tulloch, R.E., and Charles Wawn.

Our readers will be glad to hear that after much agitation and many appeals it is decided to establish a new national museum in the East of London. The chief thing exhibited at this museum will be food in all its ramifications.

The parochial authorities of St. Pancras are about to invite four or five well known architects to send in competition designs for a new district school for about 900 children. The building will cost about £40,000.

The Metropolitan Board of Works has paid £7,500 into court as purchase money for the Heralds' College, with the intention of pulling it down in order to form the new street from Blackfriars to the Mansion House.

The Board of Guardians for the Prestwich Union have elected Messrs R. Neill and Sons the contractors for the building of the new workhouse, which is intended to be a model of such houses for the destitute. The work will cost fron £25,000 to £30,000.

The Health Committee of the Liverpool Town Council passed the following resolution on the question of labourers' dwellings:—That the council be recommended to give the sum of £100 to Messrs. Redman and Hesketh for the plans of labourers' dwellings signed by them, in consideration of their making complete working drawings of them and supplying specifications to the satisfaction of the committee; and that the council erect labourers' dwellings in accordance with such plans on the site between Ashfield-street and Sylvester-street.

Mr. Joseph Glass, the inventor of the chimney-sweeping machine now in use, died at Buxton on the 29th of December. Mr. Glass received the silver medal and the prize of £200, but he never patented his useful invention.

The annual meeting and exhibition of the Darlington School of Art took place in the Mechanics' Hall last week. The students' drawings and a large collection of photographs of enamels, crystals, and porcelain, drawings by Raphael, and other works of art from the South Kensington Museum, were exhibited and greatly admired. The annual report, which was read by the secretary, Mr. J. C. Janson, stated that the institution had been fortunate in its financial results, and that the examinations last year were very satisfactory—the total number of students in 1865 was 144; in 1866, 185 and in 1867, 161.

MEETINGS FOR THE WEEK.

MON.—Royal Institute of British Architects. At the ordinary General Meeting a paper on the "Architecture of Moscow," by Mr. E. l'Anson.

TUES.—Institute of Civil Engineers. Renewed discussion upon the papers on the "Victoria Bridge," and on "The railways at Battersea, &c." S.

WED.—Geological Society, 8.

SAT.—Associated Arts Institute. Exhibition of sketches; subject—"The Lotos eaters." Tennyson.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1453. J. SADLER. AN IMPROVED NAIL-CUTTING MACHINE. Dated May 16, 1867.

This invention consists in the application of a shaft rotating at one half the speed the main shaft of the machine rotates at, which main shaft gives motion to the cutting blade by means of a crank and lever. Upon the slower rotating shaft the inventor places an excentric, from which excentric, by means of a band and rod, he communicates an oscillating motion to a lever fixed upon a vertical shaft; to this lever he connects a guide which moves the nail plate from side to side of the cutting blade, from which plate the blank for the nail is cut. From this lever he also carries a rod to another lever of somewhat similar construction to the last, communicating an oscillating motion to this second lever, which carries the plate from which the nail blank is made. This second lever is constructed with means of regulating the angle at which the nail plate is required to be to the face of the cutting blade at the moment the nail blank is cut off, so that the blank may be of the proper size and shape requisite for the nail. And the nature of the invention further consists in the employment of two nippers operating each in combination with one pair of holding dies. He communicates motion to these by tappets upon the slower rotating shaft referred to above, or upon another shaft rotating at one-half the speed of the main shaft used for giving motion to the cutting blade. And the nature of the invention further consists in the combination of a shaft (rotating at half the speed of the shaft referred to in this specification as the main shaft) with two tappets upon it, each acting upon separate levers; the oscillating motion thus given to the levers moves forward the heading bolts which head the nails. PATENT ABANDONED.

1464. W. R. LAKE. IMPROVEMENTS IN THE MANUFACTURE OF WHITE LEAD. (A communication.) Dated May 17, 1867.

Sulphate of lead and carbonate of baryta, in the proportion of 100 parts of weight of carbonate of baryta to every 152 parts of sulphate of lead, are placed in a vessel, to which is added water, the mixture being stirred until it is all reduced to a thin paste. After it has been well combined by thorough stirring, the said mixture is heated for three or four hours to a temperature of about 160 deg. Fah., though this temperature may be considerably reduced, or may be raised to nearly the boiling point, without materially affecting the result. The stirring is continued during this part of the process. This treatment will cause the following interchange of elements to take place, namely, the sulpburic acid of the sulphate of lead combined with the baryta, forming sulphate of baryta, and thus liberating carbonic acid, which unites with the lead, forming carbonate of lead. This is then dried in the ordinary way.—PATENT COMPLETED.

1465. W. R. LAKE. AN IMPROVED MODE OF PRODUCING CHLORIDE OR OXY-CHLORIDE OF LEAD, AND TREATING THE SAME FOR MANUFACTURING WHITE LEAD. (A communication.) Dated May 17, 1867.

This invention consists, first, in the treatment of oxide of lead with the chloride of sodium, or its equivalent, substantially as described, for producing a superior chloride or oxy-chloride of lead. Second, in the production of a chlorosulphate or white lead from a chloride or oxy chloride of lead for the purpose, substantially as described. Third, in the production of a carbonate of lead from a chloride or oxy chloride of lead for the purpose, substantially as described.—PATENT COMPLETED.

1476. B. SHEIL. IMPROVED PAVING FOR ROADS AND WAYS. Dated May 18, 1867.

This invention consists in cementing together small stones into slabs, iron or wooden frames or moulds being employed for the purpose. PATENT ABANDONED.

1480. J. SMITH AND J. L. IBBOTSON. IMPROVEMENTS IN RAISING AND LOWERING REVOLVING SHUTTERS. Dated May 18, 1867.

This invention consists in the use of a crank handle, whereby motion is given to toothed wheels, causing a drum or pulley to revolve. Round the said drum or pulley and over a similar one at the top of the window, is drawn tightly a steel bolt or band. The top pulley or drum is attached to a roller on which the shutter is coiled when wound up. A pawl works in the teeth of the toothed wheels, by which means the shutter can be stopped at any point. The said pawl is fitted with a handle, by pulling which the toothed wheels are released, and the weight of the shutters causes them to descend. To ease the dead drag on the rollers, and to cause the shutters to coil up more smoothly, a small friction roller is so fitted behind the shutter that it will pass over it on to the main roller. Instead of a friction roller, two loose pulleys may be employed, one at each end, which will serve the same purpose. PATENT ABANDONED.

1510. J. HARGREAVES AND T. ROBINSON. IMPROVEMENTS IN THE MANUFACTURE OF STEEL AND SOFT IRON FROM CAST IRON. Dated May 22, 1867.

This invention consists in the use of any of the salts which yield oxygen on the application of heat, such as the nitrates, chlorates, chromates, manganates, and stannates, mixed or in combination with any of the oxides of iron or manganese, or any other suitable powdery or granular substance, as agents to act on fused or molten cast iron, to burn out therefrom at any desired speed the excess of carbon in, and at the same time to remove other impurities from the said cast iron, and thereby convert it at one operation into steel or soft iron.—PATENT COMPLETED.

Trade News.

TENDERS.

ASCOT.—For a house, offices, and conservatory, near Ascot, for Mr. Wm. Chappell. Mr Alfred Smith, architect:—

Longmire and Burge	£2,983 0
Robert Lawrence	2,877 10
Joseph Norris	2,718 0
James Pither (accepted)	2,550 0

BRIGHTON.—For alterations and additions to Sylvan Lodge, Brighton. Mr. T. Simpson, architect. Quantities supplied:—

Jackson and Shaw, London	£4,310
Nightingale, London	4,269
Auscombe and Newnham, Brighton	4,195
Bruton, Brighton	4,147
Cheesman and Co., Brighton	3,800
Steddy, London	3,700
Chappell, Steyning	3,687
Sawyer, Dulwich	3,650
Farr, Brighton	3,460

BIRCHETT'S-GREEN (NEAR MAIDENHEAD).—For villa residence for Mr. A. Lawrence, Great Marlow. Mr. Charles Carter, architect:—

Silver	£1 990 0
Revel	1,950 0
Woodbridge	1,929 10
Matthews	1,797 0
Simmonds	1,637 0
Allaway	1,650 6
Colby	1,449 15
Smith	1,258 0

CITY.—For new buildings, Idol-lane and St. Dunstan's-alley, Great Tower-street, for Messrs. Smith, Hanson and Crosfield. Messrs John Young and Son, architects:—

Jackson and Shaw	£9,500
Mansfield and Price	9,308
Browne and Robinson	9,124
Henshaw	9,050
Ashby and Horner	8,840
Conder	8,475

WEST COWES (ISLE OF WIGHT).—For the erection of a villa residence at West Cowes, Isle of Wight, for Mrs. Venning. Mr. Francis Newman, architect. Quantities supplied:—

Chinchen	£1,474 0 0
Wheeler	1,464 0 0
Cooper and Dyer	1,450 10 9
Sibley	1,427 0 0
Denham	1,399 0 0
Thomas	1,379 0 0
Barton	1,360 0 0
Ball (accepted)	1,348 0 0

LONDON.—For alterations to 100, St. John-street road, for supplementary workhouse for Guardians of the Poor, Clerkenwell. Mr. W. P. Griffith, architect:—

Starkie	£455 10
Fricker	345 0
Smith and Sons	340 0
Brett	310 0
Perkins	305 0
Sharman	300 0
Richards	295 0
Grover	293 0
Sawyer	290 0
Dore	284 8
Terry	275 0
Greenwood	270 0
Allard	268 0
Porter (accepted)	249 0
Poole	240 0

LEYTONSTONE.—For Leyton-tone Main Drainage. Mr. John T. Brassey, surveyor to the Committee:—

	Contract No. 1.	Contract No. 2.
J. Porter	£4,3..0	£3,759
P. Pound	4,070	—
H. Bellamy	3,800	3,300
P. Porter	3,750	—
J. Clark	3,688	3,210
H. Beard	3,636	3,179
Adamson and Taylor	3,607	3,144
Wood	3,600	2,980
J. Nicholson	3,570	3,120
Munday and Hutchinson	3,550	3,150
H. Potter	3,487	3,100
Kent	3,440	2,980
R. Hubbard	3,347	2,939
Williamson	3,300	2,800
J. Bloomfield	3,253	2,786
Wainwright	3 200	2,700
Thackrah	3,100	2,650
J. Smith	2,785	—
Brewer and Steggles	2,977	2,515
Harris	2,975	—
Dickenson and Oliver	2,960	2,570
Knight and Son	2 893	—
Tinsley	2,824	2,510
Moxon	2,800	2,450
Jackson	2,790	—

RYDE.—For the erection of an assembly room, &c., at the Townhall, Ryde, for the Ryde Commissioners. Mr. Francis Newman, architect. Quantities supplied:—

Meader	£3,000 0 0
W Newman	2 989 0 0
Ball	2,900 13 4
Lee	2,777 0 0
Langdon	2,750 0 0
Barton	2,720 0 0
Denham	2,711 0 0
Parsons and Saunders (accepted)	2,490 0 0

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Charles Nicholas Fisher, Keeton's road, Bermondsey, builder, January 28, at 11—Edward Fitch Maxted, Praed-street, Paddington, plumber, February 3, at 11—George Rule, Murray-street, New North road, slater, February 10, at 11.

TO SURRENDER IN THE COUNTRY.

William Masters Collinge, Newport, Monmouthshire, painter, January 27, at 2—Joseph Hunter, Spilsby, carpenter, January 22, at 11—William Powell, Leicester, plumber, January 25, at 10—Joseph Priestly, Snaith, gas engineer, January 27, at 11—William Wakerley, Leicester, joiner, January 31, at 12—Thomas Archer, jun., Dunston, engine builder, January 22, at 12—James Courtney, Exmouth, builder, January 21, at 11—Charles Cuff, Wolverhampton, carpenter, January 20, at 12 Henry Etheridge, Mansemore, Gloucestershire, builder, January 22, at 12—David Harding, Willingdon, Sussex, builder, January 23, at 11—William Jones, Liverpool and Woolton, builder, January 22, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

February 11, R Marshall, Everton, builder—January 24, J. Martin, Liverpool, contractor—February 20, W. H Palmer, Tysoe street, Clerkenwell, surveyor—February 18, R. H Bird, Hammersmith, builder—February 20, J. J. Lovegrove, Ilewoith, decorator—February 20, A Barnsby, Old Brentford, barge builder—February 21, W. Hey, Meadow-row, New Kent road, architect—March 5, J. Smith, Great George-street, Westminster, contractor—February 5, S Robinson, Richmond-street, City road, marble mason—February 5, R. Atkins, Blacklock-road, Holloway, builder—January 29, J. Simmons, Bow common, brickmaker—February 3, C. R Teagne, Old Jewry, surveyor—February 5, M. J Hobbs, Kingston on Thames, plumber—February 24, W. Kean, West Bromwich, timber merchant—February 5, J. Whitebread, Paddington, builder—January 24, C. Lucas, Leckhampton, stonemason—February 3, R. Smith, Blackburn, plumber — February 14, R. Watts, Penyglodfa, carpenter—January 30, J. Barbage, Cambridge, builder.

PARTNERSHIPS DISSOLVED.

Mortimer and Co., Leeds, builders—Tomlinson and Son, Hulme bricklayers—G and T. Figg, Ampton-street, Gray's-inn road, and Gunpowder-alley, Shoe-lane, builders—J. and S. Melton, Dartford, builders—Middleton and Bissell, Birmingham, architects—Smith and Co., Leicester, engineers.

DIVIDENDS.

February 7, E. and L. Powell, Hereford, builders—January 23, J. T. George, Cumbourne, builder—January 29, P. Hill, Garston, brickmaker—January 29, L. P. Santos and H. Evans, Liverpool, merchants—January 27, J. Mitchell and J. Flet her, Altrincham, dyers—January 23, W. and S. Green, Keighley, builders.

DECLARATION OF DIVIDEND.

M. Yeatman, Winbourne Minster, builder, div. 3s.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£10 0	£11 10	Archangel, yellow		£11 10	£13
Quebec, red pine		3 0	4 10	St. Petersburg, yel...		10 10	11 0
,, yellow pine		2 15	4 0	Finland		8 0	9 0
St. John N.B. yellow		0 0	0 0	Memel		0 0	0 0
Quebec Oak, white		5 5	5 10	Gothenburg, yellow		8 10	10 10
,, birch		3 10	4 10	,, white		8 0	9 0
,, elm		3 10	5 0	Gefle, yellow		9 0	11 0
Dantzic oak		3 10	6 0	Soderhamn		9 0	10 10
,, fir		2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir		3 0	3 10				
Riga		3 0	3 5	yellow		16 0	22 0
Swedish		2 0	2 5	Deck Plank, Dantzic,			
Masts, Quebec red pine		6 0	7 0	per 40 ft. 3 in.		0 15	1 4
,, yellow pine		5 0	6 0	PUMICE STONE per ton		6 0	8 0
Lathwood, Dantzic, fm		4 10	5 0	OILS, &c.			
,, St. Petersburg		6 10	7 10	Seal, pale	per tun	40 10	41 0
Deals, prC., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Sperm body		110 0	112 0
				Cod		36 0	36 10
				Whale, 8th Sea, pale		39 10	0 0
Quebec, white spruce		13 0	19 0	Olive, Gallipoli		67 10	68 0
St. John, white spruce		13 10	15 10	Cocoanut, Cochin, ton		56 0	57 0
Yellow pine, per reduced C.				Palm, fine		40 10	41 0
				Linseed		34 15	35 0
Canada, 1st quality		17 0	18 10	Rapeseed, Eng. pale		34 0	38 10
2nd do		11 10	12 10	Cottonseed		33 0	33 10

IRON:—

Welsh Bars in London	per ton	6 10 0	6 15 0	3	
Nail Rod	do	7 5 0	7 10 0		
Hoops	do	8 5 0	8 10 0		
Hoops, Single	do	9 15 0	10 0 0	2½	
Staffordshire Bars	do	7 7 6	7 10 0		
Bars, in Wales	do	5 15 0	6 0 0	3	
Nails	do	5 10 0	6 0 0	net	
Foundry Pigs, at Glasg. No 1	do	2 15 0	3 6 8	2½	
Swedish Bars	do	10 5 0	10 10 0	net	

STEEL:—

Swedish Keg, hammered	per ton	15 5 0	15 10 0	2
Swedish Faggot	do	10 10 0	12 10 0	2

COPPER:—

Sheet & Sheathing, & Bolts	per ton	80 0 0	82 0 0	
Hammered Bottoms	do	82 0 0	0 0 0	
Flat Bottoms, not Hammered	do	85 0 0	0 0 0	
Cake and Tough Ingot	do	71 0 0	72 0 0	
Best Selected	do	79 0 0	80 0 0	
Australian	do	83 0 0	85 0 0	
Y. l. Metal Sheathing & Rods	per lb	0 0 7	0 0 0	

ZINC:—

English Sheet	per ton	26 10 0	27 0 0	2
Devaux's V. M. Roofing Zinc	do	29 0 0	0 0 0	

* And 5 per cent. discount if laid upon the new system 0

TIN:—

English Block	per ton	94 0 0	96 0 0	
do Bar	do	95 0 0	97 0 0	2½
do Refined	do	97 0 0	99 0 0	
Banca	do	92 0 0	95 0 0	
Straits	do	87 0 0	0 0 0	nett

LEAD:—

Pig, English	per ton	21 0 0	0 0 0	
,, Spanish Soft	do	19 0 0	0 0 0	
Shot, Patent	do	22 10 0	0 0 0	2½
Sheet	do	24 5 0	0 0 0	
White	do	27 10 0	30 0 0	5

SPELTER:—

On the Spot	per ton	21	0	0	21	2	6	net
QUICKSILVER	per lb	6	17	0	0	0	0	

REGULUS OF ANTIMONY

French	per ton	28	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 24, 1868.

CRITICISM *VERSUS* CREATION.

THIS is a strange, but it is to be feared a true, issue. The present is an age of picking to pieces. Every department of intellectual activity supplies abundant evidence in support of this proposition. In literature we are busy with the past, taking down the dusty volumes from the shelves, where former generations have laid them, reproducing, re-examining, and rehabilitating the opinions and even the reputation of men who have long since finished the sum of their labours and laid down to rest. In art, a very small acquaintance with the so-called "works" of the day must suffice to convince any observer of ordinary intelligence that, if the "originals" were carefully eliminated from the "copies," it would not be difficult to number the former on one's fingers. Meantime, there is no little activity in the art world, no lack of noise, and plenty of spirit. From Mr. Ruskin downwards, every one is engaged in exposing faults, and very occasionally point out excellences. In short, all the best and most earnest work in the world is critical, and the best and most earnest men are critics. At first sight this may not appear an evil. Nor is it one, considered apart from other circumstances. But when the work of criticism comes to supersede that of production—when the critical faculty is found to be developed at the expense of the creative—then a great evil results. The age is not one of real progress. Those who come after us will find that we have done little, if anything, to help matters forward. The most they will have to say in our favour is that, by dint of hard digging, we contrived to turn up some treasures, and that, by means of harsh criticism, we succeeded in the destruction of a few fallacies. Is this a worthy sum of work to be placed to our credit in the great record of human progress? Will it win for our memories many laurels, or achieve an enduring fame? The answer must be, No! and, while we are engaged in this unproductive labour, the opportunity for more substantial achievement is passing, and, still worse, the place of real work is being filled by that which is spurious.

While our best men are engaged in a critical crusade against the bad in art, and are busying themselves with the demolition of theoretical evils, more practical workers of far less ability are building the edifices which will last for scores, perhaps centuries, of years, the unimpeachable proofs of our impotence, and even of our poverty of expedient; and in every department of work men of small calibre are setting their hideous marks on the age, while the minds of a higher order are making themselves and everybody about them miserable by graceless though clever criticism. This is a very serious matter. It is serious for the world, serious for art, and serious for those who are misapplying their talents. We are by no means sure that Mr. Ruskin, and those who follow in his steps, are not doing more harm than good by the line they are pursuing. No doubt clever criticism is a valuable help to the ripening skill of the honest worker. Engrossed with his task, he cannot see things from an artistic point of view, and the critical faculty of a friend, or even of an enemy, may help him. It is, therefore, well that there should be critics, and, if they are as numerous as clever, there can be no cause to complain, provided only that the army of professional fault-finders is not needlessly recruited from the ranks of the army of creation. This is the circumstance we deplore, and the fact that so many of our best workers are talking rather than acting has led us to think that it may be worth while to throw out a hint on the subject.

It would be easy to name many who began to do good art work, and have quite abandoned the task for the desultory, and perhaps, on the whole, easier occupation of picking holes in the works of men around them. Granted that these men have met with much to dishearten them. The world has not been kind—certainly anything but considerate with respect to their efforts. Perhaps they have not been appreciated as their talents deserve. But why retire discomfited? Young men not yet at their meridian faint before the sun of their lives has climbed to its zenith—weary of work and skulking in the shade ere the burden of the day has reached its maximum. What a pitiable sight! It is nothing to the purpose that each of these unproductive geniuses can give a very sufficient reason for his idleness. "It is impossible to make people love and appreciate real art work. The age is so hopelessly commercial that true excellence is sacrificed to meretricious value. The day is not ripe for art. Things are come to such a pass that we must abandon the whole business, and retrace our steps, to regain the thread of real truth and goodness in the art of the thirteenth century." These, and a score of like excuses, are not worth one cent when they come to be weighed against the fact that all who can work, but refuse or "decline" to do so, and take to fault-finding, are not only guilty of a negative error, but commit a crime against the cause in which they profess to be engaged.

We begin to suspect that the issue is even deeper than that involved in the case as we have stated it—"Criticism *versus* Creation." It is just possible that the critical faculty is incompatible with the faculty of creation. Either the propensity to find fault becomes in time so strong that the man begins to criticise his own works, and fails to produce anything capable of surviving the ordeal; or else the energy of the brain is so concentrated on the business of fault-finding that there is none to spare for any other enterprize. Should it be true that those of our art workers who have taken so largely to criticism have lost the power of production, and this is why they are beginning to decline competitions, and in other ways to cease from their once busy labours in the world of art, the cause is no less to be regretted then the consequences. When clever designers of cathedrals, town-halls, and churches turn to censorship of art, a certain evil as well as a contingent good results. They may detect and expose errors with masterly ability—they may even go farther, and do positive service by advising their own clients, and the clients of other men, sagaciously on art matters, but the work of design and creation they once did is lost. The same amount of work is done, because the world is not over-eclectic, and cries ceaselessly "give, give, give;" but other men, with less power, and incomparably less real talent, satisfy the necessities of the passing moment, and in so doing erect permanent monuments, not only to their own shame and incompetence, and to the lasting discredit of the age, but to the undying disgrace of those who shirked the duty of real and original work in the world, and took, as a pleasure or pastime, to criticism. No ephemeral trimphs of critical skill, or imaginary benefit to the taste of the passing moment, will atone for this grievous sin against and practical desertion from, the ranks of her pioneers and defenders.

MARKS ON DEALS AND QUALITIES OF TIMBER.*

FELLING, SELECTING, AND TRANSPORTING TIMBER.

THE growth and selection of timber suitable for commercial purposes leads us to its home in the forests. Where quality is not an object, economy in point of cost steps in, and common goods are traded in to the largest extent, from the nearest points to the markets of consumption. The native-grown timbers of Sweden and Norway lay claim to this position, both in the English and French markets. Unlike the Russian forests, where the timbers of finest growth are only selected, those of Sweden and Norway may be felled without regard to size and quality. They have a ready market for every quality, one which is guarded from competition by the lowness of freights. The finest of the Swedish timbers are selected for conversion into deals, or to be hewn into squared timbers—their faulty wood may find the same channel as seconds, thirds, or fourths deals, or as brack logs of hewn timber. Their smaller sizes are used for conversion into boards or battens, and into small timbers used throughout the mining districts, and for building purposes along the seaboard counties of England and Scotland. Diminishing in scale, we are introduced to the short square or round logs shipped in such amazing quantities for railway sleepers. This is a comparatively new branch of the timber trade, dating from the extension of the railway system. Until very recent times these "tramways," as our American brothers call them, were laid upon sleepers of English growth, larch being the class of wood most deservedly employed. As this timber became scarce and costly, sleepers of Scotch fir were introduced, the objections to them on point of durability being overcome by the invention of creosoting. At this point the timbers of Norway and Sweden were brought into competition with those of the English and Scotch forests, and from that date "the sleeper trade" has grown into gigantic proportions. An inferior article once introduced, no matter under what disguise, speedily breaks through strong prejudice; and as pre-existing matters fall into disuse, the new competitives rise into importance. We have an illustration of this fact in the sleeper trade. When the wood of the Scotch fir was first introduced, it was only with the aid of creosoting. At that time every sleeper was creosoted. As time wore on, the attempt was made to lay them down without this preserving application. Economy—be it truly so or not—taught our engineers to pursue this course, until now they are generally used green from the forest, and creosoting is becoming a thing of the past. Thus has the sleeper trade been added to that long list which centres in the forests of Sweden and the wooded districts of the Baltic Sea. Continuing the uses to which the diminished timbers of the forests are applied, we have the sister trades of pit or mining props and telegraph poles. These are either round, square, or partially square, and are regulated in their value by the sizes of their tops, and somewhat by their length. This is particularly the case with mining props. If they are 3in. tops and a long specification, they are of more value than short specifications. As they taper considerably the butt ends may thus be applied to purposes for which props with 4in. or 5in. tops may be used. In instancing their value, we may note that they are sold per six dozen or 72ft.; 3 tops will rate at 3s. 9d., 4 tops at 4s. 9d., and 5 tops at 6s. For mining purposes, although largely used, they are inferior to the English-grown larch, which is always preferred, even at double or treble cost. These small timbers, composed of robust, healthful trees, are nearly wholly sap-wood. A 7in. or 8in. butt will rarely show more heart wood than can be covered with a half-crown piece. When used as telegraph poles they are either charred at the bottoms, or subjected to a half-bred process of creosoting. In some cases they are creosoted throughout their entire length. Practice has taught us that decay first seizes upon this class of wood at the ground level, and that the best means of preventing it is to case the wood with a sheet of zinc, extending from six inches below the ground to six inches above. Although this principle is not largely adopted with telegraph poles, it is generally with fenc-

* Continued from page 24.

ing poles round the enclosures of timber yards. Still diminishing in size, although it must be noted that we are changing from red wood to white, we have the scaffold poles of our builders, which are sold when poles by the sizes of their butts, being divided into two classes, either over or under 4in. in diameter. When they are below 2½in. at the top ends, they are sold as rickers at so much each. In this case they are generally 22ft. long. With poles of the above description, their value will be ruled by the specification. "A fair average," as it is called in the trade, will be 33ft., sixty per cent. of them being over 4in. at the butts. In value they would rate at 1½d. per foot for the over 4in., and 1d. per foot the under 4in., the "rickers" being sold at 1s. 7d. each. These prices must be taken as an average, as they vary to a great extent in different parts, being influenced by the distance from the native forests, and the cost of ground for storage. Taking Sunderland, Hartlepool Hull, London, Liverpool, and Bristol, we have an advancing scale of freight which swells the cost of the goods, and it is no uncommon thing for goods to be put on rail at these northern depots, and despatched to London, Liverpool, or Bristol, to compete with goods shipped direct to these ports. Before closing this review of the various purposes to which the produce of the Swedish and Norwegian forests are applied, we may note a still smaller class of wood which is shipped to this country as "spars." These are considerably smaller than the "rickers" spoken of above, and are mainly consumed at the ports to which they are shipped. These are not applicable to the builder or contractor, but are used by the boatmen on the rivers, and fishermen on the coast, as poles for boathooks, spars for sails, and other allied purposes to which wood of a light and tough nature can be applied. With such a field before them, we need not wonder at the growth of the timber trade in Sweden and Norway, nor need we be surprised at their mode of felling trees, being able to cut down all before them, as, for one purpose or another, they have a ready market.

As we advance northwards along the coast of Sweden, we are introduced to different customs. Here the smaller trees cannot be felled to a profit; and, although they have a large sale for common goods in a converted form, still it is not every tree that will give a return for conversion; a medium-sized tree will pass through the saw-mills at the same rate as the smaller ones, and produce a better result; it thence follows, even with common goods, that the forest trees are selected. As we advance still further northwards, and are introduced to the ports of Gefle, Soderhamn, and Sundswall, where are shipped the best of Swedish goods, this selecting of the timber is pursued on a more developed scale. The forests are penetrated for miles inland, and trees of the finest growth are alone subjected to the axe of the woodman. The trunks are divested of the tops, branches, and the bark, and in this naked form are slung on wheels and conveyed to the banks of the nearest lakes or rivers, and cast upon the waters. Travellers in these districts are charmed with such scenes, and speak in rapturous terms of the deep and silent lakes skirted by everlasting forests, the only scenes of life being a few daring men piloting a raft of timber, propelled by the current of the water, or an improvised sail, oar, or paddle. Along the wooded margins the stillness may be broken by the tramp of horses and the shouts of men and women, as they near the waters with their heavy loads. The next moment the clean white trunk of some lord of the forest will be reflected in the lake—a splash of water, and the sudden return of the rude foresters with their train, tells us that one other tree has been rendered up to the demands of ever growing commerce. This custom of selecting timber in forests is a matter of considerable interest, as the purposes for which they are selected varies with different countries. At Riga, the finest timber is selected for ships' masts, for both the British and French navies. Men known as "mast brokers" are sent into the provinces to select and mark the trees as they stand in the forests. The finest are grown in the districts which border the Dneiper, and are from thence transported by land (about 23 miles) to the Dwina, where they are rafted in lots from 50 to 100 each, and floated down to Riga. These masts are valuable from their length and size, ranging from 18in. to 25in. in diameter, and from 70ft. to 80ft. in length. They contrast strongly in size with the timbers of Sweden and Norway, which in no case range above 18in. From the fact of such fine timbers being shipped from Riga, the French botanists imbibed the notion that they were a different species to the ordinary Scotch pine. This led the Minister of Marine of the French Government in 1785 to send a master mast-maker, named Barbe, from Brest, to Riga, to obtain seeds of this particular class of timber. He brought back a great quantity, which were sown in different districts in France, but in every case they produced the ordinary Scotch pine. With botanists there is still a variety of the Pinus Sylvestris called Pinus S. Rigensis, the Pin de Riga, Pin de Russie, and the Pin de Mature, of the French. It was the fact of the forests of Livonia and Lithuania, where the Scotch pine grows to its greatest size and perfection, that led these old botanists into the above error. The effects of soil, climate, and locality upon the growth of timber are such that generations of botanists have been led into the delusion that they have added new pages to the history of science by their fancied discoveries. There is, perhaps, no tree in the list of those useful to man that shows more variation under the influence of circumstances than is the case with the Scotch pine. A giant of the forest in Southern Russia, and a stunted shrub in the North; a towering mast, with a small conical head, in the dense shade of the forest, and a picturesque tree, with wide-spreading arms, in the open field; on strong clay lands producing a highly-coloured resinous wood, and on poor sandy land a white, tender, worthless material; one which upon the debris of granitic rocks will thrive, and upon the most fertile districts of the chalk will pine for nourishment.

Pursuing our subject of selecting timber in the forests, we are introduced to the best Russian shipments, and we shall there learn why their shipments are so vastly superior to those of Sweden and Norway. These goods are brought from great distances—the best trees have long since been felled in the home forests. We have a natural feature at this stage which is worthy of notice—where the largest trees in a forest are ready for felling and are cut out, those in the neighbourhood are interfered with by the admission of light and air, and, although in a few years they may grow as large as their prostrate brothers, they are only a second crop, inferior in quality to those selected in the first instance from the primeval forests. Such is the delicate nicety with which unaided nature shapes her works, that the best shippers will only purchase trees felled from the virgin forests. This compels the goods to be brought from greater distances, and thus, in point of quality, keeps the best shipments at high prices. Best Archangel goods are now rating at £13 15s. per Petersburg standard; the best shipments of Petersburg (Gromoffs) at £12 15s., other shipments from £11 15s. down to £10 15s.; the best Swedish brands from £9 15s. down to £8 15s. The great Russian forests are the property of the nobles, and during the toleration of serfdom the felling and conversion of the timber was carried on by gangs of these humble peasants on the lordly soil. As the rivers are the main agents in its transport, and they are only active during the summer months, it naturally follows that the felling of the timber is carried on during the interval, *i. e.* in the winter. We in these temperate climes have no conception of the hardships attending this life in a Russian forest. A party of these woodmen will start into the woods in the early morning, lighted only by the reflected light of a far distant sun, whose influence is all but lost beneath the thick overhead covering of dark sombre firs, whose branches are loaded with snow. Part of the group may be mounted on horses following in single file through the narrow tortuous paths of the forest. Those on foot are spreading wide on either side, walking upon the surface of the deep snow in clumsy snow-shoes, which are composed of a hoop like piece of birch bent in the form of a battledoor, and plaited across with hemp cords to which their feet are fastened. These men are searching for trees suitable for felling, picking the largest and straightest trunks, and those possessing the cleanest and yellowest bark, rejecting nine hundred and ninety-nine in every thousand. A suitable tree is found, the snow is cleared away, and the axe is stalwartly applied. Having been prostrated, the top is cut off, leaving a trunk of 60 or 70 feet. The next process is to divest it of its bark, and cut a groove or chase round the smaller end, in which to fix a rope; six or nine horses are then yoked to the log, the leaders and the followers are mounted, as are also most of the other horses, and the log is moved along the surface of the snow. The upper side of the log is morticed at the butt-end for the insertion of a hand-spike, and, as the tree is drawn over hillocks and along the circuitous paths of the forest, this hand-spike serves as a helm to guide it on its way. The conveyance of these large trees, the long lines of horses, and the number of fur and skin-clad men accompanying them through the forests and across the fields of snow, present an appearance very interesting. Strange as it may seem, in many cases, what with sledging to the rivers and rafting to the saw-mills (where the trees are delivered into the hands of the merchants), many of them are conveyed upwards of 1,000 miles. Even with this care of selecting, there is an average of 1 in 10 rejected by the merchant. This latter process of selecting is carried on jointly by the merchants and the noblemen's overseer, the test being the blow of a hatchet on the end of the log—if it produces a sharp sonorous ring, it is a sure sign of soundness; but, if it gives off a dull heavy thud, it is rejected as unsound. This principle of felling and sledging the trees to the banks of the frozen rivers is pursued through the long winter months, and, as the summer brings its attendant thaws, the piles of timber are moved off with the currents. As these logs are far more valuable than the indiscriminate class floated down the Swedish and Norwegian rivers, they are not allowed to take their own course into the open lakes, but the piles or rafts are tied together and men are mounted upon them as pilots. If it is a short journey they can brave the weather, but, if it is a long journey, they are housed in rude huts composed of wood and bark. Petersburg goods have to be rafted through the great Lake of Ladoga, which may be termed an inland sea. This is a work of great danger, as storms and sudden gales of wind will frequently occur, driving the rafts of timber far from sight of land to be beaten to pieces in the centre of the lake. Viewing this evil, and the great loss of life annually attending this staple trade, Peter the Great was led to construct the Ladoga Canal, along which the rafts are now conveyed with perfect safety to the River Neva, the stream of which carries them down to Petersburg, where they remain in the timber yards of the merchants till they are ready to be floated down to Cronstadt for foreign shipment. Austria, Prussia, and Germany are supplied with timber from the neighbouring mountains. Here the same life of hardship is led by the fellers in the forests, an illustration of which has been given during the present winter in the forest of Rothwell, in Austria. Eighteen of these woodcutters selected a valley at the base of a mountain range, and, as they were breakfasting in a hut, they were overwhelmed by an avalanche of snow, and along with their hut were swept

away. Three days elapsed before they were missed by their friends, and when a search was made for them eleven were extracted from the snow, seven of whom were dead, and the other four so exhausted by cold and hunger that they are not expected to live. The other seven have not yet been found. Such is the life of these toilers in the forests. They are entitled to our notice, as we are indebted to them, in the first instance, for our qualities of timber.

We shall conclude our notice of selecting timber in the forests by a glance at our brothers in the backwoods of America. The New World boasts of everything upon the grandest scale. The pine forests of the United States and Canada are the most extensive in the world, and they contain the most gigantic specimens of timber trees. Canada, with few exceptions, before clearing was commenced by European settlers, was one unbroken forest of pines and firs, which clad its hills and extended along its plains to the banks of the rivers, and even covering the river islands. The bulk of our Canadian timber is shipped from New Brunswick, and the timber trade in the North of Europe is assuming great magnitude. The following account of the mode of cutting the timber in the backwoods of Canada is abridged from the pen of M'Gregor. "Several persons form themselves into what is called 'a lumbering party,' under the command of a 'master lumberer,' who manages the whole. The necessary supplies of provisions, clothing, &c., are generally supplied on credit by merchants, who are to receive payment out of the stock of timber sent down the rivers the following summer. The party then proceed into the woods and select a place for their encampment, near a stream of water; here they build a log hut, forming a pit or cellar below it, to preserve those things which are liable to be injured by the frost. The cold is so intense that they are obliged to keep up a constant fire night and day, and they drink enormous quantities of rum, generally without water. When they work they divide into three gangs; one of which cuts down the trees, another hews them, and the third is employed with oxen in dragging the logs to the nearest stream. Here they lie till the snow begins to dissolve in April or May, when the rivers swell, or, according to the lumberers' phrase, 'the freshets come down.' At this time all the timber cut during winter is thrown into the water, and floated down till the river becomes sufficiently wide to make the whole into one or more rafts. The water at this period is exceedingly cold; yet for weeks the lumberers are in it from morning till night, and it is seldom less than a month or six weeks from the time that floating the timber down the streams commences, until the rafts are delivered to the merchants. No course of life can undermine the constitution more than that of a lumberer or raftsman. The winter snow and frost, although severe, are nothing to endure, in comparison with the extreme coldness of the snow water of the freshets, in which the lumberer is, day after day, wet up to the middle, and often immersed from head to foot." The lumberers of New Brunswick, and those who cut down timber in the United States, take great care to select trees of a proper size. A good authority states that not one tree in 10,000 in the woods is fit for the purposes of commerce.*

The Department of Science and Art are again busy in gathering examples for the forthcoming and concluding Exhibition of National Portraits, which will open in April next. The exhibition will comprise, first, portraits of persons (deceased) who lived between 1800 and the present time; secondly, portraits of persons living before the year 1800, who were unrepresented or inadequately represented in the two previous exhibitions. Portraits must be sent in not later than the 3rd of March next.

* To be continued.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary general meeting of this Institute was held on Monday evening last, Mr. Joseph Clarke, F.S.A., in the chair, at which M. Constantine Thon, of St. Petersburg, Government architect, and author of the work on the Palace of the Cæsars, Rome, was unanimously elected as honorary and corresponding member. Mr. W. Fogerty, of Dublin, and Mr. G. Judge, jun., of London, were elected as fellows; and Mr. H. H. Vale, of Liverpool, and Mr. Samuel Brooks, of London, were elected as associates.

Professor Donaldson (honorary secretary for foreign correspondence) announced in terms of regret the decease in November last of M. Baudirecter Fischer, architect, of Carlsruhe, and read a brief necrological notice of that gentlemen, translated from the "Carlsruhe Times;" also that the honour of knighthood had been conferred by the Lord-Lieutenant of Ireland upon Mr. Charles Lanyon, M.P., of Dublin, fellow of the Institute, and president of the Institute of Architects of Ireland, and that a letter of congratulation on that event from the Council had been forwarded to that gentleman.—The subject of the proposed New Building Act was introduced by Mr. Chatfield Clarke, with the view to inquire whether the attention of the Council had been directed to some of the provisions which he thought tended to hamper the profession very much in the execution of their works, more especially in the neighbourhood of London. He thought it most desirable that these stringent provisions should be watched by the Council in the interests of the profession generally.—Professor Donaldson stated that the bill in question had been carefully examined by the District Surveyors' Association, of which he was a member, by whom some emendations had been suggested, and submitted to the Metropolitan Board of Works. The proposed prohibition of the use of stone in staireases and other parts of the interior of buildings, which had excited so much surprise in the profession, he believed resulted mainly from the recommendations of Captain Shaw, with a view to the prevention of accidents at fires, but there were other provisions of the bill which required to be considered, and the subject could not be more appropriately taken up than by an independent practical body like this.—Mr. Charles Fowler joined in the request that the consideration of the Council should be given to this subject, and the chairman gave a promise to that effect.

The paper read was "On the Kremlin of Moscow," by Mr. Edward I'Anson, who commenced by some observations on the architecture of Russia, before it merged into the prevailing classic architecture of modern Europe. He would make a few allusions only to the architecture which he had the opportunity of seeing in other parts of the empire. After describing in graphic terms the imposing view which Moscow presented as first seen from the eminence of the Sparrow-hills, some three or four miles from the city, Mr. I'Anson dwelt, at considerable length, and with minuteness of detail, on the vast aggregation of buildings, especially of churches, there being no fewer than 32 churches and 170 chapels, cupolas, and towers, within the walls of the Kremlin. Situated in the centre of the town, the Kremlin, he said, is, as it were, the kernel of the whole city, and is wrapped round with the other portions of Moscow, and it is the oldest part of the town. It is nearly triangular in form, the base of the triangle next the river Moscowa, by which it is bounded on the south side, being, as measured from the map in Dr. Clarke's "Russia," about 2,000 feet. The greatest width on the north-east side is also about 2,000 feet. The total circumference of the walls is 7,280 feet, within which are numerous churches, chapels, and public buildings already mentioned. The walls are chiefly of brick, as, indeed, are almost all the buildings incorporated with or contained within them. The finest range of towers is on the river-side, where they are seven in number. Beyond the long vista of towers on the river-side is a modern church, much larger in size than the churches of the Kremlin, viz., the church of St. Saviour, still in progress, the interior of which is being finished, as he was informed—for he did not visit it himself—with the richest mosaics and coloured decoration. Externally, the bulb-shaped domes are remarkably elegant in their contour. On the north-west side there are five towers, the most ornamental being the Trinity Tower. After giving a description of this and the succeeding towers, Mr. I'Anson proceeded to point out the leading characteristics of the various gateways forming the entrances to the Kremlin. Having described the Kremlin walls, he now entered the interior. As the heart of Moscow is the Kremlin, so the heart of the Kremlin is the patriarchal Cathedral of the Assumption, or Repose of the Virgin. This, one of the oldest and most interesting churches in the Kremlin, is in dimensions what, in the West, would be called a chapel, rather than a cathedral, but the smallness of space is forgotten in the fulness of its contents. On the platform of its nave, from Ivan the Terrible downwards to this day, the Czars have been crowned, and along its altar screens are deposited the most sacred pictures of Russia. Round the walls are buried the primates of the church, and at the four corners lie those most highly venerated. The floor is paved with slabs of polished steel. Hieroglyphics and pictures constituted more than half the education of these grown up children of the ancient world, and they still constitute more than half the education of these grown-up children of the modern world. Notwithstanding various alterations and repairs at various epochs, the Cathedral of the Assumption probably retains much of its primitive form, and is, therefore, one of the most interesting church monuments in Russia. Next to this, in situation and size, is the Church of the Archangel Michael, where lie, each in his place, the coffins ranged round the wall, the long succession of Czars, from the founder of Moscow to the predecessor of the founder of St. Petersburg, and twice a year a funeral service is performed for the sins of all of them. Near to the two churches above-named is the third most important church in the Kremlin, and completing the group of those intimately connected with the history of the Czars. This is the Cathedral of the Annunciation, in which the Czars are baptized and married. It is the smallest of this group of three monumental churches of the Kremlin. The arrangements and decorations of this cathedral were described in detail. Amongst the other objects of interest in the Kremlin is the lofty tower or belfry of Ivan Veleki—John the Great—erected in the year 1600. The cross on the summit is about 18ft. high, and the total height about 270ft. It is one of the buildings injured by the French during their occupation of Moscow, all traces of which, at the time of the author's visit, were concealed by plaster and whitewash. In the lower part is a chapel dedicated to St. John, the tower being, in fact, its campanile. Above this are suspended thirty-four bells, the largest of which weighs no less than 64 tons or about 140,000lbs. The celebrated great bell of Moscow lies at the foot of this tower. The weight at present is 440,000lbs., its height 19ft. 3in., and the circumference 60ft. 9in.

In size, no building in the Kremlin approaches that of the palace and treasury combined. Within the palace, in addition to numerous magnificent rooms appropriated to state occasions, is also a labyrinth of fourteen chapels, multiplied by sovereign after sovereign, till the palace has become more like the dwelling-house of the Pope than of the Emperor. These chapels, crabbed-ribbed, low-browed, painted within and without, in the old barbaric grotesqueness of mediæval Russia, are encased with the external magnificence of modern civilization and European grandeur. The treasury, which adjoins the palace, contains a vast collection of trophies and standards, coronation, church, and state robes, crowns, imperial orbs, plate, &c. In addition to these, there is still another palace, a small church, the sacristy of the Holy Synod, the Miracle Monastery, the Ascension Convent, the High Court of Appeal, and several Government buildings. That which he would last allude to—the arsenal, which stands close to the Nicholas Gate—is a building of the date of 1713, where are deposited the enormous guns taken by the Russians to the large number of 875, of which no less than 365 are the cannon taken during the retreat of the French, and, as the least honourable place, they lie prostrate on the ground. The Austrian, Italian, and other trophies of war lay tier above tier over the French pieces below. Mr. I'Anson next proceeded to describe the church outside the Kremlin, known as the Church of St. Basil. This is the name given to one church in the general structure, still it is only one of twenty-one churches which are there co-existent, the whole together being known to the natives as the Cathedral of the Protection. Although styled a cathedral, the building is circumscribed probably within 150ft. square on the ground, agreeably spiry in form, with nearly a dozen domes grouped around a central summit, like a close clustering grove of young pine trees. There is

harmony among them, yet with variety infinite. The titles of each of the coalesced churches, as given by Lyall, were enumerated in the paper. Immediately adjoining the Kremlin, to the north-east, is the Chinese quarter of the city—the mercantile part—which is walled round like the Kremlin. This also has its ancient gates, and several ancient (for Russia) buildings within its walls. One of them is a small church,—"the Mother of God of Georgia," which is a perfectly typical church, nearly square in form, from the roof of which rise elongated octagonal spires, crowned with five bulbous-shaped gilt domes, terminated by the usual lofty cross, standing over the crescent. In this quarter of the city are also the corn magazine, the custom house, the fish market, and an establishment peculiar to Russia, closely resembling the bazaars of Constantinople or the French passages.

Mr. l'Anson went on to remark that the modern churches of Moscow and all the others he saw in Russia are in the Italian style, generally of the worst character, from which, however, he excepted one great church, the work of a French architect, the St. Isaac's Church, which he described as a grand and imposing building, having the usual central dome and the four small surrounding domes common to all the Russian churches. The great ribbed dome is covered, it is said, with actual plates of gold, and the imperial records have never revealed the cost of this church. It is a great, but not a Russian work. The domes of the churches were described as being, for the most part, more graceful than those of Constantinople, and approaching nearer to the form used in the tombs of the Caliphs at Cairo. A striking feature in the neighbourhood of Moscow is the number of important monasteries which stud the plain in many directions, and are most of them very extensive, for they contain within their walls the conventual buildings and many chapels, bell-towers, and burial-places. Mr. l'Anson next proceeded to speak of the great extent to which picture veneration is carried by all classes throughout the whole of the empire. These, in public and in private, constitute the consecrating element. Sacred pictures are to be seen in the corner of every room, at the corner of every street, over gateways, in offices, in steamers, and in taverns, with the lamp burning before them. It is against the canons of the Church to have any graven images in the churches, and, therefore, the decoration is confined to pictorial representations; but the strict rule is often departed from by embossing the background to the pictures, and the jewelled crowns with which they are surrounded are in full relief. St. Isaac's Church at St. Petersburg was the only church in which he recollected this rigid rule was departed from, the general rule being that the edifices themselves are as simple and undecorated as possible. The apsidal termination, as far as he saw, was a constant feature in all the churches. Another subject of remark was the marvellous value of the decorations of gold and silver and precious stones in the churches and on the shrines and tombs, the priests themselves, often men of great stature, being clad in heavy gold and pearl-embroidered robes. And all this took place in a country where there is hardly any metallic currency in circulation. Mr. l'Anson then referred to the large bequests made by the wealthy portion of the population to the funds for the preservation and repair of the churches, more especially for the large amount of gilding to the roofs and domes which, with the other parts of the buildings, suffered from the extreme severity of the climate; and, in conclusion, he remarked that the source from whence the architecture of Moscow was derived was, he thought, clearly Constantinople. The historical evidence on this point appeared to him conclusive. Any observer who had seen the architecture of Constantinople could not doubt as to its being the parent of that of Russia. As regarded the towers, there is a more complete Italian feeling than in the churches. No doubt the plan was precisely defined by the tradition and usages of the Greek Church; but the whole treatment is traditional, just as we in England now cling to the older form practised in church-building. There could not be a more suggestive type of the architecture of the Kremlin churches than several of the fine fountains in Constantinople. Although the relation between the two nations has, from political causes, in modern times not been always preserved, yet, in earlier times, and in ecclesiastical matters, the relations between the two were always preserved with filial fidelity, the more remarkable from the reversal of their respective positions in everything else. It was said generally that Russian architecture is not original, and that it is a coarse and rude imitation of other works; but he asserted that all the three principal churches of the Kremlin to which he had referred more particularly in detail have a distinct and special character, and, on the whole, he felt that the Russians might fairly lay claim to very considerable ingenuity, good taste, and artistic power.

A brief conversation, in which Professor Donaldson, Mr. W. Haywood, Mr. Basil White, and Mr. Chas. Barry took part, followed the reading of the paper, in which it was sought to elicit from the author of the paper a more definite opinion with regard to the distinctive features to which Russian architecture could lay claim; but on that point Mr. l'Anson said he could give no further opinion than that which he had already expressed upon it

The paper was illustrated by photographs and drawings of the principal buildings referred to.

A cordial vote of thanks was passed to Mr. l'Anson for his elaborate and interesting paper.

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting was held on Friday, the 17th inst, the president, Mr. R. Phené Spiers, in the chair. The minutes of the last meeting were read, and Messrs T. Verity and R. E. Purchase were duly proposed and elected members of the Association. The president then introduced Mr. H. Matthews, who read a paper on "Painting as a Fine Art and its principles, and their full development in the works of the ancient masters." Painting, said Mr. Matthews, although not recognized by the ancients as one of the fine arts, was, nevertheless, well-known and practised by them. The graver and the pencil wrote an universal language, and their uses were probably known to many nations before the art of writing. The Egyptians practised painting to a very large extent in the decoration of their stupendous architectural monuments, and thus by the hieroglyphical paintings furnished to us the only source through which we became acquainted with the history of that wonderful people. The Greeks, before the time of Alexander the Great, were not especially distinguished in the art, and were only acquainted with four simple colours, white, yellow, red, and black. Yet with these poor materials, Zeuxis and others produced their great works. During the time of Alexander the art rapidly flourished, owing to the great encouragement given by that monarch. Pliny tells a story of two contending painters of this age, one of whom painted grapes so naturally that the birds came to peck at them, and the other, a curtain so well, that the judges attempted to draw it aside, thinking his picture was hidden behind it. The conquest of Greece by the Romans afforded that people an opportunity of becoming acquainted with its art treasures, but it was not until the time of Augustus that painting obtained any great pre-eminence among them. During his reign the art rapidly spread in the decoration of buildings, and the style known by us as Arabesque was introduced and extensively practised. After his death, however, painting again seems to have been neglected, for Pliny tells us that, between the reigns of Augustus and Vespasian, their lived only seven or eight painters of any celebrity. The early Christians at first entirely eschewed the art, considering that it tended to sensuality and heathenism, and then only used it to represent symbolical subjects and monograms, such as the cross, the anchor, the sacred monogram—the shepherd, with a flute, to represent our Lord; the ship buffeted by the waves, to represent the Church, &c. Upon the establishment of the Papacy, the churches began to be adorned with paintings copied in a great measure from works of art found in the catacombs, and the art began to grow into considerable importance. Charlemagne very greatly encouraged it, and during his reign it flourished, but declined at his death, and was only kept alive under the fostering care of the Roman clergy. While thus alternately rising and declining in the West, Constantinople, in the East, had attracted, among artists of all kinds, many great painters, the fame of some of whom still exists. Not till the thirteenth century did the art again revive in the West. In 1276 allegorical subjects first began to be represented. In 1349 a guild or body of painters was formed, under the patronage of St. Luke; a similar society had also been established in 1290, but embraced as well other artists of design. The clerical element, however, greatly prevailed in both these societies. Many potent and noble families now began to cherish painting. Ludovico Sforza, Duke of Milan, attracted many artists to his court, and placed his academy under the care of Leonardo da Vinci, one of the greatest masters of his style and age. At the close of the fourteenth century the existing schools of painting were the Italian, the German, Flemish, Dutch, French, and English. The Italian school was divided into those of Florence, Rome, Venice, Verona, and Lombardy; and, again, that of Lombardy into those of Parma, Cremona, and Milan. Art, now declining elsewhere, began to flourish vigorously at Florence, under the patronage of the powerful Medici family. Cosmo, and his son Lorenzo the Magnificent, drew to their court all the greatest men of the day, among others the great Michael Angelo, who, in boldness of style, grandeur of conception, and strength of manner, surpasses all others. Going to Rome, he was commissioned by Pope Julius II. to paint the ceiling of the Sistine Chapel, the whole of which, dissatisfied with the performance of artists whom he had engaged to work under him, he executed himself. His greatest work is the Last Judgment, painted for Paul III., who wished it in oil, but was refused by Michael Angelo, who declared that oil painting was only fit for women. Raphael, who was called the prince of painters, was also employed by Julius II. to decorate the Vatican, and by Leo X. to prepare the famous cartoons for the tapestries. Mr. Matthews proceeded to give an interesting account of the school of Venice—pre-eminently the school of colour, and of which Titian was the greatest master. He then sketched, at some length, the other Italian schools, and regretted that time would not permit him to complete his paper, by giving an account of the Flemish, Dutch, German, French, and English artists. He trusted that what he had read had interested the members, and would induce them to pay frequent visits to our National Gallery, for the purpose of studying the great masters.

After a short discussion, a vote of thanks to Mr. Matthews was carried, and the meeting terminated.

DESIGN.*

THE subject of my paper in its broadest sense may be defined as the mind, or the imaginative spirit, possessed by the followers of every branch of the Fine Arts. Whether I name the painter, the sculptor, or the architect, you will at once admit that the faculty which he must possess, in a greater or less degree, in order to attain to excellence, and to make a name in his profession, is the power of design.

Design is the inventive quality of Art. The materials with which the artist conveys his thoughts (his designs) to those around him, and the skill with which he employs those materials, though important details of Art, are insignificant when compared with the inventions of fancy which even in the best, the truest, Art, they most inadequately depict or represent.

The painter's pencil, and the sculptor's chisel, though wielded by the most skilled craftsmen (in the absence of the power of conceiving or realizing original ideas), produce but very tame and imperfect results. I do not deny that the dullest individual might be taught to use the pencil or the chisel with precision, and the technical details of Art may be acquired by all who will devote to them sufficient time and study; but, to go a step beyond the sphere of the copyist and the imitator—for this is the limit of technical excellence—to produce an original thought, or to embody a new idea, is the province of the real artist, and can never be arrived at by simple study.

Almost everyone, however, possesses to a certain extent this inventive faculty, and, although it can never be instilled by study, it may be improved and perfected by it; in fact, the development of this gift in its varied forms is one of the most important provinces of Art education.

My object now is, not so much to submit to your notice what has been, or what may be, done in the way of training this inventive power of the Art student in what is called Fine Art, as it is to consider another signification of the term "design," namely, the adaptation of ornamental forms to the enrichment or decoration of given surfaces or objects. The subject, even thus narrowed, admits of consideration in many ways. I shall endeavour, firstly, to trace, as concisely as possible, the origin

* Read by J. R. Redgrave before the Associated Arts' Institute, January 4th, 1868.

and growth of ornamental design, and then point out the manner in which the facts thus elucidated may be employed in the formation of rules and principles for the guidance of the specially trained artistic designer.

The oldest existing monuments of our race, those of the Egyptian and Assyrian nations, teem with suggestions of the utmost value to the student on the application of ornamental forms, not only to the grand bold outlines of their temples and palaces, but even to the minutest articles of their furniture, their utensils, and their clothing. Incised in almost imperishable materials, the vast granitic blocks of Luxor and Karnac, and engraven on the marble walls of Nineveh, are to be found the simple and beautiful conventionalized forms which may be called the alphabet of the designer. Here may be seen the rudiments of the fret, the anthemion and the wave scroll of the Grecian artist, and we may trace them back to the natural forms which surrounded the workers of Egypt—to the lotus which floated on her rivers, the papyrus which bordered her lakes, to the palm branches which gave fruit and shelter, to the ripple of the Nile waters, or the curling waves of the sea into which it flows. The forms are derived from Nature—we recognize the type, yet they are not imitative, but conventionalized and subordinated to a law of symmetry, and adapted to the stern and grand outlines of her architecture. Here, then, are seen two principles, which will be found to pervade all really good Art.

But we must reverence and esteem this early people more, perhaps, as the foster-parents and precursors of the Arts of Greece, than for the correctness and beauty of their own art. Surely if Greece owed much of her later refinements and perfection to the Egyptians, there must be much in their work, for this cause only, which should inspire us to find out what is good and beautiful therein. From Egypt, Greece learned that "simplicity of form is an element of beauty," a maxim that we in these days may well cherish and ponder over. From Egypt, Greece learned the use of colour in assisting and enriching the elementary forms of the mouldings of her temples. And, lastly, to Egypt she owed what, after all, was the great cause of her unequalled success, not only in her arts, but in every other aspect which has rendered her in all times a model for other nations—her civilization.

Unlike Egypt, the details of Grecian architectural ornament are rarely to be traced directly to natural forms. Those we have named as transmitted to her from Egypt, the Grecian artists refined to the utmost purity of grace and elegance. Satisfied with a few ornamental forms, and not recurring to Nature for new themes, the Greek age after age studied to perfect those he had adopted—to purify the curves, to dispose the varying quantities agreeably, and to adapt the relief to the surface, with the most consummate taste and the keenest sense of beauty. Thus the principles to be derived from the study of Greek ornament, are refinement of line and curve, and the most perfect subordination of the ornament to the object ornamented.

The ornaments of Greece, which had come down to us only as sculptured on her temples or painted on her pottery, may be characterized as in the highest degree pure and severe. I know of no example of the use of natural forms—all her enrichments are conventional. The decorations are applied only to the leading lines of the temples, and to the borders of the draperies and garments: the Doric period of Greek Art, the age when her manners were most pure and her culture had attained its highest excellence, is particularized by the utmost severity of its architectural forms, and the simplicity of its ornament. As Greece became more and more voluptuous, her Art became more florid, and in the continuation of her Art by Rome, we lose entirely the features by which Grecian Art has been described. Rome possessed herself of the outlines of Greece, and plastered them over with abundance of weak and coarse ornament. She degraded the higher curves of her mouldings, multiplied the minute parts of her orders, and increased the impost of her ornamental forms, until the Art of Rome, founded upon the most perfect Art in the world, inspired by the same associations, dedicated to the same religion, and surrounded by all that was perfect in the simple and beautiful Art of Greece, sank so low that it became extinct. The greatness of Rome as a nation ceased to protect her from despised barbarians, and, with the fall of the Roman empire, Art was, we may almost say, exterminated. The ornamental arts, as practised in Greece, I have shown to be the growth of ages—advancing when sound principles were observed, but rapidly retrograding when the magnificent Roman sought pomp and splendour rather than refinement and grace, and elevated ornament from being a beautiful and subordinate accessory to undue importance and over-prominence.

In the Divine books we read of ornament derived from another source, and intended for the decoration of the tabernacle of the Most High. 500 years before Homer sang, and 1,000 years before Phidias wrought, artists of Judea were inspired for that sacred work. Nothing of this Art remains; even the Temple, subsequently built and rebuilt on Zion, has been so completely razed by the Assyrian and the Roman, that the very place where it stood is disputed, and our countrymen are at this moment mining and tunnelling to search for its foundations. Yet from the Bible we learn certain facts regarding it. We find that it also had its types in Nature. We read of the almond and the pomegranate, alternated by a simple symmetrical law—we read of entwinings and interlacings—of the palms, of capitals, and, from the forms in beaten gold upon the doors, we may be sure that the relief was low, and the ornament subordinate to the use of the object ornamented. Much of the ornament of the far East, then almost beyond the circle of European civilization, may have been derived from this source. And when Rome emigrated to Constantinople, and, the emperors of the East adopting Christianity, sought to build the temple of Santa Sophia in a style that should widely differ from heathen architecture, a union was effected of ornamentation derived from the East with the degraded forms of Western architecture.

No such gradually increasing civilization, no such Divine inspiration, ushered in the succeeding style, which, arising after the destruction of Classic Art in the West, received its impulse from Christianity stirring the vigorous imaginations of the Northmen, and which, gradually superseding the spread of Art from Byzantium, and passing through one or two marked phases, reached its zenith in the Early Decorated period of Gothic Art. Here we have the utmost grace of proportion, and the most perfect fitness of the ornament. The Gothic artist made lavish use of natural forms, selecting such as should harmonize best with the objects he was enriching. He chose the oak, the vine, or the ivy of his native land, and twined it truthfully and lovingly round the graceful bell-cap, or gathered it into varied groups and clusters in his finials, not strictly imitative, but subdued to the wants and scope of his material. He enriched his walls with diapers, and covered his floors with encaustic pavements; he made his windows glow with all the colours of the rainbow, and taught the subdued sunlight to wander through the lofty aisles of his cathedrals. Never, perhaps, has Art history contributed more evidences of a thorough spirit of design common to the workers of every material. The iron worker and the mason, the carver and the carpenter, wrought each in his separate sphere and material; and yet the one grand whole—the cathedral or the palace which grew up under their hands—preserved its characteristics of unity and variety—a variety of parts with a perfect whole; and, though what is called Gothic Art abounded more in enrichment than did the Classic, yet, at the best period, that of which I have spoken, ornament was entirely subservient to architectural form and to structural lines, serving to pronounce and enrich, but not to obscure them. But Gothic, like Classic Art, was ruined by the abuse of ornament; slowly, yet steadily, its proportions became debased, its enrichments lost their simplicity, and, when its structural lines and parts were thus obscured, this style also lost its influence on the world.

The decline of Gothic Art was hastened by the advent of the Renaissance—a re-birth, not of the pure forms of Greek architecture, but of those of Rome at its best period. True Gothic Art had never developed itself in Italy as in the more northern countries of Europe, and had always been more or less influenced by degraded classicism. In Northern Italy the Lombards and Goths implanted much of their northern freedom, and introduced a style called Italian Gothic, containing features of marked originality, yet never clearly developing the perpendicular principle—the marked characteristic of Northern Gothic. When Classic Art was revived, it found immediate acceptance in Italy, but the principles of the true Renaissance being confined to the acceptance of Classic examples alone, and in no way favouring an appeal to Nature for original thoughts, it became a style of learning, rather than of feeling and imagination. It ignored originality, and did not even seek to refine and perfect the ornament it borrowed from the past. In England, it resulted in the picturesque but grotesque Tudor style. In France, under the Grande Monarque and his successor, it developed into what is called after them Louis Quatorze and Louis Quinze, remarkable for the endeavour to ignore structural truth, for an effort to avoid symmetry of parts as far as possible, and for the lavish display of burnishing and gilding in the ornamental details—pomp and display ruled instead of purity and simplicity, and, while the laws that regulate these styles are easily perceived, the true designer avoids them as grotesque and misleading, and to be studied only for an insight into the varied treatments of metal and metalized surfaces.

I trust you will excuse the hasty glance I have bestowed upon the history of ornamental design. My object has been, by rehearsing the outlines of the leading historic styles, to draw your attention to the teachings and the warnings they must convey to the student. We have seen how, in all cases, the truest taste was that in which the ornamental was made secondary or subservient to the object to which it was applied; that simplicity of the outlines and of the component parts belongs to the purest periods of all Art, and that, while the Grecian artist tempered Nature to the stern and severe outlines of his temples, and produced the beautiful conventional ornaments we invariably associate with the name of his country, the Gothic artist drew his inspiration directly from Nature, and found that Nature, in her beauteous and manifold forms, accorded best with the flowing curves of his mouldings, and the rich tracery of his cathedrals. We have seen when, in times of luxury and excess, the Romans sought to obtain richness by the lavish use of ornament, that they succeeded only in stifling Art; and we have seen, lastly, when the Gothic artist disregarded the simple rules of fitness which had guided his ancestors in the employment of decoration, he made what should have been one of the chief glories of his Art, the cause of its ruin; and, finally, that a re-birth, if only founded upon precedent and the past, wants that vitality which shall give it a firm hold on the taste and feelings of a different race, and a different age. It would be difficult, nay, I think almost impossible, to draw up a code of rules applicable to all classes of design. All that I can hope to do, within the limits allowed me, is to continue the consideration of those general laws we have already deduced in our *resumé* of historic styles and periods, and to endeavour to supply a few illustrations which may be of use to the Art student and designer.*

WORKS IN PARIS.

WITH French architects and builders the past year was evidently a busy one, if we may judge from the number of public works which were completed during the year. The list includes the following works:—The Universal Exhibition building; the fine church of the Trinity, facing the Chaussée, and the gates of the church of St. Laurent; the mayoralty-houses of the third and fourth arrondissements; the transformation of the Trocadero, the buttes de Chaumont, and the Luxemburg-garden; the Avenues Empereur, Josephine, Jena, and Bosquet; the Magenta, Hanssman, and Philippe Auguste Boulevards, the streets Turbigo, Rennes up to the Vieux Colombier, Monge, Pont-Neuf, Halles, Puebla from the Villette to Charronne, Murillo, and Rembrandt; the barracks of the city, the barracks or hotels of the Staffs of the Paris Guards, and the firemen (*sapeurs pompiers*) on the Boulevard of the Palais de Justice; the leather-market, the market Chabrol, the Roule market, and the great cattle-market of the Petite-Villette; the connecting railroad; the waterworks of the Dhuys; the Hotel des Mines on the Boulevard St. Michael; the places of the Arc-de-Triomphe, Europe, Chateau d'Eau and the Trinité, and that near the Théâtre Francais; the museums of the Archives of the Empire, Pierreponds, and St. Germain-en-Laye; the prison of the Madelonnettes, Rue de la Santé; the lunatic asylum of St. Anne; the Court of Cassation and the Assize Court, and, lastly, a number of schoolhouses.

* To be concluded in our next number.

BUCKINGHAM GATE.

ABOUT a century prior to the ever-memorable year 1666, which saw its complete demolition, Old St. Paul's Cathedral was partially destroyed by fire. The re-erection of the cathedral lagged for want of funds, and a portion of the stone which had been provided for its restoration was "borrowed" by the first Duke of Buckingham, who built with it the now interesting architectural relic of Old London which stands at the bottom of Buckingham-street, Strand. It marks the site of York House, celebrated as having been successively the residence of the archbishops of York, the birthplace of Francis Bacon, and the home of one who, with great truth, has been called "the profligate and time-serving Villiers." The gate was erected in 1626, by Inigo Jones; and we need hardly add that it is the only vestige remaining of the once splendid mansion to which it was the water-gate. Buckingham Gate is executed in rock-work or rustic, in the Italian style of architecture, the material being Portland stone. It is justly regarded as a very tasteful and appropriate structure of its kind. The front of the arch facing the river bears the arms of the Villiers family; and on the north front is inscribed their family motto, "*Fidei coronata cruce*"—the cross is the touchstone of faith. Time, however, has, to a great extent, defaced its outlines, and obliterated its ornamentation. Peter the Great lived in a house (Pepys's) on the site of the last house on the west side of the street. The studio of William Etty, the painter, was in the same street; and who but remembers that Mrs. Crupp, the landlady of David Copperfield, lived in Buckingham-street, Strand? The important works now in progress in connection with the Thames Embankment are at this moment sweeping away Buckingham Gate. What will become of it remains to be seen.—From the "Savage Club Papers" for 1868.

BUCKINGHAM WATER-GATE.

BURTON CHURCH.

THIS curious old church (illustrated in another page) is situated near the lower end of Ullswater, in Westmoreland. The most remarkable feature is the tower, which is in the centre of the church. The lower part is very old—Saxon or Early Norman, and vaulted over below the belfry with a barrel vault composed of a mass of twigs and mortar. The original arches in the tower walls are very small, hardly more than door openings; but in later times lower and wider arches have been inserted in a rude manner, going right through the ancient ones, and giving a very curious appearance to the interior.

AISLE ROOF, PARISH CHURCH, WOLVERHAMPTON.

THIS old perpendicular church is one of the finest and richest in the Midland counties. It has a lofty central tower, and is almost on a cathedral scale. There are galleries to each aisle, lighted by an upper storey of wooden glazed tracery, as shown in our lithographic sketch. Every part of the church is very elaborate, and well worth a visit from the student. It has lately been restored by Mr. Christian.

MARTON VICARAGE.

ONE of our illustrations this week is a view and ground plan of Marton Vicarage, near Ousebburn, Yorkshire, lately erected for the Rev. J. R. Lunn, from designs and plans by Mr. John Ladds, jun., architect. The style may be termed Gothic, freely treated, and the object aimed at has been to get rooms of convenient size and height, well lighted and of plain substantial finish and character, well grouped rather than ornamental. The whole of the external walls are one and a half brick thick, built hollow, with a cavity of 2½in., and the walls are bonded together with Mr. George Jennings's patent vitrified bonding bricks, which have been found to answer admirably, and form very dry and strong work. The exterior is faced with pressed red bricks, interspersed with bands of white bricks. The heads and sills of windows and all stone work are carried out in Burton Leonard stone, and the roofs are covered with slate. The external woodwork is painted, but the internal woodwork is stained and twice varnished. The whole of the buildings have been carried out for the sum of £1,568, by Messrs. John Chambers and Son, of Bishop Monkton, near Ripon, York, builders.

REFERENCES TO PLAN.

A Drawing room
B Dining room
C Study
D Open porch
E Vestibule
F Hats and coats
G Hall
H Stores
J Servants' stairs and stairs to basement
K Cupboard
L Larder
M Kitchen
N Scullery
O Boot house
P Coach house and harness room
Q Two stall stable
R Cow house
S Manure pit
T Open shed
U Poultry house
V Pig sties
W Dust and ashes
X Garden W.C.
Y Servants' W.C.
Z Kitchen yard

BEDFORD MIDDLE-CLASS COLLEGE.

IN our description which accompanied the engraving of the Bedford Middle-Class College last week, we omitted to supply the references to the plan. They are as follows:—

1 and 2. Schools.
3. Dining hall.
4. Plunge bath.
5. Chapel.
6 and 7. Masters'-rooms.
8, 9, 10, 24, 28. Class rooms.
11, 12. Visitors' and waiting-rooms
13. Secretary's-room.
14. Committee room.
15. Library or class-room.
16, 17. Masters' rooms.
18. Library.
19. Kitchen.
20, 21. Pantry and scullery.
22. Dining room.
23. Drawing-room.
25, 26, 27, 29, 30, 31. Lavatories, box-rooms, and cap-rooms.
32, 33. Boot-room and workshops.
34. Servants' hall.
35, 41, 42. Laundry, drying closets, and washhouse.
39, 40. Serving rooms.
43, 46. Coals and wood.
44, 45. Manservants' bed-rooms.
47. Manservants' sitting-room.
49, 50, 51, 52, 53, 54. Offices, &c.
55. Matron's sitting-room.

BASEMENTS.

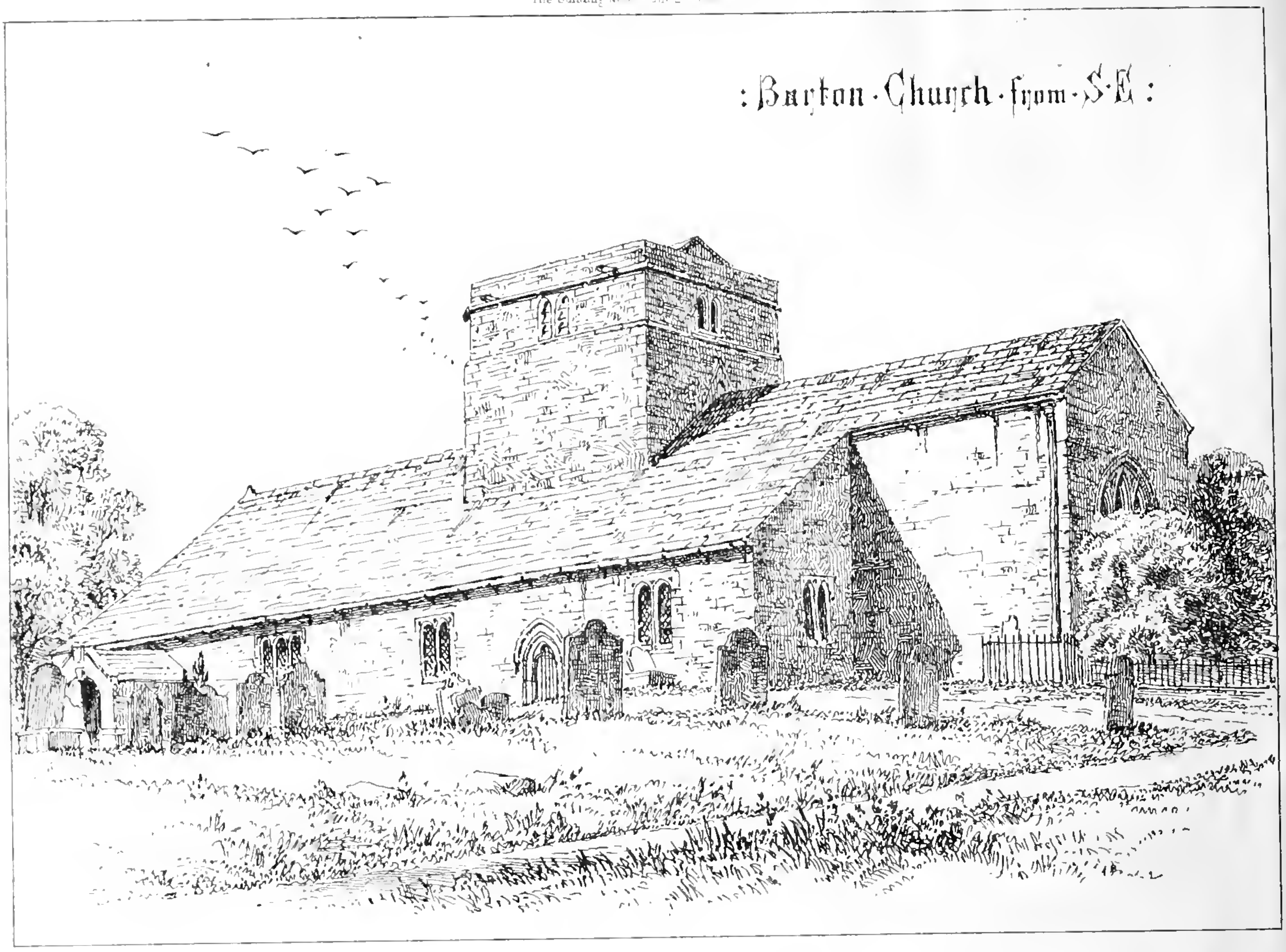
1st,
A. Boilers and coals.
B. Engine room.
C. Workshops.
2nd,
A. Stores
B. Potatoe stores.
C. Beer cellar.
3rd,
A. Coals.
B. Store.
C. Beer cellar.

SOCIETY OF ENGINEERS.

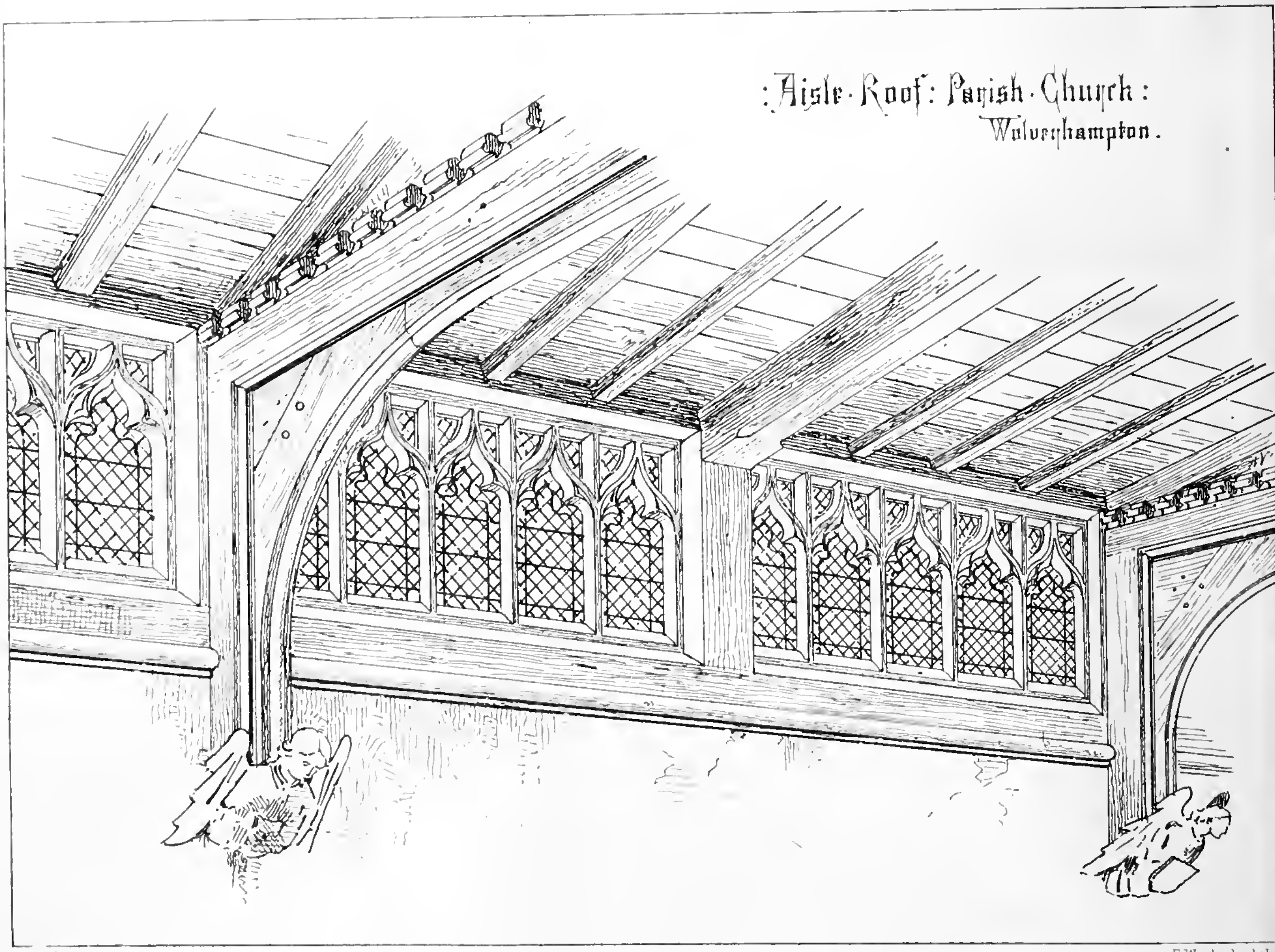
THE first meeting for the season of the Society of Engineers was held in Exeter-hall on Monday. Mr. W. H. Lefevre, the retiring president, occupied the chair, and having introduced the new president, Mr. Baldwin Latham, C.E., the latter proceeded to read his inaugural address. After discussing the present state of the railway interest, the electric telegraph question, and the subject of technical education, Mr. Latham next glanced at the state of sanitary science. He remarked that 650 towns were now governed in their sanitary operations by the Public Health Act of 1848, and with great benefit to the various localities. From a table it appeared that in the towns of Banbury, Cardiff, Croydon, Dover, Ely, Leicester, Macclesfield, Merthyr, Newport, Rugby, Salisbury, and Warwick, typhoid fever had been reduced at rates varying from 40 to 75 per cent., and phthisis at rates of from 41 to 49 per cent. Proceeding to examine the case of Croydon as one example in detail, Mr. Latham showed that the sanitary expenditure had been, in the gross, £195,000, and the saving in 13 years as follows:—Funerals (less), £12,195; sickness prevented at £1 each, £60,975; value of labour of persons kept in health, £166,828. Total, £239,998. A most important improvement that had yet to be looked after was sewer ventilation, as it was quite clear that the volume of water poured into a sewer always displaced an equal amount of mephitic air. This fact had been completely overlooked by the constructors of the old sewers. In Croydon the death rate had been under 2 in 1,000 by the construction of the sewers; and in Liverpool, a proverbially unhealthy place, 42 in 1,000. Next to good sewerage was an abundant supply of pure water, and there were various schemes under consideration for procuring a supply of good water for the metropolis.

The premiums for papers read during the year 1867 were presented to Messrs. S. W. Worssam, jun, for his paper on "Mechanical Saws;" A. Rigg, jun., for his paper on "Heavy Guns;" J. Gresham, for his paper on "The Injector;" Ewing Matheson, for his paper on "The Quality of Iron." The following candidates were balloted for, and duly elected, as members—Robert F. Farlie, John Thomas Chappell, Henry Gore, Lieutenant-Colonel Henry Wray, R.E., and George Spencer; as associates—James Knox, Edward Harlock, and C. W. Salmon.

The Lord-Lieutenant of Ireland last week conferred the honour of knighthood on Mr. Charles Lanyon, M.P., President of the Institute of Architects, Ireland. Mr. Lanyon is a member of the firm of Lanyon, Lynn, and Lanyon, architects, Dublin and Belfast. He represents Belfast in Parliament.



:Barton·Church·from·S·E:



:Aisle·Roof: Parish·Church:
Wolverhampton.

E Wimbridge lith

Marton Vicarage : nr. Ousebburn York :

Mr. JOHN LADDS, JUNR. ARCHITECT.

F Wimbridge lith

Printed by Whiteman & Bass

BRICKLAYING IN LONDON AND PARIS.

MR. GEORGE HOWELL and MR. JOHN JEFFREY contributed the two papers on bricklaying to the "Reports of Artizans," to which we referred in the two preceding numbers of the BUILDING NEWS. As these papers are full of useful information, we think we cannot do better than give copious extracts from them. Mr. Howell says that, though there are but few brick buildings in Paris, there are a great many bricks used there. He says the internal walls, vaults, arches, &c., in the new wing of the Louvre, and also in that unique building, the New Opera House, are all of brick. This is pretty good evidence that brickwork, for ordinary purposes, will be the cheapest and (both considered together) the best. One other circumstance shows that brickwork has its advantages, viz., that there is a company started in Paris endeavouring to compete, in building operations, by the use of concrete. It is called,

COIGNET'S BETONS AGGLOMERES.

The company consider that they can build cheaper, that the walls occupy less space, and that the entire building is more solid and fireproof. The composition of the beton is as follows:—20 parts sand, 4 parts lime, 1 part Portland cement. I visited the large block of buildings in "Rue de Miroménil" and "Rue de Naples," built by the company with "betons agglomeres," composed as above. The block of buildings is very large, and is seven storeys high. The entire block is composed of this concrete—walls, vaults, stair-treads, and risers, ceilings (or rather between the floors and ceilings—each is covered in with this concrete, slightly springing from slim iron girders), and even the roof. It is, in fact, a fine specimen of the kind of building, and should give the projectors and proprietors satisfaction. The building is certainly fireproof, there being but very little wood to burn throughout the entire block. The floor is composed of very narrow slips, only 3in. wide, with a very few similar slips bedded in the concrete to nail them to. Then there are the doors and window-frames, all of a slight character. The solidity of the building was something remarkable. Not a single crack or fissure could we discover, as the result of settlement or anything else. Yet I consider it the heaviest block of buildings I have ever seen covering the same space of ground. This fact argues in its favour. With regard to their walls occupying a less space, there was no instance of it in this example of their work. The proportions stand as follows:—English brickwork, 2½ bricks; beton, 2ft.—equal; English brickwork, 2 bricks—18in., beton, 20in.; in favour of brickwork, 2in. English work, one brick, or 9in.; beton, 12in.; in favour of brickwork, 3in. In their vaults the beton was thick at the haunches and about 7in. or 8in. at the crown, but in all cases it would equal our 9in. vaults, or two rings of 4½in. each, and in many cases exceed it. Then, with regard to price, a well-known builder and myself went into the figures, and the result was given to the manager on the spot. Their work on the average costs £15 per English rod; we considered that brickwork equal thereto could be done for £11, or at most £12. It is but right here to state, that the company have put forth a statement with figures, of which this is an abstract:—They estimate that in London they can build in beton per metre cube, or rather let us take equivalents in English, 35ft. cube, at the rate of £1 6s. 11d., whilst in brickwork they estimate it would cost in mortar, £1 9s. 2d., or in cement, £1 15s., or in beton, with 1-20th part in cement, £1 10s. 8d. Thus, taking their own figures at a saving of 2s. 3d. in a metre cube, I do not think that they will be able to compete with brickwork; yet, under a variety of circumstances, beton will be most valuable.

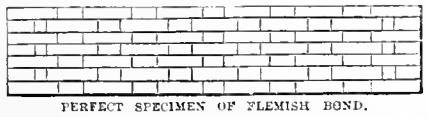
STYLE AND QUALITY OF WORK.

In good brickwork, the first thing to be considered is "bond." There are, properly speaking, but two sorts of bond; one is called "Old English" and the other "Flemish." Old English bond, so called, as it was the only style used in this country up to the time of William III., consists of alternate courses of stretchers and headers; and the Flemish bond, introduced by Flemish workmen who came over with the Flemish king, consists of alternate header and stretcher in the same course. In none of our old buildings will you see Flemish bond.

The English workmen pay great attention to bond, and pride themselves upon its perfection. Many architects and clerks of works select old English bond for heavy buildings, on account of its superior strength. I cannot, of course, deny that its strength might exceed that of the Flemish bond if carried out in all its integrity, but this I affirm, without fear of contradiction, that Flemish bond is equal to every possible and impossible emergency. I defy any architect to point out any one instance of its failure to sustain, without fracture, any superincumbent weight or pressure ever brought to bear upon it. The reason of failure, when any such has taken place, is not the weakness of the style of bond, but the want of bond, by snapping header after header, sometimes for whole courses, in order to save a few front bricks, whether red-rubbers or malms. If the courses are laid regularly and fairly—the headers being properly and constantly placed their whole length in the wall—it cannot fail; I defy it to do so. Nevertheless, the Old English bond should always be used in rough work, inside and outside, as it is a little quicker in practice, and all the "bats" can thereby be used up with facility. And in this there is no fear of failure with regard to strength, as walls never split or separate in the centre; their fractures are generally due to the foundations, for a heavy pier will settle more than a light one, and hence it frequently happens that the fracture takes place through the arches of windows or doors. If I were asked whether the old English bond, or style, cannot be made to look well for front work, I would answer—Yes; but it will always look heavy and confused. It can never have the light appearance of Flemish bond, which I will now examine in all its details, with such examples as I saw in Paris.

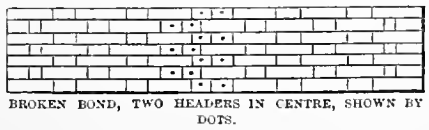
This bond, as I before stated, consists of alternate header and stretcher in the same course. It should be started thus:—First a stretcher, then a header and stretcher, to the end of the piece of wall or pier, always taking care that there be a stretcher at either quoin. (Sometimes this cannot be done in very small piers; the bricklayer will then reverse one of the quoins.) This first course being "run out," start the next course with a header, then a "closer" (a quarter-brick), then a stretcher, &c., till the end of the second course, taking care that both quoins are started alike, as I before pointed out. The following rules should be observed:—1st. If there be any "broken bond," *i.e.*, if in running out your bond you find it does not finish alike at both quoins, then start from each quoin and work to the centre, so that the broken bond, if there be any, may fall in the middle of the pier. Sometimes it will require two headers instead of one; if so, let them follow each other all up the pier until its finish; if you do not, it will detract from the entire piece. Sometimes it will requre three headers, then you will find that it will require two stretchers in the next course, and so on all up the wall. (This is not considered broken bond.) In some instances it will require a three-quarter, but this should at all times be avoided, if possible. Never, under any circumstances, place a closer in the middle, or any other portion of the wall or pier, except at the angles next to the header, as before described. To be partienlar with regard to this, I give the following examples:—

FIG. 1.



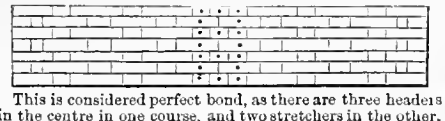
PERFECT SPECIMEN OF FLEMISH BOND.

FIG. 2.



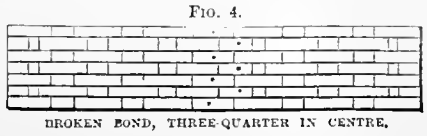
BROKEN BOND, TWO HEADERS IN CENTRE, SHOWN BY DOTS.

FIG. 3.



This is considered perfect bond, as there are three headers in the centre in one course, and two stretchers in the other, as shown by the dots.

FIG. 4.



BROKEN BOND, THREE-QUARTER IN CENTRE.

The beauty of brickwork will very much depend upon the "perpends" being perfectly kept, that is, the perfect regularity of the perpendicular joints right up the building. Stretcher over stretcher should be kept parallel; so also should the broken bond, if any occur. If this be neglected the beauty of the work is entirely destroyed. The work should also be kept upright, and level on the face, the bricks being laid "square" to the line.

I have been thus precise, because I found some of these rules entirely disregarded in Paris. In the first place, the French workmen use a three-quarter at the quoins on the top of the stretcher, instead of a header and closer, as in the examples. Thus the pleasing effect of our quoins in England is entirely lost. I found this rule almost universally broken in Paris.

2nd. If they have broken bond, they seem to be altogether indifferent as to whether it continues parallel with itself up the pier, or whether it be chased from side to side. I shall give some examples of the improper work I saw in Paris, and indicate the proper style, as we should do it in England.

EXAMPLES OF BRICK-BUILDING IN PARIS.

I shall first take some of the buildings on the Champ-de-Mars. There is the Turkish building, with five courses of red Flemish bond, alternate with 15in. blocks of white stone, being equivalent to five courses alternate of red and white. There were three-quarters at all external quoins, and a three-quarter followed by a header at the quoins of all openings. In one pier there was a three-quarters header, stretcher, and a closer, as in fig. 5. It

FIG. 5.

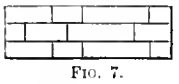


FIG. 6.

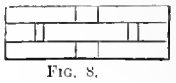


FIG. 7.

FIG. 8.

should have been a stretcher on either side and a header in the centre, with a header and closer in the next course, and a stretcher in the centre, as in fig. 6. Another pier had two headers, one stretcher, and a header, as in fig. 7. It should have been two stretchers and a header, as in fig. 8. In several instances there was what we term chimney-bond—two stretchers and a header, as in fig. 8, when it should have been two stretchers and a header as in fig. 6. One larger pier had header, closer, stretcher, header, stretcher, header, and three-quarter. It should have been header and closer on either side, followed by two stretchers and two headers in the centre. See fig. 2.

Arches of the same building. There were a simple 2in. "camber" on face and soffit, and a large "semi" 14in. face and 25½in. soffit—that is, a brick and half face and two and three-quarters bricks soffit. The face-bond was right; not so the soffit. The long flat arch in the gallery of this building, with two and half bricks soffit, was correct bond; but the piers in support thereof were closer, stretcher, header, and three-quarter, instead of two stretchers, and a header, as in fig. 6. There were six semi-arches, with 18in. soffits, to all of which were wrong bond, being two three-quarters and a header when it should have been two stretchers in one course, and two headers, with closers on either side, and a header in the centre of the next course, &c.

At the entrance of the Catacombes de Rome there was a peculiar arch, constructed on the principle of the trefoil, with three small sub arches and pendants. It was executed in alternate sets of red, white, and black bricks. It looked somewhat tasty, but was essentially weak.

In this criticism on bond, let it not be thought merely a matter of taste, for, even if any person were disposed to question my conclusions as to the appearance of the several piers and arches which have been examined and shown by examples, it still remains a fact that the bond of fig. 2 is stronger than that of fig. 1, 3, or 4.

Chapelle du Parc.—This church presented a very pleasing appearance, and to a non-professional eye would be gratifying and satisfactory. It is built of yellow bricks, with sunk joints, drawn by a thick jointer; has large buttresses, and large Gothic and some small Norman windows. It has an octagon tower on a square base. The arches are coloured red, black, and cream colour. Its fine windows, bas reliefs, and other ornamentations, together with its roof—partly heavy French tiles in different pattern, and specimens of cut slates—make the building, as a whole, look well. But the brickwork is very bad—a no regularity of bond. The openings had been made too large, and patched up with cement 4½in.

and 5in. of a side, coloured and jointed to appear like bricks. It is now cracked away from the brickwork, and shows a straight joint all up the original reveal.

Mr. Howell gives many more instances of brickwork in Paris, and concludes this part of his subject by saying :—Undoubtedly the best specimen of brickwork in Paris is the triumphal arch or "gateway to the front entrance of a mansion," a full-size model, in the outer circle, by George Smith, of London, with terra-cotta dressings, by Blanchard. It has a terra-cotta base: two piers, one on each side, with moulded panels and small cut strings. The centre consists of panels, projections, and mouldings, with terra-cotta facia, frieze, and cornice. The entire piece is a fine specimen of gauge work in Flemish bond, in good red rubbers. Every pier is correct as to bond, as in fig. 1. The bond is preserved in the recesses, set-offs, and angles, whether external or internal. The brick mouldings are well and finely worked. The joints are dipped, and therefore show the workmanship well. It is a credit to the workman who did it, and to the employer who had it done. The arris of the quoins, and the members of the mouldings—quirks, beads, cyma-recta and cyma-reversa, &c., &c.—were as fine as if in marble. Thus the only good specimen was London work. The back part was in old English bond, well kept, and a large two-ring arch.

Mr. Howell gives the following information on prices of brickwork, as quoted :—1st quality, per cubic yard — Solid masses or foundations, £2 11s. 6d.; walls, any height, £2 12s. 8d.; vaults and arches, £2 14s. 2nd quality—Foundations, &c., £2 0s. 3½d.; walls, £2 1s. 7d.; vaults, £2 2s. 9d. Cheapest work—Foundations, £1 2s.; walls, £1 3s. 1d.; vaults, &c., £1 11s. 9½d. The price of bricks varies according to the locality from whence they come; but this is similar to ours—it simply means quality. We have Suffolk whites, Stafford blues, and Ballington reds; also Stourbridge fire-bricks, &c.

Mr. Howell concludes with the following remarks on examples of good brickwork in London: —Good plain gauge-work—No. 82, Piccadilly, the basement of Bridge-house Hotel, the new Sun Fire Office at Charing-cross, gateway and piers of one entrance to Greenwich Hospital, and the grand entrance to Hampton Court. Mouldings—43, St. Martin's-lane (fluted pilasters and cornice), several door-ways in King's Bench-walk and other parts of the Temple, and Old Cromwell House, Hampstead. Machine-moulded bricks—Grosvenor Hotel and other large hotels and stations, particularly on the London, Chatham, and Dover lines. Arches—14, Southampton-street, Strand, the entrance to the Woking Cemetery Station in the Westminster-road; and for groined arches and vaults, the splendid piece of work at the High Level Station at the Crystal Palace. "Tuck-pointing" and good "trowel-work" do not seem much known in Paris.

MR. JEFFREY'S REPORT.

With M. Fouché I visited the concrete houses being built for the Emperor, in the Avenue Daumesnil, the contractor being Mr. Newton, C.E., Chancery-lane. In looking over them I found they are not conveniently constructed. Each house is to accommodate three families, each to have one sitting-room, one bed-room, a kitchen, cellar, and water-closet. A staircase is erected for each three dwellings, and in going up the staircase they will have to pass through the sitting-room and bed-room, to get into the kitchen, which is very awkward. Supposing some one was laying ill in the room, and they wanted to carry anything to the kitchen, they must pass through the other two rooms to get into it, which will be a very great evil; and they must pass through the bed-room to get from the kitchen into the living-room, the bed-room being in the centre. The bed-room and sitting-room are about the same size as the rooms of an English cottage; the kitchen is very narrow. The estimated cost at first was 6,000fr. (£240), not including water and gas. When several of the dwellings were built, the Emperor came to view them. He saw they looked rough and heavy, and he inquired if something could be done to give them a better appearance, and make them more ornamental; and now they are plastering 1½in. of plaster of Paris all over the concrete, and drawing it out to imitate stonework. I am given to understand they will cost now 10,000fr. (£400) each house. It is understood that the Emperor will present them to a society of working men; they being some distance from the centre of Paris, they will be let out at a small rental.

I visited a large house being built of concrete, situate in Rue De Miroménil, No. 98. It has fifteen windows to each storey in front, and has four storeys above the ground floor. The concrete for this house was made in blocks, like stone, and bedded one upon the other with a regular bed; and around the windows and doorways they run the concrete into a mould, to imitate flowers and other devices, similar to stone carving; it has a dull, heavy appearance. It will be very awkward to repair; I cannot see how they can repair it. The building is not admired, nor the system approved of by the French workmen. My opinion is that concrete might do as well as bricks or stone for a cottage or dwelling-house. For a factory, workshop, or other buildings where iron beams, engine gear, steam-pumps, or other fixtures have to be let in the walls, it would not answer; for where there are holes to cut, or the walls to be molested in any way to fix anything to them, I cannot see how they can be made secure, because, when the concrete is once set hard and it is broken, nothing will adhere to it to make it solid and firm like the original.

The men that do the bricklaying in Paris—it being very inferior and requiring no skill—are called limousins. They come from an old province, Le Limousin, now the Département Corrèze. Many of them hold plots of land there, and cultivate them. In the spring, when they can work in Paris, they leave their homes and families to look after this land, and go to Paris. Numbers of them go together. They hire rooms and live together, engage a woman to wash, cook, and look after them. They live cheap, being together; it costs them about 2fr. a day, lodging and all included. They work all the time they can, Sundays as other days, and receive wages for a day of ten hours, 4fr. 50. (3s. 9d.). The labourers' wages are 3fr. There are many young lads, about 15 and 16 years of age, who go up from that province, and they are set to lay the bricks and rough stones in the walls. They are not put apprentices to the trade, but catch it from the others who are more experienced. They are not educated when they first come up: there are night schools which they attend, and receive a very good education, and make great progress. In learning to build walls some become first-class masons (maçons). The first-class mason's wages are 6fr. per day, and sometimes these young limousins become the largest contractors. Some take the laying of stones in the walls by the job, and they are called bardeurs, and their average wages are 5fr. to 5fr. 50c. (4s 2d. to 4s. 7d.) The masons, bricklayers, and labourers, when they have no work, congregate together in the morning, about half-past five o'clock, in front of La Place d'Hotel de Ville (named by the Frenchmen, La Grève), and the employers, when they want any men, go there and hire them, generally taking one limousin and one labourer together. The limousins are very saving; and when the frost sets in, so that they cannot work, they go home with their savings and remain there until the next year, when the work opens again.

In Paris they adopt the system of co operation; that is to say, a number of masons take the masonry work of a large building by contract, and a number of carpenters take the carpenters' work, and other trades the same. Each trade keeps its contracts distinct from the others. The money earned by each trade is equally divided among the men of each trade who so co-operate, so each man is his own master, and earns as much as he can. They work Sundays as other days. They have no day of rest, except once a month. They are paid once a month—the first Saturday in the month—except when the month commences on a Saturday, then the second Saturday in the month. The day after they have received their wages they very seldom work; that is the only rest day they have, except when the weather prevents them from working, and that is where we Englishmen stand above them—we keep our Sunday a day of rest every week.

CATHEDRAL ARRANGEMENT.*

IT seems strange indeed that it should be needful at this time of day to discuss the principles on which an English cathedral church ought to be arranged. Lichfield, Hereford, Llandaff, are facts; they are opened to all the world to go and look at them, if they please. And yet if you speak, especially if you speak to a member of a capitular body, of the simple, natural, and rational arrangements which have been carried out in those three minsters, you are commonly met with a look of blank amazement. People in general, especially deans and canons residentiary, simply do not know what you mean, and seem inclined to set you down as a lunatic for broaching doctrines so strange that they cannot make head or tail of them. The vulgar notion of a cathedral is that it is a church divided into two parts. One part is confessedly intended for divine worship, and into that the congregation is to be crammed how it best may. The other part, commonly the larger of the two, seems to have no certain use; perhaps it was built for the congregation to rub its shoes in before it went into the part intended for worship. Indeed I am not sure that I ought to have said that a cathedral was a church divided into two parts. I once heard it said, perhaps with more practical truth, that a cathedral was not a church, but that it had a church inside it. Anyhow it is held to be the *differentia* of a cathedral that its larger portion should be certainly empty, possibly swept, but on no account garnished. So to be is, if I may quote Greek, the *to li en einas* of the thing. It is what makes it a cathedral, and distinguishes it from any other building which is not a cathedral. Some years ago—things are perhaps better now—I found the small church of Saint Asaph with its nave empty, and its congregation rammed, jammed, crammed into its choir, because, forsooth, it was a cathedral. I was told with great glee in the noble parish church of Grasmont, in Monmouthshire, "Our church is like a cathedral." That is to say, the choir was crammed with pews, and the nave stood empty and desolate. The historical origin of this error is very plain. In monastic churches the accommodation of the ecclesiastical body was everything; the laity were present only on sufferance. If, as often happened, the parish church and the monastic church were under one roof, the parishioners had no rights in the monastic part of the building. They had their own parish church, with nave, choir, and high altar, forming one architectural whole with the church of the monks, but for all legal and ritual purposes distinct from it. The monks, moreover, had to perform constant services, some of them by night. If they found it convenient and comfortable to fence themselves in their choir by high walls and solid screens, they had a perfect right to do so. The laity had a choir and high altar of their own, and they suffered no wrong in being cut off from the choir and high altar of the monks. In parish churches the arrangement was always different. No one ever doubted that the parishioners had a right in the high altar of their parish church. No one ever doubted that the service said in the choir was a service which ought to be audible and intelligible to the congregation. In a parish church therefore, though the choir was always fenced off with a screen, it was a screen which was so light as not seriously to interfere with sight and hearing. Now a cathedral church served by secular canons differs in no way in principle from a parish church. It is not, as ecclesiastical dignitaries would sometimes have one believe, the private chapel of the dean and chapter. It is the church of the bishop and his flock; it is the common church of the diocese, the church where every man living in the diocese is as much at home as in the church of his own parish; it is the great model church of the diocese, the church which ought to set in everything a standard which smaller churches may follow as nearly as their means allow them. It is, therefore, larger, more enriched and served by a more numerous clergy, than other churches. But whatever rules of arrangement apply to the parish church apply to the cathedral church, and *vice versâ*.

Now it happened unhappily for this Church and realm, that several of our cathedral churches came, by a change introduced in the tenth century, to be served by monks, instead of by secular clergy. A cathedral thus served was at once put in a false position as regarded both the bishop and the people. Monks naturally tried to oust both bishop and people as completely as they could. An exaggerated love of corporate independence was characteristic of the times, and the monks carried it to the highest pitch. The example spread to those cathedral churches which were still served by secular clergy. Deans and chapters made themselves as independent as they could, both of the bishop and of the people. The cathedral gradually came to be looked on as their freehold, with which they might deal as they pleased. They gradually deprived the bishop of all direct authority, and reduced him to a mere visitor. Looking on the church as their own, they fenced their

*A paper read at a meeting of the Worcester Diocesan Architectural Society, January 14th, 1868.

choirs in with high walls and solid screens, just as the monks had done. They did thereby, what in a purely monastic church was not done, a distinct wrong to the whole people of the diocese, who ought to have the same access to divine worship in the common church of the diocese as they had in their several parish churches. The solid screens, I need hardly say, were originally built to keep the laity out of the choir. A revolution now occurred which exactly reversed their use. The changes of the 16th century affected the question in many ways. The old rule of the nave for the people, and the choir for the clergy, was no longer strictly observed. Sometimes the clergy invaded the nave; sometimes the people invaded the choir. In the cathedral churches the latter corruption took place. The clergy and choir were in many places no longer enough to fill the choir. Their actual numbers were in many cases reduced. The laxity of residence which had crept into the unreformed Church still remained. Many a stall had no owner, or an owner who never occupied it. At the same time the services now began to be said in the vulgar tongue, and people were naturally more anxious to hear and join in every word. A solid screen is undoubtedly not so great a barrier to hearing the service as people think. One who is familiar with the service can stand in the nave and follow with no great difficulty; but so to do requires one who is familiar with the service. It is no wonder that, when the English services were held, people were anxious to get as near as they could to the clergy. In parish churches the priest often left the choir, and came out to a reading pew in the nave. In cathedral and collegiate churches the laity commonly thronged into the choir, into which the clergy, with their diminished numbers, no longer thought of forbidding their entrance. The solid screens, built to keep the people in the nave and out of the choir, now served to keep them in the choir and out of the nave. The notion gradually spread over men's minds that the choir was the place, not only for the clergy and singers, but for any worshippers whatever, and that the nave was nobody could tell exactly for what. As far as I know, one church alone in England preserved the ancient arrangements down to our own times without yielding to the fashionable corruptions either way. This was the collegiate church of Wimborne Minster. I remember that small but most interesting minster as it stood 20 years back. The choir, raised on steps, fitted with an open screen of the time of James the First, was still occupied by the clergy and choir, while the congregation occupied the nave. The dignity thus given to a church certainly not above the third rank was most striking. One could have wished to get rid of an organ over the screen and of certain pews and galleries in the nave, but all the essential arrangements were there. The demon of restoration has since visited Wimborne as well as other places; he has, indeed, moved away the organ, but, in so doing, he has lowered the steps and carried off the screen and the canopies of the stalls. Such is the taste of the nineteenth century. The nineteenth century, however, if often blind, is often well-intentioned. That our great naves should stand empty has gradually offended people's common sense, and the fact has gradually dawned even upon deans and chapters. The remedy has generally been what is called "service in the nave." That is to say, instead of the people trespassing in the choir, the clergy are set to trespass in the nave. I do not deny that in some minsters this practice may be unavoidable. Churches like York and Canterbury are perhaps too large for the whole space to be made available at once. I say "perhaps," because abroad, in churches like Amiens, whose area cannot be much smaller, the whole of the nave and choir is made available at once. Again, when the solid screen is of very ancient or beautiful work, there will naturally be a strong antiquarian feeling against destroying it. I leave these two classes of cases with a "perhaps." But as to our cathedral churches in general, I say, without the slightest feeling of doubt, as the result of many years' thought and inquiry on the subject, that the right course is neither to cram every congregation into the choir, nor yet to have alternate congregations in the nave and the choir, but to use both at once, the people in the nave, the clergy and singers in the choir, the choir being fenced with a light open screen. No arrangement can be simpler, and yet people seem not to understand what it means. To such persons I can only suggest that Lichfield is accessible by railway, and that Lichfield is now the model church of England. I name Lichfield as a beacon. I may also name Hereford and Llandaff, though there are defects in both. I regret that at Hereford the choir was moved from its ancient position under the tower. I regret that at Llandaff the ancient space of the choir was contracted, and that there was, when I was there last, no screen at all. These two churches then are not so perfect as Lichfield, but all the essentials of a correct arrangement are preserved in them, and where so much has been well done I am not inclined to find fault. I will name two other churches—not as beacons, but as warnings. First comes the cathedral church with which I am most concerned, that of Wells. That minster was unluckily "restored," as it called, a little too soon. It was done before these things were properly understood, under a dean who strangely combined boundless munificence with obstinacy and ignorance. Every kind of savage barbarism was committed: the very monument of the great benefactor, Beckington, was not spared, but, seemingly from sheer wantonness, deprived of its canopy. And on the tomb, not of the benefactor, but of the destroyer, we read, "Multum ei debet Ecclesia Wellensis," a happy adaptation, one would think, of Lucan's address to the kindred destroyer, Nero:—

> Multum Roma tamen debet civilibus armis,
> Quod tibi res acta est.

But among the other enormities done at Wells at that time and since, I have now only to deal with the arrangements of the choir. One must suppose that Dean Jenkyns knew that the nave existed, as he could hardly have got to the choir door without going through it. But he clearly thought that a nave was built to rub shoes in. His only idea was to cram his congregation into the narrow space of a choir and presbytery. It was thought a great feat to move the stalls from the proper place in front of the pillars, and, instead, to stick them between the pillars. Thus the continuous range of stalls and canopies, so glorious at Winchester and Ely, are wholly lost, the stalls being set, four or five together, between the pillars. The miserable effect, the destruction of all harmony and propriety, is easily imagined. Then the stalls, mere articles of furniture after all, are actually made of stone; the way in which the stonework and woodwork are joined together is painfully ludicrous. And it will hardly be believed that, quite lately, instead of there being any movement for destroying these abominations, a large sum has been squandered in enriching their backs with a sort of diaper work, thus recognizing and perpetuating the mischief. Below the stalls, are other stalls allotted to women (who sit, oddly enough, cheek by jowl with the officiating ministers, the priest vicars), and so all the evils of appropriated seats are let in. The less dignified part of the congregation is driven up into the presbytery, to block up the way to the high altar, which is made utterly insignificant, through lack of steps and of proper height in the reredos. The organ, of course, blocks up the eastern arch of the lantern. The whole arrangements are the exact antipodes of Lichfield. The arrangements of Wells are an undying disgrace, as the arrangements of Lichfield are an undying honour, to all who had any hand in either. The effect of these Wells arrangements within the choir speak for themselves. But ever and anon, on certain special occasions, there is "service in the nave." This means that the choir is forsaken. On the very occasions when there is a larger attendance than usual of the canons, it is impossible for them to take their proper stalls, and they are stuck, in a confined hugger-mugger way, in the eastern bays of the nave. The congregation is cut off from the altar, or sometimes, to make the absurdity greater, a sham altar is put up outside the screen. And all this in a small minster where no screen work of any value is left, where there was absolutely no necessity for not forestalling, where there is now no excuse for not imitating, the correct arrangements of Lichfield and Hereford. And yet I have found people who simply could not understand what I meant when I urged the necessity of rendering the nave available. Their only notion of getting more space was—it sounds hardly credible, but such is the case—lengthening the choir to the east, by throwing in the lady chapel, after the barbarous manner of Salisbury. The other case of warning is at Bristol. As the nave of that church, is about to be rebuilt, there is some chance of better things, but at present the arrangements are certainly the most absurd in Christendom. The old nave having vanished, a nave and choir had been made within the remaining space, that of the crossing, the choir, and the lady chapel, the high altar being thrust to the extreme east end. Unluckily the usual plan was followed of cramming the congregation into the choir. By way of reform, the whole of the old fittings have been destroyed, and a glazed screen has been stuck across the eastern lantern arch, cutting off the crossing. The tradition that a cathedral must have some empty space cut off by a screen of some kind thus far survived. East of the screen is the congregation, east of them the clergy, the grotesque thing being that all the ancient traditions of choral arrangement are forsaken, the dean having a throne opposite to that of the bishop! The practical mischief is not so great as at Wells, but the absurdity and grotesqueness of the effect is without a parallel. Now the Dean and Chapter of Worcester have, like Hêraklês, to choose between virtue and vice. They have no such plea about size or the like, such as may possibly be admitted at York or Lincoln. The question lies before them—will they imitate any perverse device like those of Wells or Bristol? or will they have sense, taste, or vigour enough to follow the good examples of Lichfield and Hereford? A great responsibility lies upon them. It is open to them to turn over a new leaf, and to wipe out the memory of their old misdeeds. The destroyers of the Guesten Hall, before all men in England owe a duty to men of taste and knowledge throughout all England. Let the arrangements of Worcester Cathedral be such that the name of the Guesten Hall need never be brought up against them again. Let them make Worcester another Lichfield, and no one will refuse them the friendly greeting which the prophet promises to every returning penitent.

EDWARD A. FREEMAN.

Somerleaze, Wells, January 13, 1868.

THE BUILDERS' BALL.

TO "trip the light fantastic toe" is almost always delightful, even for its own sake; but if in pleasing ourselves we can also manage to please others, the result is doubly satisfactory. We know a way whereby our readers may secure this double satisfaction. Let them attend the Builders' Ball at Willis's Rooms on the 30th inst. If they will, we can promise them, judging from past balls, a large company, beautiful ladies, excellent music, plenty of dancing, and a substantial supper. Considerable benefit results to the charity from this annual ball, the entire superintendence of which is admirably carried out by Mr. Joseph Bird, one of the directors, and who for several years has acted as honorary secretary to the ball. The Builders' Benevolent Institution was commenced in 1847, for the relief of decayed master-builders, &c., and their widows; and have now upon their funds 45 pensioners—25 males, receiving £24 per annum, and 22 females at £20, with a funded stock of £9,150.

NOTICES OF PUBLICATIONS.

"Curiosities of London." By JOHN TIMBS, F.S.A. A new edition, corrected and enlarged: Longmans.

PERHAPS "Curiosities of London" is hardly the most appropriate title to describe this remarkable volume. It is really a cyclopædia of London—a handbook or treasury of reference to the thousand and one objects of interest — buildings, institutions, amusements, laws, manners, customs, and observances—within and connected with the metropolis. Of the great value of the work itself, alike to professional and non-professional men, there can be no doubt. No more reliable or entertaining guide could be named than Mr. Timbs, who can boast of having nearly sixty years' personal recollections of London, and his numerous works of this class testify to the tenacity of his memory, and the greatness of his industry. The present work was originally published in 1855. It has been corrected and enlarged, and the portly volume now before us may be truthfully described as a library in itself. And no mean one either.

"The Savage Club Papers for 1868." Edited by ANDREW HALLIDAY: Tinsley, Brothers.

ONE of the very latest, and one of the very best of our annuals. The work of which this is the second series, consists of contributions in prose, poetry, and pencil, by the members of a well-known *coterie* of authors and artists. The object they have in view is the formation of a fund, to be devoted to the relief of distress in their ranks

when such may happen. The editor, however, is careful to state that "we appeal to no one's charity. There is the book—let it stand upon its own merits." To enable the reader to judge what these merits are it will be sufficient to mention that the volume contains upwards of thirty papers and poems, contributed by G. A. Sala, J. R. Planché, A. Halliday, John Oxenford, Westland Marston, Dion Boucicault, T. W. Robertson, John Hollingshead, Walter Thornbury, James Greenwood, W. Brough, and other well-known light literateurs. Among the artistic productions, those of Gustave Doré, George Cruikshank, Harrison Weir, E. C. Barnes, and J. Palmer, are more particularly worthy of mention. We give one of the illustrations, and an extract from the book, elsewhere. The volume is got up with taste.

"The 'Edina' edition of Burns." Illustrated: W. P. NIMMO, Edinburgh.

UNDER the poetic and very appropriate title of "Edina," Mr. Nimmo has issued an elegant edition of the poems and songs of Scotland's national bard. There have been innumerable editions of Burns, but it would be difficult to produce a more creditably executed work than this. It is illustrated with engravings from original drawings by R. Herdman, Gourlay Steell, John McWhirter, W. M'Taggart, Waller Paton, S. Bough, D. O. Hall, Clark Stanton, and other Scottish artists of distinction; it is admirably printed on toned paper, and handsomely bound in green and gold.

"Haddon Hall." By GEORGE CATTERMOLE: W. Bemrose & Sons, London and Derby. Illustrated.

OF famous English mansions, few are better known or more celebrated than the castellated hall of Haddon. Its embattled turrets, its spacious courtyards, its terraced gardens, its noble banqueting rooms and curious galleries, its fine old domestic chapel, and all its quaintly interesting belongings, together with its picturesque situation on the banks of the Wye, have been lovingly described and dwelt upon by architects and antiquaries times without number. Mr. Cattermole here furnishes an additional account of the history and antiquities of the mansion, the only fault of which is its brevity. The book contains a series of twenty lithographs, from drawings made on the spot. The illustrations consist of exterior and interior views of Haddon, many of which are badly drawn. The lithographer has, in fact, half spoiled his illustrations by overloading them with work.

"Plympton in the Olden Time." By JAMES HINE, F.R.I.B.A.: Keys, Plymouth. 1867.

NOT many persons, barring the dwellers on the Plym, know where Plympton is. Nevertheless, the Devonshire town, so called, is one of the most interesting old world nooks in all England. Plympton may be said to have no recent history—it belongs to the past. Once upon a time, it was a much more significant place than its neighbour Plymouth. Its Norman castle was the residence of the redoubtable Baldwin de Rivers, the second Earl of Devon, and Lord of Plympton; its priory was once the richest and most flourishing in Devon; Sir C. Wren represented the town in parliament in 1685, and was probably the first architect ever returned to the House of Commons; and it gave birth to the greatest of English painters—Sir Joshua Reynolds. "The old grammar-school," remarks Mr. Hine, is the most venerable and interesting school of art in England. Not only was Reynolds educated within its walls, but Northcote, Haydon, and Sir Charles Eastlake were also pupils at this school. This building, which is Gothic, of picturesque design and arrangement, was erected in 1664. An engraving is given of the cloister of the grammar-school, the subject of almost the first drawing Reynolds ever made. We have also illustrations of Plympton Church, two curious old houses with slated fronts, in which the slates have been cut in the shapes of clubs, spades, hearts, and diamonds, and particularly of a fine Norman doorway at the priory, which has engaged shafts on each side, and the chevron ornament carried round the jambs as well as the arch, which latter is formed of alternate voussoirs of grey and green stone. Mr. Hine's little history is well worth perusal.

"Norwich Drainage:" Jarrold & Sons, Printers, Norwich.

THE proposed expenditure of £75,000 (with no guarantee, we are told, that it will not amount to £100,000) upon the drainage of Norwich, is being viewed it appears with "the utmost alarm," by the ratepayers of that venerable but somewhat contentious town. We have before us the memorial of a number of the ratepayers (how many we don't know) to the Board of Health, in favour of what is now known as the earth-sewage system, as against the water-closets and irrigation system. Stated concisely, the argument of the memorialists is that the water-closet system has been attended with serious evils, and that it is doubtful whether the irrigation is not itself rendered noxious and pestilential. They advocate for the other system a fair trial, on the ground that it has been adopted in some public buildings in this country, and has been approved by the Indian government; moreover, that it is *prima facie* consistent with nature. They adduce a large amount of carefully collected evidence to support their argument, and to combat the teachings of Mr. R. Rawlinson, Mr. Latham, and other prominent advocates of water-closets and irrigation. We recommend the evidence to the attention of our readers. The question has become one of pressing public importance, and the Norwich ratepayers have at least a right to be heard.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Baptist Chapel was opened on Wednesday week at Henley-on-Arden. It is built of blue Wilnecote stone, with Bath stone dressings, and will hold 200 persons. The style is Gothic, and it was erected by Messrs. Clarke and Smallwood, contractors, from the designs of Mr. George Ingall, architect, Birmingham.

On Saturday morning a violent gale of wind raged in and about Wells, which has done damage to the beautiful and unrivalled west front of the cathedral, upwards of 300 cwt. of the ornamental work having been blown from the northern tower of the west front.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting on Monday, at the Society's-house, No. 7, Whitehall; the Earl of Romney in the chair. Grants of money were made in aid of the following objects:—Building new churches, viz., St. John the Evangelist, in the district parish of St. Paul, Balls-pond, Islington; St Saviour, Everton, in the parish of Alveley, near Bridgenorth; enlarging or otherwise increasing the accommodation in the churches at Chart Sutton, near Staplehurst; Chrishall, near Royston; Llantrissant, near Newport, Monmouth; Ormsby, near Great Yarmouth; St. Austell, Cornwall; and South Thoresby, near Alford. The society likewise accepted the trust of sums of money as a repair fund for the chapel of Cowgill, in the parish of Sedbergh, York, and for Hanney Church, Berks.

Designs for a limited competition is invited for a new church in Lichfield. The church is intended to be a memorial to the late bishop of the diocese.

St. Michael's and All Angels', Brighton, which was erected three or four years since from designs by Mr. Bodley, is about to be enlarged, we may say reconstructed, under the architectural superintendence of Mr. Wm. Burges.

BUILDINGS.

The crypt beneath Westminster-hall has been redecorated and gilded by Messrs. Crace, of Marylebone.

A company has been started, and a considerable amount of money has been raised, for the purpose of building a pier at Saltburn-by-the-Sea. Contracts for the work have been let to Mr. John Anderson, of Middlesborough, and it is said that the pier will be completed in June next. A landing-place for vessels has long been needed, and when the pier is finished many excursionists from the Tees, the Wear, and the Tyne will have an opportunity of spending a pleasant day at little cost in this really beautiful watering-place.

New cattle-markets are to be constructed at Melton Mowbray, the expense of which will be met by the funds of the "Town Estate." As usual, in almost every work of the kind, great difficulty and difference of opinion exist in respect to the site. It is earnestly hoped that the mistake made by a neighbouring town, viz., of placing it as far as possible from the railway station, will not be repeated in this instance.

A new wing called "the Eyre Crabbe Wing" has been added to the Royal South Hants Infirmary, Southampton, by the widow of Colonel Eyre Crabbe, R.H., an old Peninsular officer, at an expense of £3,600. The building, which was designed by Mr. Crichton, architect, Southampton, consists of a set of store-rooms on the basement floor, above which are two wards, each affording space for eighteen beds. The wards are built on the most approved principles of hospital construction, the floors being of oak, and the walls and ceilings of Parian, which gives a polished non-absorbent surface.

The new Town-hall for the Pendleton district of Salford borough is nearly finished. The building is situated at the corner of Broad-street and Broughton-road, and has, from its commanding and open position, a very pleasing effect. It is built in the Italian style of architecture, and is from the designs of Mr. Alfred Darbyshire, of this city, the contractors being Messrs. Cochrane, Parker, and Co., also of this city. The probable cost will be from £8,000 to £10,000.

WATER SUPPLY AND SANITARY MATTERS.

In fourteen districts of the Madras presidency, says Mr. Jacob, there are 43,000 irrigation reservoirs now in operation; 10,000 more have fallen into disuse. The embankments, by which their waters are retained in hollows, valleys, and combes, average half a mile in length. One dam now broken is 30 miles long, and encloses an area of from sixty to eighty square miles.

The town of Alford, in Lincolnshire, which should, from its position, be one of the healthiest in the kingdom, is, from the prevalence of dirt, and want of drainage and good sanitary measures, scarcely ever free from contagious disorders. Some of the leading inhabitants succeeded a short time back in forming a local board, only, however, to encounter the most obstinate opposition from the town's people. Scurrilous handbills, containing gross personalities, have been widely circulated, personal violence threatened, and hundreds of pounds, diverted from their proper object of benefiting the town, have been uselessly spent in legal proceedings. A correspondent says some of the respectable inhabitants are leaving the place, and trade is becoming seriously injured.

Dr. Letheby's annual report on the sanitary condition of the city of London has just been presented to the Commissioners of Sewers. That portion of it which relates to the cholera epidemic of 1866 is extremely valuable. Dr. Letheby considers that the water theory, as to the production of disease by choleraic pollution, is disproved by the facts he adduces. He says the native home of the cholera is the swampy and low-lying districts of India, and, in its visitations to this and other countries, it always follows the lines of traffic. In 1867 the city of London appears to have had an exceedingly low death rate, and to have been exceptionally healthy.

In order that no delay may take place in the carrying out of the works at Sefton Park, Liverpool, the council met specially on Wednesday for the purpose of accepting a tender for executing sewerage, excavating rock, and other works. Several tenders have been received, and the improvement committee have recommended the council to accept that of Mr. S. Campbell for £72,345. The work will be immediately proceeded with.

Mr. Tidd Pratt, in a paper which he has just issued from his office, states that he is almost every day receiving complaints from persons who cannot obtain payment of their claims from burial societies, and he calls upon the public press, clergymen, and others to endeavour to prevent the working classes from joining burial societies established under the Friendly Societies' Acts without first ascertaining that they are joining solvent institutions. There is reason to believe that considerable misapprehension exists among a large section of the public as to the purport of Mr. Tidd Pratt's certificate, which it is so common to see quoted as if it were a guarantee of the soundness of a society. It should, therefore, be understood that he is bound to certify the rules of a society if they are not illegal, and that his certificate as to the sufficiency of the contributions does not in any way vouch for the solvency of the society, or the respectability of the trustees, treasurer, or officers, or that the money will be paid on the death of the party insured.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

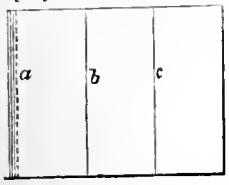
Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p m on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

SIR,—In binding the BUILDING NEWS how should the illustrations be placed, as binding them in double would destroy the whole sheet engravings? Would you kindly inform me of the best method?—ANXIOUS.

[Any ordinary bookbinder can insert the double sheets in the volume without injuring them. He has only to give each sheet an extra fold. Let the following diagram represent the sheet. The shaded part is stitched in between the leaves: *b* and *c* represent the folds. Let the fold *c* fall on the dotted line *a* and the thing is done.



E. W. PUGIN's letter too late.

W. H. S.—You will find some of the information asked for in "Photographs from Sketches," by Augustus Welby Pugin, published by Ayling, Oxford street.

MR. W. BURGES writes to say that, on account of pressing professional duties, he has been unable to send the second article on "Art Workmanship at the Society of Arts."

TURNERS' YELLOW.—An oxychloride of lead has been manufactured under this name, by heating together salammonia.

RECEIVED.—S. H .S.—G. B.—E. L. B.—R. L B.—H. H. S.—P. E. M.—I. N.—C. H. and Co.—L. R.—R. and S.—T. H.—T. C.—G. H. O.—G. W. B.—M. H. and Co.—I. D. D.—B. S. and K.—Messrs. L.—T. L.—W. and C.—I. P. S.—B. and Co.—R. G. K.—R. and S.—R. N. Y. (2s. 6d.) G. R. R.—(I. D. D., the copy did not come to hand)—I. V., Exeter, next week.—W. U. L.

Correspondence.

ARTIZANS' REPORTS.

To the Editor of the BUILDING NEWS.

SIR,—I note that of the money raised for sending English workmen to Paris, a portion has been employed, as usual in these matters, in sending Germans. In the BUILDING NEWS last week, p. 22, I find our great English trade of watchmaking, in which we hold a high rank, represented by Hermann F. Jung, silver-work by P. A. Rasmussen, bookbinding by Louis Genth.—I am, &c.,

D. Y.

[Has not our correspondent found something like a mare's nest? There are hundreds of men born and bred in this country who inherit German and French names, but who are, nevertheless, excellent English citizens. Those mentioned above evidently possess considerable ability, and write the English language well; and we see no reason why they should not be selected by the Society of Arts to report on artizan-work at the Paris Exhibition. In fact, we see good reason that they should be selected, supposing them to be competent men and able to speak French, as in all probability they can.]

PREVENTION OF FIRES IN THEATRES.

SIR,—A communication in your journal for the 3rd of January, from a correspondent signed B., has induced me to address you upon the above-named subject, which has occupied my thoughts at various times for several years. Having had opportunities in former years of becoming acquainted with the general construction and arrangement of several of the metropolitan theatres—previous to their destruction by fire—and from what I have observed, I fear that all theatres, as generally constructed, are doomed at some time or other to the same fate—destruction by fire. The remarks of your correspondent B. are very applicable to the purpose stated, and I believe many provisions have been made for the same purpose; but, in my opinion, the great and principal precaution should be in the construction of the theatre at first, which, if well studied and carried out, although it might not prevent fire or make a theatre fireproof, might do so to a great extent, and thereby prevent the fire from spreading so rapidly, and causing such entire destruction as hitherto. The destruction of a theatre by fire, and its prevention by the manner of construction, as well as the several appliances for extinguishing the fire, has, I believe, been frequently discussed, and various arrangements proposed; but I do not remember any proposition for a more general use of iron as a principal material in the construction of the interior of a theatre, in place of the great amount of timber and woodwork generally used, which, with the great quantity of other inflammable matter, is, as your correspondent B. states, so easily ignited, and converts the interior of a theatre into a body similar to a well laid preparation for a fire in an ordinary grate that only requires the match to be applied, or, in the case of a theatre, an unobserved spark, the result being a sudden and powerful conflagration, which the best contrivances and arrangements have hitherto been unable to check or to overcome, destroying in a few hours all that had so recently been so valuable and beautiful. This has led me to think that, if a more general and judicious use and combination of wrought and cast-iron was used in the several parts of the construction of a theatre, very much of the destruction and loss would be prevented. For the walls and other parts of a theatre, good sound brick masonry, wherever it can be used, must be considered the best material, as shown by the remains of Her Majesty's Theatre.

The manner in which iron is used in the construction of the roofs of the principle railway-stations at their London termini suggests, I think, the way it might be applied in the formation of a roof to a theatre, and by the proper arrangement of the several parts to suit the purposes required, might be made the means of sustaining the usual amount of flooring for painting-rooms and shops. The framing of the necessary machinery, flies, &c., all of which might be formed more or less of iron, also parts of the framing for carrying the wings, might be composed of rolled angle or T iron, especially those parts most exposed to the action of the wing lights, thereby doing away with the necessity of covering those parts usually formed of wood with plates of tin to avoid ignition.

The principal girders, joists, framing, and supports of the stage might also be formed of rolled and boiler-plate iron, giving more strength, in less space than wood.

The principal flaps, falls, slides, and grooves, might be formed of plate iron, covered with boards, to correspond with the floor of the stage. Iron framing might also be introduced into, and form parts of, the fronts, floors, partitions, doors, supports, &c., of the audience portion of the theatre, the decorated surfaces being formed by carton pierre or other varieties of similar material for ornamentation, drapery, looking-glass, &c., attached to the frame, also much of the ornamentation in relief, sunk and perforated panelling, mouldings, &c., might be formed of iron.

Where the floors of the several passages, corridors, &c., could not be formed of arched masonry, they might, as well as the floors of the saloons, dressing, and other rooms, be constructed in the manner and of the materials known as Fox and Barrett's, or others, the upper surfaces being laid with ornamental tiles, stone, or wood, as required. Any apertures or doorways only occasionally required to be open, might be closed by Clark's or other iron shutters. Iron shutters or curtains have, I believe, been applied to shut off the stage from the audience.

The halls, approaches, and stairs would necessarily be formed of masonry, or a combination of iron, and might be so arranged as to be separated from any parts of the building where fire might occur, and thus remain uninjured. By the means herein suggested, many parts of the theatre would become separate compartments, so that a fire occurring to the drapery, furniture, &c., in one or more of these compartments, might be checked before communicating with other parts, and, as I have before stated, be prevented from spreading so rapidly as it usually does. It may be objected that I have suggested the use of iron too freely, and that the expansion or contraction would be a serious obstacle; but I apprehend that the advanced scientific knowledge of the nature and properties of iron, and its application in large quantities, as shown by the works and constructions of our principal engineers, would enable any of our eminent architects to construct such a building as I have shadowed out.—I am, &c., W. C. J. WEST.

33, Percy-street, Bedford-square, W.

DARLINGTON WORKHOUSE COMPETITION.

SIR,—It was well you headed the observations on the above competitions "communicated," for it is far from being fair and impartial. There are some very good plans and some very neat and suitable elevations, but the competition seems very likely to prove as very many others before it—"unsatisfactory;" and, if this is a specimen of others, I am not surprised at the constant complaints from the architectural profession. It is notorious here that every underhand influence is being used by some local competitors to secure the prize, notwithstanding the "worry" which your correspondent foresees, three having sent either pamphlets or circulars to the several guardians and those most likely to influence them, headed, "What a Workhouse should be," &c., and which, of course, explains their design. In addition to some of the competitors "haunting the place," their friends are constantly there—one newly elected councilman, elated no doubt by his recent "victory," wishes to set every one right, and, having one favourite in whom he is much interested, is to be found in all sorts of positions explaining the merits of this particular design to all comers, especially any stray guardian—at the same time artfully stabbing each of the others in its turn.

It is observable, also, that several of the competitors have deliberately violated the "conditions," both as to scale and colour. The scale was to be one-eighth, but some are very much less than that. The perspectives were to be in outline only, or etched with the pen, but some are highly coloured. This ought not to be allowed. It is proposed that a professional gentleman should be engaged to select the three required. This seems the only way now to mend matters. If he is a suitable and honourable man, and the guardians abide by his decision, justice may yet be done, and a great scandal removed from the town. What, Sir, is the remedy for all this constant complaint? I think that, if competitors themselves would be honourable, much might be saved, and that, if the committees would generally employ an unbiassed professional man, possessing a fair share of ability and common sense, they might save themselves much unjust imputation.

LOOKER-ON.

LONDON ORPHAN ASYLUM COMPETITION.

SIR,—In your remarks upon the late competition for the London Orphan Asylum at Watford you state that the third premium was awarded to a "Mr. Webster." I shall be obliged if you will kindly correct this, as I had the honour of receiving that distinction. It is not for me to discuss the particular question you propose, but I should be rejoiced to do anything towards placing architectural competition on an honourable footing, one half the evils of which are created by those upon whom the whole recoil.—I am, &c.,

THOMAS H. WATSON.

9, Nottingham-place, W., January 23.

REBUILDING ST. ANDREW'S, HERTFORD.

SIR,—I enclose the conditions to architects for the St. Andrew's Church Competition, at Hertford, advertised in last week's BUILDING NEWS. If you could find it a corner I would be obliged. It shows what a "remarkable nerve" the committee have.—I am, &c., ALFRED W. PHILLIPS.

5, Offa-street, Bedford, January 22.

Materials.—Left to judgment of Competitors. Bricks of all kinds, also flint, can be had in the neighbourhood.

Cost.—The old materials of present structure, except such parts as belong to and are connected with the tower, will be given, in addition to £3,000.

Accommodation for six hundred sittings, of which from seventy-five to one hundred must be for children.

Tower.—The new work must be properly connected with this; but the design can propose rebuilding of the same, or its removal to another position.

Site should be visited by every competitor, as the old church and tower is at present standing thereon. No block plan, therefore, will be sent.

Payment will not be made by the committee for any of the drawings, specifications, correspondence, travelling expenses, postal or other charges connected with this competition.

Architect.—The committee are not to be canvassed, since it is their intention to select (if any) that design which in all respects is the most worthy of merit; and on satisfactory references being given, it is their intention to employ the successful competitor as architect, on the usual terms. CHARLES N. WILLIAMS, M.A., Hon. Sec.

January, 1868.

Petroleum is said to have been discovered at Broseley, Shropshire, while sinking a shaft in a field.

Intercommunication.

QUESTIONS.

[716.]—HOW TO ASCERTAIN TRANSVERSE STRAIN You would oblige by informing me the lengths of bearing usually adopted when ascertaining the amount of transverse strain any such substance, as a bar of iron, &c., will bear.—R. N. Y.

[717.]—RED PINE GIRDER.—Will you, or any of your numerous correspondents, oblige me with a formula for ascertaining the breaking weight of a red pine girder, with ½in. wrought-iron flitch in middle of ditto (as per sketch),

Wrought-iron length bolted to timber.

if bearing is 14ft. in clear? According to Hurst, an ordinary beam of this size breaks with 784cwt. on the middle, and with the introduction of the wrought-iron flitches, at 700 cwt., which I do not think can be correct.—DEVONPORT.

[718.]—CONCRETE.—1. Does the Building Act permit houses to be built of concrete? 2. Is concrete as durable as brickwork? If not, what is the relative durability of the one to the other? I infer, from the silence of the champions of concrete on the subject of its durability, that they have nothing to say on that head that will be to its advantage.—C. T. S.

[719.]—COMPOSITION ORNAMENTS FOR PICTURE-FRAMES, AND ORNAMENTAL MOULDINGS, &c.—Can any of your readers give me a good receipt for the above?—D. G. M.

[720.]—LINSEED OIL AND TURPENTINE.—How can I, in a simple way, ascertain whether linseed oil and turpentine are adulterated?—W. W.

[721.]—VARNISH FOR PIPES.—I should be glad if some one would give me some information as to the constituent ingredients of Dr. A. Smith's varnish for pipes, and how it is applied.—J. H. H.

[721.]—PUGIN TRAVELLING STUDENTSHIP.—I would feel much obliged if any of your readers could afford the information concerning the Pugin Travelling Studentship, when vacancies occur, necessary qualifications, &c Also if there will soon be an opening.—CELT.

[Our correspondent is informed that intending competitors for the Pugin Travelling Studentship are required to send in the necessary drawings to the rooms of the Institute of British Architects (9, Conduit street, Hanover-square), on or before Friday next the 31st inst. Carriage and all expenses must be paid. Any further information on the subject "Celt" may obtain by applying to Mr. C. L. Eastlake, the assistant secretary of the Institute.]

[722.]—IRON MINIUM PAINT.—Can any correspondent inform me where this description of paint is produced? I want to know whether it can be applied to wood as well as iron for preserving purposes.—C. C.

[723.]—AN ARCHITECT.—If an architect employs a quantity surveyor and take a portion of the money for the quantities, and if there should be a deficiency, can the architect be made responsible to the builder?—A. A.

[724.]—SMOKY CHIMNEYS.—I shall be obliged if you will inform me whether strong winds affect the draught of wide or narrow chimneys most; also whether you would consider 10in. diameter a sufficient size for a common kitchen chimney?—R. B.

[It is a common mistake among builders to make the chimney too small. The area of a chimney should be too large rather than too small, because it can be readily reduced to any desired size by means of a sliding register plate near its bottom or a damper plate applied to the top, adjustable by wires or chains passing over pulleys. Wide chimneys are not so liable as narrow ones to have their draught affected by strong winds. Besides, if the common open range is used, the current air through a small chimney is not sufficient to take away the smoke, and an oppressive atmosphere is the consequence. In a kitchen chimney of less than 6in. in diameter, cooking operations could be scarcely carried on. The capacity ought to be considerably larger.]

[725.]—FLOATING BRICKS.—It would much oblige a student of the "Intercommunication" if some of your readers would give me some information as to the strength and manufacture of floating bricks.—S. M.

[Floating bricks are a very ancient invention, being mentioned by Pliny. The earth with which modern floating bricks are made was discovered by M. Fabroni, and is called fossil meal. It is abundant in Tuscany and in the territories of Sienna. According to the analysis of M. Fabroni, it consists of 55 parts of silicious earth, 15 of magnesia, 14 of water, 12 of alumina, 3 of lime, and one of iron. It exhales an argillaceous odour, and when sprinkled with water throws out a light whitish smoke. It is infusible in the fire, and, though it loses about ¼th part of its weight, its bulk is scarcely diminished. Bricks composed of this substance, either baked or unbaked, float in water; and 1-20th part of clay may be added to their composition without taking away their property of swimming. These bricks resist water, unite perfectly with lime, are subject to no alteration from heat or cold, and the baked differ from the unbaked only in the sonorous quality, which they have acquired from the fire. Compared with common bricks their strength is little inferior, and much greater in proportion to their weight. A floating brick masonry, 7in. × 4½in. × 1in in 8 lines, was found to weigh only 14½ ozs. whereas a common brick weighed 5lb. 6¾ oz.]

REPLIES.

[715.]—ROYAL ARMS.—I think there is no liability incurred in issuing a descriptive card or advertisement headed by the Royal Arms, if nothing is contained therein tending to lead the public to believe that the article advertised is protected by a patent. An Act of Parliament passed for the prevention of fraudulent trade and other marks, forbids the placing of any mark on any manufactured article with such intent (unless, of course, patented), under a penalty of £5, but I do not think it could touch "F. K." for merely using the arms as an ornamental heading.—P. A. T.

WAGES MOVEMENT.

The threatened strike in the building trade at Chesterfield appears likely to be averted.

Trade is very dull at Bristol, and as yet little prospect of any change for the better, as very few works of any magnitude are anticipated for the present year.

A strike is at present existing in Newcastle-on-Tyne in the wood-working trade, although not connected with the building trades. The coopers assert that the masters are endeavouring to reduce their wages, and, the masters not yielding, the strike is the consequence.

STATUES, MEMORIALS, ETC.

The statue of the late Sir Robert Peel is now placed in New Palace-yard, Westminster, but it is not yet decided when it is to be uncovered.

A monumental brass has just been executed in St. Margaret's Church, Westminster, to the memory of William Whateley, one of Her Majesty's consuls, and formerly a churchwarden of St. Margaret's parish. The brass is inlaid with coloured marble, and was executed by Mr. T. Gaffin, the sculptor of the Quadrant, Regent-street.

In addition to the marble statues of William III and James I., lately placed by the side of the members' entrance to the House of Commons in Westminster Hall, a statue of Charles I. is now placed there. The marble statue of George IV. has not yet been placed on its allotted pedestal, the statue of that King now placed in the hall being a plaster model.

LEGAL INTELLIGENCE.

A DANGEROUS BUILDING.—Mr. F. H. Caiger, surveyor in the Dangerous Buildings Department at Scotland-yard, applied to Mr. Maude for a peremptory order to eject a family from a house in Church-place, Greenwich, the continuing to remain therein being considered dangerous to the lives of such inmates. It appeared that some time since an order was served upon the landlord to put the property in repair. No notice, however, had been taken of such notice, and recently an adjoining house had been pulled down, the consequence of which had been to occasion the falling of the back wall of the house in question. Fortunately this occured at a time when the family was out of the house, otherwise loss of life must have occurred; but possession was still retained, the holders refusing to leave, saying they had nowhere else to go to. It was altogether dangerous that they should be allowed to remain any longer, as the house might at any moment fall. Mr. Maude at once signed the necessary order, which was placed in the hands of one of the warrant officers of the court to execute, with instructions, if necessary, to remove the occupants to the workhouse.

BREACH OF AGREEMENT.—WILKINS V. BELL AND ANOTHER.—The plaintiff brought this action at Nisi Prius against a firm of land agents and surveyors at Charing-cross, for breach of agreement in not teaching his son their business, and not paying him the prescribed salary. In November, 1866, the young man was apprenticed to the defendants for three years, the father paying a premium of £100, and they undertaking to pay him a salary of £50 for the first year, with an increase of £10 yearly for the rest of the period. He remained with defendants until last December, when he left, in consequence, as he said, of not obtaining payment of his salary, and the allegation was, that during the greater part of the time he was employed in going errands, and in other ways which did not enable him to acquire a knowledge of the business carried on by defendants. He admitted to having refused to obey the instructions of the defendants on certain occasions, but, on an intimation by the learned judge that such misconduct did not relieve the defendants from liability, he parties agreed to a verdict being returned for the plaintiff, with £100 damages, on the understanding that the indentures were to be cancelled.

MEETINGS FOR THE WEEK.

TUES.—Institute of Civil Engineers. "On the Relation of Fresh Water Floods of Rivers to the Areas and Physical Features of their Basins," by Colonel P. L. O'Connell, Assoc. Inst. C.E., 8.

THURS.—Inventors' Institute. "On Economic Apparatus for Ensuring the Combustion of Fuel, whether used for Manufacturing or Domestic Purposes," by M. J. risbie, to be followed by discussion, 7.30.

SAT.—Associated Arts Institute, "On the Relation of Art to Ethnology," by R. H. S. Smith, M.A., F.S.A.

Our Office Table.

The German obituary of 1867 includes the names of Professor Sohn, the eminent portrait painter, and Professor Cauer, the elegant sculptor, in addition to those we gave the other week.

A curious medal is to be sold at Paris in a few days. The lead of which it is composed was a portion of that used to rivet the chains of the Bastile. On one side is a representation of the taking of the Bastile, and the date July 14, 1789. On the reverse is an inscription, of which the following is a translation:—"This lead sealed the chains which chained the victims of despotism, and recalls the period of liberty conquered in the year 1789."

We have seen some new specimens of stencil-plates manufactured by Messrs. Berkeley and Co. particularly suitable for expediting lettering on plans. The metal is prepared on Muntz's principle, which makes it so malleable that it is almost indestructible, with fair using. The front part of the lettering, &c., is bevelled (by a process of acid), which causes the plates to lie perfectly close to the surface of the paper, and prevents the possibility of the ink spreading or blotting under the plates when being used, at the same time enabling an person to produce with ordinary Indian ink an accurate impression equalling very fine hand-work. The plates are inexpensive, and by the use of alphabets, a title, with 100 words, can be produced in twenty minutes.

It was stated at an adjourned meeting which was held on Friday for the purpose of establishing a Co-operative Building Company on the plans lately laid down by Mr. A. Walton, architect, of Cardiff, that nearly 500 members had joined the movement, the great majority being from the masons and painters. From the reports given in, it was estimated that 5,000 shares of £1 each would be taken up in a few weeks, and that the company would be prepared to undertake building operations in March next.

The experiments in Paris with the new system of gas-lighting invented by MM. Marechal and Tessier du Mottray continue to be made with the most satisfactory results. At the request of the Emperor, the private apartments at the Tuileries were illuminated by means of their apparatus, and nothing it is said could have been more successful. It now appears that the discovery is more or less due to the intelligence of an Englishman, Mr. Drummond, who one evening making use of hydro-oxygen gas, happened to throw into the flame a piece of common white chalk with which he had been drawing on a blackboard. The heat was so intense that the chalk became a mass of light, which shone like the sun. It is the reproduction of this very light which astonished the crowd on the Place de l'Hotel de Ville, and which has so delighted the Emperor. While on the subject of gas, we may mention that in accordance with instructions received from the Secretary of State for War, some important trials in connection with its consumption, and which promise to be of great advantage to the public, have just been completed at the gasworks of the Royal Arsenal, Woolwich. It has been found that by combining bitumen with coal in gas retorts that the gas is evolved with great rapidity, and that it gives an illuminating power from one burner equal to twenty-five sperm-acetti candles. The experiments have been so satisfactory that 200 tons of bitumen have been ordered by the War Department for use in the Arsenal.

At a meeting of the Society of Scottish Antiquaries, last week, Mr. Stuart, the secretary, read a paper by Mr. Henry Laing, on the Carved and Heraldic Shields of the Apartment in Holyrood House known as Queen Mary's Audience Chamber. The paper was illustrated by a large drawing in colours. After alluding to the art of carving in oak, especially in ecclesiastical decoration, as seen in the chapel of King's College, Aberdeen, and in the Cathedral of Old-Machar there, both of which is very rich in this kind of ornamentation, Mr. Laing gave the details of the shields on the ceiling of Holyrood. One of the shields is that of Henry II. of France, and it is placed immediately over the shield of his son Francis, the Dauphin. As the latter ceased to be Dauphin in July, 1559, the date of the work must have been in or before that month.

The Belgian Academy of Sciences and Arts offer a premium of 1000 fr. (£40) for the best inquiry respecting the period at which the architecture in the Low Countries was affected by Italian influence, with indications of the persons to whom such influence is attributable, and citations of works in illustration of the same.

The interior of the official residence of the Lord Mayor has for some weeks past been undergoing a costly and elaborate process of decoration under the direction of the city architect, Mr. Horace Jones As we stated some time ago, the Commo n Council at the suggestion of the Lord Mayor, voted upwards of £2,000 for the purpose, and the work will probably not be completed until the end of February. The money is being chiefly expended in the embellishment of the Egyptian Hall and the saloon.

In consequence of considerable inconvenience having arisen to the public from unauthorized persons in the neighbourhood of Westminster Abbey assuming the character of guides, and thus misleading and exacting money from visitors under the pretence of showing them the precincts and the entrance to the church, we are requested to warn the public against all such persons, and to state that the north door of the abbey is always open on week-days from 7.45 a.m. till dusk, and on Sundays, for the services, both this door and that by Poet's-corner. On week days the latter door is closed for the present, in consequence of the works for the restoration of the chapter-house close by.

The Dean and Chapter of Carlisle are making some alterations in the approaches to the Cathedral in that city, one of the alterations being the widening of the footpath leading to the main entrance. To effect this improvement, it was necessary to level some of the graves, and certain parties being of opinion that this was a desecration appealed to the Chancellor of the diocese, who has in the meantime stopped the progress of the work, until a proper plan be furnished.

The Vicar of Leamington has raised the question of the liability of a contractor for the use of a churchyard in carrying out work connected with a church. In building the south transept of the parish church a portion of the churchyard is occupied by workmen, and the vicar, who had stood aloof (the work being done under a faculty by a Church Completion Committtee), new claims of the contractor £20 for one year's occupation, and has officially notified that he shall proceed against him for the recovery of a fine of 40s. per day, so long as he continues to use the churchyard without paying for it while completing the parish church. The singular demand has created some local interest.

The arbitration as to the strip of land required by the Liverpool Corporation for town improvements, to be taken from St. Peter's churchyard, was closed yesterday by an award of £5,500 as the value of the land.

The exhibition of the Society of Femalo Artists (9, Conduit-street) will open on Monday, the 27th inst., and the General Exhibition of Water-Colour Drawings, at the Dudley Gallery, on the 3rd of February.

Mr. J. R. Longford, writing from the Engineer's Office, Manchester and Sheffield Railway, says that our statement on page 860, No. 675, in relation to the train going on the railway bridge over the Niagara Falls "without the engine," is incorrect. He speaks from personal experience.

The rapid progress made in the construction of the new Blackfriars' Bridge, contrasts very favourably with the almost proverbial slowness hitherto attendant on bridge building. The four piers are now virtually completed, and two out of the five iron arches are placed and nearly finished. The centre arch will have a span of 185ft., the two immediately adjoining a span of 175ft. each, and the two shore arches 155ft. each. The total length of the bridge will be 960ft., and the breadth 80ft., nearly double that of the old bridge. The gradient of the whole bridge will be only 1 in 40; the rise in the old bridge was 1 in 22. The whole outlay will be about £320,000, or about £4 per superficial foot. Another year will see the completion of the work—indeed, on an emergency, it might be used as a thoroughfare for foot passengers as early as June or July next.

The vestry of Marylebone having advertised for a vestry clerk at a salary of £2 10s. a week, about 30 persons applied for the situation. Mr. S. Ford was selected.

Trade News.

TENDERS.

ARROW.—For alterations and additions at Cambridge Lodge, Arrow. Mr. J. H. Rowley, architect:—

Woodbridge	£650
Crabbe and Vaughan	636
Shurmur	565
Sharpington and Cole	555
Nightingale	543
Salter	490
Fole	475
Chapman	445

BAYSWATER.—For alterations and additions to No. 29, Porchester-terrace. Mr. Charles Innes, architect:—

Fish	£1,280
Macey	1,232

BRIGHTON.—For Turkish bath. Messrs. Goulty and Gibbins, architects. Quantities supplied by Mr. J. Chester, Lansdown:—

Patman & Fotheringham	£8,697
Lockyer	8,555
Piper and Wheeler	8,500
Nightingale	7,533
Chappell	7,470
Hall	7,363
Cheesman (accepted)	7,263
J. Sawyer	6,953

CITY.—For alterations and additions to warehouse, Monkwell-street. Mr. H. H. Collins, architect:—

Sale	£543
Cohen	478
Pearse	381

DOVER.—For two houses, for Mr. S. Finnis. Quantities supplied:—

Fagge	£3,367 0
Davis	3,175 0
Featherstone and Co.	2,976 0
Adcock	2,962 18
Cozens, Brothers	2,950 0
Tunbridge	2,840 0
Stiff and Co. (accepted)	2,780 0

KILMORE.—For building Kilmore Church, Co. Down. Mr T. Drew, architect:—

	Church.	Spire.	Total.
M'Laughlin & Harvey	£3,368	£719 14 10	£4,087 14 10
Lowry & Son	—	—	3,732 0 0
Freeman	3,090	620 0 0	3,710 0 0
M'Gaughey	2,999	651 0 0	3,650 0 0
Murphy	2,950	530 0 0	3,530 0 0
Doolin	2,937	525 0 0	3,462 0 0

LONDON.—For erecting warehouse in Idol-lane, for Messrs. Smith, Harrison, and Crossfield. Messrs. John Young and Son, architects:—

Jackson and Shaw	£9,500
Ashby and Sons	9,450
Mansfield and Price	9,308
Browne and Robinson	9,124
Henshaw	9,050
Ashby and Horner	8,840
Conder	8,475

ST. PANCRAS.—For building dispensary, St. Pancras. Messrs. Goulty and Gibbins, architects:—

Collings	£1,627
Lovatt	1,602
Sawyer	1,576
Abbott	1,520
Staines and Co.	1,497
Sheffield	1,489
Lathey, Brothers	1,487
Outcheson and Walker	1,447
Palmer	1,446
Nutt and Co.	1,407
Thomas and Son	1,399
Newman and Mann	1,395
Brass	1,381
Sharpington and Cole	1,375
Crokett	1,350
R. Mann	1,345
Scrivener and White (accepted)	1,341
Nightingale	1,333
Perkins (withdrawn)	1,197

WAPPING.—For the erection of a public-house. Mr. C. Dunch, architect:—

Moreland and Burton	£2,280
Newman and Mann	2,156
Kilby	2,115
Hill and Keddell	2,090
Piper and Wheeler	2,069
Hearle	2,055
Ennor	1,964
H. and J. Johnston	1,912

WEST COWES.—For the erection of a villa residence, for Mrs. Venning. Mr. Francis Newman, architect. Quantities supplied:—

Chinchen	£1,474 0 0
Wheeler	1,464 0 0
Cooper and Dyer	1,450 10 9
Sibley	1,427 0 0
Denham	1,399 0 0
Thomas	1,379 0 0
Barton	1,360 0 0
Ball (accepted)	1,348 4 0

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Adams, Ore, Sussex, builder, February 4, at 11—Henry Hughes, Hanover-street, Carlton-road, Kentish-town, builder, January 29, at 12—William Nicolls, Robertsbridge, builder, January 29, at 11 Charles Henry Clothier, Woolwich, builder, February 3, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Allen, Buckingham, brick and tile manufacturer, January 28, at 11—Alfred Clark, Hinton St. George, Somerset, carpenter, January 25, at 11—William Jelly, Salford, plasterer, Jan. 28, at 11—Thomas Lewtas, Blackpool, brickmaker, Jan 29, at 1—John Hargreaves Milnes, Leeds, plumber, February 3, at 12—Edwin Parkin, Sheffield, joiner, January 27, at 1—John Stafford, jun., Leeds, blue slater, February 3, at 12—Thomas Cox Stretton, Old Basford, builder, Feb. 4, at 11—Edward Tompson, Chorlton-upon-Medlock, timber dealer, January 28, at 11—Thomas Webster, Eccleston, near Prescott, builder, January 28, at 11—Charles King, Bristol, mason, February 7, at 12—John Smith and John Lawson Ibbotson, Barrow-in-Furness joiners, February 6, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

February 28, W. Brooks, Clarendon-road, Notting hill, builder—January 23, J. Barritt, Luton, builder—February 3, G. M Nichols, Leeds, bricklayer—February 6, A. Callard, Honiton, builder—E. Horrex, Bury St. Edmunds, builder—February 14, M. Gladwell, Rougham, plumber—February 20, R. Basley, Ipswich, paperhanger—February 11, H. H. Strick, Stafford street, Lisson-grove, carpenter—February 10, W. Verrier, Bishop's Lydiard, builder—February 10, I. Kirkbride, Carlisle, mason—March 18, T. Weeks, Winton, Hants, bricklayer.

PARTNERSHIPS DISSOLVED.

Henderson and Co., Newark-upon-Trent, engineers—Duff and Howlett, Tothill street, builders—Harrison and Co, Hyde and Audenshaw, brickmakers—Turnpenny and Anderson, Bradford, Yorkshire, joiners—Potter and Spriggs, Rhyl-street, Kentish-town, builders—Osborne and Ashworth, Bradford, Yorkshire, plumbers.

DECLARATIONS OF DIVIDENDS.

G. F. Tildesley, Willenhall, iron merchant, div. 1s. 5¼d.—J. S. Branch, Liverpool, lime burner, div. 1¾d.—P. Anley, Whitecross-street, builder, div. 1 11-16d.—W. Flint, Church-street, Stoke Newington, builder, div. 2s. 6d.—S. Proctor, Chesterton, near Newcastle-under-Lyme, builder, div. 2s. 10d.

DIVIDEND.

February 3, J. Lawson, Leeds, blue slater.

BANKRUPTCY ANNULLED.

William Townsend, St. Mary Cray, Kent, builder, January 18.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£10	0 £11 10	Archangel, yellow	..	£11	10 £13
Quebec, red pine	..	3	0 4 10	St. Petersburg, yel.	..	10	10 11 0
,, yellow pine	..	2	15 4 0	Finland	..	8	0 8 0
St. John N.B. yellow		0	0 0 0	Memel	..	0	0 0 0
Quebec Oak, white	..	5	5 6 10	Gothenburg, yellow		8	10 10 10
,, birch	..	3	10 4 10	,, white	..	8	0 8 0
,, elm	..	3	10 5 0	Gefle, yellow	..	8	0 11 0
Dantzic oak	..	3	10 6 0	Soderham	..	9	0 10 10
,, fir	..	2	0 3 0	Christiania, per C.,			
Memel fir	..	2	0 3 10	12 ft. by 3 by 9 in.			
Riga	..	2	0 3 5	yellow	..	16	0 22 0
Swedish	..	2	0 2 5	Deck Plank, Dantzic,			
Masts, Quebec red pine		6	0 7 0	per 40 ft. 3 in.	..	0	15 1 4
,, yellow pine	..	5	0 6 0	Pumice Stone per ton		6	0 8 0
Lathwood, Dantzic, fm		4	10 5 0	Oils, &c.			
,, St. Petersburg		6	10 7 10	Seal, pale	.. per tun	40	10 41 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Sperm body	..	110	0 112 0
				Cod	..	36	0 36 10
Quebec, white spruce		13	0 19 0	Whale, 6th. Sea, pale		39	10 0 0
St. John, white spruce		13	10 16 10	Olive, Gallipoli	..	67	10 68 0
Yellow pine, per reduced C.				Cocoanut, Cochin, ton		56	0 57 0
				Palm, fine	..	40	10 41 0
Canada, 1st quality,		17	0 18 10	Linseed	..	34	15 35 0
2nd do	..	11	10 12 10	Rapeseed, Eng. pale	..	38	0 38 10
				Cottonseed	..	33	0 39 10

IRON:—

Welsh Bars in London	.. per ton	8 10 0	6 15 0	8	
Nail Rod	do	7 6 0	7 10 0		
Hoops	do	8 5 0	8 10 0		
Hoops, Single	do	9 15 0	10 0 0	7½	
Staffordshire Bars	do	7 7 6	7 10 0		
Bars, in Wales	do	6 15 0	6 0 0	5	
Nails	do	6 10 0	8 0 0	net	
Foundry Pigs, at Glasg. No 1	.. do	2 15 0	3 5 6	2½	
Swedish Bars	do	10 5 9	10 10 0	net	

STEEL:—

Swedish Keg, hammered	.. per ton	15 5 0	15 10 8	2
Swedish Faggot	do	10 10 0	12 10 0	2

COPPER:—

Sheet & Sheathing, & Bolts	.. per ton	80 0 0	82 0 0	
Hammered Bottoms	do	92 0 0	0 0 0	
Flat Bottoms, not Hammered	.. do	85 0 0	0 0 0	
Cake and Tough Ingot	do	71 0 0	72 0 0	
Best Selected	do	79 0 0	80 0 0	
Australian	do	83 0 0	84 0 0	
Y. l. Metal Sheathing & Rods	.. per lb	0 0 7	0 0 0	

ZINC:—

English Sheet	.. per ton	26 10 0	27 0 0	2
Devaux's V. M. Roofing Zinc	.. do	29 0 0	0 0 0	

* And 5 per cent. discount if laid upon the new syste

TIN:—

English Block	.. per ton	94 0 0	96 0 0	
do Bar	do	95 0 0	97 0 0	2½
do Refined	do	97 0 0	99 0 0	
Banca	do	92 0 0	95 0 0	nett
Straits	do	87 0 0	0 0 0	

LEAD:—

Pig, English	.. per ton	21 0 0	0 0 0	
,, Spanish Soft	do	19 0 0	0 0 0	
Shot, Patent	do	22 10 0	0 0 0	2½
Sheet	do	20 0 0	0 0 0	
White	do	27 10 0	30 0 0	6

SPELTER:—

On the Spot	.. per ton	21 0 0	21 2 6	net
QUICKSILVER	.. per btl	8 17 0	0 0 0	

REGULUS OF ANTIMONY

French	.. per ton	28 0	0

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THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 31, 1868.

MR. FERGUSSON ON THE PRINCIPLES OF RESTORATION.

MR. FERGUSSON, from the time he has devoted himself to architecture, has been distinguished by a boldness and originality of treatment; and this even in a branch of architectural study—restoration—which in many cases is nothing more than a mechanical pursuit, that may be called compilation. Our day has been fortunate in possessing a large school of writers and professors of art, who are not dependent on the professional pursuit of art. We say this is an advantage, because, when a man once becomes interested in the active practice of his profession, he seldom has time to carry out to his own satisfaction a course of research and investigation demanding long time and protracted attention. The chief literary labours of Cockerell, Professor Donaldson, and Falkener, were carried out in the earlier part of their lives, and, notwithstanding subsequent contributions, their after labours have been partial, or only the development of their previous studies. It is, therefore, an advantage when such men, for instance, as Ruskin, Beresford Hope, Browne Willis, and Richard St. John Tyrwhitt, can be enrolled in the art-army to devote to it their chief time, or their more disposable leisure. Fergusson unites the advantages of the amateur and the professional man: of the professional man, in a sufficient conversance and practice in architecture to bring him within strictly professional allegiance; and of a freedom of devotion which allows him to bestow on his favourite art all requisite duties of ministration. Thus he has rendered essential service, not only in the way in which he has made philosophy and history illustrate architecture, but by his own artistic instinct in the treatment of construction and of detail. He may be said greatly to have extended the range of architecture, not only by illustrating its place in the systems of history and philosophy, but by many other services. Notwithstanding all that was effected by his predecessors, he may be considered as the real introducer of Indian architecture into England, a mission to which he is still devoted. His restorations of the monuments of Assyria, of the buildings of Jerusalem, of the Mausoleum, and of the mode of lighting Greek temples, have not been barren scholastic treatises. Whatever may be the absolute truth in these cases—and we differ from Mr. Fergusson in more than one instance—they constitute a positive contribution to the resources of art, and many of the suggestions, ingenious and practical, have been adopted, altogether apart from their immediate appropriation.

Restoration is a copious subject. There is the restoration of a Gothic church in nature by the architect, with or without regard to the data before him, and there is controversy enough on these matters. What may be classical or antiquarian restoration is another form of the subject, and that we have in hand now. It may refer to plan or to construction, but both are much connected. Where the whole or the greater number of the bases of the columns are *in situ*, the restoration is a simple labour—we have a plan with the defined remains in black, and have only to fill in the deficiencies in outline, and cannot go far wrong. This is not a work greatly taxing the powers, and is little above paste and scissors performance.

It is, however, not so when we have fewer ill-defined fragments, materials in confusion, or no materials at all, and only scanty historic indications to guide us. Then it is that noble exercises for architects are obtained—contests in which the public interest is readily excited, and where there is the valuable privilege of choosing one's side. What a pity it will be if the Junius controversy can be solved by indubitably attributing the authorship to Francis or any one else! What such controversies are in literature are the controversies as to restorations in architecture. It will be a great pleasure to find the site of the Temple of Diana at Ephesus; but, if, which is not very likely, sufficient fragments are discovered, it will be a loss to those who back either the views of Professor Donaldson or Mr. Falkener as to the columniation of the temple. We expect no such issue can affect those of our readers who have made up their minds in favour of Mr. Fergusson himself, or of Mr. R. Poppleton Pullan, as to the restoration of the Mausoleum. Restoration is, in its nature, subject for controversy, because, after all, we can only arrive at relative, and not at absolute truth. Mr. Fergusson has been involved in several of these controversies, and an attack on the restorations of Nineveh and Persepolis, made by Professor Rawlinson, in the fourth volume of his "Five Ancient Monarchies of the Eastern World," has driven Mr. Fergusson to a personal defence in the "Fortnightly Review," which, though seen by some of our readers, can hardly receive the attention of all.

He first lays down his principles of restoration, on which we will not now comment, though we think they will form matter of discussion. He says:—

> Before, however, proceeding to discuss these, it may be well to state briefly the principles which have guided me in every restoration I have ever made, and which lie, as it seems to me, at the root of the question.
>
> First—Any restoration to be correct must be conformable with the principles of common sense; or, in other words, must result in the form best suited to meet the requirements of the purposes for which the building was designed.
>
> Since the erection of St. Peter's at Rome, architects have so generally neglected this rule, that we have almost forgotten its existence. We were so accustomed to see architects putting up Grecian Doric porticoes before churches, jails, panoramas, or private houses, that it never occurs to us to ask what purpose they were intended to serve. And we now see Gothic towers, and castles, and mansions, erected with all the accessories of monasticism or of mediæval warfare, and we never think of asking how far they are suited to modern enlightenment, or to Snider rifles and Armstrong guns. But before the sixteenth century, I assert absolutely and without fear of contradiction, that no such puerilities were committed; and if any restoration does not result in the most practically convenient design that the mechanical knowledge of its builders could invent, or that the materials at their command would admit of—reject it at once.
>
> A second principle is that every ancient building must form part of a gradually developed series. Whatever may be true of Darwin's theory as applied to Nature's laws, it is absolutely true of all man's architectural works anterior to the sixteenth century. Every building was developed, according to certain well-established principles, out of some preceding one, and, if a restoration will not fit into the series—reject it.
>
> As a corollary to this, every building erected in the same age and at the same place, and for the same purpose, is practically identical, *mutatis mutandis*, with all the others.
>
> A third principle is that, if the building were erected for ornamental purposes, and your restoration turn out a deformity—pause. This rule, however, is the most difficult of application of the three, because it may happen that the means available do not suffice to enable a restorer to form a definite opinion as to what the people of that country and age may have thought beautiful or otherwise, and in all instances it requires very considerable familiarity with a new style before we can feel sure that we are in a position to judge of it æsthetically.

Mr. Fergusson says that it was upon these principles he first proceeded to the restoration of the Assyrian palaces. He found one building older than them, and of the same class, sufficiently described. This was Solomon's House of the Cedars of Lebanon, of which our readers have Mr. Fergusson's sketch-restoration in his "History of Architecture," No. 145, in the first edition, and No. 97 in the new edition. Although this appears to be only 75ft. wide, it was constructed with three rows of cedar pillars to support the roof. At the other end of the series, he found the palaces of Susa and Persepolis crowded with four and six rows of pillars on their floors.

These pillars he considered to have been developed out of wood, and that in earlier edifices the Assyrians might have used pillars, and those of wood. Mr. Fergusson seems to have been most guided by considerations of climate and of the constructions suitable to it, considerations which are not likely to weigh with Professor Rawlinson, at Oxford, in his snug apartments, in the same way as they do with those who are habituated to the climate of Asia.

Mr. Fergusson very naturally thought that the light could not be introduced through openings in the roof. It is to be noticed that even in modern domed buildings where this is done, the light is sparingly introduced through small orifices, and then at such a height as not to affect the shade and coolness of the lower portions of the buildings. He further considered that the excavations proved that it had not been introduced through the lower part of the walls; while an examination of the plans showed that there was no difficulty in introducing a sufficiency of light between the walls and the roof, in such a way as to exclude both the sunshine and the rain, hence the proposition of that mode of roofing, which may be found in detail in Mr. Fergusson's works, and which has been assailed violently by the Professor. What Professor Rawlinson chiefly relies on is the assertion that no bases of pillars have been found within the apartments, nor any marks on the brick floors of such pillars, or of the pressure of the pillars. He says, too, that stone pillar bases have been found in wide doorways. Mr. Fergusson joins issue with the Professor as to the alleged pillar bases in the doorways having been employed to bear wooden pillars, for he says these would have slipped.

Before going further into Mr. Fergusson's case, we may refer to what the Professor supports as alternatives in opposition, namely, the hypæthral, as proposed for Greek temples, and the spanning of the area by beams, from which he says archæologists have hitherto shrunk. This is not unnatural, for the beam theory can obtain no support under the circumstances. As to the hypæthral theory, it has also little weight, for the buildings would have been next to useless in such a climate. Mr. Fergusson observes that the builders first raised a mound of loose earth, above 30ft. high. We think it quite possible, however, that the mounds may have been of earth prepared in the usual way, cut into the shape of bricks or tiles when wet, and applied when dry, which would have given a harder foundation, and labour was not a consideration, as it was a forced contribution. Mr. Fergusson says loose earth, on which they placed great moundlike walls, averaging from 15ft. to 20ft. thickness, and arranged them so that the area of the solids, as represented by the walls, should be as nearly as possible equal to the voids forming the rooms, and they did not carry these walls above the height of 20ft. Such a mass might rest in equilibrio, but the tendency, he considers, if any, would be for the floor to rise. To counteract this, he suggests, that, after being carefully beaten, a common process, the floors were paved, and that on the pavement woolen shoes were placed, circular in form, according to the Persepolitan examples, and extending over a considerable surface of the pavement. Into these shoes the wooden pillars were shipped, and by them the heavy roof was supported. Such a system would be in perfect equilibrium, and would last for ever, until disturbed by decay, or some such accident as the fire to which he attributes the destruction of all those palaces: but it would not, after such an accident, show any bases, or marks of them on the pavement.

Our readers will see that, according to this view, the wooden structure was to a great degree independent of the walls. We are rather surprised that Mr. Fergusson has not noticed

that this system of construction, of having the timber framing separate from the walls, is still to be found in Asia, but the chief reason assigned for its adoption is as a security against earthquakes, so that the timbers are not even bonded to the walls. One very curious thing we have seen is that in a building, say a two-story house, the roof has been put on before a wall has been raised.

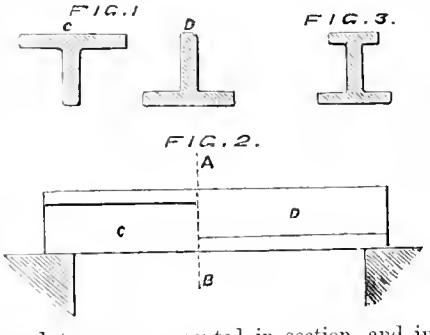
So far as to the restorations of Nineveh. Of the Chehil Minar we cannot now speak, but we will lay before our readers Mr. Fergusson's last words on the hypæthral theory :—

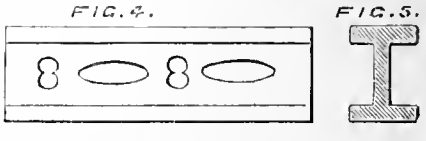
The hypæthral suggestion may require a little more consideration, not from its superior applicability to the present question, but because of the collateral issues it involves. For twenty years I have been trying to put this fallacy right. It is dying, but slowly; and it is only by continual reiteration that its end can be hastened. Like the Druidical origin of Stonehenge and the primæval antiquity of Silbury Hill, the hypæthron has become a matter of faith. Those who believe in it are not any longer required to give any reasons for the faith that is in them, but are allowed to consider that they have proved their case, if they can point out any flaw or deficiency in their opponent's argument. In vain I have challenged the production of a single specimen of this strange contrivance, either ancient or modern, as existing in any part of the world. Except the Pantheon at Rome, where the difficulties of the vault forces it on the architect, and in two, it may be three, Roman decastyle temples, which possessed internal courts, that may be so called, I do not know of any examples. It does not exist in Roman houses, as Mr. Rawlinson asserts, because there is all the difference in the world between a partially roofed court and a partially unroofed apartment. It did not exist in Egypt, the most rainless and temperate climate in the world; and no example is known in Persia or India, or any other country I am acquainted with. Yet, strange to say, Professor Rawlinson quotes me (p.380) as an authority for its existence in India! Had he read the paragraph he refers to, or looked at the plan therein mentioned, he could not possibly have made such a mistake. I have, afterwards, again and again reverted to the subject; as, for instance, in the "Handbook of Architecture," wood cuts 47 to 50. I must, therefore, now be allowed to state, as clearly as I can, that, though the Indian builders may not be the best in the world, they do know something of their art. They put roofs on their buildings to keep off the sun, and to keep out the rain; and they do not immediately afterwards take off a large enough portion of them to let in both. In fact, the hypæthron, as it is usually understood, was impossible so long as common sense was the prevailing element of architectural design. It was the creation of men who built Grecian temples in northern climates, and is believed in by men who build Gothic edifices in the nineteenth century.

THE EFFECT OF SHAPE AND POSITION UPON THE STRENGTH OF IRONWORK.

"IT is stronger that way," is the reason every village carpenter would give why he placed his purlins and rafters with the greater side vertical, and for a long time engineers and architects in dealing with constructions of iron were content to rest their faith upon no better foundation. So long as they confined themselves to simply imitating, with some unimportant modifications, those examples which precedent and experience had demonstrated to be thoroughly reliable, no evil resulted. But, with the introduction of railways, and the unprecedented exigencies of locomotive traffic, a departure from the old patterns, so to term them, became imperative, and it was then apparent how very little was known respecting the influence of the form and position of beams and bars upon their absolute ultimate strength. Owing to the failure of numerous railway bridges, in the infancy of steam locomotion, it was rendered necessary that a series of investigations and experiments, conducted with all the accuracy and skill at the command of the profession, should be undertaken, and the results made available for future guidance, reference, and authority. Although the correct position in which to place a rectangular beam is universally known, yet we are far from having ascertained a similar amount of knowledge regarding those of a different shape. The manner in which the strength of an ordinary T iron is affected by its position, affords an excellent illustration of our meaning. Mr. Hodgkinson carried out some experiments upon this subject, and, with the view of deducing some definite conclusions with regard to the ratio of the breaking strain of beams precisely identical in shape and scantlings, but fixed in two different positions, he selected two cast-iron beams of the shape shown in fig. 1. They were seven feet in total length, cast from the same pattern, placed upon supports giving a clear span of six and a half feet, and broken by the gradual addition of weights suspended from their centres. It may be remarked here that, whenever possible, in testing girders and beams, either for deflection, or for ascertaining their actual breaking strength, it is preferable to perform the operation by the agency of direct weights alone, and not by the intervention of levers. There are many reasons why levers are usually resorted to. In the first place, they are more convenient, and the testing operation is conducted with greater ease and dispatch, the progressive piling up of the necessary weights being dispensed with. Evidently when the testing is to be upon a large scale, levers must be employed, as it would otherwise involve an extraordinary amount of labour, and incur an unwarrantable waste of valuable time. The objection to the use of levers is that, even when they are constructed upon the most delicate and approved principles, they exert more or less degree of violence upon the specimen under test, which consequently does not yield to the action of a simple weight, but is, if it may be so expressed, coerced or forced to break. One thing is very certain, that, if one of two similar bars were broken by a lever, and the other by dead weights superimposed regularly and gradually, the latter would be found to require a greater total weight than the former to determine its fracture.

In fig. 1 the two cast-iron bars we have referred to are represented in section, and in fig. 2 they are shown each in half elevation, and resting upon the supports. The fig. 2 is divided by the line A B, one-half of the beam being represented with the table, or horizontal portion, upwards, and the other half with it downwards. The bar that was broken with the table portion upwards, as represented by C in the figures, yielded to a weight of 0·162 tons, while that with the table downwards, D, required 0·50 tons to effect its fracture, evincing practically three times the strength of its neighbour. Notwithstanding the palpable character of an experiment of this description, and the advantage to be gained in an economical point of view in profiting by it, yet it is a common occurrence to witness it completely disregarded, and the beams placed in that position affording the least amount of strength. Not only was the difference in the actual breaking weights strongly displayed, but the deflections varied also in a corresponding proportion. The ultimate deflection of the bar D was exactly 4½ times that of C, and the permanent deflection, or set, as it is technically called, was nearly in the ratio of 8 to 1. Having acquainted ourselves with the fact that the bar in the one position is three times stronger than in the other, let us now endeavour to account for the circumstance. The bars being of cast iron, the first point to bear in mind is that that material possesses a compressive strength which is to its tensile strength as 6 to 1, and consequently it will be weaker or stronger accordingly as its fracture is determined in relation to one or other of these resistances. Referring to fig. 1, it will be at once perceived that the bars may be regarded as consisting of two separate portions, the table or horizontal part, and the vertical part or rib. This latter constitutes the real resisting part of the bar, since it is virtually the depth, and therefore the position of it and the strain it is exposed to will affect the strength of the beam. When in the position represented by the bar C, that is downwards, the action of the weight tends to extend it, that is to accomplish its fracture by overcoming its tensile strength, which we have stated to be comparatively small, with respect to that it exerts against compression. But when the bar is broken in the position D, the conditions attending its fracture are reversed—the rib is upwards, and fails by the yielding of its compressive and not of its tensile strength, and consequently supports a much greater weight previous to fracture. Beams of the section shown in fig. 1 are much inferior in strength to that in fig. 3, in which the ratio between the areas of the top and bottom flanges is as 6 to 1. But they are, nevertheless, not to be altogether discarded. They possess the merit, a very important one in a practical sense, of being readily cast, and are not, by any means, a weak or unscientific form of beam, although inferior to the particular example quoted, which represents the section of maximum strength with a given area of metal, for all beams of cast iron. For very light weights and small spans the T-shape would be available, where there would be an absolute waste of material in employing the doubled-flanged section in fig. 3. Care must be taken to be very cautious in using cast-iron beams with openings in them, as shown in fig. 4, a description of design favourable for ornamental purposes, but certainly not for any other. A distinction here is at once apparent between the conditions attending similar examples of construction in wrought iron. Experience has long since confirmed the opinion that open-work wrought-iron girders, including all the varieties of the lattice, warren, and trellis forms, may be used with the same safety as their older and more cumbrous predecessors. It might have been that the objections raised by the advocates of the solid sided girders, against the employment of the more elegant and lighter system, were founded upon the argument that because it had been proved to be not suitable in the case of cast iron, it was, therefore, not likely to succeed with wrought. However well arguing analogically may answer in some matters, it does not always hold good in questions of a scientific nature.





That many of the older authorities upon engineering and architectural subjects were lamentably, although not culpably, ignorant of the proper forms of iron beams, may be judged from the fact that Tredgold considered the beam represented in fig. 5 to give the section of maximum strength, wherein the top and bottom flanges are equal in area. Subsequent experiments, however, have demonstrated that, far from approaching in its powers of resistance the section of maximum strength (see fig. 3), it is considerably weaker than the T form in figs. 1 and 2. It is, for cast iron, therefore, an objectionable form which should never be employed. In addition to the theoretical considerations governing the design of a cast-iron beam, those of a practical nature must be attended to with equal if not greater regard. The strength of any beam is directly proportional to its sectional area, that is, the number of square inches contained in a section

perpendicular to its longitudinal axis. With cast-iron beams there is no question but that the strength, while obeying the above law, is also in a great measure dependent upon the superficial area, not in a theoretical but in a practical point of view. A little reflection will indicate that, as the process of cooling in the melted mass commences at the surface, those layers lying immediately subjacent to it, are cooled with a considerably greater degree of rapidity than those placed more remote, and towards the centre of the beam. Besides, if we imagine a certain thickness of the metal near the surface to be solidified, while the internal portions of the beam are yet in a state of incandescence, when they are in the act of cooling, they are prevented from contracting according to the laws governing metals, and remain, therefore, solidified in a condition of permanent initial tension, which, from the contents of the present article, must be very injurious to the future strength of the beam. Since the outer and inner portions of a large casting, or of a thick beam, do not cool uniformly, it might be expected that there would be a difference in their relative powers of resistance.

This has been proved to be the case, by testing pieces of the metal taken from different portions of the same casting, and the result has evinced much discrepancy between their relative breaking strength. All angles, marked disproportions of area, unequal thickness of metal, and abrupt bends, should be avoided as much as possible in designing cast-iron beams, whatever may be the peculiar shape selected. There is but little use in calculating the proportions of the various parts, and adhering blindly to the rules of theory, if due attention be not given to the requirements of the foundry. We shall resume this important subject at a future period in connection with wrought-iron beams, which have, in a great measure, superseded, for spans possessing any magnitude, and for railway bridges, their cast-iron predecessors.

DESIGN.*

BEFORE proceeding further, let me remark that the details, whether derived from past ornament or direct from Nature, are the materials of the designer, and are separate from the rules for their arrangement and adaptation, which have been called the principles of design. I may remark also that formerly the architect not only designed the structure itself and the ornament that enriched it, but the furniture, the hangings, the glass, the metal work, and the utensils, at least of the sacred edifices. Hence the architecture of a period ruled the ornament of a period, and hence the necessity for studying the architecture of the past if we would have a large view of the principles of its ornament. Indeed I would impress upon you an earnest study of the past, not to repeat merely, as did the artist of the Renaissance, but to learn the laws which guided them of old, and then to go to Nature for new details to subdue to the wants of ornament, as was indeed the practice of the men whose works I would urge you to study—these abound with a knowledge of the past. You may go to Nature without fear of the meanness of mere imitation. In Nature's domains we find every form which has served to make Art beautiful. Surrounded by the glowing tints of spring, or the mellow hues of autumn, by the perfect forms of opening flowers, and the stately splendour of the full grown forest trees, the man is dull indeed who would not endeavour to enrich the objects which arise under his hand—the house wherein he shelters himself, the articles which serve him for his domestic wants, and the implements wherewith he obtains his food and carries on his daily avocations—with transcripts from or imitations of her wondrous ornaments. The student who has been taught to look at Art merely through the light of bygone ages, or to judge of beauty by the measure of the taste of his countrymen, has much, very much, to unlearn ere he can hope to attain any great extent of originality. He may modify and recombine the forms of Classic Art, or he may, perhaps, generalize them, and thereby lose not only the spirit of their first adoption but their truth. He may strike out for himself a new path, founded on the Art of some ancient people, but he will rarely succeed in producing designs in the spirit of the times in which he lives, or likely to suit the taste of the public. He has commenced at the wrong end of Art; he can look at Nature, when he comes to acknowledge her as the one source from which his ornament should be derived, only by the false light of the ideas he has acquired. His foliage, his flowers, his forms are not the foliage, the flowers, the forms of Nature, but of the school in which he has learnt, and here is the great danger of the too exclusive study of the ornamental forms of any particular country or style, without reference to the peculiar circumstances or conditions which led to their adoption, or occasioned their use. Ancient Art must be to the designer a model—an oriflamme—of what great and good designers of past ages gleaned from or admired in the storehouse of Nature; he must see in it an example of how to draw from her boundless treasury similar and parallel ideas, and to combine and modify them to suit his own times, and the means of production or the formative processes of his own country.

I may, therefore, consider ornamental design under three heads:—The law of arrangement, which governs the details or component parts; the subservieney of ornament to utility; and, thirdly, the source of design, and the treatment of its elements to suit the material on which the design is to be wrought.

Ancient ornament was mostly subordinated to a geometrical arrangement. In Egypt, in Greece, and in ancient Italy, this was usually the case, even in those works which had little mechanical aid, such as the carved ornaments of their temples or the painted decoration of their furniture, while, in works produced in the loom, geometrical recurrence became more or less a necessity. In some of the Egyptian temples there is observable an apparent symmetry, as in the capitals of columns, which have a likeness in general form, combined with a large variety in the details of the parts. In many of the minor ornamental treatments, the details or elements of the ornament are arranged in an alternate symmetry, as we found was the case also in the ornament of the Jewish Tabernacle, and in the priest's garments. This also was the case with Greek sculptured ornament, while we find it varied on the borders of their garments—on the ornaments of their utensils and vases, with a recurrence of two and one—a recurrence on opposite sides of a central line—one and three, &c. Rarely in Classic Art is the law of apparent symmetry adopted, while it is found to give great freshness and variety to Gothic ornament. We may, therefore, deduce that symmetrical arrangement, apparent symmetry, and recurrence or alternation of parts, are laws observed in the best periods of Art.

From ancient Classic Art, as well as from the best Art of the Oriental nations, another ornamental law is observed, which is, that the general form of the moulding, or any part of the surface decorated, is not disturbed by its ornamentation. The ornament being incised, as was much of Egyptian ornament, or parts of the general surface lowered, leaving the ornament in relief, or otherwise, the relief was very low. This ought also to be the case in the decoration of all instruments or utensils, as indeed it mostly is in the best periods. Thus, we rarely find any relief ornament in the beautiful Etruscan vases, the pure form chosen being preserved, the ornament being merely painted on bands and borders, in simple bands of black, white, or red; while in the best goldsmith's work of the Middle Ages we find the same law attended to. From ancient Art we also learn that simplicity and restraint are principles acted on, and which ought to be kept in view by every designer.

How large is the unornamented surface in the Doric temples, supporting, and enhancing the few simple elements used in the parts decorated, as was the case also in their vases and utensils; and what repose and perfect taste is the result! How contrary to the application of ornament in the early part of the present century, when our pottery was hidden under a heap of decoration, and our goldsmiths covered their vessels with coarse and ill-executed relief, pleasing, it is true, the purchasers of their wares, who considered not the Art embodied, but the weight of silver and the glitter of surface! And I must allow that there are many causes in the present day leading to this extravagance and excess in ornament rather than to restraint, the greatest cause being readiness of mechanical reproduction. In the time of the handicraftsman decoration was sparely applied, and the workman strove after perfection. Now, the machine so easily attains a mechanical perfection of parts that the manufacturer is induced to overload his work with ornament, and thus to vitiate the taste of the purchaser. This leads me to consider what is and must always be a most important drawback to freedom and variety in design—namely, those mechanical means by which the design is to be manufactured, or by which the pattern is to be many times repeated in or on the raw material.

The mediæval workman or artizan had few, if any, of the modern appliances for the rapid production of his hangings, his metal work, or his woven fabrics—his handicraft was unfettered by the cylinder, the electro-block, and the mould. The beautifully wrought forms of hammered ironwork, and the flowing and varied lines of brocaded silks, the rich diapers that covered the walls, and the quaint tiles that decorated the floors, were innocent of steam machinery. How altered is all this now! The moment that the manufacturer becomes possessed of a design, his only idea is how it may be produced and repeated in endless numbers by the mould, the block, or the cylinder. With these he may be able to present a most precise resemblance of the Art which was most admirable in that design; he may be able to represent the outlines and the colours with far greater exact precision than the worker of the Middle Ages could ever achieve; but how dull, how monotonous, is the result of his labours when compared with the skill of the handicraftsman, which is like the ever-changing repetitions of Nature, where on a tree with a million leaves no two would ever be exactly alike, or the ornaments of a Gothic building, where the tracery of every window, the foliage of every corbel, and the carving of every stall, is different. And this leads me naturally to another direction of the modern designer's studies—the knowledge of the processes of manufacture involved in the production of the objects for which he will be called upon to prepare designs. He must learn the width of the paper, the cotton, or the silk, and infer from them the sizes of his blocks or groups. He must acquaint himself with the girths of the cylinders, and calculate the frequency of his repeats. He must be able to judge of the numbers of cards required to reproduce his drawings in the Jacquard loom, and he must know the processes which the metal, the clay, or the glass undergo in their various stages, from the raw material to the finished object. More than this, also, he must be able, to a very great extent, to judge of the variation which the outline of his design will be subjected to from the nature of the impossibility of representing curved or flowing lines in woven carpets, or delicate and well-kept outlines on block-printed paperhangings.

I must now very briefly consider another law of design—its relation to utility. Having decided on a form which combines the greatest convenience for use with the utmost elegance, the designer has to enrich it with suitable embellishment. The talent and skill which he brings to bear upon this, and the style of ornament chosen, are secondary matters as compared with the position and quantity of the decoration, the fitness of the ornamentation to the object and to its uses as a whole. To give an illustration—when we desire to produce an article for some purpose which necessitates our taking a firm hold of it, it is usual to roughen the surface to be grasped. This may be done ornamentally, but it should not be so treated as to mar the originally conceived graceful form, or, by the lumpiness of its relief, to inconvenience the holder, so that, instead of facilitating his power of grasping it, he is prevented from holding it with ease and security. Yet, how often is beautifully wrought work thus misplaced!

Another important quality has already been alluded to, viz., reserveduess. Nothing is so vulgar as redundancy. Ornament should be so distributed that it only occupies a part, and that a small part, of the surface, either in bands or groups agreeably disposed so that the natural surface may serve as a contrast and foil to the enrichment, and supply the quality known in Fine Arts as breadth. We will assume that the article to which the decoration has to be applied is a silver goblet. If the enrichment, whether it be in the form of chasing or *repoussée* work, is too lavishly applied—if the foot, the stem, and the bowl of the

* Read by GILBERT R. REDGRAVE, before the Associated Arts' Institute, January 14th, 1868, and continued from page 61.

cup are alike loaded with orn ament, even if th ornament be the best of its kind—few will deny that there is too much of it; the eye wants some quiet plain surface to contrast with the richness of the remainder. This is obtained by reserve; and the knowledge of what amount of surface should remain untouched by his art is an important consideration to the designer.

I have already spoken strongly of the necessity of recurring to Nature and natural forms, for new details of ornament. The laws of arrangement are few, simple, and easily mastered; even the structural lines that govern the disposition are very limited. The right line, the oblique line, the curve (simple or complex), the scroll of varied curvatures, represent the sum of these leading lines. The details which they govern, and with which they may be clothed, are as infinite as are the natural objects from which they are derived. But how is the artist to use these details? Imitatively, or, as it has been called, conventionally—a term often misused, but which really means subordinated to the materials in which they are to be wrought, and the manner of working them. Here my subject leads me to what might well furnish matter, not for a section of a lecture, but for many lectures, and I have time only for a few concluding sentences.

I am sure that I have said enough to convince you that I am an advocate for Nature as the only true source of novelty in design, but I must not be misunderstood as implying that Nature is to be merely imitated. As in Fine Art, so in ornament; the lowest merit is that of mere imitation—nay, as it often degrades Fine Art, so it is often a fault in ornamental Art. What should we say of a sculptor who should cast the human figure, and think the exact imitation he achieved Fine Art? Or what should we think of a goldsmith who should electrotype natural leaves and flowers, and place the meretricious tinsel on his cups and chalices as good ornament.

Details derived from Nature must be subordinate to Art—must be treated in a large manner, suppressing those minutiæ which are unnecessary to expression—must be rendered suitable to the material and mode of execution in which the design is to be wrought. And it will in most cases be found that the more literal the imitation, the meaner will be the style, the weaker the expression of the work. I would conclude, therefore, with the eloquent words of one who had some experience as a designer, and who made many efforts for its improvement in this country—the late Mr. Dyce. He says, "I conceive that the Art of the past is, like its literature, a storehouse of which the treasures must be known by us before we are in a condition to become explorers in our turn. Heartily concurring in the opinion so ably urged by my colleague (the lecturer on botany as a source of ornament) that original design can only be produced by the same means from which it resulted in past ages, namely, by a reference to Nature, the source of all beauty in design, I would only require that such reference should be aided by the experience afforded us in the labours of our predecessors. The first step in any pursuit is to inquire what has already been done. When a man undertakes to treat of any subject, he first sets himself to read all that has been already written upon it. And so it must be in ornamental Art. We do not now take it up for the first time—its principles have been more or less truly developed from the earliest ages; sometimes they have been developed in one direction, sometimes in another; sometimes the development has been a right one, sometimes erroneous; but through all there has predominated that very attempt which we in our turn must make, namely, to apply the treasures of natural beauty to the purposes of decoration. Hence the peculiar value of the study of ancient ornamental Art. I am no advocate for a blind obedience to precedent, but let us not fall into an opposite extreme. Let us beware, lest by undervaluing and neglecting the study of ancient Art, we commit as great a mistake as those who study only to reproduce it. Let us beware, lest, while we think we are producing novelties, we are only, in fact, doing that badly which has already been done much better."

ST. MARY'S, ITCHENSTOKE.

OUR two illustrations are engraved from photographs showing the exterior of the east end of the above church, and its interior, looking west. The building is of brick, laid in cement, faced with Godalming stone, with Bath stone dressings. The ground plan shows the disposition of its parts.

The lower portion of the western façade is occupied by a porch or narthex extending the full width of the building, and vaulted and roofed with Bath stone. It is divided externally and internally into three compartments. Of these, the centre one, containing the western door, projects slightly beyond the others, and presents a gabled façade to the west. The two side compartments have lean-to roofs, formed of slabs of Bath stone, weathered to correspond with the adjoining buttresses. The western doorway is large and lofty, of three orders, the mouldings very bold, the capitals foliaged, supported by shafts of red Mansfield stone. In the pediment above the doorway is a niche with shafts of polished red granite, containing a statue of Our Lord as the Good Shepherd. The apex of the gable is surmounted by a floriated cross in Mansfield stone.

Above the porch is a large rose window, with a pointed hood-moulding. In the pediment above is a double quatrefoil enclosing in its cusps a massive boss of ruby glass—the gable is surmounted by an eight-pointed interlacing cross. The doors are in two valves, sliding backwards and forwards on rollers in a recess provided in the masonry. They are of oak, ornamented with iron scroll work, and within them and working in the same recess is an elaborate wrought-iron grille, by Brawn, of Birmingham. In summer the oaken doors will occasionally be drawn back, and the grille drawn forward in their place. One of the valves of the oaken door contains a swing wicket, which is found useful in south-westerly gales.

Passing through these doors the porch is entered. Its interior is divided into three compartments by two transverse arches of two orders, deeply moulded, and resting on foliaged capitals surmounting sixteen polished shafts, which are alternately red serpentine and green marble. The vaulting of the central compartment is quadripartite, and the two side compartments are tunnel vaulted. The vaulting is of Bath stone, with deeply moulded ribs, and carved bosses and caps. Stone seats, containing sitting room for sixteen persons, are fixed round the three sides of each of the lateral compartments, and between these seats and the vaulting the walls are enriched by a diaper of the same pattern as that in the spandrils over the nave arches at Westminster Abbey. This narthex is lighted by cross-shaped windows situated at its northern and southern extremities, these openings being filled by a ruby cross, surmounted by a crown, with the legend underneath,—

CHRISTI CRUX EST MEI LUX.

This narthex or vestibule communicates with the nave by swing doors provided with large panels of plate glass, covered with chocolate baize: they open both ways, or are folded back in the thickness of the western wall. By this arrangement, a sheltered vestibule or porch is provided, effectually securing the interior from draughts, and at the same time the entrance is made at the western extremity of the building, by far its most effective position, as regards the "coup d'œil" in entering the church. Passing these swing doors we enter the nave, which is fully illustrated in the accompanying interior view (taken from the altar, looking west). Its most noticeable feature is the design and coloured ornamentation of the roof. The design of the roof is shown in the engraving. The key-note of its colouring is the natural tint of its material (yellow pine) varnished, but unstained. The principals are darker, from having been exposed to the weather for some weeks before the church was covered in. The panels of the roof are "sown" with purple cinquefoils, with a white eye and margin. The ridge piece, wall plates, intermediate principals, and purlins are all deeply moulded with projecting rolls, separated by deep hollows, all mitreing into each other: the colouring of these, as also that of the arched ribs of the roof principals, and the cornices, is from the Church of Sainte-Nazaire, the old Cathedral of Carcassonne, the best thirteenth century example extant of such ornamentation. The section of the roofing ribs (which are 8in. thick) consists of three filleted rolls, separated by two deep hollows filled with "pellets:" these pellets and fillets are gilt. The colouring and gilding thus sparingly introduced assorts so well with the natural tint of the material of the roof, that the result is eminently effective and harmonious.

The capitals of the shafts throughout the building are all different, and carved from natural foliage, the forms having been duly conventionalized for translation into stone. The spandrils of the wall above the windows are diapered, as in the porch; the wall spaces beneath the windows and above the bench ends are also enriched by three panels of similar diapering in each bay, each panel being enclosed in a narrow tile border designed for the purpose. The easternmost bay of the nave serves as a chorus cantorum, containing the organ and the singers.

On entering the western door, the eye ranges past the nave to the chancel arch and apse beyond it. The chancel arch fills up the entire width of the nave; its springing is of the same height as that of the nave roofing ribs, with which it is also concentric, thus avoiding the dead wall space that usually stops the eye above the chancel arch, and thereby robs the chancel of the crowning grace of lofty proportion. There is, in fact, only one line of springing throughout the church, the capitals of the nave windows, of the nave roofing shafts, of the chancel arch, of the apse windows, and of the apse vaulting shafts, being all on the same level.

The apse consists of five sides of an octagon; it is vaulted in Bath stone. The ribs are of the same section as the arched ribs of the nave roof, except that they have greater depth. The tracery of the apse windows is shown in the exterior view. It is noticeable that the capitals of the window mullions of the apse are on the same level as those of the adjacent vaulting shafts. This arrangement distinguishes the apsidal chapels of the Cathedrals of Beauvais and Trèves, and is one very much more harmonious in effect than the usual method of placing the caps of the mullion shafts at a higher level.

The arrangement of the sacrarium is peculiar—it is circular on plan. A circle is inscribed within the octagon of which the apse forms five sides, and the portion of this circle projecting beyond the piers of the chancel arch renders the altar steps and altar rail arcs of the same circle. The space enclosed by the altar rail is, therefore, circular on plan; and the pavement is a modified reproduction, in glazed green and chocolate tiles, of one of the concentric labyrinths (called heavenly Jerusalems) that so frequently occur in the pavement of early French cathedrals. Beneath the apse windows is an arcade, with shafts of polished red granite and Californian marble, the latter a diaphonous material closely resembling the so-called Algerian agate, but infinitely richer in colour. This arcading forms three niches under each of the five apsidal windows. The three beneath the easternmost window form the reredos, and are filled in by glass mosaic executed by Powell. The twelve remaining niches are backed by slabs of polished marble, and form a row of sedilia, encircling the apse, as in the early basilicæ. The pellets and fillets of the vaulting ribs of the apse are gilt, and the foliage of the central boss is picked out with gilding, as are also the more prominent fillets in the mouldings of the chancel arch. This small amount of gilding harmonises well with the warm cream colour of the Bath stone. From the central boss of the apse vaulting is suspended a very good jewelled "corona lucis," by Hardman. The altar consists of a massive slab of oak, with a gilt pellet moulding round its under edge, supported at its angles by four stout shafts, with gilt bases and capitals of early French foliage. The space between the two shafts at the back of the altar is filled in with a panel covered with porcelain tiles of a richly coloured diapered pattern. The altar rail is of brass, and forms in plan a segment of a circle. The riser of the chancel step is of tiles, inscribed "Non nobis, Domine, non nobis, sed tuo Nomini da gloriam." The eagle, designed by the architect, is of brass, with a jewelled collar and crown.

The church contains thirty-two windows, all of which are of stained glass; that of the five apse windows is from Mans and Auxerre, and is peculiarly rich in effect.

The illustration shows the composition of the west wall of the interior. Its surface is diapered; the rosettes that fill up the spandrels between the rose window and the string beneath it are composed of a central boss of emerald glass, surrounded by eight pear-shaped bosses of emerald and ruby glass alternately, the whole fixed in a setting of moulded and gilt stonework. The shafts of the arcade below are of polished chocolate coloured serpentine, backed by polished slabs of Sicilian marble, some of which are already filled up with monumental inscriptions.

The general design of the font is shown in the illustration. From a circular step of polished black marble, 4ft. 6in. in diameter, rises a circular plinth of the same material, supporting eight shafts of Californian marble clustered round a central column of black marble, the foliaged

capitals and bases of the shafts being gilt. On these capitals rests the bowl of the font, formed of one block of polished black marble, with eight sides, each a perfect square. In the centre of each square is sunk a jewelled rosette of gilt bronze (of similar design to those below the rose window). Each side is bordered with a row of smaller jewels (emerald and ruby alternately), set in gilt cup-shaped settings. A vertical row of similar jewels, but larger, is similarly set in the central black marble shaft between each pair of the smaller shafts. The idea of thus combining gilt bronze and coloured enamels on a ground of polished black marble is taken from the tomb of Mary of Burgundy, in the Church of Notre Dame, at Bruges.

The bench ends are rectangular, containing sunk panels filled up by scroll work of gilt metal. The panels of the pulpit (which is approached directly from the vestry) are similarly treated.

The exterior of the east end, and also the bell-turret, is shown in the exterior view. The eight shafts of this turret are of polished red serpentine, and harmonise well with the architrave of glazed tiles, chocolate and green alternately, which is placed over the niche containing the bells. The bells are swung by levers. The finials of the cross surmounting the bell-turret are gilt buttercup leaves; the cock is from Saint-Chapelle. The ridge-cresting of the nave roof is of buttercup leaves; that of the chancel is of buttercup leaves at the top, the two lower tiers of leaves being copied from very beautiful exotic types. The cresting of the chancel roof, the metal finials, and the lead rolls from which the centre finial springs, are painted chocolate, picked out with gilding.

The cost of the church was almost entirely defrayed by the incumbent, the Rev. Charles Conybeare, the only exceptions being that the rose window was presented as a memorial to the late Lord Ashburton, by Lady Ashburton, and a portion of the cost of the chancel was subscribed as a memorial to the incumbent's father-in-law, the late well-known ecclesiologist, Mr. Markland; the narthex was presented by Mrs. Markland, and some of the internal fittings, as memorials, by other friends. Mr. Henry Conybeare was the architect.

THE SEWAGE QUESTION.

THE notices served by the Conservators of the Thames on the various local boards of towns which at present discharge their sewage into that river, have been the cause of considerable perplexity. The question of the drainage of these towns is placed on altogether a different basis from that which it assumed before these notices were issued; and accordingly we find the engineers to the different boards busy in the explanation of their theories, and the preparation of their schemes, for the drainage and utilization of the sewage. So much is said about projects of combination of towns for this purpose, that there seems some danger of a gigantic blunder being committed. It was actually suggested, at a recent meeting in Manchester, held to consider the drainage of towns in the surrounding district, that the only way to dispose of the sewage was to send it into the sea, or to combine a number of towns, and execute some grand project. A proposition was also made within the present year to carry the sewage of Kingston, Surbiton, and other towns in the Thames valley, now drained into the river, away to the sea, through Kent, by means of an immense main sewer. Of course to any proposal for utilization, the old objection of the difficulty of obtaining sufficient land upon which to use it is raised. Towns, for the purpose of utilizing the sewage, ought to be individualized—not combined. Even the sewage of a single large town should not be concentrated to one point, if it can be accumulated at two or more, and thence distributed in different directions. Of course, at first it is much cheaper to lay down one main than to lay two; but, considering the probable extension of towns in directions yet unforeseen, it certainly appears true economy to place the irrigated land further into the country, and thus make way for the extension of buildings. It is argued that the nuisance arising from irrigated land would be intolerable near a town; but why should the sewage be exposed to the atmosphere? By conveying it beneath the soil we avoid this, and we at once send it to the roots of the plants, and retain in the soil for their benefit its volatile parts, which, when exposed above the surface, are offensive and become lost. By this means also we can benefit root crops and cereals. Mr. Wilkins's experiment at Reading in 1855 amply proved the benefit derived by plants fed with sewage conveyed beneath the surface. The mean rate of fall of the river from Oxford to London being little more than two feet per mile prevents any general system of irrigation by gravitation, and the necessity arises of pumping the sewage to elevated land. Great facility is offered for this purpose by the power of the water falling down the river, which should obviously be used for preventing the fouling of the stream by the sewage of towns on its banks. In October last the members of the local boards of Windsor and Eton addressed a letter to the members of the various boards throughout the kingdom stating the above fact, and that, after mature consideration, there appeared to them to be the three following systems of drainage worthy of special consideration.

1st, That in which the whole of the sewage and rainfall of a district is conveyed by one set of sewers to a given point.

2nd, That in which the sewage and a portion of the rainfall is conveyed by sewers to one outfall, whilst the remainder of the rainfall is carried away in a composite manner to the nearest watercourse.

3rd, That in which the sewage and rainfall are kept perfectly distinct, and each conveyed away by itself—the sewage to a given outlet, and the rainfall to the nearest watercourse.

The letter then proceeds to the consideration of these three schemes, the first of which it practically condemns. It also urges many objections against the second, which is that practised and advocated by Mr. Rawlinson; and reports favourably on the third, which, as it states, Mr. Menzies, the Deputy Surveyor of Windsor Forest and Park, was the first to bring to a practical conclusion. The principle he lays down, is, at least, a simple one—exclude all the rainfall and all the subsoil water from the foul drains, and conduct the sewage, with its attendant regulated quantity of flushing water, to the outlet, and then apply it to the land. A pamphlet has just been issued by Mr. Charles Slagg, Assoc. Inst. C.E., Borough Surveyor of Kingston-on-Thames, on "The principles of Town Drainage," and apparently specially prepared in reply to this letter of the Windsor and Eton Local Boards. Now, as Mr. Slagg remarks, the last-mentioned system may be the best in a town which has no existing sewers or drains, but when we come to the consideration of the case of a town already drained, or partially drained, the question assumes quite another aspect. The reservation of the present sewers for sewage only, and the construction of new drains for the rainwater, would be a work not only of extreme costliness, but considerable difficulty. This important consideration, he thinks, must prevent the adoption of scheme No. 3. With regard to scheme No. 1, he considers that the general proposition that sewers should carry off all the rainwater as well as the sewage to the outfall, is perfectly untenable. Sewers made large enough to do this would be so costly as to prevent the possibility of their construction; and, beside this, the difficulty of dealing with the whole body of rainwater at the outfall increases the impracticability of the scheme. The 2nd system—viz., that in which the sewage and a portion of the rainfall is conveyed by sewers to one outfall, and the remainder of the rainfall to the nearest watercourse, he recommends as the most advisable for general adoption. He advocates that one-third of the surface water (that falling in the streets) should be kept out of the sewers altogether; that another third, that from the roofs of buildings, should be stored, used, and sent into the sewers gradually; and that the remaining third, that from the back premises of houses, should be allowed to flow into the drains as it falls, for the purpose of flushing the drains, and for the sake of economy of construction. Without expressing any decided opinion, we certainly think Mr. Slagg's argument worthy of attention. It is now pretty generally admitted that public rivers never can be absolutely pure. It has been proposed by some who advocate the artificial filtration of the sewage that a comparative standard of purity should be enacted by law. But it is by no means certain that any process of filtration can be perennially effective. The recent experiments made by Mr. Byrne in this direction, and which we noticed at the time, serve to show that all filtering mediums become inoperative after a short time, and that the liquid will then be rendered more impure than when it entered the filter. Would not an enactment be preferable, founded on the broad distinction of rainwater and sewage? the former to flow into the rivers by the natural channels, and the sewage to be used for purposes of irrigation. Let the authorities then take as much land of various kinds as is necessary to the reasonable use of sewage of towns, and make the best use of the sewage upon it that may be practicable, and there let the question, at least for a time, rest.

THE NEW AMERICAN RAILWAY CONSTRUCTOR.

A NEW machine, which, if it performs half what is promised, is certainly one of the most remarkable ever produced, has been brought out in the United States. It is the invention of Mr. D. W. Robertson, of Star city, Humboldt, Nevada, and is described as an apparatus which, by a combination of movements, levels the loose surface of the soil, places the ties at uniform distances, follows any curve, accommodates itself to ordinary gradients, deposits the rails with the chairs attached, and fastens them securely in their places. It is stated that as much work can be done with it by 20 men as by 200 without it. A San Francisco paper says, the machine is comprised within a frame, 60ft. long, 8ft. high, and 12ft. wide, and has somewhat the appearance of the skeleton of a wooden bridge placed on a low railway truck. This truck only supports one third of the length, the forward part, which is two thirds of the whole, overhanging the ground over which the track is to be laid. The heavy stringers which taper gradually to the front, give strength to the machine and preserve its balance. It is fitted with a 10-horse engine, and, as it travels forward, moves on rails of its own laying. A plough in front of the machine levels the ground for the permanent way, the ties brought from the back over the workmen's heads, by two endless chains, are laid on the ground exactly in their required positions. Clamps connected with a hoisting apparatus, raised sufficiently high, pick up singly the rails, which are stacked at the rear of the platform, on each side of the motive power, while in suspension. They are run forward by means of overhead tracks and cars, till they hang over the spot they are meant to occupy. The chains are slipped over the rail ends, as they travel, and the rails are then lowered by machinery to their places. The chairs have then to be nailed firmly to the woodwork, the spikes driven home, and the constructor travels on over the road it has just made. Fresh ties can be constantly supplied by the track behind, without stopping the work. The front of the machine can be elevated or depressed to the fractional part of an inch, to accommodate the rise or fall of a gradient. It can, if necessary, turn itself on a radius of 200 feet. A position for the managing engineer is built among the heavy framing above, from whence, comfortably sheltered, he can control and survey the whole.

FROM AUSTRALIA.

MR. JOHN B. MURRAY, Corresponding Secretary of the Stonemasons' Friendly Society, in Sydney, in a letter to Mr. Richard Harnott in this country, says:—With regard to the state of trade in this colony at the present time, I am very glad in being able to inform you that it is in a very healthy state; in fact, I have never known it to be in a better condition for some time than it is at present, for every mason seems to be employed, which is a very good sign. Since I wrote you last, tenders have been called in for the erection of the new General Post-office, which is to be a very good job, and will employ a good number of masons for some time. Also, a premium has been offered for the best design for a new Townhall, to be built in Sydney, and, as the time has expired for the competitors to have in their designs, we expect that tenders will be called for the erection of it forthwith; so, taking everything into consideration, such as trade is with us at the present time, and our prospects for the future, we cannot find room for any complaint as regards the work in the city. The railways, I am glad to inform you, are going on well; a large number of masons are employed upon them at the various places, and everything seems to be going on in good order.

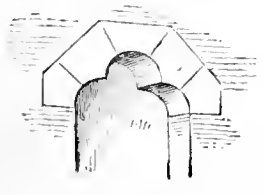
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. XI.

IF one feature has distinguished our modern English architecture more than any other, it is the arch in its decorative functions. In the extended use and multiform applications of this feature belong the common ground on which the architects of the Italian and Gothic revival meet. Both schools here alike agree in the main—both reject the counterfeits for the realities, and both are seeking to develope the capabilities of the constructive arch, and make it decoratively an important element in design. We hardly know which set of artists have been most successful in bringing into play the twofold office of the arch, for we find in both cases the same desire to modify and vary its form, making it more or less the keynote of the whole composition, whether that composition assume an English, Italian, or French style of expression, whether it wear a Classic, Gothic, or Moresque character.

In our modern buildings the Gothic principle is still at work, though disguised under numerous forms of treatment. Thus, in our modern Palladian or Italian style, we find various combinations of the arch and lintel, and many modifications of the column, from the simple to the clustered shaft.

In some of the designs recently submitted for the New Law Courts, and illustrated in the BUILDING NEWS, ample evidence is afforded of the combination and mixture of characteristics of both styles; high-pitched roofs and other semi-pointed features being blended—in some cases incoherently—with the horizontal members, cornices, and columnar arrangements of the Classic Renaissance. The form, variety, and disposition of the arched openings, however, will be found in all instances to give an essential character to a composition in whatever style it may be conceived; and we may here devote our consideration to some very suggestive forms of the arch for the minor purposes of window and door heads.

One form of arch, singularly useful and highly effective for small openings, is the



square and round-headed trefoiled form. The flat-headed kind adapts itself most admirably for windows and doorways in positions that do not admit of height over them, and can be used consistently either in the horizontal or pointed styles, or in that common-sense style which is being gradually evolved out of the elements of both, and is assuming a place to itself in the architecture of the future. The

Fig. 1.

round-headed trefoil combines most agreeably with both round and pointed arch forms, and many happy examples of its use may be seen. Where external apparent height is required, but where floors or ceilings debar the architect from obtaining sufficient for this need internally, the trefoiled head suggests itself as an easy and effective means of finishing window and door apertures (see fig. 2).

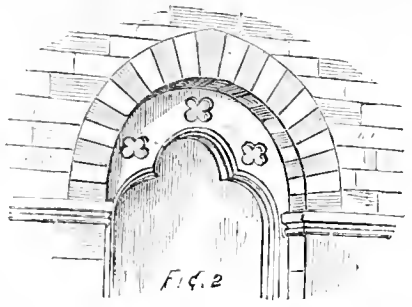


Fig. 2.

Windows arranged in couplets and triplets are often productive of the most pleasing combinations; and when a continuous series of windows, as in a long façade, is varied by single and double lights, or by couplets and triplets of them, a more charming variation is effected than can possibly be obtained by mere ornamental adjuncts or bands of coloured materials used in conjunction with a repetition of similar apertures. The plan of recessing such lights as shown in fig. 3, or enclosing

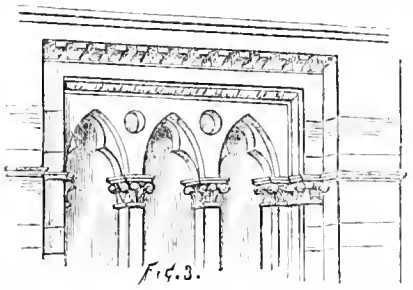


Fig. 3.

them under an outer relieving arch, gives a richness sometimes desirable in relieving the wall surfaces, without destroying the breadth or continuity of the composition; and, by connecting the lights in groups, the windows are not rendered unmanageably large. This is a great consideration in private dwellings; and in many public buildings and offices where plenty of light is required, and height of room is limited, thereby necessitating a regular distribution of small apertures. Such a grouping of lights is admissible in both Classic and Gothic structures, though in the latter only has it been extensively followed. The fenestral arrangements of some of our recent buildings evince a masterly conception and treatment of the above principle of design, and constitute a marked advance in our modern architecture. The end or Lothbury front of the Central Credit and Discount Company's offices, lithographed in the BUILDING NEWS (p. 11 and *ante*), presents a fair example of the grouping of small window openings in a building of semi-Gothic or Venetian character.

Figs. 4, 5, 6, show three distinct treatments

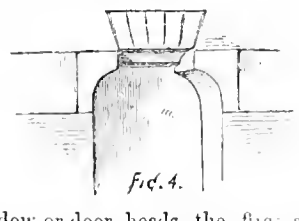


Fig. 4.

of window or door heads, the first and last combining the arch form with the lintel.

Fig. 5.

Width of opening can be frequently obtained without encroaching on the side

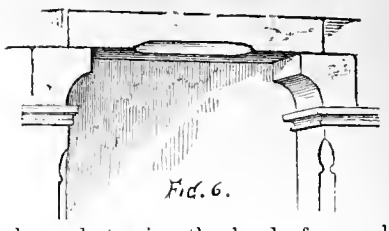


Fig. 6.

jambs, or destroying the head of an arch or its mouldings, by corbelling the most promi-

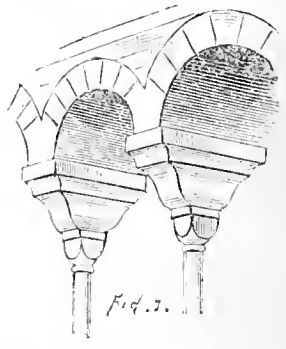


Fig. 7.

nent members of them at a proper height (fig. 8).

A correspondent has suggested the consideration that flat arches or square-headed

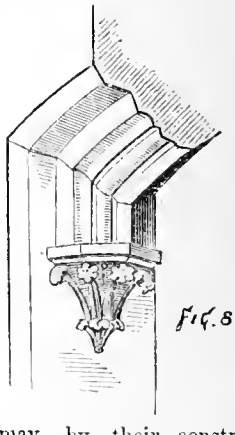
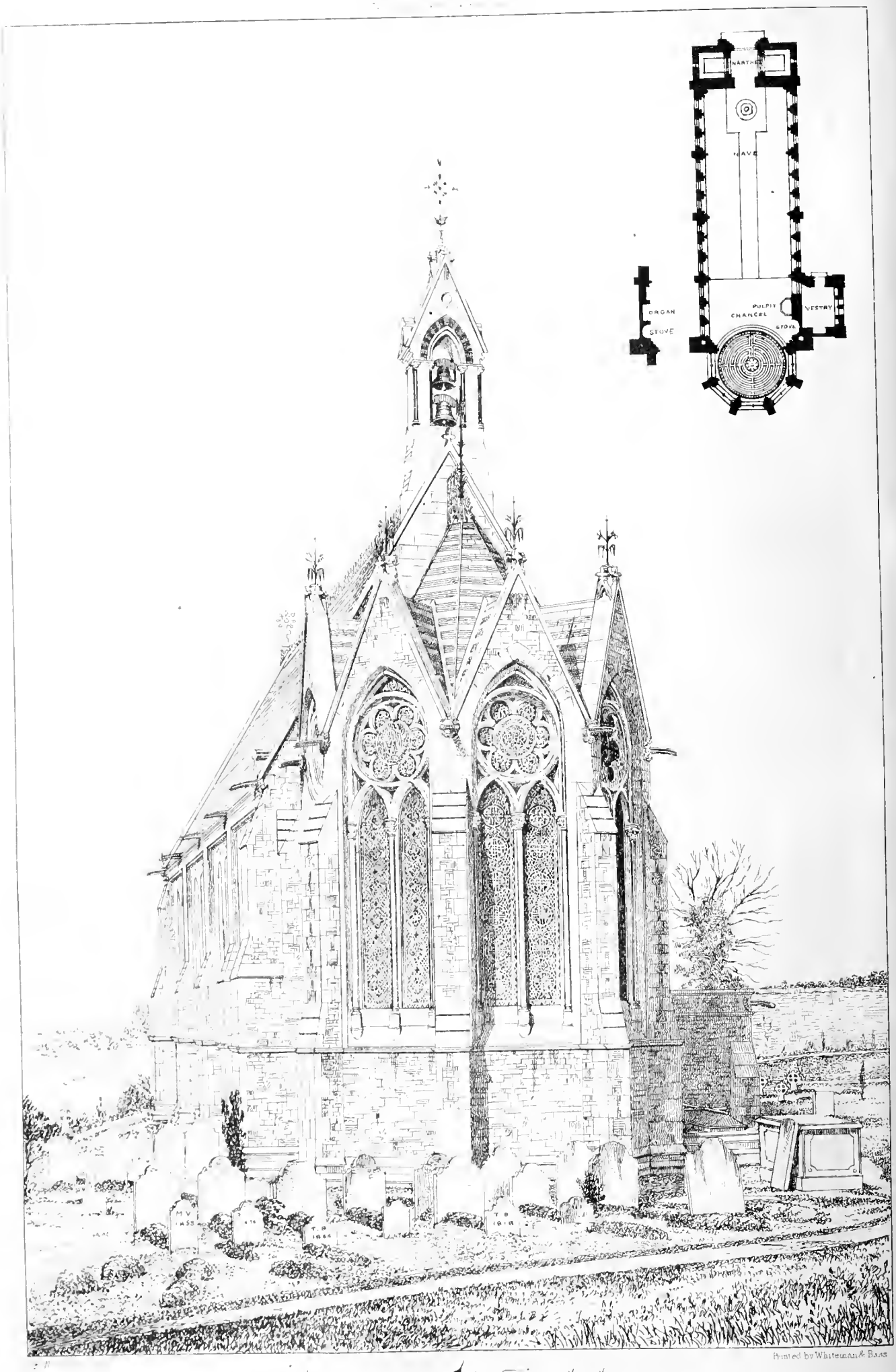


Fig. 8.

openings may, by their construction, be equally as good and strong as pointed arches, a point to be impressed, as he observes, in Gothic and Classic alike. The practicability

of making the arch stones of sufficient depth, so as to form a segmental, semicircular, or pointed line of extrados, is all that is required; and there can be no reason why the square-headed window openings and pedimental heads of our Italian Renaissance style, should not be so treated, instead of becoming mere masks of a defective construction. G. H. G.

Professor Wheatstone, upon whom it is said the Government is about to confer the honour of knighthood, was appointed Professor of Experimental Philosophy at King's College, London, in 1834. He was associate of the Ordnance Select Committee at Woolwich during the Crimean war, from 1855 to 1859, and a member of various other Government commissions. He has received the degrees of D.C.L. and LL.D. from the Universities of Oxford and Cambridge, and is corresponding or honorary member of all the principal scientific academies of Europe. He is also a Chevalier of the Legion of Honour, and has received two gold medals granted by Her Majesty and awarded by the Royal Society for attainments in physical science. He invented the concertina, the stereoscope, and the solar clock. He was the originator of the submarine telegraph, and his researches in electricity conducted mainly to the introduction and development of the electric telegraph in its present practical form as employed in this country. His latest invention is an apparatus for conveying instructions to the engineers and steersmen on board large steam vessels, which has received the favourable consideration of the Admiralty.



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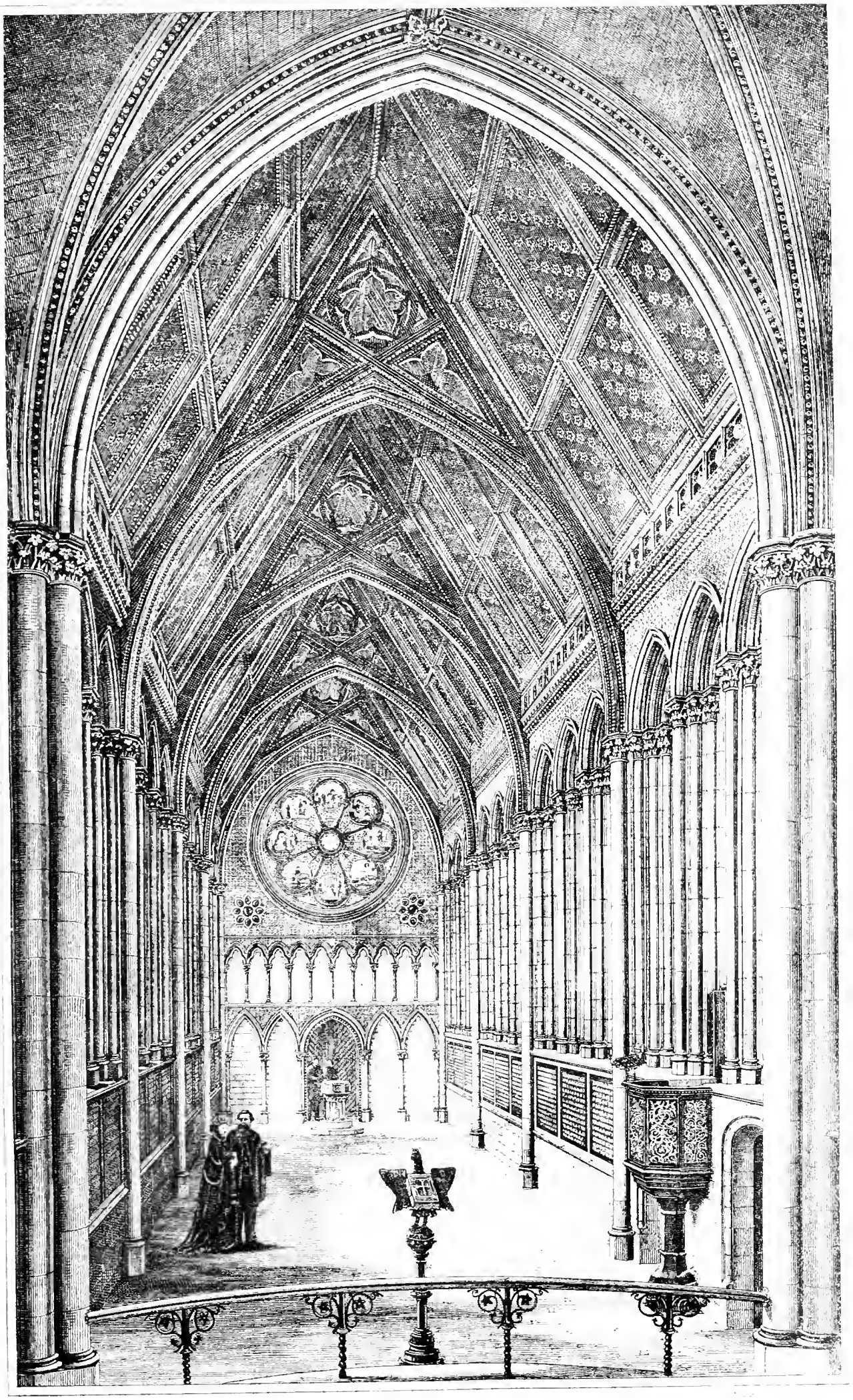
St Mary's. Itchenstoke.

Mr. HENRY CONYBEARE, ARCHT.



St MARY'S, ITCHENSTOKE - INTERIOR

ST. ANDREW'S, HERTFORD.

ABOUT six years since an effort was made to rebuild this church, and about £2,000 were either paid or promised. A limited competition was invited, and four sets of designs were sent in; and those of Thomas Smith and Sons were selected. The word "selected" was written on the drawings by the rector, and there it now remains. A fancy fair was held for the purpose of getting together funds, when Messrs. Smith's designs were exhibited as those chosen. Illustrations of the designs were engraved on steel and sent, with a circular, to the leading men of the county, asking for subscriptions. The money not having come in sufficiently, the matter has remained for some time in abeyance. The rector, however, having left Hertford, his successor very naturally wishes to have a better church, and the affair is consequently revived. The committee met, but, strange to say, Messrs. Smith's designs are thrust aside, and a new unlimited competition is invited; and we hear that no less than ninety-four architects have applied for the necessary information for competition. We beg to ask the committee whether they think they are acting justly towards Messrs. Smith. No reason has been given why their drawings should be set aside, and we suppose there is no reason but that the new clergyman has, perhaps, some architectural friend whom he wishes to have the job. We hear that Messrs. Smith are not to be so easily extinguished as the committee may imagine, and that it is intended to ascertain what a judge and jury may have to say on the subject. The committee may say that, as they could not get the £3,800, which was Messrs. Smith's estimate, they intend having a smaller and cheaper church—one that should cost only £3,000. That, however, would be no justification for setting Messrs. Smith aside, as these gentlemen have offered to modify their plan to meet the necessities of the case. Their original plans provided for 650 sittings in the church and 182 in the gallery, making a total of 832, for £3,800. The new church is to have only 600 sittings for £3,000. The Messrs. Smith have given ample evidence of their ability to build excellent churches. It is well that competitors for the intended new church should be cautious how they deal with Hertford Church-building Societies; and if architects were animated by a true spirit, they would not, after knowing the facts, enter into the second competition.

PRIZES FOR ART WORKMEN AT THE SOCIETY OF ARTS.

BEFORE going through the various articles *seriatim*, it may be as well to make one or two observations upon the Exhibition itself, as well as upon the details of the programme, which have naturally affected the execution of the specimens. It is much to be hoped that the gentlemen who drew up the conditions may see their way a little clearer another year. Now, everybody knows that a sculpture in marble demands a very different treatment from a sculpture in stone: and yet the very first division contains a prize offered for a carving either in *marble or stone*, from a frieze by Donatello. Had any close-grained stone, such as lithographic stone, been specially mentioned, the mistake would not have been so bad; but an inspection of the copies executed in freestone, and the solitary one carved in marble, shows how very much the material influences the work. There ought either to have been a prize for marble, or a prize for freestone, or prizes for both; but the same model should hardly have been employed in each case. Again, by the programme we learn that the competitors could procure both a cast and a photograph of the model. This is surely wrong, for a photograph will often give a very different idea of an object from what we obtain from a cast. It appears only just that every man should be put on the same platform, and be supplied either with a photograph or else with a cast; certainly he should not be allowed his option.

As to the Exhibition itself, there are only two complaints to make—viz., that the objects are not placed in the sequence of their numbers (for instance, one of the human figure prizes in stone is in the hall, and the others upstairs), and that the casts of the originals are not supplied to the Society's rooms. It is true that most of the photographs are there; but still, for comparison, it would have been far better had the casts themselves been placed in juxtaposition with the copies. But, to return to the works, they are divided into two divisions—viz., works executed from prescribed designs—for which forty-six specimens have been sent in—and subjects sent without prescribed designs. These latter amount to sixteen. There are thirty-two additional works in wood carving, also without prescribed design.

Class I., of the first division, gives prizes for the best work executed in marble or stone, after part of a frieze of a chimney-piece by Donatello, in the South Kensington Museum, or a relievo in terra cotta; dimensions two-thirds the size of the cast. It is not easy to see why the latter condition was imposed, for Donatello himself, as well as every other good artist, would doubtless have found it necessary to introduce some modifications when treating the same subject in different dimensions. If the object of the authors of the programme was to exercise the workmen in such differences, it appears to me that they are beginning at the wrong end, and that our workmen are a long way off from the attainment of such technical minutiæ. At present we should be amply satisfied if they could only copy the real size in a decent manner. The terra cotta Amorini are evidently intended to be copied in stone; but why copy terra cotta in stone? Surely there are numbers of casts of beautiful works in stone contained in the Architectural Museum; but they mostly belong to the twelfth, thirteenth, and fourteenth centuries, the art of which periods does not appear to be in much favour either at South Kensington or with the authors of the programme. Three specimens have been sent in for this prize; but, inasmuch as they are all separated, and as the photograph is very small, it is rather difficult to ascertain how nearly they approach the original, which may be either a good or a bad specimen of the master. The work executed in marble shows how very superior that material is for the mode of treatment. Nobody appears to have gone in for the Amorini.

The next prize is for ornament. In this case the model is a carved chair-back, which, by the same strange perversion as noticed above, is to be copied in marble, stone, or wood—here the dimensions are also to be reduced. As far as can be judged by the photograph, the original is a rather average specimen of the time of Henry II., remarkable for nothing but an exceedingly comic lion's face, certainly about the last thing one would suppose to be recommended for study by art workmen. Two copies of this work of art are sent in, both in stone.

The third prize is given for a copy of a Gothic bracket in the Architectural Museum; but in this case we are informed that the details may be improved by the introduction of small animals, and the human head changed according to taste. It is a pity that it never struck the authors of the programme that the hideous Pagan chair-back might also have had its details improved with advantage. No one has gone in for the Gothic bracket, even with the permission to improve it.

We next come to something really practical, viz., work carved in wood, after a panel in carved oak. Three specimens have been sent in for this prize. As there is no photograph and no cast, we are obliged to fall back upon our reminiscences of purely Renaissance carving, for, of course, this is a Renaissance panel. Two of these specimens appear to have been enlarged, and the third, which we may presume to be the size of the original, appears rather lumpy for its scale. This finishes the stone and wood carving, for, although two other prizes are offered, there appear to be no competitors. The subjects consist of an Italian carved frame, and a gilt console table ornament of the time of Louis XVI.

We now arrive at the metal work, which forms Class II., and begins with the human figure as a bas-relief. The first prize is offered for a copy of the celebrated Martelli bronze mirror-case, attributed to Donatello, and now at South Kensington, dimensions, 6½ inches in diameter; or a panel in low relief of the Virgin and Child, in South Kensington Museum, dimensions one-third of the original—the material of the latter is not named, but it looks very like a marble bas-relief of Donatello. Only one competitor has gone in for the Martelli mirror-case, viz., A. Du Four. He has executed his work most admirably, and it is well worth the sum (£20) placed upon it. The material is wrought iron—the original is in chased bronze, another instance of the misapplication of materials.

Three specimens are sent in for the reduced panel of the Virgin and Child, of which No. 11 is the best. A prize is also given for the best imitation of a tazza in silver, date 1683. This has been responded to by Alfred Page, whose work is very creditable, except as regards sundry of the details of the figures, such as the wrists, &c.; but they may occur in the original, for few people would expect to meet with much good art belonging to the year of grace 1683.

Class III. is hammered work in brass, iron, or copper. The model is a knocker in wrought ironwork. A photograph alone is supplied. Three specimens are sent in—two in brass and one in iron. Of the brass ones, No. 15 is incomparably the best; in No. 14 the backplate is so beaten up as to be practically useless; and in No. 16, the iron specimen, it is not beaten up at all, and is cut out of too thick a plate of iron, whereas the photograph most distinctly shows it beaten up slightly, and executed on a very thin plate.

There is no competition for the carving in ivory, so we may go on to Class V.—chasing in bronze. Three specimens are sent in. The work is a panel in low relief of the Virgin and Child, the original being in marble. A rough casting in bronze, on which the chasing must be executed, was supplied by the Society at cost price. The panel in question is the Donatello Virgin and Child we have noticed as serving as model for the *repoussée* work in metal. In this case a rough metal cast ought certainly to have been put alongside the specimens, to show us what ground the competitors had to work upon, as also a cast of the original. The prize for ornamental bronze chasing is offered for a copy of a silver-gilt missal cover, a photograph only being supplied. Two competitors send in. One has executed his work, as desired, in bronze; the other evidently thought that a silver-gilt missal cover would be most properly copied in silver, and has, accordingly, very logically executed his work in that metal.

The Goldsmiths' prize for etching and engraving upon metal is the next on the list. The subject given is an arabesque ornament (an exceedingly well known one) of Lucas Van Leyden. Mr. Hindly, an apprentice of Messrs. Garrard and Co., has produced a very fair copy on silver; so has G. B., on ivory; although both have failed to produce the energetic ugliness apparent in the faces of the original engraving. G. B. has filled up his work with black, and we are thereby enabled to judge of it more easily than in the case of his competitor, who has left his plate as it came from the burin: he should have blacked in at least one half of it. Space compels me to pass by the sections of painting upon porcelain, engraving

on glass, die-sinking, glass-blowing, and book-binding, and to confine my observations to the three remaining sections, which are more particularly connected with architecture, viz., decorative painting, wall mosaics, and illumination.

Two prizes are given in decorative painting. The first, for a work executed after a photograph of ornament by Aldegrever, and the other, after a picture-frame at South Kensington. As usual, three works are sent in for the ornament, but in all three there is a want of knowledge of the human figure; in fact, one specimen is very bad indeed. The one competitor for the picture-frame has simply copied it, as if it were marble, with a few gold lines here and there. It is a laborious piece of work, and looks very much as if due to South Kensington teaching.

For illumination, a prize of £5 is offered for the best copy of an altar card, attributed to Giulio Clovio, at South Kensington, or from an MS. border, date 1450, also in that museum. The dimensions are to be one half larger than the photograph; this is probably to obtain the size of the original, as anything more absurd than enlarging or diminishing an illumination can hardly be imagined. How is it that the authors of the programme have consented to ignore the great ages of illumination, viz., the thirteenth and fourteenth centuries? Miss David has made a very excellent copy of the fifteenth century MS., although it leaves something to be desired as regards the figures and the burnished gold. It is strange what a mystery and difficulty is made of this same burnished gold, and how many preparations are sold for its production, when the process can be learnt from any picture-frame gilder. Of course, a certain amount of experience in the manipulation of the burnishing gold size has to be obtained, but that, as well as the use of the burnisher, is a mere matter of time—people cannot expect to acquire in one day or one week what it takes an apprentice years to learn, I mean with regard to the manipulation; for the process is no secret at all. The other copy of the fifteenth century example is by no means so successful. The copy of the Giulio Clovio is very neatly and carefully done, but does not involve the same difficulty as the other specimen.

Among the specimens sent in, without prescribed design, is an illuminated page, in the style of the early fourteenth century (No. 59). The ornament, the birds, and the grotesque animals are very well done, but the angels are very unlike those of the period, although the inspiration has been sought in Fra Angelico; the gold, as usual, is a failure, and the writing is a mistake. A little more careful study of ancient examples and of the human figure, would make the lady artist proficient in this style of illumination.

Only one competitor appears for the mosaic prize (a female head to be executed after one from Raphael's cartoon of the Beautiful Gate), and he has worked his subject in only two colours, viz., a brown head upon a blue ground. The effect is not brilliant, as mosaics ought to be; and, in fact, does not do justice to the workmanship, which is very good.

No less than thirty-two works have been sent in to the second division, viz., Wood carving without prescribed design. Only two stand out from the rest, viz., the Neptune, carved in walnut wood by Charles Liddle, and the frieze from "Midsummer Night's Dream." The latter betrays great energy in the action, and some parts of it are exceedingly well carved; had it been finished, a more decided opinion might be pronounced upon its merits, which it is almost impossible in its present state. The figure of the boy who has fallen down appears very much out of drawing, as regards the bend in the back. It is to be desired that next year Mr. Leach will favour us with a complete specimen of his skill. The authors of the Statue of Daphne and the Nativity of Cain would both be the better for some careful studies in anatomy, more especially the latter competitor.

Next year it is to be hoped that this Exhibition will be far more successful, both as regards the number of works sent in and as regards their merit. At present the affair is very uphill work. The Society of Arts have not room to exhibit the specimens as they ought to be exhibited, the masters do not always allow their workmen to compete, and the programme might be improved with advantage by the introduction of a few more mediæval objects, and by the reduction of the heavy, lumpy Renaissance work which seems so much in favour.

It is also to be desired that there may be fewer gaps in the catalogue, as compared with the programme. Thus, we find that some branches of industry are not represented at all—*e.g.*, enamel and ivory carving; but, after all, what is wanted is to get hold of the apprentices, and to make it a point of honour with them to have obtained a Society's prize. As to the workman proper, he generally remains pretty nearly as he was a year or two after his apprenticeship.

W. BURGES.

EXETER AND ITS NEIGHBOURHOOD.

OUR readers will be glad to hear that in the above city improvements are taking place, and these of such a nature as to give satisfaction to all lovers of architecture. Those who are acquainted with the "faithful city" of the West will be the more gratified at this, for to whom does not Devonshire afford sunny memories? The cathedral, with its stately towers, elaborate west front, and almost faultless interior; the superb High-street, many of whose houses still retain rich and quaint old wood carvings upon their picturesque fronts; the curiously antique and tumble-down Guildhall, looking as if the first "Pickford's" that by chance may graze its projecting columns will bring the whole fabric to the ground; and the far-famed figure of "Father Peter," at the corner of North-street—all these are objects upon which much has been, and could be, written. Our object, however, is not to dwell on these, tempting as their topics are, but to speak briefly of the new buildings and restorations which have been in progress during the past year of 1867.

Most prominent of these, then, is the Albert Memorial Museum, in Queen-street, now nearly finished, and erected from the designs of Messrs. I. Hayward and Sons, of Exeter. The style is Early French Gothic, and there is a purity of feeling pervading the whole that renders it a building of great merit. The internal arrangements are excellent, and give great satisfaction. We doubt not, therefore, that in its double capacity as a museum and school of art great advantages will be reaped by the city. There is a large amount of excellent stone carving, the whole being as successful a specimen of simple conventional ornament as we have yet seen. This may be attributed principally to the zeal of the architects, who have spared no pains in instilling true artistic feelings into their carver, encouraging him during the progress of the work to visit the rich cathedrals of Normandy, and placing their valuable library at his disposal. In a finely carved niche on the grand staircase a figure of the Prince Consort will be placed as soon as it arrives from the studio of Mr. Stephens, of London, into whose hands it has been entrusted—Mr. Stephens, by-the-bye, being himself a native of Exeter. His marble figures of Sir Thomas D. Acland, on Northernhay, and of Earl Fortescue, in the Castle-yard, are works of the highest order; and I trust the one of the Prince will be equal to either in its vigour. The last production we have of his chisel—John Dinham, Esq., on Northernhay—fell considerably below our expectations; and his Gothic figures upon the restored part of the cathedral's west front are exceedingly poor. I hope he will seize this opportunity of retrieving his somewhat fallen name. The building will be open at Easter, when a bazaar will be held to raise funds for erecting the right wing, which yet remains to be built. Mr. E. Luscombe, of Exeter, is the contractor.

The handsome church of St. Michael and All Angels, on Mount Dinham, erected by Mr. Gibbs, is fast approaching to completion. On the 13th the spire was finished, and a gilded iron cross, 10ft. high, fixed on the apex. The spire is 225ft. high—twice as high as the cathedral towers—and can be seen for miles around. The organ is fixed, and a beautiful west window of stained glass adds greatly to the general good effect of the interior. There is some good stone carving on the nave capitals, and over them corbels of natural foliage of considerable merit. The benches are of oak; and, altogether, this bids fair to be about the finest church in the west of England. Mr. Hawkins, of London, is the architect; Mr. Peter White, of Vauxhall-bridge-road, the contractor—he also finding the carving, most of the angels being executed in London and sent down.

The Church of St. Mary Major, situated in the Cathedral-yard, and regarded as the oldest in Exeter, was taken down in 1865, and has been rebuilt from the designs of Mr. Ashworth, of this city. The style is Early English, and the whole of the available stones from the former edifice have been re-faced and worked in as far as possible. The church was opened for public worship on the first Sunday in 1868: it consists of a chancel, nave, and south aisle, the two latter being separated by rich clustered marble columns, surmounted by carved Portland capitals. There is a deal of ornamental carving on the interior, and outside as well; all of it being very fair. The benches are of oak, and open. The tower will be surmounted by a spire, but this will stand over for the present. Several old carvings—preserved from the ancient church—are introduced, the most curious representing the martyrdom of St. Lawrence, the poor, unfortunate individual being stretched upon a gridiron, one of his two fiendish executioners being in the act of turning him over with a long pole. This stands in the tower, and near are a number of the monuments from the last church. In the chancel arch are inserted two interesting corbels of early work; these are in a capital state of preservation. Mr. Tozer was the contractor—Messrs. Mitchell and Son doing the stonework and supplying the carving. The cost has been about £6,000. Another ancient church, that of St. Mary Arches, is being restored. Some of it is Norman, but the major part Perpendicular. Messrs. Hayward and Son are the architects. The church of St. Martin's has had its exterior renovated, the tower restored, and a new porch erected. Mr. Best, of this city, was the architect. The parish church of Rewe, near Exeter, has also been restored, as far as funds will permit, under the direction of Mr. Ashworth; the builders being Messrs. Stephens and Son, of Exeter.

The pretty and elaborate church of Clyst, St. George, situated about five miles from Exeter, is undergoing some additions. Under the superintendence of the rector, the Rev. H. T. Ellacombe, the altar is being carved and enriched by Mr. Harry Hems, sculptor, of London; and some wood carving for the roof is in progress by Mr. Ship, of Bristol. A new porch has also been erected over the entrance-gate to the grave-yard.

A new chapel, from the designs of Messrs. Habershon and Pite, of London, has been built at the neighbouring town of Exmouth. It is in the Geometrical style. There is a little decoration outside in the shape of some stone carving, which is executed with good taste.

The largest and most important building in progress in this neighbourhood is that of Marley House, the residence of John Bryce, Esq. This is an immense mansion situated between Exeter and the sea, and built upon the site of a former house. The total cost will be from £30,000 to £40,000. Mr. Benmore, of Exmouth, is the architect, and Mr. E. Luscombe, of St. Sidwell's, Exeter, contractor. There are several other large works now on hand—the asylum at Wonford, the new hotel at Exmouth, &c.; but these we must leave for reference at another time. J. V.

OBITUARY.

The death of Dr. John Davy, the brother and biographer of Sir Humphry Davy, and eminent as a chemist, geologist, and physiologist, took place on the 24th inst. Dr. Davy displayed an intimate acquaintance with, and had written largely on, the sciences of meteorology, geology, and chemistry. One of his most recent works consists of a series of "Lectures on Chemistry," in which this science is regarded in its relations to the atmosphere, the earth, the ocean, and the art of agriculture. He was a fellow of the Royal Societies of London and Edinburgh. Dr. Davy was born in Penzance, in Cornwall, in 1790.

Building Intelligence.

CHURCHES AND CHAPELS.

On Tuesday week the Bishop of Lincoln consecrated a new church at Dembleby, Lincolnshire, lately erected. The structure is in the Norman style, and was built from the designs of Mr. Kirk of Sleaford, at a cost of little over £1,100.

The annual meeting of the Leeds Church Extension Society was held on Wednesday week, under the presidency of the Mayor of Leeds. The report, which was read by T. G. Teale, stated that the board, during the first two years of its tenure of office, had spent over £11,000. In development of the scheme for parochial rearrangement, the board has formed the nucleus of two additional parishes, and has also undertaken the commencement and continuance of other projects. For the accomplishment of these, however, additional funds are urgently needed, and for these the board earnestly plead.

A chapel of ease has just been completed at Calton, near Stamford Bridge, and has been consecrated to St. John the Baptist. The architect is Mr. G. F. Jones, of York, and the chapel has cost £1,500.

An influential meeting of the friends of the York Diocesan Church Building and Endowment Aid Society was held at York last week, under the presidency of Earl Fitzwilliam. The Archbishop of York, who was present, ventured to express the hope that if, for another ten years, they were able to continue the grants in the same proportion, they would, by increasing all endowments below £100, wipe away that which at one time was a disgrace to the Church and to the landed interest of the country. Resolutions were passed commending the society to the enlarged support of churchmen, and requesting the archbishop to issue a pastoral, recommending parochial collections in its behalf. Before the meeting separated sums amounting to between £6000 and £7000 were promised.

EDINBURGH.—At a recent meeting of the subcommittee appointed to take steps for the improvement of St. Giles's Cathedral, Mr. R. Matheson, of Her Majesty's works, showed plans of the proposed improvements, which were cordially approved of. The intention is to open up the building on the comprehensive scale adopted in the Cathedral of Glasgow; but in the meanwhile the alterations are to be confined to the choir or high church. The perspective view of the interior of the choir shows the gallery taken down, a new pulpit at a low level, and the whole of the seats, with rows of stalls along the sides, in the elegant style of the King's College Chapel at Old Aberdeen. The estimated expense is £3,500.

SALISBURY.—Last week special services were held in the parish church of St. Thomas to celebrate the extensive restoration which has taken place, at an expense of nearly £2,000, of the chancel of this edifice. The church, which is a fine example of the architecture of the fifteenth century, is dedicated to St. Thomas à Beckett. It was erected as a chapel of ease to the cathedral, and consists of a nave and two aisles, a chancel with two aisles, and a square and lofty tower on the south, containing a magnificent peal of bells. The interior is very spacious, and contains many specialities of interest. The roof of the nave is of oak, trussed, and over the crown of each arch is the figure of an angel bearing a shield, a similar image being in the middle of each side. The aisles are also roofed with oak, divided by cross-beams into compartments, and the intersections adorned with bosses. In the middle and at each side are a series of figures of angels bearing shields. Among other objects of interest in the church there is a large monumental tablet, which never fails to attract the attention of strangers, carved out of a solid slab of oak, representing some events in the history of the Patriarchs, with the inscription underneath, "Here underlyeth the body of Humphry Beckham, who died the second day of February, 1671, aged 83. His own worke." The restoration works have been carried out under the direction of Mr. G. E. Street. Above the communion table is a fine reredos, containing a crucifixion sculptured in alabaster, with a coloured diaper background, executed by Mr. Earp, of London. Twelve clerestory windows have also been filled with stained glass by Messrs. Harland, of Frome. The contractors for the works were Messrs. Rogers and Booth, of Gosport.

BUILDINGS.

The new Post-Office at Bristol will be ready for occupation in about two months. It is in the Grecian style; the frontage is 70ft., the depth 130ft., and the height 60ft. The cost of the building is between £12,000 and £13,000. It has been erected by Mr. James Diment, builder, from plans prepared by Mr. Williams, from the London office of the Commissioners of Public Works.

The works of the new building intended for St. Thomas's Hospital are very far advanced, the brickwork and masonry of the basement floor being completed; and the walls above the surface are being constructed in a massive and substantial manner.

A preliminary start has been made in the matter of the new city improvements at Edinburgh. The arrangements for the purchase of a large block of buildings in the first section of the plan have been completed. This block, which lies between Canongate and Cowgate, and is intersected by fourteen narrow closes or wynds, contains several relics of the olden time, some of which will have to be swept away. There is the site of the Episcopal Chapel in Blackfriars-wynd, date 1722; the mint, formerly the mint of Scotland, which dates from 1573; the Journeymen Freemasons' Lodge, occupied by them for upwards of a century; Oliver and Boyd's printing and publishing offices, formerly the Marquis of Tweedale's house (seventeenth century); and the palace of Archbishop Beaton, which belongs to the sixteenth century.

We understand the legal arrangements for the Keble College at Oxford were completed on Monday, and that building operations will soon be commenced. The site is one of the best out of Oxford, being near the New Museum.

A block of model dwellings intended for a class somewhat above ordinary mechanics and labourers has been erected in The Mall, Kensington. The building contains forty-eight separate tenements, approached by well-lighted stone staircases. The amount of accommodation differs to suit large or small families—sixteen tenements having one bed-room, while twenty have two bed-rooms, eight have three bed-rooms, and four have each four bed-rooms, in addition to the living room of each residence. The rooms are all lofty, and provided with fireplaces, and with sash windows opening at top and bottom—a plentiful supply of fresh air is introduced through a system of hollow walls, ensuring ventilation without draught. The roof is flat, affording a drying-ground, and an extensive open space is set apart as a playground in the rear. Mr. James Murray, of Portman-street, is the architect, and Messrs. Lucas, Brothers, are the builders.

The new Townhall, Ipswich, was formally opened on Wednesday. The building is in the Venetian style. The front façade has a projecting open arcade, supported on Corinthian columns, over which are statues representing Justice, Learning, Commerce, and Agriculture. In the centre of these are the arms of the borough in alto-relievo. Above the crowns of the arches forming the arcade are three medallions, in which are placed sculptured heads of Cardinal Wolsey, born in Ipswich in 1741; and Richard II. and John I., who both granted charters to the town. The hall has also a clock-tower 120ft. high, with a clock by Dent; this clock has a good toned bell of 16cwt. Directly opposite the main entrance is a Sessions' Court, 38ft. by 34ft., and 33ft. high from the floor to the dome. On the right of the main entrance is a magistrate's room, 31ft. 6in. by 26ft. 6in., and 19ft. high. A grand staircase leads to a vestibule through which one passes to the Council Chamber. The decorations of the hall, grand staircase, and vestibule are very rich; the staircase is 32ft. long by 24ft. wide. The Council Chamber occupies about the whole length of the western side; the length of this fine apartment is 74ft., the width 31ft., and the height 26ft. On the left of the Council Chamber is a library, 40ft. by 31ft., and 24ft. high. Messrs. Bellamy and Hardy, of Lincoln, were the general contractors; and the cost of the hall has been about £16,000.

WATER SUPPLY AND SANITARY MATTERS.

The borough engineer of Liverpool, in his evidence the other day before the Rivers Pollution Commissioners, stated that the borough of Liverpool extended for about six miles north and south of the margin of the Mersey, and about two miles inland. Up to the year 1846 the sewage was discharged into the dock basins, but there had since been constructed, under his superintendence, 210 miles of sewage works, with eight outlets into the river; and the bulk of the sewage was discharged at the extreme north and south ends of the town below low-water mark.

The Child's Hill (Hampstead) Drainage Committee invite schemes for the best mode of carrying out their powers under the Sanitary and Sewage Utilization Act. The engineer whose scheme is selected will be employed, upon the terms to be arranged between the committee and the engineer, but the committee do not pledge themselves to accept any of the schemes submitted. Plans and estimates must be forwarded to Mr. A. T. Cox, the secretary, on or before the 10th of February next.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—H. C.—E. W. P.—I. B.—R. L. B.—R. L.—S. D. W., with photo.—L. and R.—S. D.—L. and Son.—A. J. M.—H. H. O.—G. E. D.—C. B. A.—W. H. J., with tracing of old church.—E. L. R.—J. C. E.—C. and C.—I. P. S.—F. B. T.—E. S.—E. and J. L. M.—I. S.—H. W.—W. K.—H. H. S.—W. M.—Jenner (thanks).—G. R. R.—W. S.—G. T.—S. and Son.—W. H. T.—W. I.—W. P.

Correspondence.

MR. FERGUSSON AND MODERN ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Fergusson should have been a bishop; he could then have pronounced dogmatic decisions, which, if not privately undisputed, would, at all events, have been publicly received in solemn silence. He must not, however, be permitted to rate a whole institute of architects with impunity; and it seems to me high time that some protest was made against his self-assumed authority. He always speaks and wishes to be recognized as having spoken *ex cathedra*. Hence, when another man would reason, he takes upon himself to judge and decide categorically, as though every one were hanging on his lips for a decree; noticing just as much of the matter under his consideration as is convenient for his own immediate purpose, whether of personal depreciation or general abuse. Passing by other instances of this spirit, let me remark, in regard to that more immediately interesting to myself, that he assumed the office of judge—so Dr. A. Barry protests—before having heard the pleadings of both sides, because this afforded him an opportunity of mounting his favourite hobby for general observations, and of abusing my father in particular. Regardless of justice, on one hand, he is taken to task for summing up *against* evidence; for I am sure that, if one half of my evidence proves to Mr. Fergusson's mind that my father spoiled the original designs for the Houses of Parliament, it can scarcely be disputed that the other half very much more forcibly proves that he made the original designs. Now, however, Mr. Fergusson shirks the real question altogether; and, after introducing one quite irrelevant, covers his retreat by a second question of an entirely abstract nature, even more irrelevant than his first. I will, nevertheless, follow him, as it concerns not only myself, but the whole body of living architects, not to speak of the army of architects who have lived since the year 1500.

Without taking any particular credit to myself for the faculty, I claim to be competent to distinguish between archæology and architecture; and at the same time I do not acquiesce in Mr. Fergusson's teachings or definitions. In opposition to him, I define an archæologist—*i.e.*, a mere architectural archæologist—to be one, who, in making designs, not only studies the works of antiquity as a book whereby he may learn the principles of the art which produced them, and see how these principles were variously developed by successive architects, in what forms they resulted, what ideas

sprang from them, how they were influenced by, and in what outward expression they satisfied and symbolised, the wants of the then existing generations, but actually reproduces such works, irrespective of all considerations of appropriateness, and modern wants, convenience, and requirements, thus making the present subservient to the past, and expressing, not the thoughts and character of his own mind on the age he lives in, but those of men and ages long since departed. A good architect, however, must be a sound archæologist. In designing a building, whilst considering solely "the purposes and age for and in which it is to be erected," he will work it out from his own thoughts and brain power, without reference to books and examples; but, so far from "not thinking of the past, or of any other clime," or unreservedly rejecting the forms and developments of bygone ages, he will bring to bear on his work the wisdom, genius, and power of the great men by whom they were produced. Far, moreover, from fostering a supercilious disdain for them, he will avail himself of their experience and reverence their works, even to the extent of designing the self-same features and using the self same forms for the same wants. It is a shallow philosophy, which, from a morbid desire of being novel, or a slavish fear of being a copyist, shrinks from a loyal avowal of the obligations a man is under to those from whom he has learnt the very alphabet and grammar of his art. In saying this, I am not likely to be misunderstood. No man has more roundly abused archæological whims and old-world copyisms than myself; and none have been more soundly abused for so doing. But I denounce quite as strongly a principle such as that enunciated by Mr. Fergusson, which, followed out without qualifications, leads to nothing but extravagance and eccentricities. The partial truth it contains requires carefully guarding by the principle of authority; and a reverence for the past is the best guarantee for success in the present. This seems to me to be the great safeguard against a spurious originality, which, if sought for apart from the restraints I have mentioned, only results in the weak, crazy, and fantastic developments of modern Paris and London. To throw archæology overboard "in order to get at a real and true architecture," is very much like discarding grammar in order to write with real and true elegance.

All that is true in Mr. Fergusson's definition of an architect has been the burden of my song for many a day; but what he really means is to be found in his article in the "Builder," on the Law Courts, which, although containing much that is both true and admirable, is so disfigured by his usual extravagance that it loses half its value. His ideal architect, it seems, is to cut himself off from "the past, and from every clime" under the sun, except his own. He is to free himself from "the trammels of archæology," and to invent a new style, with no principles but "common sense" and "progress" to guide him. He is to engage on every fresh work with the amusing conviction that "Gothic (English) spires and Grecian porticoes are equally absurdities" in England; that all modern architecture is "a falsehood,"—Classical, one falsehood, Gothic, another; that a love of Gothic art is a mania to be classed with crinolines and chignons, and consigned with them to the limbo of absurd fashions; that veneration for the Middle Ages is "sentimental;" and (if I rightly understand Mr. Fergusson) that neither "pointed arches nor classical pillars" should be tolerated. With such convictions and in such a spirit, a man is to be successful in producing an original and entirely satisfactory style of architecture, "in harmony with the feelings and advancement of the age." Will Mr. Fergusson, for once, be a little less visionary and a little more practical, and give us some idea of the "original, common-sense architecture" about which he discourses so dogmatically? There are several newly-erected buildings in London, which seem to be, at least, efforts in Mr. Fergusson's right direction. The Charing-cross Hotel is wildly original, details and all: does that please him? The Strand Music-Hall has certainly no parentage: surely, this cannot be far wrong. Better still, the new University Buildings in Burlington-gardens, which were pulled down last summer and bodily carried off when but half erected: these, at all events, ought to have passed Mr. Fergusson's muster, for they they were totally unlike anything ever yet seen, not only in design, but even in their general construction and masonry.

In these buildings we certainly find few "crotchets," such as those Mr. Fergusson so flippantly attributes to my father; but a mass of childish fancies, ludicrous abnormal conceits, and fantastic originalities. My father's "crotchets," at all events, had authority on their side; but these are the coinage of the most depraved taste, opposed alike to all "true and real architecture," as to every rule of art. These, then, are the results of a principle such as that we architects are called upon to adopt; these are the will-o'-the-wisps we are to follow in our search after "a new style neither Gothic nor Grecian," until we are lost in a quagmire of incompetence and conceit. Space forbids me to follow Mr. Fergusson any further. Perhaps another opportunity may be afforded me of noticing the "syllabus of errors" with which he has favoured us; but I do not think, since we are all such benighted creatures, that we cannot even appreciate the difference between "archæology and architecture," and that all architecture since the year 1500 has been more or less a failure. Mr. Fergusson, in addition to his darling occupation of finding fault, might take the trouble to build up as well as pull down, and substitute something "true and real," for the strange alterations of the present day. We might then place a higher value on his crusade against all modern architecture and architects.—I am, &c.,

E. WELBY PUGIN.

COMPETITIONS AGAIN.

SIR,—Your correspondent of last week—Mr. A. W. Phillips—acted neither "wisely nor too well" in selecting the case of St. Andrew's, Hertford, as a vehicle for exposing a system which, but for such pernicious instances, would be a valuable institution. Although, from "prima facie" evidence, it was palpably evident that the selection would terminate locally, the paucity of information given as to the site, &c., and the puerile invitation for competing architects to visit the same, being sufficiently indicative of that intention on the part of the committee, it had, to a certain, or rather *un*-certain extent, one redeeming feature—the probability of the favoured individual being engaged as architect on the usual terms. The above-mentioned case is completely put into the shade by the particulars furnished for partially re-building St. Mary's, Lichfield, which is as follows:—

SIR,—In reply to yours, I send you copy of resolution:—That instructions shall be given to any architect who may be willing to compete to rebuild the present church, in unison with the present spire, to seat 1,000 to 1,100 people, and not to cost more than £6,000. Designs to be sent to me on or before February 1, 1868.—I am, &c.,

Jan. 16, 1868. R. CROSSKEY, Churchwarden.

The above was written on headed note-paper, Rock and Co., No. 3172, with "St. Mary's Church, Johnson's house, and monument," depicted thereon; and this, forsooth, was considered sufficient bait to catch competitors. Architects must be clever individuals to surmise correctly the dimensions and date of the former, and the size of the site of St. Mary's, from such information as the above; and must be, moreover, great fools to expend the requisite time, talent, &c., without even a prospect of obtaining any remuneration whatsoever. This instance is all the greater exhibition of "nerve" when it is known that the vicar of St. Mary's has guaranteed £4,000, and that the friends of Bishop Lonsdale, in whose memory the edifice is to be erected, have also promised substantial assistance towards the required amount.

Another mild instance of "nerve" which lately came under my notice, was that of an individual who, under the misnomer of "£ s. d.," invited designs for a villa residence to cost £700 or £800; the bait in this case being £3 3s. Really, Sir, you can expect to see nothing but "inalienable rubbish" in competitions under existing arrangements. Cannot this state of things be possibly ameliorated?

Innumerable instances of this kind might be adduced, and more are turning up daily; but for the present, "hold, enough." With apology for such extensive trespass on your valuable space, I am, &c.,

F.

January 28, 1868.

DARLINGTON WORKHOUSE COMPETITION.

SIR,—Having read, in your impression of the 17th inst., an article on the designs sent in for the Darlington New Workhouse, and having occasion to visit the north, I thought it would be a convenient opportunity to call and see them at the Hall of Exhibition, in Darlington. With your paper in my pocket I entered the room, and at once found the designs of "Alpha," on the left of the hall. It occurred to me as being very strange, whilst reading the criticism, that the author should leave out twelve sets of plans, and only criticise the above one in the way he has done, because, if guilty of all these faults, it was not worthy of comment at all. Therefore, I examined the plans very closely, referring to the paper from time to time, and at last came to the conclusion that some unfair work and means had been used to seriously effect them. Taking the first objection, as to the plans not being scaleable, and being in the profession myself (although no pencil, paper, or scale could be used), I managed, with the aid of my stick and thumb, to check over the lengths and heights, which I found to correspond and agree one with another, and I positively say that these plans would answer for working drawings, for the sizes could easily be taken of them to build from. But this critic gets out of it again by saying doors and windows, at any rate. We shall hear of that in its proper place, when we arrive at the matron's room.

He then writes that the elevation is coloured red. Undoubtedly it is, and so are all the others coloured, and some with far more pretension than the one in question; but looking at the view, where colouring is strictly forbidden, I find that it is carried out to the very letter (the conditions being that all views or perspectives must be in outline only, or etched in with a pen), and I could not find that a brush had been used on it at all.

But I did find that one of the designs he recommends (I shall not mention "motto," as it is unfair) is coloured as much as it could be, and the author of it has tried as much as possible to convey to his inspectors how it would look when on fire. He then proceeds and makes the unblushing statement that in the centre of the house is the kitchen, with nothing to prevent smells, and that there is no back kitchen, or any necessary adjuncts thereto. On examination, I find that the kitchen, instead of being in the house, is leading from it through a large open area, dividing the same off into two large yards, then again into two small private ones, so as to keep children from looking into the windows which look into the private yards, and each window giving abundance of light therein, and capital ventilation. Near the end, at one side leading out of the main kitchen, I find a large open back kitchen or boiler house; also leading out at each side of main kitchen are small passages, one side taking you into a large open dairy, pantries, &c., the other, into houses for plate, bread, provisions, baking, &c., &c., with all the necessary accommodation that a house could possibly require.

The writer goes on to say that the matron's room has no light therein, and is 23ft. from any window. This is evidently stated for a purpose, as there is a large light or window into the private yard; and, moreover, this is not the matron's room, it is only an office for the master or matron to sit in, to see what may go on whilst the inmates are dining. The matron has her private sitting room, and a bed-room adjoining, near the old people, in order for quick and better attendance, each of the rooms having two windows therein.

He then proceeds to the dining-hall, and writes that there are bed-rooms over the same. This is utterly false—there is not one at all. On looking at the first floor plan, it distinctly shows to be roofed and slated in, and a section is absolutely made to show the dining-hall and kitchens, which clearly shows them to be only one storey high.

The next thing is he wants to know what has "seduced" the author to do away with corridors. Why the very fact of having the sexes divided into four—men, boys, women, and girls—does away with that expensive confusion and grouping together of the different sexes, having each a separate house, as it were, to themselves, with all necessary conveniences thereto, and staircases separate, so that the inmates can go in and out of each room without going through the others; consequently, no corridors are required, thus, not only saving expense, but receiving more light in having windows out at each side instead of one. The only fault I can find is that the designer ought to have had a covered verandah along the centre of the workshops and provision stores, leading into the dining-hall, so that the inmates could have walked therein under shelter, which would also have answered admirably for a walk or promenade for the old people, and, with this slight addition, the plan would not only be an original one, but distinct and perfect.

I examined the whole of the other designs, which present to the eye a very beautiful and striking effect, but writing a criticism on them, as to their merits and demerits, I consider unfair until the prizes are awarded; but in this case of slander and libel against "Alpha," I do consider it the duty of anyone to reply and correct these infamous accusations, and let your readers know the truth, exposing the infamous lies that this writer has had the unblushing impudence to invent and commit to paper.

When I stood before the designs your correspondent admires, it more and more convinces me in my first idea, that he was a competitor himself, and had to use these means to bring his designs into note. But out of evil sometimes cometh good, and I feel certain it will prove itself in this case, when the gentlemen who have the same to settle give their decision. In conclusion, this writer, to figure the comment he has written off to advantage, is obliged to copy the words of Mr. Charles Dickens, without giving to that distinguished gentleman the credit thereof, showing clearly that he has no originality, no qualification as a competitor, or any respect for himself as a gentleman as regards the truth, and believes in nothing, unless it has been done for him to copy off before.—I am, &c.,

FAIR PLAY.

Intercommunication.

QUESTIONS.

[726]—ZINC.—It is well known that iron rust penetrates the body of the metal, and that when once the process of oxidation has begun it goes on very rapidly. Would some of your readers inform me whether zinc is affected in the same way when exposed?—R. S.

[727.]—QUANTITY SURVEYORS' LIABILITY.—Can any of your correspondents inform me whether or no a person endorsing bills of quantities with his name and address would be considered solely responsible for their accuracy, even if he has received a portion only of the surveyor's commission?—B. B.

[728]—GOLD LACQUER.—If some one of your readers would kindly inform me how I may make a good gold lacquer I should be obliged.—WHITBY.

[Gold lacquer may be made as follows:—Put into a clean 4-gallon tin 1lb. of ground turmeric, 1½oz. of powdered gamboge, 3½lbs. of powdered gum sandarac, ¾lb. of shellac, and 2 gallons of spirits of wine. After being agitated, dissolved, and strained, add 1 pint of turpentine varnish, well mixed.]

[729.]—HYDRAULIC CEMENT.—Will you inform me at about what temperature a hydraulic lime should be calcined, and also what are the clays best adapted for the manufacture of artificial puzzolana?—A READER.

[730.]—VOLUNTARY ARCHITECTURAL EXAMINATION.—Can you inform me whether the voluntary examinations in connection with the Royal Institute of Architects are still held as formerly, or whether the scheme has been abandoned? The reason of my asking is that I have not seen the advertisements this year as usual. —R.

[The Voluntary Architectural Examinations will take place at the Institute, as arranged, in May next, and will be advertised in due time. The advertisements did not appear earlier than this last year.—C.L.E.]

[731.]—NEW SYSTEM OF GAS LIGHTING IN PARIS.—Could you inform me where I could obtain full particulars of the light mentioned in your last edition as far surpassing gas in Paris?—J. SUDBURY, jun., January 23.

[We gave some additional information on this subject in our last number. It appears that the proposed method of illumination may be termed new when applied upon a scale so vast as that suggested, but viewed simply as a means of producing a brilliant light, it is familiar to every chemist. The gas is produced by the union of oxygen and hydrogen, though the process is not identical with the well-known oxy-hydrogen light. The projectors of the scheme intend employing the oxygen in the proportion of about a fourth of the coal gas, so as to increase the intensity of the illuminating power nearly eight times. It may be stated, however, that the economy of the project is rather doubted, and some further information on the subject is wanted.]

REPLIES.

[717.]—RED PINE GIRDER.—The breaking weight of a red pine girder, 14in. square and 14ft. bearing, is 784 cwt. on the centre, as stated by "Devonport." It is also correct to say that the same girder, sawn down the middle and bolted together with an iron plate between 14in. × ¾in., will have its breaking weight less than the above. The reason is, that the breaking of the iron plate takes place at a degree of deflection only one-twentieth of that which occurs when a plate of wood of similar dimensions is broken. The value of W, for the iron plate of the above girder, is 175 cwt. on the centre, and the deflection would amount to ·586in. W, for the wood flitches, is 784 cwt. on the centre, and is reached with a deflection of 1·724 in.; nearly three times greater than that of the iron. It is clear, therefore, that the compound girder will have its iron plate broken before the entire strength of the wood has been exercised. It is true, that by judicious bolting, the greater stiffness of the iron will be partially employed to increase that quality in the wood; but, nevertheless, the proportion of wood to iron and its disposition in the above girder is such, that the iron plate will surely fail with a less load than 784 cwt. On some other occasion I may, perhaps, be permitted to show what are the proportions to be observed between wood and iron in the formation of a flitch girder, so as to obtain an increase of strength by the use of the iron plate. Mr. Hurst's formula should be used with caution. It gives the value of W too high, in my opinion, for a flitch girder.—PURLIN.

[717.]—Mr. E. W. Tarn gives a good formulæ for flitch girders, subject to this condition, that the relative thickness of the wood and iron be such that the full resistance of both shall be brought into play. The resistance to deflection of wrought iron is twenty times greater than of fir, having the same length, breadth, and depth. Consequently, to get the full value of both materials in combination, the iron should be one-twentieth the thickness of the wood, or an ¼in. boiler plate should be bolted between two fir cheeks, each 5in. thick.

W = limit of safety in lbs. for the iron plate.
b, *d*, and *l* the breadth, depth, and length, in inches.
W¹, *b*¹, *d*, *l* the same for the fir beam.

$$W = 21000 \frac{b\,d^2}{l}$$

$$W^1 = 1400 \frac{b^1 d^2}{l}$$

Let S = W + W¹ = strength of composite beam.
$b^1 = 20\,b$.
t = full thickness = $b + b^1$.
Then

$$S = 2333 \frac{t\,b^2}{l}.$$

These formulæ will give 352 cwt. as the load which could be borne by "Devonport's" beam without injury to the elasticity. Without the iron plate, the limit of safety would be reached at 204 cwt. These weights would represent the permanent load distributed over the whole beam.

Hurst's formula for the flitch girder seems to be a safe one, for in an experiment at Woolwich, in 1860, it is recorded that two deals 9in. × 3in., with a ¾in. flitch bolted between them, broke with a pressure on the centre of 18·079lbs. The bearing was 17ft. Hurst's formula would make the breaking weight 16·009lbs.—X.

There is a very useful paper on "Iron Girders," in the BUILDING NEWS, of Jan. 22, 1858, worth "Devonport's" attention.

[719.]—COMPOSITION ORNAMENTS FOR PICTURE-FRAMES, AND ORNAMENTAL MOULDINGS.—In reply to "D. G. M.," I give two receipts for the above. 1. Boil 7lbs. of best glue in three and a-half pints of water, melt 3lbs. of white resin in three pints of raw linseed oil; when these are well boiled put them into a large vessel and simmer for half-an-hour, stirring well; now pour in a large quantity of whitening, sifted fine, mix to the consistence of dough, and it is ready for use. 2. Dissolve 1lb. of glue in a gallon of water, boil in another kettle 2lbs. of resin, one gill of Venice turpentine, and one pint of linseed oil; mix all together, and boil till all the water evaporates, then add whitening till the mass attains the consistence of putty. This composition will be hard when cold, but on being warmed may be moulded to any required shape, and may be fastened either to plain surface or mouldings, by means of glue.

[720.]—LINSEED OIL AND TURPENTINE.—Good turpentine, when exposed to the air, always lessens in bulk by evaporation, but gains in weight by absorption of oxygen, which makes it more binding in its proportions. This peculiarity none of the mineral oils possess; on the contrary, the mineral is so completely volatile, that upon exposure the spirit flies off, leaving the oil without anything to assist it to harden.—W. R. T.

[722.]—IRON MINIUM PAINT.—This paint is manufactured by A. de Cartier, at Anderghem, near Brussels. It is a pure oxide of iron, mixed with about one-fourth its weight of silicious clay. It is now extensively used in this and other countries for painting the ironwork of ships, gas holders, &c. A writer in "Gwilt's Encyclopædia," says it is solid, durable, and cheap. It preserves iron from oxidation, and hardens wood. It is a dark brown in colour, but mixes easily with other colours, such as black, yellow, and green. To test its purity, it is said to be sufficient to dilute it with a small quantity of water and spread it on paper, when, if pure, the edges of the paper will preserve the special tint of the iron minium.

WAGES MOVEMENT.

The operative slaters of Glasgow have taken advantage of the pressure of work, consequent on the late storm, to strike for a rise of wages. The masters have resisted the demand, on the ground, we understand, of its being a breach of a distinct agreement, arrived at some time ago, that no change should take place in the rates without three months' notice.

The Employers' Association at Bradford (Yorkshire) have given the members of the Building Lodge the usual six months' notice to expunge the following rule out of the existing local code of rules:—Sub-contracting, &c.—5. All sub-contracting, piece-work, and artificial light to be discontinued; and no worked stone from quarries or lower paid localities (except flags and landings worked on one or both sides) to be allowed. Ornamental carving, turned balusters, and small columns, may be contracted for, but all roughing for carving and turning to be done by masons' day work.

According to the Society's decision, the Birmingham Lodge of Stonemasons have given their employers the usual notice of six months that they intend to return to the local code of rules granted them by the Society, to come into operation last May, but when under negotiations with their employers a very different code was agreed to. Since giving the existing notice, the Master Builders' Association have forwarded the Birmingham Lodge a counter notice of six months that they intend to abide by their recently adopted code. The result of such notices between both parties can only be solved at the expiration of the appointed time—about the beginning of next May.

The Leeds Lodge have also received six months' notice from the Master Builders' Association of that town that they intend to commence paying their workmen by the hour on July 1, 1868.

STAINED GLASS.

A two-light stained glass window, by Mr. A. J. Mingaye, has been placed in the Roman Catholic Church of Our Lady, Kentish-town. The subjects are the "Raising of Lazarus" and the "Healing of the Son of the Widow of Nairn."

A memorial window to the late incumbent has been placed in Tweedmouth Church by his daughters. It is a circle, containing a centre circle and quadrants. In the centre is the "Lamb," and in the quadrants representations of the "Four Evangelists." Mr. Wailes, of Newcastle, is the artist.

A stained glass window has been erected to the memory of Mr. Samuel Clapham, in St. Stephen's Church, Kirkstall, by Messrs. O'Connor, of Berners-street. It is in three large medallions, and the subjects are "The Expulsion from Paradise," "Moses with the Tables of the Law," and "Jesus Delivering the Sermon on the Mount."

A stained glass window has been erected in St. Michael's Church, Coventry, by Messrs. Heaton, Butler, and Bayne, in memory of the late Mr. Thomas Sharp, author of "The Coventry Mysteries." The subjects represented are "The Good Samaritan," "The Faithful Servant," "The Publican and the Pharisee," and "Giving up the Talents."

Three stained windows by Messrs. A and W. F. O'Connor, of London, have been placed in St. Mark's Church, Dewsbury. The subjects are, in the east window, the "Resurrection" and "Ascension," with the "Blessed Virgin and the Apostles" placed in the side-lights; in the west window "The Crucifixion;" and in the north aisle window, which is of three lights, "Our Lord Blessing Little Children."

LEGAL INTELLIGENCE.

POLLUTION OF WATER.—When a well is supplied with water, which percolates through the earth, and does not flow through any defined channel, although the owner of the well is not entitled to the water until it actually enters his well, the occupier of adjoining property will be restrained from using a cesspool therein, in such a manner as to pollute the water coming through his property and supplying the well. This was the holding of the Master of the Rolls in a recent suit for an injunction to restrain the use of a cesspool upon the defendant's premises (near Norwich), in such a manner as to pollute a well belonging to the plaintiff—the case of Womersley *v* Church.

ACTION AGAINST IMPROVEMENT COMMISSIONERS FOR INJURING PROPERTY BY SEWER CONSTRUCTION.—The Earl of Derby *v*. The Bury Improvement Commissioners.—This was an action by the Earl of Derby against the defendants for injury to his reversion to certain lands by cutting a trench and constructing and maintaining a sewer therein, and also by diverting into such sewer a brook which flowed through the said lands. The case came on for trial before Mr. Justice Mellor and a special jury, at the Manchester Spring Assizes, last year, when, by consent, a verdict was found for the plaintiff, with £5,000 damages and 40s. costs, subject to the opinion of this court, upon a special case to be stated by Mr. Baylis, the court to have power to draw inferences of facts and to reduce the damages. The defendants wished to get rid of a nuisance caused by the pollution of a certain brook, and could not do so without constructing a new sewer. Instead of selecting a course by the bed of the stream or the highway, they resolved to take a diagonal and shorter route through enclosed land belonging to the Earl of Derby, called Huntley Feld, which had been let on lease, and without giving notice to the owner they entered upon the land and constructed the sewer in question. On the part of the defendants it was contended that, with the object of abating nuisances and carrying out a comprehensive system of drainage for the general benefit of the whole locality, the Legislature had conferred upon them the power to act in the way they had done, while, on the other hand, it was agreed that their powers were confined to the local act, which did not permit them to construct sewers through private lands without due notice, and that, if that act was not sufficient for their purpose, they should apply to Parliament for additional powers, and not fall back upon the general act. Upon the conclusion of the arguments the court took time to consider their judgment.

ACTION FOR DAMAGES.—On Wednesday the case of Polleyn *v*. Hill and another was tried in the Court of Exchequer. The plaintiff, a journeyman carpenter, brought this action against the defendants, his former employers, for serious bodily injuries alleged to have been sustained through their negligent construction of a floor-cloth manufactory at Deptford, which was blown down by a severe gale which prevailed on July 15 last. Mr. Willis was counsel for plaintiff, and Mr. Serjeant Parry counsel for defendants. The defendants were contractors for the main portion of the building, and at the time of the occurrence some other contractors were engaged in enclosing the sides with corrugated iron. When the structure fell the plaintiff was on the ground floor, and he received an injury which brought on fits, and was likely to be of a permanent nature. The defence was that the building was properly constructed, and in accordance with plans and specimens, as well as under the superintendence of the district surveyor, and the fall of it was to be attributed to the removal of certain struts by the other contractors, or to the effects of the gale itself. Mr. Baron Bramwell, in summing up, said the defendants would not be liable if the plaintiff knew of the dangerous state of the building, and did not take proper precautions for his own safety. The jury, after being locked up for a short time, found a verdict for the plaintiff—damages £350.

DISPUTED CLAIM FOR REPAIRS.—Gregory Perkins and another *v*. Charles Crowdell—This was a claim before the Leicester County Court for £4 6s. 6d., for repairs done to some houses. In July last defendant instructed plaintiffs, who are builders, to make some repairs to some property in Bedford-street. They executed the work, and on presenting the account defendant made no objection to it, but upon being pressed for payment he disputed the amount. Defendant said the amount charged was excessive, and he had had the repairs valued, and they were only estimated at £2.—His Honour adjourned the case to allow defendant an opportunity to produce evidence as to the value of the repairs.

CONVICTION UNDER THE SMOKE NUISANCE ACT.—Mr. Thomas Humphries, the extensive wood merchant, of Jacob-street, Dockhead, Bermondsey, was summoned before Mr. Burcham, on Friday last, at the Southwark Police Court, under the Smoke Nuisance Act, by order of the Home Secretary, for not having his furnaces so constructed as to consume the smoke. Mr. William Sandison, C.E., the Government inspecting engineer, said that, according to instructions he received on the 14th of November last, he visited the defendant's premises, and found a six-horse engine at work at the saw-mills cutting firewood. Dense volumes of black smoke were

emitted from the shaft, and on examining the furnace he found the air-box screwed down, so that whatever may have been done to consume the smoke, it was rendered quite useless. They were burning small coal and refuse, which sent forth such dense smoke as to be a great nuisance to the neighbourhood. Witness saw the manager, and on his promising to comply with the Act of Parliament, fourteen days and ten days were allowed to have the furnace properly constructed, but nothing had been done. The manager said that they had employed a bricklayer to look to the furnaces, and they thought it was all right. He was willing to do anything Mr. Sandison suggested. The Magistrate told him that Mr. Sandison had suggested a proper alteration a long time ago, and as he had neglected that, he must pay a fine of 40s. and costs.

MEETINGS FOR THE WEEK.

SAT.—Associated Arts Institute, "On the Relation of Art to Ethnology," by R. H. S. Smith, M.A., F.S.A.

MON.—Society of Arts, Cantor Lectures, "Preservation, Preparation, and Culinary Treatment of Foods." by Dr. Letheby, M.A.

Society of Engineers.—"On the Surveys of Proposed Lines for a Ship Canal, between the Atlantic and Pacific Oceans. Paper by Dr. Cullen.

Royal Institute of British Architects.—"On the Peculiarities of Domestic Architecture in America." by Gervase Wheeler.

TUES.—Institute of Civil Engineers. "Floods in the Nerbudda Valley, with remarks on Monsoon Floods in India Generally" by Mr. A. C. Howden Assoc. Inst. C.E. at 8; also Discussion upon Fresh Water Floods of Rivers

WED.—Geological Society at 8.

Our Office Table.

Mr. H. H. Vale, of Liverpool, was elected a "fellow" of the Royal Institute of Architects, at its last meeting, and not an "associate," as mentioned by our reporter last week.

The Committee of the Burlington Fine Arts Club have issued a programme of an exhibition of works of art in bronzes, terra cottas, majolica wares, illustrated MSS., decorative books, goldsmiths' work, &c, intended to be held at their rooms during the coming session.

The following nominations as Associates of the Royal Academy have been made:—P. C. Hardwick, E. Welby Pugin, W. Burges, Thomas Wyatt, and Charles Barry. There are two vacancies, and the ballot will take place on this day.

The principal tradesmen of Chester and the neighbourhood connected with the building trade, have formed a district association in connection with the General Builders' Association. The principles of the association are the promotion of the trade interests of each district by the introduction and settlement of the best trade rules, rate of wages, and trade prices; by taking common, instead of individual, action on all general questions; by cultivating mutual good feeling and fellowship; and by the various associations working in connection with one another. Mr. T. Hughes, of Aldford, has been appointed chairman, a vice chairman, and a committee of ten members (two for each of the following branch trades, viz., masons, bricklayers, joiners, plumbers, and painters), were also elected. It has been decided to establish a register of non-unionist workmen, for the benefit of such workmen and for employers.

Mr. G. Dobie, painter, of George-street, Edinburgh, has set a good example in the matter of technical education. With the view of encouraging art studies among journeymen house-painters, he offered a number of prizes, amounting in all to £52 10s., for the best designs of drawing-room and dining-room wall decorations. The competition was open to the whole of Scotland, and thirty-six competitors entered. The designs sent in are now on view at Mr. Dobie's saloon, and they are said to be, on the whole, very creditable pieces of work, several of them, indeed, displaying artistic skill of a high class.

The bill for permission to lay down tramways through certain metropolitan streets passed standing orders on Wednesday unopposed. This bill failed to pass during two previous sessions. This time the memorials against the promoters have been withdrawn, and certain technical difficulties previously existing removed.

An architectural competition, open to all nations, is announced by the Peruvian Government. The subject is a design for a monument to commemorate the victory obtained on May 2, 1866, over the Spanish squadron. It is required that the drawings be sent to the Peruvian Legation in Paris, 66, Rue de Ponthieu, on or before February 15. We may add that the particulars of the competition lie on the library table at the Institute of Architects, in Conduit-street, for the inspection of members.

The committee of the Metropolitan Board of Works have appointed Mr. Palmer to the office of superintendent-foreman of the western division of the fire-brigade. Mr. Palmer was engineer attached to the chief station in Watling-street, and he has succeeded Mr. Tiveotdale, who has proceeded to Birmingham to take the command of the Corporation Fire-Brigade of that town. In esteem for Mr. Tiveotdale's long service, Captain Shaw, the chief of the Metropolitan Fire-Brigade, has presented him with an elegant inkstand, in the form of a manual fire-engine, bearing a silver tablet, with an appropriate inscription.

The members of the Huddersfield Archæological Association held their annual conversazione last week. Mr. T. Brooke, the president of the society, occupied the chair. The report was read, and it showed that the society had made considerable progress during the year. Papers were also read which had been contributed by the Rev. Canon Raines, of York, on "Topographical Materials for Askrigg Wapentake;" by Mr. C. Monkman, Malton, on "Flint Implements and Weapons;" and by Mr. Albert Way, on "An Enamelled Relic of the Roman Period, found at Slack." The Rev. G. L. Mellor gave an interesting description of some of the rubbings from monumental brasses.

Among other interesting relics recently discovered at Pompeii are three handsome bronze bedsteads, which are said to be the most elegant yet found there.

The Historic Society of Lancashire and Cheshire have decided, on the suggestion of Mr. Forrester, one of its members, to establish a biographical section in connection with the society. In bringing the matter before a meeting of the society held last week, Mr. Forrester remarked that he thought it desirable that they should have a record of the lives of those members who had risen to positions of note. He cited as an example the late Mr. Elmes, the architect of St. George's Hall, and the Collegiate Institution, Liverpool, whose brief though brilliant career he considered would make a remarkably interesting paper. The proposition was warmly entertained by the meeting, and Mr. Kilspin was invited to write a paper on Mr. Elmes and his works. That gentleman, we understand, has consented to do so.

We have to announce the death of Baudirector Fischer, honorary and corresponding member of the Royal Institute of British Architects, at Carlsruhe. A short biographical notice of the deceased gentleman will appear in the next sessional paper of the Institute of Architects.

Mr. Beresford-Hope, at the request of the Committee for the Conservation of Ancient Monuments and Remains, has given notice that he will call the attention of the House of Commons, after the recess, to the condition of buildings possessing historical or archæological interest in the custody of Public Departments, and make a motion on the subject. As it is his desire to present as full and important a case as he can to the House, he would be grateful to any one who would aid him with information bearing on this matter. He requests that letters may be addressed to him at 1, Connaught-place, Hyde Park, W.

The Rev. Mr. Kell writes to put the public on their guard against purchasing spurious antiquities. They are represented to be pilgrims' badges, or signaculæ, used by pilgrims between the twelfth and thirteenth centuries when visiting different shrines, and are in the form of a short dagger, signet ring, brooch, spur, amphora, or relic box, to be suspended on a garment. They are manufactured wholesale in Birmingham.

We understand that Mr. Marsh Nelson, the architect, is engaged in inquiring into the cause of the fire at Her Majesty's Theatre, and that his report will shortly be published in an official form.

The tender of Mr. Samuel Campbell, Liverpool, has been accepted for road-making, drainage, and other works of that class, at Sefton Park, in that town. The amount is £72,345.

As a proof of the violence of the hurricane which swept over Edinburgh the other day, the papers there state that on the following morning between sixty and seventy tons of lime, fragments of chimney-pots, slates, and tiles, were collected from the streets.

The "Nottingham Daily Guardian" gives a report of an interesting paper read by Mr. Wm. Stevenson, of Nottingham, on "Trees and their Religious Associations," before the Nottingham Naturalists' Society.

The contract for building the new hotel for the London and North-Western Railway Company, at Lime-street Station, Liverpool, has just been let to Messrs. Haigh and Co., of Liverpool, for about £72,000.

At the meeting of the Archæological Association on Wednesday week, Mr. Cuming in the chair, Mr. H. Kettel exhibited a very fine flint implement which had been picked up in the Weald of Sussex. He also exhibited a very fine club, eleven inches in length, made of clay slate, found near St. Isabel, in South America, in a district where clay slate does not occur. It was precisely similar to a weapon of half the size found some years since in the North of Ireland. Mr. E. Roberts remarked that the good similarity of implements found in all parts of the world seemed to show that in the earliest times a much freer communication existed than we were disposed to believe. Mr. T. Sherratt exhibited a highly interesting gold ring, found in an ancient tomb in the State of New York. Mr. George Wright exhibited a marble head, found at Alexandria, which he supposed to be a head of Marcus Aurelius Antoninus, the philosopher. Mr. Adams was of opinion that the head, though of Roman work, was of some Egyptian or Eastern chief, an opinion which was not shared by many present. Mr. Cuming exhibited a head in marble, which he had identified as that of Magnia Urbica, one of the wives of Marcus Aurelius Charinus. Mr. F. A. Waite exhibited an interesting brass tobacco box, engraved, the property of Mr. Cullinan, in whose family it had been preserved for more than a century. It was of the period of William III., and was said to have been engraved by one of his troopers.

Trade News.

TENDERS.

COVENTRY.—For factory for Messrs. J. and J. Cash. Quantities by Mr. W. Harris, Birmingham. Mr. S. Taylor, architect:—

Wilson	£1,800
Woof	1,700
Lovatt	1,614
Dutton	1,546
Barnsley	1,528
Briggs	1,510
Makepeace	1,498
Worwood	1,488
Hardwick	1,470
Frith	1,466
Nelson	1,450
Hallam and Co.	1,450
Marriott	1,447
Jones	1,445
Jeffery and Pritchard	1,428
Hardy	1,369
Moffatt	1,325
Chandler (accepted)	1,267

DERBY.—For new foundry and offices, at Derby. Mr. G. H. Sheffield, architect:—

Greasley	£1,495
Gadsby	1,486
Stoddard	1,470
Bradbury	1,461
Thompson	1,400
Dusatoy	1,329

ISLEWORTH.—For residence for Mr. A. H. Johnson. Mr. C. Jones, architect. Quantities furnished by Messrs. Richardson and Waghorn:—

Hiscock	£3,250
Mitchell	3,021
Nye	2,897
Killby	2,867
Gibson, Brothers	2,797
Waters	2,785
Adamson and Sons	2,666

LIVERPOOL.—For the lodges, bridges, fountains, colonnades, and other architectural works in Stanley Park (exclusive of boundary railings), for the Corporation of Liverpool. Mr. E. R. Robson, architect:—

Parker and Sons	£24,460
Wells	18,700
Lee	18,250
Hughes	18 239
Burroughes and Son	16,993
Tomkinson	15,700
Jones and Son	15,538
Urmson	15,415
Haigh and Co	15,412
Mullin	15,263
Campbell (accepted)	13,456

ST. PANCRAS DISPENSARY.—In our tender of this work, last week, it was erroneously stated that Messrs. Goulty and Gibbons were the architects. We are now informed that Mr. Edward L. Robins is the architect. We are informed that Mr. B. C. Nightingale's tender was not accepted, through having no signature when opened.

ST. MARYLEBONE.—For extension and alterations to St. Marylebone Public Baths and Washhouses. Mr. C. Eales, architect :—

General Works.	
Hawkins	£5,401 12 9
Scrivener and White	3,416 0 0
Saunders	3,100 0 0
Perkins	3,029 0 0
Godden and Webb	2,985 0 0
Sawyer	2,929 0 0
Manley and Rogers	2,876 0 0
Ebbs and Son	2,846 0 0
Foale	2,300 0 0
Engineering.	
Hayward, Brothers	£615
St. Pancras Ironworks	414
Jennings	248

STRAND.—For sundry alterations to houses in the Strand and Adam street, for Mr. Attenborough. Mr. Arthur Allom, architect. Quantities by Mr. T. Begg :—

Rigby	£1,590
Brass	1,497
Howard	1,430
Mansfield	1,420
Macey	1,379
Newman and Mann	1,135

STRATFORD.—For the erection of a townhall and public offices at Stratford, E., for the West Ham Local Board. Messrs. Lewis Angell and John Giles (Giles and Biren), joint architects. Quantities supplied by Mr. D. W. Young :—

Jollard	£14,785
Charlton	12,345
Rivett	12,333
Nightingale	12,057
Higgs	11,895
Keeble	11,800
Sawyer	11,800
Hill and Keddell	11,753
Howard	11,679
Foster	11,365
Hedges	11,358
Adamson and Sons	11,300
Nixon and Son	11,247
Aviss and Son	11,230
Newman and Mann	11,185
Mann	11,145
Mansfield, Price, and Co.	11,100
Piper and Wheeler	10,994
Myers and Son	10,969
Perry and Co.	10,955
Henshaw	10,895
Webb and Sons	10,683
Enoor (accepted)	10,239
Mundy and Hutchinson	8,600

ST. LEONARDS-ON-SEA.—For St. Leonards British Schools, St. Leonards-on-Sea.—Mr. Benjamin Tree, hon. sec :—

Lower and Burgess, Seaford	£3,114
A. and J. Batstone, St. Leonards	2,679
G. Geary, Hastings	2,645
H. Hughes, St. Leonards	2,543
C. Batstone, St. Leonards	2,464
D. Parks, Hastings	2,464
Nightingale, Lambeth	2,456
G. E. Jones, Hastings	2,450
J. Howell, Hastings	2,424
J. Page, St. Leonards	2,396
J. Jones, St. Leonards	2,395
W. Rodda, St. Leonards	2,361
J. Wood, St. Leonards	2,349
N. F. Sadler, St. Leonards	2,244
A. Vidler, Hastings (accepted)	2,224

WESTMINSTER.—For building new house and shop, 28, Brewer-street, Westminster, for Mr. Apted. Quantities not supplied :—

Nightingale	£808
Sapwell	770

WOODSTOCK-STREET.—For building house, No. 9, Woodstock-street, for Mr. Machu. Messrs. Parriss and Co., architects :—

Winterton	£1,339
Sawyer	1,230
Nightingale	1,226
Wilcocks	1,190
Palmer	1,167
Enoor	1,138
Sharpenton and Cole	1,130
Shofield	1,110
Crabb and Vaughan	1,008
Faulkner and Lee	1,089
West	1,053
Wilson	1,049
Snoden	1,045
Rodgers and Richards	970
Perkins	927
Smith and Simmons	735

PROPERTY SALES.

JAN. 21.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Copyhold two cottages, known as Ivy and Mount Cottages, Mount-pleasant, Crouch-end, Hornsey, let at £52 10s. per annum—sold for £1,120.

By Mr. Thos. Fisher.—Freehold ground rents, amounting to £274 18s. per annum, secured upon 59 houses, situate in Herne-hill, Waoless and Wigmore-roads, Coldharbour-lane, Brixton—£5,465.

By Messrs. Candy and Luckin.—Leasehold six houses, Nos. 4 to 9, Finsbury-park-terrace, Seven Sisters-road, Holloway, annual value £50 each, term 96 years from 1866, at £6 each per annum—£2,845.

Freehold ground rent of £20 per annum, secured on four houses, situate in Brooksby-walk, Homerton—£430.

By Messrs. Hards, Vaughan, and Leifchild.—Leasehold residence, No. 1, Belmont-villas, Lewisham, let at £61 per annum, term 61 years from 1846, at £7 per annum—£660.

Leasehold three houses, Nos. 48 to 50, Manor-road, Rotherhithe-road, estimated to produce £89 14s. per annum, term 61 years from 1863, at £15 per annum—£410.

Leasehold two residences, Nos. 1 and 2, Western-road, Bromley hill, Kent, annual value £47 each, term 95½ years from 1865, at £5 each per annum—£680.

JAN. 22.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold estate, known as Cookham Firm, in the parishes of East Grinstead and Horsted Keynes, Sussex, comprising a farmhouse, with homestead, buildings, and 79a. 3r. 6p. of arable, pasture, and wood lands—£2,050.

Freehold residence, known as Pitt Place, with grounds, gardens, farm homesteads, and 53 acres of arable and pasture land, situate in the parish of Mottestone, Isle of Wight—£2,420.

Freehold 27a. 3r. 39p. of arable, pasture, and wood land, in the parish of Brixton, Isle of Wight—£950.

Freehold 2a. 2r. 1p. of meadow land, situate as above—£165.

An undivided moiety of and in the farm and lands known as Stronds or Hawkeshill, otherwise Axcells, in the parish of Mottestone, Isle of Wight, comprising four fields, with building and garden, containing 13a. 1r. 8p.—£340.

Freehold residence, known as Carisbrooke Cottage, Carisbrooke, Isle of Wight, let at £14 per annum—£310.

Rectorial tithe rent charge of £101 15s. 9d. arising from 356a. 1r. 38p. in the parish of Shalfleet, Isle of Wight—£1,820.

Leasehold two houses, with stabling, bakery, &c., known as Buckingham cottages, Westminster, let on lease until Lady-day, 1874, at £14 per annum, and underlet at rentals amounting to £107 4s. per annum, term 40 years from 1855, free from ground rent—£660.

By Mr. George Wilson.—Freehold house, No. 69, Peel-street, Silver street, Kensington, annual value £40—£340.

Freehold two plots of building land in New-road, Hammersmith—£165.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

David Gaved and William Henry Rackett, Penge, builders, February 5, at 1—Frederick William Harcum, Albert-street, Kennington-park-road, engineer, February 17, at 11—George Hayward, Hawkhurst, plumber, February 4, at 1—Richard William Jennings, Liverpool-street, City, gasfitter, February 4, at 1—Charles Turland, Barnet, builder, February 17, at 1—William Flood, Southampton-street, Pentonville, builder, February 19, at 11—Frederick Hersee, Old Kent road, builder, February 13, at 11—William Luxford, Myrtle-street, Dalston, builder, February 13, at 1—William Rowden, Portobello-road, Notting-hill, painter, February 19, at 11—John Springbett, Peckham, builder, February 13, at 1.

TO SURRENDER IN THE COUNTRY.

John Abbott, Newton Heath, joiner, February 4, at 11—John Ashforth, Doncaster, painter, February 5, at 12—George Broughton, Leeds, plasterer, February 3, at 12—Joshua Fitchett, Manchester, plumber, February 11, at 9.30—George Simpson, Stamford, painter, February 3, at 11—John Benjamin Stone, Brighton, painter and paperhanger, February 10, at 11—Charles Warren, Torquay, builder, February 6, at 11—George Hamil, Haddenham, engineer, February 6, at 11—Thomas Hesketh, Manchester, joiner, February 7, at 12—William Henry Hulbert, Cirencester, plumber, February 7, at 12—William Vaile, Birmingham, builder, February 12, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

February 13, J. Farrar, St. Helen's, builder—February 17, W. Jones, Liverpool and Wootton, builder—February 13, J. and C. J. Mackay, Liverpool, timber merchants—February 11, T. Gower, Newtown, Salop, stonemason—February 15, J. Hunter, Spilsby, builder—February 5, J. B. Rees, Swansea, builder—February 19, E. Clarke, Judd-street, Euston-road, plumber—February 19, M. Doody, Mortimer-market, Tottenham-court-road, dealer in building materials—February 20, H. Etheridge, Maisemore, builder—February 10, F. Strong, Derby, plumber and glazier—February 14, A. Clarke, Hinton St. George, carpenter—February 19, W. Powell, Leicester, plumber—March 3, D. Harding, Willingdon, Sussex, builder.

PARTNERSHIPS DISSOLVED.

W. and A. Pycock, Leeds, slate merchants—Bates and Co., Sedgley, fire-brick manufacturers.

DECLARATIONS OF DIVIDENDS.

S. Berrisford, Stockport, engineer, div. 12s. 9d. on new proofs, and a fourth div. of 4s. 9d.—W. Wrennall, Leyland, Preston, builder, div. 2s. 1¾d.

DIVIDEND.

February 6, W. S. Parfitt, J. Barnard, and A. Harvey, Devizes, engineers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£10	10 £11	10	Archangel, yellow	£11	10 £13 0
Quebec, red pine		3	0 4	10	St. Petersburg, yel.	10	10 11 10
,, yellow pine		2	16 4	0	Finland	7	10 8 10
St. John N.B. yellow		0	0 0	0	Memel	0	0 0 0
Quebec Oak, white		5	5 5	10	Gothenburg, yellow	8	10 10 10
,, birch		3	10 4	10	,, white	8	0 9 0
,, elm		3	10 6	0	Gefle, yellow	9	0 11 0
Dantzic oak		3	10 6	0	Soderham	9	0 10 10
,, fir		2	5 3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16	0 22 0
Memel fir		3	0 3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	16 1 6
Riga		2	18 3	5	PUMICH STONE per ton	6	0 8 0
Swedish		2	0 2	7	Oils, &c.		
Masts, Quebec red pine		6	0 7	0	Seal, pale	per tun	39 0 40 0
,, yellow pine		5	0 5	0	Sperm body		105 0 110 0
Lathwood, Dantzic, tun		4	10 5	0	Cod		35 0 35 10
,, St. Petersburg		7	10 8	10	Whale, Sth. Sea, pale		38 0 39 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli		72 10 0 0
Quebec, white spruce		13	0 19	0	Cocoanut, Cochin, ton		66 0 67 0
St. John, white spruce		13	10 15	10	Palm, fine		39 10 40 0
Yellow pine, per reduced C.					Linseed		34 15 35 0
Canada, 1st quality		17	0 18	10	Rapeseed, Eng. pale		37 0 37 10
2nd do		11	10 12	10	Cottonseed		34 0 40 0

IRON :—

Welsh Bars in London	per ton	6	10 0	8 15 0	3
Nail Rod	do	7	5 0	7 10 0	2½
Hoops	do	8	5 0	8 10 0	
Hoops, Single	do	9	15 0	10 0 0	
Staffordshire Bars	do	7	5 6	7 10 0	
Bars, in Wales	do	6	10 0	6 0 0	3
Nails	do	8	10 0	6 0 0	net
Foundry Pigs, at Glasg. No 1	do	2	15 0	3 5 6	2½
Swedish Bars	do	10	6 0	10 10 0	net

STEEL :—

Swedish Keg, hammered	per ton	15	5 0	15 10 0	2
Swedish Faggot	do	10	10 0	12 10 0	2

COPPER :—

Sheet & Sheathing, & Bolts	per ton	80	0 0	82 0 0	
Hammered Bottoms	do	92	0 0	0 0 0	
Flat Bottoms, not Hammered	do	85	0 0	0 0 0	
Cake and Tough Ingot	do	71	0 0	72 0 0	
Best Selected	do	75	0 0	80 0 0	
Australian	do	67	0 0	83 0 0	
Y. l. Metal Sheathing & Rods	per lb	0	0 6½	0 0 7	

ZINC :—

English Sheet	per ton	26	10 0	27 0 0	2
Devaux's V. M. Roofing Zinc	do	28	10 0	0 0 0	

* And 6 per cent. discount if laid upon the new syst

TIN :—

English Block	per ton	93	0 0	96 0 0	
do Bar	do	94	0 0	97 0 0	2½
do Refined	do	94	0 0	99 0 0	
Banca	do	90	0 0	91 0 0	net
Straits	do	87	0 0	87 10 0	

LEAD :—

Pig, English	per ton	21	0 0	21 0 0	
,, Spanish Soft	do	19	0 0	0 0 0	
Shot, Patent	do	22	10 0	0 0 0	2½
Sheet	do	20	5 0	0 0 0	6
White	do	27	0 0	2710 0	

SPELTER :—

On the Spot	per ton	20	0 0	20 5 0	nett
QUICKSILVER	per btl	6	17 0	0 0 0	

REGULUS OF ANTIMONY

French	per ton	28	0	0 0 0	

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THE

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AND

BUILDING-TRADES' DIRECTORY

FOR 1868:

A BUSINESS BOOK OF REFERENCE FOR THE

Various Industries connected with the Arts of Construction

THROUGHOUT

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COMPRISING

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 7, 1868.

CONTINENTAL JOINERS' WORK.

DURING the past year we have heard of the above class of work being imported into this country, but in such a cursory manner that its introduction has been officially denied in evidence before the Royal Commission on Trades'-Unions. From numerous inquiries we have received from various quarters, we have been induced to investigate the subject, and, in doing so, we have no other object than placing our readers in possession of the full facts and bearings of the question. We find that Frederickstadt and Stockholm, in Sweden, are the two ports from which prepared woodwork is exported. In the former case, we have no evidence of anything further than mouldings and prepared flooring being sent, nor have we received any very flattering notice of their quality; but, in the case of Stockholm, we have to notice a superior class of goods, which embrace nearly the whole field occupied by the carpenters and joiners, and it is the productions of this latter town which we shall specially notice.

The continental joiners' work now being introduced into this country is the produce of the firm of P. J. Ekman, of Stockholm. This gentleman is an architect and practical builder of great experience, and has for many years been engaged in manufacturing joiners' work for the Swedish builders. In 1865, he visited France, Italy, and this country, and from the fact of his works, and many local advantages in labour and timber, being superior to anything witnessed in his travels, he conceived the notion of enlarging his works, and supplying the European markets, as well as the Swedish. On his way home he learnt that his premises had been burnt to the ground, and this misfortune opened out a ready method of enlarging his works. They were speedily rebuilt in a fire-proof manner, the premises embraced by the machine and joiners' shops being all in one room, 180ft. square, the building being entirely of iron, stone, and glass. The steam engine is 100-horse power, and the whole of the machinery is of the best and newest description, a portion of it being English, another portion American, and the remainder of Swedish make. To give an idea of the works, we may note that the yard and ground covers from eight to ten acres, which are situate on the quay side, for the convenience of shipping. The fuel for the steam boilers is nothing but sawdust and refuse from the machinery, the furnaces being constructed on a new plan to consume such material. In connection with this machinery, upwards of one hundred men are employed. They comprise joiners, machine men, and labourers of various grades, their hours of labour being the same as that prevailing throughout Sweden, viz., 67½ hours per week. Their hours are from 6 a.m. to 7.30 p.m., 2 hours being allowed for meals: on Saturdays they close work at 5.30. The average rate of wages is for skilled joiners and machine men, 3s. 6d., circular saw men, 2s. 3d., and labourers, 1s. 4d. Trades'-unions are unknown, and piece work is largely pursued, the men preferring to have what they can earn to being restricted to a given rate of wages.

The wood from which the goods are manufactured is of the best quality, being selected by agents at the saw mills up the country, where the sawn deals are made for exportation. They thus obtain a monopoly in the quality of the wood; and before it can get damaged by rain or shipping, as is the case with our English goods, it is received at the works in Stockholm, cut up and seasoned ready for use. This seasoning is conducted by steam pipes in chambers constructed for the purpose, and is not allowed to pass into the hands of the workmen until it is thoroughly dry. The principal goods manufactured for the English markets are mouldings, architraves, skirtings, door frames and casings, framed grounds, doors of every description, and sashes and frames; and these goods we shall only speak of from actual inspection. The mouldings, skirtings, &c., are remarkably clean and good, and, from the fact of the wood being thoroughly dry before being placed in the machine, they require no cleaning up, but come to hand in bundles from the machine. They comprise a full list of those sections in general use in this country, and, with the exception of a little more work in the skirting and the door frames, and an extra thickness in the plinth boards, they are exactly the same as those in daily use. The sizes and qualities of the doors are very numerous, ranging from 1¼in. to 2in. in thickness, and from the common square-framed four-panel doors to the six-panelled raised moulded outer doors. They are divided into two classes, *i.e.*, deal and batten framing, that is, with 9in. and 7in. framing, and 4½in. or 3½in. stiles and top rails. The various qualities of these doors are too numerous to detail, but at a glance they seem to embrace every conceivable size and make. We notice no marked distinction between these doors and those of the ordinary English make, except that the whole of the panels are jointed up in two or three pieces. This, although a more costly process than we indulge in, is a custom of long standing in Sweden. They maintain that panels in one board will not stand to their work, but if jointed up in two or three strange pieces will always maintain their even shape. The English builders are afraid of these joints separating when in work; but such is not the case, as they are prepared with tongued and grooved joints, and secured by the best fish glue—a quality unknown to our carpenters. This jointing of the panels has been severely tested in London. Water has been laid in the panels for eight days, and a panel is shown that has been fastened upon a strong frame and soaked for some hours in the canal, after which it has been suddenly placed over a steam boiler. This failed to separate the joints, but the panel is split down in what was formerly the solid wood. With this proof, we are bound to admit that the Swedish joiners are right in their treatment of door panels. The morticing, jointing, and fitting of the panels in the framing is remarkably good, and they are as level at the joints after being nearly two years in this country as if they had just left the workshop. The sashes are very similar to the English make; the back linings are solid boards grooved into the linings, and the cills are double sunk. They are imported in detached pieces, and put together in this country. This is done in consequence of the space they would occupy in the steamers. The men employed in this department are paid at the London rate of 8d. per hour, or 6s. per day of 9 hours. In addition to the above goods we noticed a stock of wood fencing and lattice work for gardens. The fencing is beautifully made, and is of a pattern largely used in the neighbourhood of Stockholm. The lattice work is a curiosity, as it is packed in a close form and may be opened out to three times its space. This is owing to the quality of the nails used, and it is remarkable with what ease they may be opened out to cover any required space. Mr. P. J. Ekman's warehouse is 33, Wharf-road, City-road, London, where may be seen the largest stock of doors, mouldings, &c., in the kingdom. We inspected piles of doors of various description, whose aggregate number was between four and five thousand.

A notice of this subject would not be complete without some allusion to the prices. We were shown outside front doors 2in. in thickness, with what they call "deal framing." The whole of the panels on the front side were planted with bold bolection moulds; on the other, or inner side of the door, the lower panels were bead and flush, and the upper panels were moulded in the ordinary way. These doors are sold at 16s. 3d. each, if 6ft. 10in. by 2ft. 10in. in size; or, in other words, at 10d. per foot. Inside doors, 1¼in. thick, deal framing, are sold at 6s. 9d. each, if 6ft. 6in. by 2ft. 6in. in size, or at 5d. per foot; for moulding these doors an extra charge of 1s. per side is made. The list price of mouldings, skirtings, casings, &c., is 20 per cent. below those of this country; and the latticework may be purchased at 2d. per superficial foot when opened to its proper space. One and a-half inch sashes and frames vary from 7d. to 9d. per foot. We were shown a sample sash, 1¼in., lamb's tongue mould, with bracketed stiles, oak sunk cill, segment-headed casement, and outside lining, at 9d. per superficial foot. The arrangements made with the works in Stockholm are such that persons requiring a special quality of goods which may not be kept in stock, can have them made to order and delivered in London in six weeks or two months from receipt of drawings. The postal arrangements and the transport of the goods are somewhat interfered with during the depth of winter; but in summer time a letter will reach its destination in four days. The goods are put on rail at Stockholm and sent to Gottenburg, from whence they are despatched by steamers to London and other ports.

Since the introduction of this class of work, some of the leading London builders have made heavy purchases, some of which have been re-shipped for Egypt and Africa. They have been landed in large quantities in London. Whole blocks of property, such as those erected by the Industrial Dwellings' Company, have been wholly supplied from this source, and references are readily given by the architects under which they have been used. From London they have spread far and wide in the neighbourhood. Those landed at Grimsby, which are in the hands of the timber merchants, have made their way to Manchester, Nottingham, Grantham, and other towns; and it may fairly be said to have speedily become an established branch of our trade throughout the main portions of the country.

POLYCHROMATIC DECORATION.

IT is at all times interesting to observe the changes which are taking place in public taste, and in no instance is this change more remarkable than in the use of colour for decoration. We believe it is to Ludwig of Bavaria and his architect, Leo von Klenze, that we are indebted for the practical application of colour to external walls, although the subject had previously been dealt with in a dilettante sort of way. Little appears, however, to have been done until elaborate experiments were made on the remains of the temple of Minerva at Ægina, resulting in the discovery of a very elaborate system of ornament. The colours were found not to be tints merely, but positive colours of the highest hues, reds, blues, yellows, and even greens being unsparingly used in large masses. Until these experiments had proved that the Greeks were masters of the use of colour, as they were of every other known art, it had been boldly asserted by the dilettanti that the traces of polychromatic decoration which certain temples undoubtedly presented were the fruits of churchwardenship and beadledom. The subject was handled in a contemptuous off-hand manner, not, however, without handsome expressions of pity for the poor Greeks. King Ludwig and Leo von Klenze, to say nothing of M. Hittorf, had different notions. The King had money to spend, and M. von Klenze had no objection to help him to do so. The result is to be seen at Munich. It will surprise those who enlarge on the rapid transmission of thought, and eager grasping of new views, to state the simple fact that, whereas the public buildings of Munich have been externally decorated with gilding and colour for a quarter of a century, there are only two

buildings in London which have been so treated, and those within the last half year. Of one of these the less said the better: the other is the house of Novello, Ewer, and Co., Berners-street, a stuccoed front of the fashion of thirty years ago, when Greek art was paramount. Now, it must be known that the house of Novello, Ewer, and Co. is the abode of the muses, and, if gay decoration is suitable to any house, it is certainly applicable to that under notice. The architecture is not very good, and, although the upper storeys set up to be pure Greek, the ground floor has circular-headed doors. With the architecture, fortunately, we have nothing to do. Messrs. Clayton and Bell found the building as it was, and they have applied the resources of their art to its rehabilitation. The house consists of three storeys above the ground floor; the decoration takes the form of pilasters of small projection, surmounted by an attic storey, and, taken altogether, the field offered for the display of polychromatic decoration is at least limited. Messrs. Clayton and Bell have done as much as could have been expected, and have converted a commonplace building into a bright and cheerful landmark, illustrating the advance of art, and indicating a new turn in the current of the taste of the day. The groundwork of the decoration is for the most part cream colour, varied with a little neutral green and buff; the patterns are in Indian red, and consist of honeysuckle ornament and lines. Over the first-floor windows are medallions on a black ground of well-known composers—Purcell, Mendelssohn, Haydn, Handel, Beethoven, Mozart, Palestrina, and Gluck. The corona of the cornice to first-floor windows is gilt. Some amount of blue is introduced into the decoration of the windows, and also in the cornice to the attic storey.

This is not successful. The blue, always difficult of treatment, is not pure in tone, and even the presence of a considerable amount of gilding does not remove a certain disagreeable impression. The pilasters are coloured with Indian red for about one third of their height, the remainder being cream colour with flutings in Indian red, and the capitals are gilt. As a specimen of polychromatic decoration applied externally, this building is interesting. It looks bright and clean, and, though in the London atmosphere it cannot be expected to remain long in that condition, it may be washed without detriment to the colours used, which have been selected with especial view to their permanency. Although this is about the first instance in this country of the application of colour to external decoration, we are certain that it will not be the last. There are many indications of the growing taste in bright colours in dress, and in internal decorations of houses and churches, and we may be assured that the façades of our buildings will not be permanently left without a clothing of cheerful colours.

NEW BUILDINGS IN LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

THE recent commercial depression in Liverpool cannot be said to be apparent at present in the aspect of things architectural, as new erections, chiefly either offices or banks, are in progress, or recently completed, on all sides in the neighbourhood of the Exchange, constituting the "business" part of the town. The north and east wings of the New Exchange-buildings are already appearing above the contractor's temporary fence-walls; and are proceeding, under the able and energetic direction of Mr. Parsons, the clerk of the works, at even a faster rate than did the west wing. The east wing is to be hurried on and completed as soon as possible for occupation; and an alteration is to be made from the original design, in the placing of a small circular tower above the rounded corner at the junction of Chapel-street and Exchange-street East, which will give more skyline and relieve the comparative lowness of the building; while the north wing will have a central compartment, with roof rising above the general roof line, forming a marked object opposite to the end of Old Hall-street. The detail is, of course, of the same character with the part already completed; but the old columns which formerly carried the arcading in the principal entrance from Chapel-street on to the quadrangle have been cleaned up and made use of again in nearly the same situation, but with bases and pedestals added; and a great deal of the old material (a capital hard, close-grained sandstone) is being worked up in the lower part, up to the top of the surbase. The Hollington stone used in the upper part of the new work will not last as well as this old stone has done; it is a pleasing material, but so soft as it comes from the quarry that great care is necessary in working and placing it, and a good deal of it will have to be dressed down again *in situ*. The fireproof floors over basement are being formed of small iron beams about four and a half inches deep and two feet apart, on the flanges of which rest the ends of a series of hollow tiles of triangular section, the angle upwards and the face downwards, and serrated to form a key for plaster or cement, while above the tiles comes a layer, about ten inches deep, of concrete. The arcade, with its rusticated pilasters and polished granite shafts contrasting with them, has a piquant effect enough; and when the work is finished the quadrangle, though from the want of repose and continuity of horizontal line it can never look grand, will no doubt present a very rich and picturesque whole.

On the opposite side of Exchange-street East the talents of Mr. Sumner are displayed in the front of the Exchange Court-buildings, which, though presenting features borrowed from very different styles, giving us reminiscences of Elizabethan as well as of Greek and Italian detail, is most happily and artistically blended into one whole, and presents more of originality combined with grace than can be found in most buildings in Liverpool, having something of that picturesque incongruity which characterizes the Elizabethan buildings, with much more of refinement and effect in the details. The rustication of the alternate quoins in the piers of the ground storey is effected by the carving of foliage on the face of the stone, instead of the ordinary devices of channelling, &c., but the carving would have been better for being less relieved and less naturalistic—it rather seems to adhere to the stone than to form an integral part of it, as in such case it should do. The walls of staircase and passages are lined with white glazed tiles, with a small border and centre ornament in light blue on the white ground, which has a cheerful and pleasing effect. There is a sad descent in style from this building to the one next it, by Mr. Cunningham, which has a great deal of showy but commonplace ornament lavished on it, with little or no artistic taste or judgment, cupids, with wreaths and festoons, disporting themselves over the windows, interspersed with griffin's heads (also with the inevitable festoons depending from them), and vases and scrolls of much elaboration, the whole having rather the effect of the regulation cement front of a gin-palace translated into stone. Mellor's-buildings adjoining, by Messrs. Picton, Bradley, and Chambers, have a good deal of merit, especially in the treatment of the deep set ground-floor windows, with arched heads, carried by shafts of grey polished granite, standing well away from the window frames, and giving a satisfactory effect of depth and shadow, though the roll moulding of the archivolt is decidedly heavy and clumsy-looking. The upper storeys are less satisfactory, the fenestration (especially in the second floor) being somewhat tame and commonplace in style; and the ornament is not happily treated, having no special relation to the general expression of the design, nor very effective in itself; the flat incised pattern in the first-floor string is very weak, and the isolated floral ornaments, repeated at regular intervals along the frieze, like so many small cabbages squeezed flat and stuck on, are simply excrescences.

Turning down Chapel-street, we find that opposite the west wing of the Exchange Mr. Boult has been revelling in a "new style," exhibited in an erection yclept Dod's-buildings. Originality, however, does not mean merely novelty, but novelty combined with beauty and truth of expression, which are scarcely to be found in this case. The lower part of the elevation consists of three large segmental stilted arches, carried on columns of polished red granite, divided into three lengths by bands of stone; the bases resting on granite pedestals, which are so limited in size that the lower member of the circular base would project some three or four inches beyond the face of the pedestal were it not sliced off, like a half-eaten cake, to bring it flush with the pedestal. Whether this be a mason's blunder, or a part of the new style, we know not; either way it looks sufficiently ridiculous. The large arches above-named go up through two storeys, and are filled in between with a conglomeration of wood-framing and glass, one window over another. Above these are the second and third storey windows, the former quasi-Italian, with round arches on light shafts and spandrils filled in with carving; the latter, quasi-Gothic, with pointed arches and coloured voussoirs. Both these storeys are pleasing *per se*, but look as if they were cut out of two different buildings, so diverse in style and expression are they. Altogether, Mr. Boult's new style will scarcely be that of the future, let us hope.

Turning into Rumford-street (along the west front of the Exchange), we find in the long façade entitled Peter's-buildings an illustration of one of the most valuable qualities of architectural design in which the Exchange-building itself is notably deficient, namely, breadth and continuity of line. The whole of the windows on each floor are of one design, and arranged in a long unbroken series; and the whole of the features of the building are in keeping with each other, and in subordination to the total effect. Unfortunately, this great (and very rare) merit is balanced by two serious defects of detail—the exceeding thinness of the piers and wall space, as compared with the openings, and the hard, thin, and wiry character of most of the mouldings and string-courses, which gives a starved appearance to the building that is much to be regretted, as there can be no doubt that, had the details been carried out in a manner more worthy of the general design, the elevation would have been one of the most dignified and pleasing among the new office buildings. But this attempt at effect by arranging an elevation in large and continuous masses should only be made when the construction and details can be carried out with a certain solidity and massiveness of style, otherwise the effect, instead of being imposing, is only tame and flat. The lover of the sublime in architecture, however, will be amply rewarded for previous disappointment if he turn down Water-street and contemplate the erection called Oriel-buildings, which the genius of Mr. Peter Ellis has called into existence. This is a kind of greenhouse architecture run mad; consisting of a series of vertical bays running completely from top to bottom of the building, divided from each other by long thin shafts, rising from the plinth without any bases, said shafts being flanked by a very large coarse "nail-head" ornament. Between these artistically designed piers are a series of bay windows with iron frames, one above the other, projecting beyond the main line of the wall, and suggesting the idea that they are trying to escape from the building. The whole thing is composed of these vertical strips of design (?) placed side by side, each bay crowned with a finial looking like a big, badly cut decanter-stopper. The style, in short, might be described as "lunar Gothic;" and no one who has not seen it would believe, we think, that

such a thing could, in the present day, be erected in cold blood by any person calling himself a member of the architectural profession.

GOSSIP FROM GLASGOW.

(FROM OUR CORRESPONDENT.)

SINCE I last wrote the event of chief interest in our architectural world has been the publication of "Gowodean."* This is a dramatic pastoral in the Scottish language, from the pen of Mr. Salmon, one of our leading architects. Mr. Salmon is—if I except perhaps his late partner, Mr. Black—the father of the profession; he is also an ex-baillie (i.e., alderman), and an elder (churchwarden) of the Free Kirk; moreover, he has his son in partnership with him, and, consequently, he may be expected to be a gentleman of "mellow'd head and judgment ripe," and not likely to venture before the public with rhyme without reason. Our leading literary newspaper, "The Glasgow Citizen," says, in reviewing this drama, "It is a century-and-a-half since Allan Ramsay's great pastoral, 'The Gentle Shepherd,' appeared, and 'Gowodean,' so far as we know, is the first attempt since then to represent the Arcadian simplicity of Scottish rural life in dramatic form, and in the ancient national language. . . . . Mr. Salmon has woven a plot of considerable ingenuity and interest, and adorned it with many gems of poetical imagery. Here and there, too, in the simple texture of his verse, he has interwoven passages so replete with beauty and wisdom as to make the reader involuntarily pause and read again." Of course, any notice of a literary work of this kind would be incongruous in THE BUILDING NEWS, were it not that the author is an architect. By the way, Mr. Salmon is not the only architect who has been also a dramatist: the names of Vanbrugh, Beazley, and Mathews will readily occur to your readers.

At the usual monthly meeting of the Water Commissioners, held on the 6th of January, the Memorial Sub-Committee recommended that a drinking fountain be erected to commemorate the projection and completion of the Loch Katrine Waterworks; that the inscription upon it should be similar to that on the floor of the tunnel at Loch Katrine; that the centre of Saint Enoch-square would be a suitable place for its erection; and that it should be somewhat similar to the fountain erected at Holyrood Palace, Edinburgh. Than the site none could be more suitable—immediately neighbouring where the great thoroughfares of Argyle and Buchanan-streets meet at right angles, and in the most direct line between the principal railway termini and the harbour, but the style of architecture recommended is very open to question. There may be a sort of sentimental sympathy between the barbarous old Scottish Gothic and Holyrood Palace, but there can be no congruency of any kind between it and the circumstances of Saint Enoch square. For some years past Saint Enoch-square has been one of the most progressive parts of the city, and is some (indefinite) day to be the site of the grand central terminus of the Union Railway, so, independently of its present surroundings (which are Classical, of a sort), it is wholly alien in genius to any expression of the Dark Ages.

In the interval since my last communication there have been two meetings of the Glasgow Architectural Society. At the former the expected discussion on the president's opinion of the City Improvement Act and the president himself were alike conspicuous by their absence, and at the latter Mr. Stevenson discoursed "On the recent competition in Liverpool for labourers' dwellings, and the influence of the municipal building regulations as shown in the various plans." Taking a leaf out of Mrs. Glass's Cookery Book—"First catch your hare"—the pet "working-man" to exercise his household suffrage must first have a house; and hence, perhaps, *inter alia*, this extraordinary activity here, there, everywhere, and elsewhere in the matter of "Better houses for the working classes," and "Every man his own landlord." After reviewing the Liverpool competition, Mr. Stevenson concluded—"The result of building acts is uniformity of planning the same proportion of street and house and court, multiplied for miles, over a whole town, producing not only the dreariest monotony of architecture (that is a matter which people now-a-days don't seem to think of much importance), but, what is worse, an absolutely equal temperature over the whole space, no draughts or currents, or movements of the atmosphere. What they should aim at is irregularity—wide streets and squares, and narrow streets opening into them. The wide space becoming heated by the sun's action in warm weather, artificial draughts would be created from the cooler narrow streets on the principle of the trade winds. Such a town would in many respects be pleasant to live in; it would have greater variety, and every street not being given up to cart traffic there would be open spaces for the children, who invariably abound in such localities, to play, without the risk of being run over." In the discussion which followed, Mr. Thomson, on the principle of locking the stable after the steed's stolen, made some observations on the (Glasgow) City Improvement Scheme, expressing an opinion that by a different arrangement of the block of houses, a population as large as that at present existing on the space to be improved could be accommodated on the same ground with perfect sanitary arrangements. Some remarks were likewise made on the extravagance of pulling down whole streets in order to straighten them—"a mistake almost as great in an architectural point of view as it is in a financial." Mr. Thomson is to resume the question at the meeting to be held on the 29th proximo, so the subject, if not the houses, has a prospect of being well ventilated. As Mr. Stevenson is a pupil of one of the most eminent London Gothic architects (and hence probably his argument for "irregularity"—a plea that he has more strongly urged upon former occasions), and Mr. Thomson is by both pencil and pen our chief apologist for Greek, it is likely that "betwixt them both they'll lick the platter clean." It is, however, surely matter for regret that the Glasgow Architectural Society did not oblige the civic powers, the public, and the profession, with its views of a City Improvement Scheme *before*, instead of after, that scheme had become part and parcel of the statute-book.

But the "Battle of the Styles" is about to be fought upon other ground than the "irregularity" or the "dreary monotony" of street architecture. We are to have a competition strictly limited—limited not as to "natural selection," but as to style, "Greek or Gothic" having been discovered by some United Presbyterians to be the only style worthy of such a building as a church These United Presbyterians, in their zeal for Popish Gothic or Pagan Greek, are either ignorant or forgetful of the great ecclesiastical works that have been designed in the flexile and beautiful Italian in both our own country and abroad, or they are else the slaves of some æsthetic prejudice. If I recollect aright, a particular style was defined in the competition for the Houses of Parliament, and we see the result. Architects certainly ought to know much better than church committees the style most suitable for a building, and they might with safety be left to the exercise of their own judgment. As a straw shows how the wind blows, the specification of "Greek" indicates that the great Gothic dynasty is at length upon the wane.

Professor Gairdner, the Officer of Health, has addressed a letter to the Lord-Provost, intimating that, in consequence of a difference of opinion between him and the Sanitary Committee, he will have to resign the direction of the medical staff. Since his appointment, Dr. Gairdner has been exceedingly active and zealous in everything tending to increase the health-rate of the city.

The Seventh Annual Exhibition of Painting, Sculpture, &c., of the Glasgow Institute of the Fine Arts was opened on the evening of Monday, the 3rd inst., by a grand *conversazione*. Judging from a hurried visit to the "private view," this year's exhibition will be superior to almost all its predecessors. The exhibition of the portraits of eminent persons associated with Glasgow is expected to be opened in about a fortnight, and will possess high local interest. David Hamilton, the eminent Glasgow architect—by the way, the taker of the third prize in the competition for the Houses of Parliament—will be represented by an excellent painting taken when he was in his prime, and a most characteristic bust by John Mossman's father, taken in later life. The two exhibitions are in the same building, the property of the Corporation—the Institute's in the original galleries on the street floor, and the portrait in the new galleries up stairs.

* "Gowodean," a Pastoral, by JAMES SALMON. Edinburgh: Edmonstone and Douglas.

TERRA COTTA, AND ITS EMPLOYMENT AS A LONDON BUILDING MATERIAL.*

IN a report on Class 65 of the Paris Exhibition, treating more especially of terra cotta, I find this passage:—"That history repeats itself is shown by the revival of the use of terra cotta. Four thousand years ago baked, cooked, or burnt earth—terra cotta—was common enough in Egypt, and was the building material of that people. It was used by the Greeks, by the Romans, and by various European countries in the Middle Ages, and now, in the Paris Exhibition, proofs are afforded in all parts of it, that modern Europe is largely reviving the use of terra cotta." Mr. Cole might have claimed even greater antiquity than he does for burnt clay, for it was of this material that the earliest building mentioned in history was constructed. "The people," we are told in the twelfth chapter of Genesis, "found a plain in the land of Shinar and dwelt there, and they said one to another, Go to, let us make bricks, and burn them thoroughly, and they had brick for stone, and slime had they for mortar. And they said, Go to, let us build us a city, and a tower whose top may reach unto heaven, and let us make us a name, lest we be scattered abroad upon the face of the whole earth." Sun dried and baked clay was employed by nearly all the great nations of antiquity in their early works. The granaries and storehouses of Egypt, the vast mounds of Nineveh and Babylon, and the aqueducts and other remains of Roman times, testify how widespread was its use. Nor was burnt earth used merely as a material for building. Strange to say, this clay, in itself so friable, when properly treated by man's intelligence becomes the most durable of substances, and has been the means of treasuring up the documentary records of a monarchy of which other direct records have wholly perished—the means of handing down to us the art of a people whose very history is lost, and whose race and era are disputed questions. You will be aware that I speak of the clay cylinders of Nineveh, and the fictile vases of Etruria. You who have examined those cylinders, whereon are marvellously impressed, in characters still sharp and clear as when they were first produced, the names and acts of rulers who flourished 3,000 years ago, will need no further proof of the durability of terra cotta, while our own museums and those of other continental nations are full of wonderful evidences, in their collections of Etruscan vases and tazzæ, not only of the beautiful art, the refined taste, and the poetic imagination of that mysterious race, but, also, of the judgment with which they selected the most durable material in which to hand them down to future ages.

As to the building material of the ancients, this seems remarkable—that before they learnt the use of the native products, the stone and marble that so universally abounded, a sort of natural instinct seems to have led them to temper the clay, to knead and mould it, to bake it in the sun, and burn it in the fire—in fact, to manufacture a material, rather than to use a natural one. In nearly all the instances I have been alluding to the substance is spoken of as brick, and I am now naturally led to investigate the difference, if any, which exists between clay burnt into brick and clay burnt into terra cotta. I find it extremely difficult to define this difference, and still more to give any general rule which should enable the unskilled observer to distinguish at once between brick and terra cotta. The same clay undergoes the same general preparatory processes, and partly from more care and attention in the shaping and firing, and partly from the use only of the purest portions, the resulting material is known in the one case as terra cotta, while, in the other, it is simply brick. The truth is that the finer grained firebricks, and the hardest and best qualities of red bricks, such as those made from the Hampshire clays, are terra cotta; and many of the second rate and softer varieties of terra cotta, more especially those of a light red colour, are unworthy of the name, as it is at present understood, and are even, if anything, inferior to brick. While speaking of the hardness of terra cotta, I may call your attention to a test of this quality which should be

* Read before the Architectural Association, 9, Conduit-street, on Friday, January 31, 1868, by Gilbert R. Redgrave.

made binding on manufacturers, namely, that it should resist the scratching of a pin, and if of a superior quality, that of an iron point.

About the commencement of the present century Messrs. Croggan had an establishment in Lambeth Marsh, for the sale and manufacture of artificial stone ornaments. The composition of this stone was a secret; but I find in the "Somerset House Gazette" for the year 1824, an interesting account of a visit to Messrs. Coade's, late Croggan's, gallery of artificial stone ornaments. The writer speaks of the many articles for which this material may be employed, and enumerated, among the objects exhibited, "ornamental figures, enriched vases, baptismal fonts, garden fountains, and capitals of pillars of the different orders, of all sizes." He tells us that "there was considerable shyness about the composition of this artificial stone, but chiefly as to the proportions of the ingredients. Some articles are first formed roughly to give them the external shape in a mould, they are then polished by the chisel while in a soft state, which they endeavour to preserve by wrapping the block carefully in wet cloths. In some cases particular enrichments prepared in matrices are added, and in others the whole is nearly the work of the hand." He seems to have some notion of the material, for he goes on to say:—"The process seemed very much like what I had observed in Mr. Chantry's workshops, in modelling the designs in clay, for the future marble to embody." He tells us that "after the figure is completed in all its parts, it is cut into several pieces for the conveniency of introducing it into the oven, and is afterwards put together, firmly cemented, and iron rods introduced into the arms or other parts that may require to be strengthened." He concludes his remarks on this part of his subject by stating the durability of the material to be fully equal to the ordinary kinds of stone, and expresses an opinion that, when the power of the composition to resist the influence of the weather is fully ascertained by a longer experience, it will encourage the more general use of it and give employment to a higher class of workmen. This account of Coade's terra cotta naturally led me to endeavour to find out some buildings of this period in London whose enrichments have been executed in this material, and I was fortunate enough to find in Pugin and Britton's "Public Buildings of London," in the description of St. Pancras Church, that "the capitals to the columns and antæ, and all the external ornaments, enriched mouldings, &c., are of terra cotta. Imitations of Greek tiles in terra cotta are ranged along the coping of the side walls, as well as round the circular part of the east end;" and in the part describing the colossal statues of females guarding the entrance to the catacombs, there is the following footnote:—"The above figures are of terra cotta—they were formed in pieces, and cemented together round pillars of cast iron, which, in reality, support the entablatures." We also learn from this work that Messrs C. and H. Rossi were paid £4,300 for terra cotta ornamental work. St. Pancras Church was roofed in in 1820, and finally completed in 1822. Although I have not yet been able to ascertain much on the subject of Messrs. C. and H. Rossi, or of their manufactory, we have in the above facts some most interesting data with regard to terra cotta work in London.

The whole of the exterior of St. Pancras Church is faced with Portland stone ashlar work, and is a splendid monument of the superior durability of terra cotta work as contrasted with one of our best English building stones, as all can compare the sharpness and freshness of the terra cotta with the worn, bleached, and disintegrated stone. The blocks used are some of them of large size, and are remarkably truly and squarely filed. The blocks forming the caryatides do not appear to have contracted very evenly in baking, and have been chiselled considerably in places to conceal the joints. This is always a great mistake, as the outer surface or coat of terra cotta gets slightly vitrified in the kiln, and the face thus formed resists the action of the weather far better than an artificial face formed with the chisel. Indeed terra cotta always exhibits the parts where the exterior has been cut or rubbed away in a very short time after the building is completed, in the shape of ugly weather stains at the joints. A singular method of employing terra cotta may be observed in those portions of St. Pancras Church where blocks larger than could be burnt in one piece were necessary, namely, the enrichedportions in terra cotta which have either been inserted in short lengths into recesses and grooved in, or merely stuck with cement against large blocks of the Portland stone. This may be very clearly seen in the three beautiful west doors, the architraves of which are enriched with terra cotta rosettes stuck against the stone, while the enriched cyma and the bead are let into grooves in the stone in about one foot lengths, the stones themselves being from 3ft. to 4ft. in length. Although one is inclined at once to condemn this treatment of terra cotta, it has many points in its favour. As the exposed mouldings of the Portland stone are the parts most liable to decay, by making them of a very indestructible material the general durability of the building is increased.

Another building in which terra cotta has been employed is All Souls' Church, Langham-place Here, I am told by Mr. Blanchard, the successor of Messrs. Coade, the capitals of the columns were supplied by that firm in the year 1822. The church is ashlared with Bath stone, and an opportunity is thus afforded to us of perceiving how favourably terra cotta compares with this material. All Souls was designed by Mr. Nash.

The quaint basso-relievo inserted in the Haymarket front of the recently destroyed Italian opera was modelled by Mr. Bubb, the sculptor, in a substance called, in Messrs. Pugin and Britton's work, lithargolite, or artificial stone. This grand name, I imagine, is merely a disguise, and may with safety be translated into terra cotta. As the lithargolite, in common with the Roman cement stucco fell a prey to the painter, we cannot glean from it any information with regard to its durability. This front was added to the old opera house by Mr. Nash, in the year 1820, and the lithargolite is dated 1821. There are, beyond a doubt, many buildings in London of this date, the enrichments of which are executed in terra cotta. In my efforts to discover other buildings besides those I have enumerated, I have had the following difficulties to contend with. About 1820, which may be called the period of the revival of the use of terra cotta, there were many patent materials before the public intended to replace stone in the numerous edifices which were springing up and supplanting the brick buildings, which prior to that time were the fashion. It was then that Parker's, now known (Heaven knows why) as Roman, cement stucco was hailed for its power of converting a brick into a sham stone front, and Austin, Mulglave, Ranger, Bagshaw, Seely, and other makers, all called their ware artificial stone: thus when this term occurs in the description of the ornamental work of a building, it is impossible to state, without actual examination, whether terra cotta or only moulded stucco was employed.

In the struggle with the various cements which ensued, terra cotta was, I believe, worsted. This was probably owing to the fact that, as the early manufacturers aimed at assimilating their productions to stone, a much more perfect resemblance could be obtained with stucco than with burnt clay, and, in fact, the quality which we now so much admire in terra cotta—its colour, was that which, in the earlier stages of its London career proved its ruin and hastened its downfall. I believe that it is not entirely superfluous to warn modern manufacturers of the fallacy and danger of attempting to produce terra cotta in direct imitation of stone. Terra cotta work must not pretend to be masonry, and the whiteness and consequent softness of some terra cotta is mainly attributable to a false notion that its resemblance to stone is an advantage.

In the brief account I have just given you of terra cotta, I have collected strong evidences of the power it possesses of resisting the influences of our London atmosphere. Had I seen fit to have brought under your notice examples from all parts of the country, I might have pointed out instances of far more lengthened exposure to our climate than I have been able to find in the metropolis. I cannot forbear, however, from making mention of two or three ancient specimens of interest to the architect. Sutton Place, near Guildford, is a most remarkable example of a Tudor building of the most elaborate kind, the ornamental parts of which are red and white terra cotta. It was built in the year 1530, by Richard Weston, brewer to King Henry VIII., and some blocks and specimens of the material, wonderfully well preserved, have been presented by the present owner to the South Kensington Museum. A still older example, and within easy access of Londoners, is to be found in the roundels and coat of arms inserted into the walls of Hampton Court Palace. This terra cotta, which is very hard, and of a light red colour, has, whether made in this country or not, been fairly exposed to our climate for 350 years, as it is certainly of a date coeval with the building. It has been attributed to Maestro Georgione, who was in this country at that time. The modelling of the heads of the Cæsars is bold and vigorous, and, although this work has been exposed to the wind and rain for ten generations, and though the brick, the stone, and almost every material used in the construction of the Palace, is more or less worn or decayed, this substance was, till within the last twenty-five years, untouched by the restorer. It is now painted, and some parts that were damaged have been added in cement. But I have already said more than enough to prove how eminently terra cotta is worthy of extensive use in London.

Terra cotta, considered with reference to the architect. The quality which causes the architect more trouble, perhaps, than any other, with regard to terra cotta, is its shrinkage. Clay, as you are doubtless aware, shrinks in drying and burning very considerably, varying according to its colour, its composition, and its position in the kiln, in firing from $\frac{1}{4}$in. to $1\frac{1}{2}$in. in the foot. In order to arrive at a fair conclusion as to the scale of shrinkage, and at the same time to obtain a genuine sample of the material, I have found it advisible to prepare a plaster-cast of some simple ornament, and to deliver copies of the same to the manufacturers who are invited to supply the terra cotta, requesting them to make a mould from the cast, and impressing upon them, firstly, the necessity of using an exact sample of the clay which would be used for the whole of the work; secondly, desiring them to do nothing in the way of touching up the clay squeeze more than is absolutely necessary for the process of moulding; and, lastly, requiring them to burn the clay blocks in various parts of the kiln, with the customary heat. These trial pieces, together with the plaster-cast, must then be returned to the architect. I have before me some such samples or trial pieces received from manufacturers, and you will perceive at once, on comparing the original with the reproductions in terra cotta, how necessary it is to induce the workman to refrain from what is called the touching up or finishing process, as much of the spirit and freshness of the design is thereby sacrificed to a little sharpness and smoothness of surface.

Having before him these samples, the architect can make his choice, and select the one of which the colour, hardness, and truth, or squareness of form, is superior. He may then proceed, by a simple rule of three sum, to ascertain the scale of shrinkage. As the average lengths of the terra cotta blocks are to that of the plaster model, so is 1ft. to x, or, as I have worked it out for one set of these trial pieces, so is 1ft. to $13\frac{3}{8}$in. This $1\frac{3}{8}$in. therefore represents the amount the clay from which this sample was burnt loses in drying and firing, and this is the shrinkage which it will be necessary to provide for in every subsequent model and full size drawing for the clay goods of the manufacturers who supplied it, and who happen to be Messrs Gibbs and Canning, of Tamworth. You observed, doubtless, that I said "average length," when speaking of the terra cotta—it is very important to obtain such an average, as some terra cottas vary considerably according to their position in the kiln, &c. In this particular specimen the difference is very slight, and is a sign of its goodness. Having set down on paper, or, better, on a slip of wood, this same $13\frac{3}{8}$in. I should proceed to divide it into twelve parts for inches, and then into quarters and eighths, and I have then the scale for Messrs. Gibbs and Canning's white terra cotta. Messrs. Blanchard's scale would have been 13in. to the foot for white terra cotta, and $12\frac{3}{8}$in. only for red. But these differences are unimportant, so long as the results obtained are uniform for large dimensions, and here I must admit that in very few cases can this ascertained shrinkage scale be relied upon for very accurate results. It is therefore necessary to make provision in façades of great length for closers or filling-in blocks which admit either of being cut to suit the dimension or inserted into each course at a later period of the work.

I will now assume that the detail drawings of the terra cotta work for a large building had to be prepared. On the subject of scale I can only impress upon you the well-known fact that (until we introduce the decimal system into England) there is no scale more intelligible and satisfactory for details than $\frac{1}{8}$in. to 1in, or $1\frac{1}{2}$in. to the foot, and to this scale the small size terra cotta drawings, showing the relative position of the blocks, should be prepared. Here I come to a very important question, namely, the size of the blocks. To arrive at a reliable conclusion with regard to

this point we must consult not only the convenience of the producer and the builder, but also the architectural effect of few or many joints. It is of course impossible to produce terra cotta blocks beyond a certain limit of size, on account of the difficulty of manipulation in the manufacture, and of the danger of imperfection in the firing, and I think that this limit should be placed at a contents of four cubic feet or thereabouts. I have seen blocks beyond this size, but when they exceed these proportions they are apt to remind one of the sheet of paper five miles long, or of the marvellous iron joists and railway metals, which are inevitable features at exhibitions, manufacturers' *chef d'œuvres* of no earthly practical use.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

PECULIARITIES OF AMERICAN DOMESTIC ARCHITECTURE.

AT the ordinary general meeting of the above Institute, held on Monday evening last, Mr. Charles Barry in the chair, it was announced that a committee of the Council had been appointed to consider the effect of the New Metropolitan Building Act and its bearing upon the profession and practice of architects generally. Professor David T. Ansted, M.A., was by acclamation elected an honorary member of the Institute; and Mr. Oswald C. Arthur, of Plymouth, was elected as a fellow. The Chairman announced that Mr. H. Austin Layard, M.P., had been recommended by the Council as the recipient of the Royal Gold Medal of the Institute for the present year.

Mr. GERVASE WHEELER read a very interesting communication "On the Peculiarities of Domestic Architecture in America." The writer commenced by remarking that the public buildings of America—those of New York being chiefly commented upon—many of them large and substantial, do not differ from similar structures, such as may be found at home. The churches depart only in plan and internal arrangements from their European types, their architecture having no especial marks of novelty. Trinity Church, in New York, was mentioned as a fair example of a large building of the Perpendicular period. The other costly churches of New York, Boston, and Philadelphia are many of them well designed, admirably built, and especially comfortable in their fittings and appointments, but they have no national difference to stamp them as American; it was, therefore, in the domestic architecture of the country must be sought the germ of a national style, if such a flower was ever to bloom on transatlantic soil. Domestic life in America was described as differing from ours mainly in this, that it is social on a much larger scale, and that it is far more comprehensive in its domestic machinery. The result practically is that the houses are all very much larger, the rooms of great size, and the appliances and arrangements to save labour to servants are most important features in the plan. It was important to remember that very much of the effect of American architecture is due to the wonderful brightness of the atmosphere and the enormous distance to the zenith. The flashing reflections of the bright tin roofs (not so common now as they were fifteen years ago) strike on first sight with peculiar distinctness, and such is the dryness of the atmosphere, even by the seaside, that these roofs are durable in a remarkable degree. Slates, however, are very largely used now, and the French *mansard* roofs are becoming quite numerous. The sudden and enormous falls of snow, and the accumulation of ice, caused one of the most marked features of an American town residence—viz., its very large and far-extending cornice, which, in fact, is only an enriched gutter supported upon brackets, and having the water led therefrom into down pipes of very large size. Thus, the first striking feature of an American house is the cornice; and an immense variety of embellishment may be seen therein. Next to the cornice the entrance doorway is a feature demanding notice. This is invariably high and wide, and elaborately embellished, in all cases consisting of wide outer doors and an inner vestibule of marble or inlaid tile flooring, and approached by a high and wide flight of steps. Beneath all the houses are very spacious and lofty sub-cellars in which is the furnace or hot water or steam apparatus, which warms and ventilates the whole building. Next above this, a little sunk below the level of the pavement, is the basement floor, comprising the usual living room of the family in front; in rear of it very large and well-arranged china closets, pantries, and serving-room; and, behind, the kitchen, continuous with which is the laundry, supplied with fixed washing-troughs of most admirable construction; the whole spacious and well lighted. The size of the houses is invariably regulated by the fixed frontage of a "lot," which means twenty-five feet by not less than one hundred feet in depth. Buildings are, therefore, on one, two, or more lots, as the case may be; and sometimes there are two upon one lot, with a frontage of only twelve and a-half feet each, where land is too costly for a full front. The style chosen for these structures is as whimsical as individual taste can select or contrive. Severe purity of any kind must not be looked for. Overcrowded ornament and incongruous elaborated details are to be seen; yet there is nothing really offensive to the eye in most of the costly residences of New York. At present, the great want is of a real meaning in the embellishments so lavishly thrown upon the buildings, although conscientious efforts are made by a few native architects to bring about the commencement of a national style by the adoption of natural forms in their designs for architectural decoration. The New Academy of Design in New York is notably an example of this; and in many a princely mansion in the upper part of that city may be traced some evidences of thoughtful care to give an American expression to familiar details. The lavish supply of water to all parts of the house was spoken of as a valuable feature in American houses; consequently, the plumbing is a very important item in a contractor's estimate, often forming quite one-fifth of the whole. In a climate so severe in winter precaution has to be taken to guard against frost; so the pipes are laid in such a manner as to let the water run back when the pressure is removed, and by opening a safety cock at the junction and closing the union attached thereto every night, all pipes are emptied. The pipes are never buried in the walls or partitions, but are all displayed in sight, and being handsomely mounted on polished or painted strips, and with furniture almost invariably plated, they are rather ornamental adjuncts to a house than a disfigurement. The supply of hot water to bath-rooms, &c., is almost invariably on the low pressure system, and supplied from boilers of cylindrical form, and of capacity of from thirty to one hundred gallons. The fuel generally employed is anthracite coal, which not only gives a greater degree of heat, but keeps the flues much freer from fouling than the kind in ordinary use here. All the large towns abound with mansions that exhibit every luxury and extravagance that wealth can supply, and which, in point of size and lavish architectural decoration, can compete with the grandest modern residences of London or Paris; but the house of moderate size, such as every dweller in a town needs, is the example which the author had before him in these brief remarks on American domestic architecture.

The building materials in use in America differ in the several States. All are well supplied, and the city of New York is in reality one vast stone quarry, so that in the upper part the excavations for foundations have to be blasted out, and the stone removed is frequently well adapted for building purposes. The immediate neighbourhood abounds with marble, and the opposite State of New Jersey has abundance of beautiful fine-grained freestone of an excellent quality. A stone is also met with very like our own Robin Hood, and is in great favour with the Americans. Timber being, of course, in great abundance, the frame of a building is usually of heavy scantling, and the joiners prefer batting thicknesses together to form girders, breastsummers, and lintels to forming them out of the solid. The bricks used are generally of excellent quality. In Philadelphia and Baltimore a red brick is made of great beauty, pressed by machinery, and remarkably true and well formed. The American bricks are smaller than ours, being but 8in. in length, so that the walls differ in thickness from our own in this proportion.

In the country wooden buildings are still very common. The mode of building is to cover a frame with rough boards externally, and then with clap boards, as they are called, which are boards planed by machinery, one end worked down to a feather edge, and laid so as to allow the thick edge to lap well over the other. Another mode is to use upright planks placed against each other, and a batten over the joints. The frame is usually filled in with soft or place bricks, half a brick thick, or sometimes with coarse plaster, and the whole is lathed and plastered internally in the usual way. Paper as a wall hanging is very seldom employed, and owners of houses used to forbid its application by tenants, even at their own expense. A peculiar mode of plaster finish, called hard finish, is commonly adopted, and consists of rendering the last coat in fine plaster and marble dust carefully floated, which dries with a hard and almost polished surface, and gives a perfectly smooth and clean face.

It would be seen by these remarks (the writer continued) that the American town house is almost *sui generis*; it is not French, nor is it English, although possessing features common to both countries. The rural houses of America, however, show a decidedly English parentage, and the sedulous attention to domestic requirements proves how much the traditional home teachings of the mother country have been respected. Twenty years ago architects were not so numerous in America as they are now, and consequently a large proportion of the country houses were built without their aid, although every effort was made to obtain professional advice. Books were consulted by individuals wanting a house to be built; illustrated designs and plans were carefully conned over and altered according to the taste and wants of the intending home founder, and with these to show what the arrangement of the floors were wished to be, the builder generally supplied the rest. Downing's books, and others of a similar character, were in great demand at the period referred to, and had Professor Kerr's "Gentleman's House" been published at that time it would have found in the United States a circulation that would have delighted its author. The larger houses in America built some years ago more closely followed European types, particularly those erected in the Southern States, and there was nothing particular or noteworthy about them, excepting the size of the rooms and the ample provision of verandahs, colonnades, and other shades affording external features. Society in America is in a transitional state, and, as we all know, it takes more than one generation to mature the finished harmonious family house, like that of the English gentleman of wealth and cultivated taste.

In conclusion, Mr. Wheeler remarked that, in one respect, our American friends have something to learn from us: good as their houses generally are the adjuncts thereto are not as carefully provided. The outbuildings are rarely so compactly arranged or so well contrived as may be seen at home. The roofs of these country buildings are rarely so much broken up as with us. The sudden accumulation of snow in the winter makes builders careful to provide even slopes and unchecked lines of descent; hence valleys and dormer windows, and multiplicity of gables, are as much as possible avoided. Towers and observatories are freely used, and are generally large and serving a useful purpose. In some cases the upper room of the tower was sufficiently large for a billiard table, and used for that purpose. In one residence he remembered, after amply providing every species of accommodation, there was sufficient space left in the cellarage for an American bowling alley, and in another for a museum of natural history and geology. He trusted that this brief sketch of recollections of domestic buildings in town and country might serve to show that Americans have made rapid and commendable progress in all that pertains to internal comfort and the conveniences of practical house life. He had purposely said but little upon the artistic expression of their architecture, because, without numerous illustrations, the subject would be unfairly viewed and still preferably, because Americans have scarcely yet reached a positivism in expression sufficient to give their designs individuality. An interesting problem remains for our transatlantic professional brethren to work out; much progress has undoubtedly been made, and he could not close his remarks on this subject without recording his individual belief that it is in her domestic architecture that America may be expected to develope a national style.

In the discussion which followed the paper, in reply to various inquiries, Mr. Wheeler gave some further details as to the system of sewerage, water supply, warming, and ventilating, &c., pursued in America. The cost of construction of an ordinary town house he estimated at from 9d. to 10d. per cubic foot, and that of a country house at from 6d. to 8d., or a little less than that. All buildings erected were subject to the regulations of the "Fire Act," which stood in the place of our

* To be concluded in our next number.

Building Act. Each city and town was divided into fire districts, to each of which inspectors were appointed to see that the provisions of the act were complied with in the new buildings.

Professor DONALDSON, in proposing a vote of thanks to Mr. Wheeler for his communication, expressed a hope that that gentleman would add to its interest and practical value by furnishing one or two plans of American houses to accompany the publication of the paper.

Professor KERR, in seconding the vote of thanks, referred to the characteristics of American society as illustrating the peculiar domestic arrangements of the houses described in the paper, and which, he said, operated with greater force in the Southern States, during the prevalence of slavery, than in the Northern.

The vote of thanks was unanimously accorded to Mr. Wheeler.

GOTHIC FORMS APPLIED TO FURNITURE, ETC.

WE illustrate, this week, a sheet from Mr. Talbert's book on Furniture—the subject having been reduced to suit the pages of the BUILDING NEWS by Messrs. McClure and Company. The illustration is a very good specimen of the suggestive nature of the sketches. Furniture of this character, though possessing many praiseworthy features, is often very poor in tone, and much akin to carpentry work, instead of what is considered cabinet work. The want of richness in the colour, which a late correspondent considered like "putty," arises, no doubt, from an impression that oak is the only wood for this class of work—that it is dishonest to stain, or vulgar to polish; but it would, perhaps, be better to use these means to enrich it than to employ gold or paint, or waiting half a century for a natural deep mellow tint. Though oak is undoubtedly a noble and native material, the kind usually employed is not of British but foreign growth. There are some woods, such as mahogany, rosewood, walnut, maple, satinwood, &c., better adapted for many purposes, both from the closeness of their fibre and colour, for cabinet work. The ignoring of these more delicately grained woods is unfortunately the rule. Then there seems to be also an antipathy to carving. Most of the works we have seen recently executed have not the least pretension to anything of the kind, and though good Gothic wood carving is difficult to obtain, yet it is one that should be grappled with, for it is the most legitimate mode of wood ornamentation, and putting it entirely aside in favour of inlays and paint is a mistake.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

WE have before us the eighteenth report which was presented at the Annual General Meeting of this Institute recently. The document gives a summary of the work of the Institute for the past year. The more interesting portions of the report refer to the prizes offered by the Institute for the encouragement of young apprentices, who it is satisfactory to know continue to manifest much interest in the different competitions. The subjects for competition during the past year were:—

1. For the best geometrical drawing, being an elevation of any existing example of Gothic architecture. To be competed for by apprentices, of not more than three years' standing, of any Scotch architect.

2. For the best perspective line drawing of any existing example of architecture, projected and raised from the plan.

3. For the best original design—subject, a memorial cross.

4. A prize, not exceeding £5 5s., for the best series of not less than five drawings of an ancient example of Scottish architecture, either of the Domestic or Ecclesiastical style, suitable for publication in the Transactions of the Institute, and not previously fully illustrated therein. No competitor appeared for this prize.

The prize for competition No. 1 was gained by Mr. J. L. Campbell, in the office of James W. Smith, Esq., architect, Edinburgh. For prize No. 2 the successful competitor was Mr. James Darling, apprentice to W. M. Gorrie, Esq., architect, Edinburgh. Prize No. 3 was gained by Mr. John Ord, apprentice to David Macgibbon, Esq., architect, Edinburgh.

Mr. David Cousin, architect, offered a prize of £2 2s. for a series of drawings of Magdalen Chapel, Cowgate, for which only one person competed, Mr. Andrew Dewar, in the office of Mr. Paterson, architect, Edinburgh, who received the prize.

The subjects for competition during the current year are as follows:—

1. The best geometrical drawing, being an elevation of any existing example of Italian architecture. To be competed for by apprentices, of not more than three years' standing, of any Scotch architect.

2. The best original design of a wooden principal rafter for a roof having a span of 50ft., with working drawings (scale—an inch to the foot) and details, with specifications. Open to any apprentice.

3. The best original design—subject, an elevation of a range of street houses, with shops on ground-floor—say 100ft. of front. Open to all competitors.

4. For the best perspective line drawing of any existing example of architecture, projected and raised from the plan. Open to any apprentice of any Scotch architect.

MANCHESTER DISTRICT SCHOOLS.

ONE of our illustrations represents the Manchester Warehousemen and Clerks' Orphan Schools now being erected in the suburbs of Manchester. It is constructed to accommodate about one hundred boys and girls, and is so arranged that it can easily be extended at a trifling cost. The dormitory and school-rooms will be well ventilated and lofty. There will be kitchen, scullery, bakery, play-rooms, and other conveniences on the basement floor. The walls are constructed of bricks made on the spot, and are formed with a 2in. cavity in the centre of the wall, the inner and outer brickwork being well tied together with galvanized iron cramps. Darley Dale stone dressings are freely introduced, and the front entrance is approached by a handsome flight of stone steps. We believe the total cost will be under £10,000. Earl Granville laid the foundation stone a short time since. Mr. Ernest Bates, of London and Manchester, is the architect.

REFERENCES.

DORMITORY PLAN.

A. Dormitory for Sick Boys and Girls.
B. Dormitory for Boys.
C. Lavatory ,,
D. Dormitory ,,
E. Lavatory for Girls.
F. Dormitory ,,

GROUND PLAN.

A. Serving room.
B. Dining room.
C. Corridors.
D. School room for Boys.
E. Class room ,,
F. Class or Work room for Girls.
G. School-room ,,

METROPOLITAN BOARD OF WORKS.

AT a meeting of this body last Friday, a report was presented from the Works and General Purposes Committee, stating the steps taken in regard to the laying out of Finsbury and Southwark Parks. It was reported that the contracts had been let for the formation of roads and footpaths, entrance lodges, gateways, &c., and the works were in active progress. Plans for laying and planting Southwark Park had been prepared, and they were submitted for the approval of the Board, and plans for the laying out and planting of Finsbury Park were in the course of preparation, and would be submitted for the approval of the Board at the earliest possible period. The Board also considered a memorial from the Commissioners of Sewers for the City of London, which stated that an opportunity was offered by the works of the London, Chatham, and Dover Railway Company to effect an improvement at the western end of Ludgate-hill, opening out northward to Farringdon-street and southward to New Bridge-street. For many years past great inconvenience has resulted from the amount of cross traffic at this spot, and it is believed that the proposed plan, which is estimated to cost £23,512 independently of personal charges, will be a vast improvement. It may be stated that the ground for Southwark Park has been acquired at a cost of £60,000. Its area is sixty-five acres; but, in order to recoup a portion of the sum expended in its formation, belts of land skirting its wider parts will be appropriated to the erection of about 300 houses, of such a class as to command a rent of £50 a year. About fifteen acres of ground will be set apart for this purpose.

ARCHITECTS' FEES.

A CASE of considerable importance to the members of the profession was tried in the High Court, Bombay, during the past month, before Sir Charles Sargent. The suit was instituted by Messrs. Scott, McClelland, and Co., against Cowasjee Jehangeer Readymoney, the Hon. George Foggo, and Narrayen Dinanathjee, members of the committee of the Native Charitable Dispensary. The following is a copy of the bill filed:—

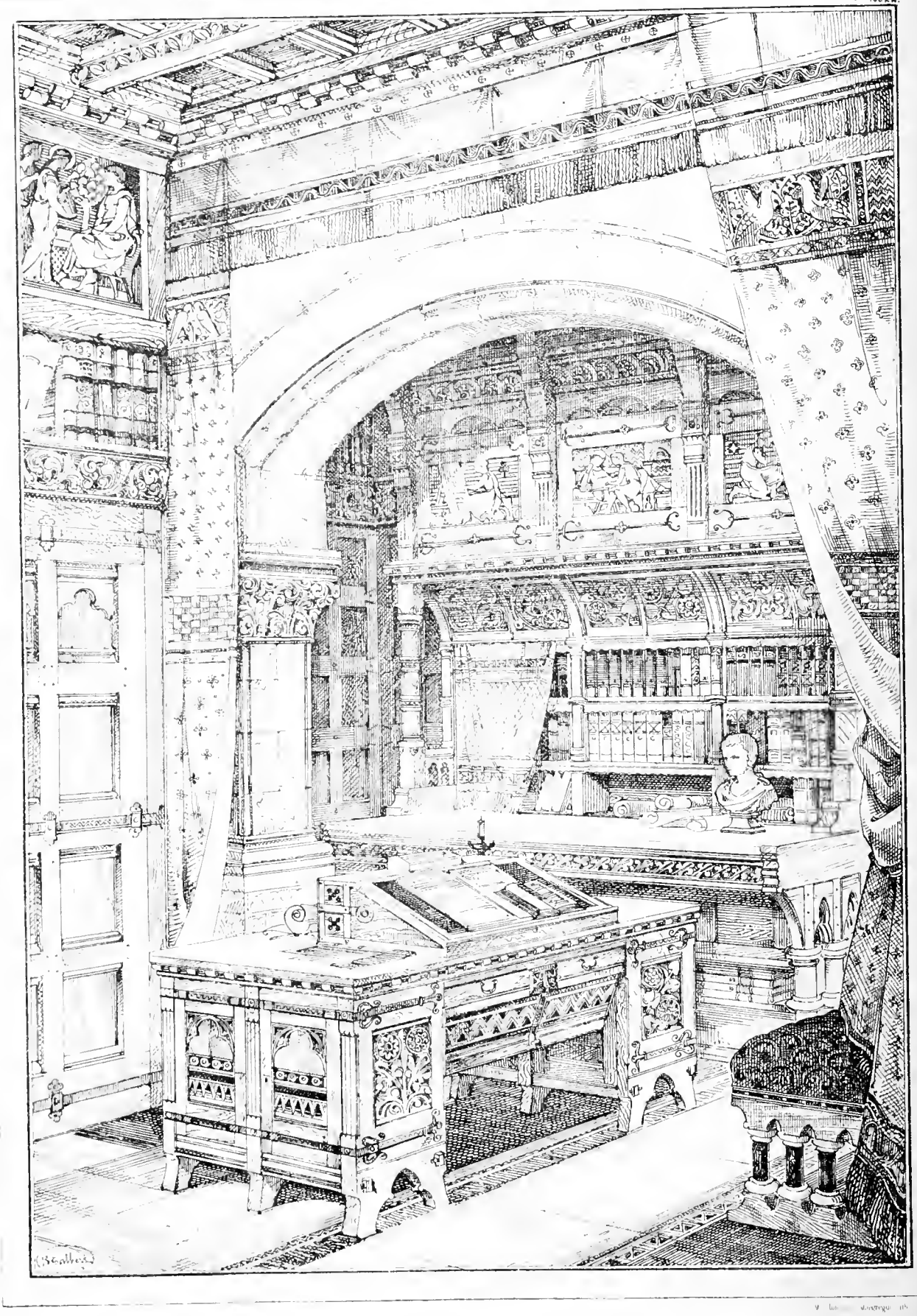
To preliminary sketches for new Dispensary, and to set plans of sections and elevations complete, and to details to large scale, at 2½ per cent. on intended cost of building (Rs. 80,000)	Rs.	2,000
Detailed estimates of same, with detailed specifications and general conditions; and to lithographed bills of quantities furnished to contractors; and to inviting, receiving, and examining tenders and submitting same to Committee (at 2 per cent. on Rs. 80,000)	,,	1,600
Extra sets of drawings for same, to different designs and to rough estimates for same; to various personal attendances on and correspondence with Dr. Vitters; taking instructions &c., on the subject, and to various personal attendances upon and correspondence with Mr. Trubshawe on the subject.....	,,	500
Total	Rs	4,100
By Cash	,,	2,500
Balance.....	Rs.	1,600

The plea of the defendants for non-payment was that the sum claimed was not due, inasmuch as the charges made were each and all excessive. A decree in favour of the plaintiffs for Rs. 1,000, without costs, was given.

LIGHTHOUSES.

IN his new work on "Wonderful Inventions, from the Mariner's Compass to the Electric Telegraph Cable," Mr. Timbs devotes a chapter to lighthouses, giving an account of the method and materials of constructing and lighting these structures. Cast-iron has been extensively used in constructing lighthouses. A small light tower was first erected on Gravesend pier. Next, a lighthouse of cast-iron was built on Morant Point, Jamaica, designed by A. Gordon, in outline resembling that of the Celtic towers of Ireland. It was cast in England, and set up at Jamaica within six months, and at one-third of the cost of a stone lighthouse of equal dimensions: its height is 105ft., and it was erected on the coral rock, by a derrick and crab from the inside, without any external scaffolding. The base is 27ft. of masonry and concrete. The tower shaft consists of tiers of iron plates, each 10ft. high, flanged together with nut and screw bolts, and caulked with iron cement. Ten radiating plates form the floor of the lightroom, secured to the tower upon brackets and finished by an iron railing. Mr. Gordon has also built, on the same principle, at Gibbs Hill, Bermuda, a lighthouse 130ft. high, and another at Point-de-Galle, Ceylon. Lighthouses of iron, cast or wrought, or partly of gun-metal, are cheap, easily erected, strong to resist vibration in hurricanes, and safe from lightning, earthquakes, and fire; their lining and ventilation providing the desired and uniform temperature. Lighthouses have also been constructed upon iron piles, fixed in the sand by mooring screws, and made compact by cast-iron braces; the Maplin and Chaplin Lights, at the mouth of the Thames, and those at Fleetwood and Belfast, are on this principle. Others have been built upon hollow cast-iron columns, as that on the Bishop's Rock, thirty miles from the Land's End, and more exposed to the force of the Atlantic than the famed Eddystone Lighthouse. The six columns are sunk 5ft. into the rock, and tapering upwards, support, at a height of about 100ft. the dwellings of the three light-keepers, with stores of provisions for four months; the whole is surmounted by the lantern, and the access to the dwellings is by a spiral staircase within a central column.

The next meeting of the British Association will commence at Norwich, on Wednesday, the 19th of August. Dr. Hooker, of Kew, the president of the year, will deliver the inaugural address.



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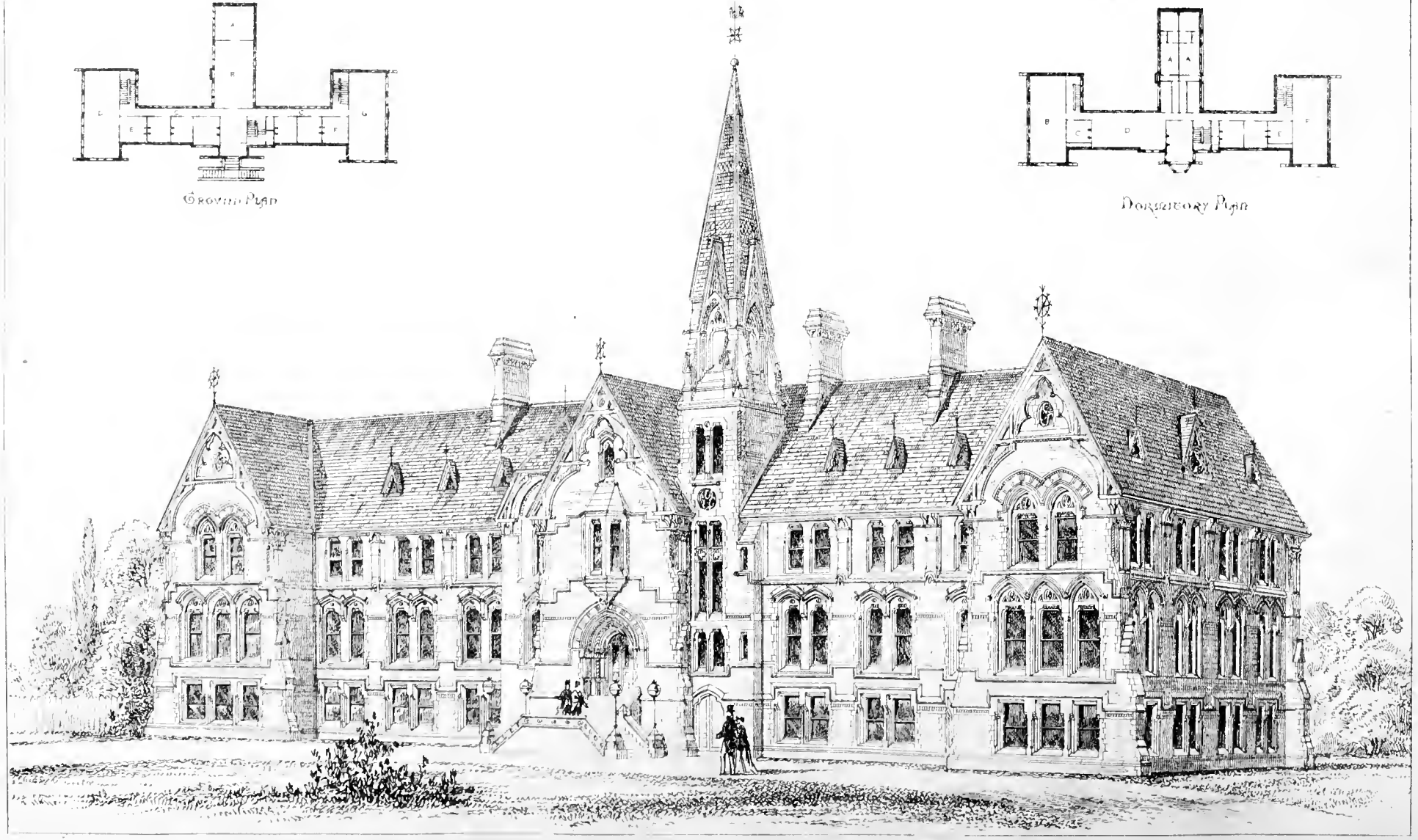
Ground Plan

Dormitory Plan



E. Wimbridge, lith

Printed by Whiteman & Bass

The Manchester District Schools, — Mr ERNEST BATES, ARCHITECT.

PUGIN *VERSUS* BARRY.

MR. GLADSTONE has ventured an opinion on this controversy. A short time since the great statesman, when visiting his constituency, stayed at Scarisbrick Hall, a building which was designed and partly carried out by Augustus Welby Pugin, about the same time as the Houses of Parliament were designed. We have not seen the Hall, but, from reliable accounts, it is one of the finest specimens of modern Gothic in the country. Mr. Pugin, in his reply to Mr. Fergusson, two or three weeks since, said, that one of the foremost statesmen of the day said, in a conversation with him,—"If I have reason for not believing all that you claim for your father regarding the Houses of Parliament, it lies in the fact that the work at Scarisbrick is so much bolder, more effective, and successful than that at Westminster." Since then Mr. Gladstone has written a letter to Mr. Pugin, in which he says, "Endeavouring to recal my words, I think they must have been to this effect:—'That I thought it impossible not to recognize the relationship of the Scarisbrick Tower and the Clock Tower; and that, much as, in common with all the world, I admire the Clock Tower, the Scarisbrick Tower, which I was then viewing, appeared to me to be a still more beautiful and *living* work.'" We hope to give in a week or two an illustration of this tower, and put it by the side of some Gothic churches erected in London from Sir Charles Barry's designs, about the same period. These illustrations will no doubt throw some light on the Pugin *versus* Barry controversy.

SOCIETY OF FEMALE ARTISTS.

THE exhibition of this Society is now on view at the rooms of the Architectural Association in Conduit-street. While fully appreciating the interesting nature of the institution, the high character of the patronage, and the labours of the contributors, we cannot but remark that, as a whole, the exhibition does not place female art in a very favourable light. In point of fact, many of these pictures, and more especially some in oils, should never have been exhibited. It would be invidious to point to examples that we cannot praise, and our readers will prefer to have attention drawn to the meritorious works rather than the others. Foremost we are inclined to place the works of the indefatigable Madame Bodichon. As usual they are sketches in Africa, and she exhibits no less than thirteen, all of interest and bearing the stamp of nature. Miss Warren contributes eight drawings, amongst which Nos. 168 and 174—views in the neighbourhood of Maple-durham—are the best in the exhibition. Lady Dunbar has several vigorous sketches, one of which—a sunrise at Minorca—is remarkable for its wonderful force of colour. The large drawing, "Ghiffa Pass, Algeria," is not so successful as the rest. Miss Mason's "Horseshoe of the Severn" is very pleasing, and very low in price. This extreme lowness of price is a noticeable feature, and we are far from thinking it a matter for congratulation. There is no reason whatever why a lady should not receive as much for her work as a man, provided the work be as good. Rosa Bonheur, if we mistake not, found her account in charging a good price for her paintings. No. 51, a view in Kent, by Mrs. Oliver, is much in the style of J. D. Harding. Miss Freeman Kempson contributes several scenes in Wales and Lakeland. Miss Adelaide Claxton exhibits a remarkable drawing, a ghost scene, with the title, "It would be spoken to;" a lady standing in front of a fire in a large old-fashioned room is apparently being mutely appealed to by a kneeling figure in ancient dress. The story is well told, and there is a weirdness about every detail. Miss Louise Rayner has produced some beautiful interiors of Knole. Interiors are at all times difficult subjects, but Miss Rayner has been most successful. The polish on the floors seems to be somewhat excessive, but, with this exception, there is nothing that can be found fault with, unless it be the very low price at which this lady rates her works. Seven guineas for No. 233, "Fireplace in the spangled bed-room, Knole," is not a fitting price. The same may be said of Miss Eliza Sharpe's beautiful water-colour copy of Maclise's play scene in "Hamlet." Of the oil paintings it is impossible to speak well. There are a few good works on the walls, and a great many that are worse than indifferent. A fancy portrait, No. 348, by Helen Hoppner Coode, is the best. Miss C. F. Williams has a pretty view on the Thames, near Earley, and an old water-mill in Devon, No. 368. Mrs. Olive Newcomen's picture, "Carting," is a very good imitation of Rosa Bonheur. Miss Bowers has truthfully represented a pony in a blown state in a winter atmosphere; and Miss Jekyll contributes a donkey foal, life size, which is boldly painted. Her other picture, No. 334, "Neptune's horses," is extraordinary rather than pleasing, and not quite correct in drawing. It is in drawing that ladies for the most part fail; they *will* make the gentlemen muffs and the ladies silly. If anyone doubts this broad assertion, a visit to this exhibition will alter his opinion, and for that purpose alone the time would not be unprofitably spent.

In the adjoining room, Gustave Doré's illustrations of the "Idylls of the King" have been exhibited for a few days. They are in juxtaposition with the steel engravings published by Moxon. The test may be too severe, but we cannot think the engravings all that could be desired. Many are of opinion that Doré's peculiar style is best adapted to wood-cuts. There is nothing in these engravings that can compare with the wood-cuts of the "Contes Drolatiques," though some are very much in the same style. Gustave Doré has a gift of filling a scene with atmosphere in a manner that no one can rival. In the steel engravings we do not perceive that this effect is successfully given, nor is the peculiar twilight, of which he is so fond, sufficiently adhered to.

NEWGATE.

WHAT a multitude of hideous associations cluster around this building! Most people would be glad to hear that it was about to be removed from the city of London to some suburban locality. In fact, at one time, we believe it was contemplated to do so. The price of land being so fabulously high in the city, it was considered to be a good arrangement to build the prison some three or four miles away and to substitute in its place warehouses and offices. Instead of doing so reasonable a thing, we learn that it is now intended to enlarge Newgate to nearly double its present size. Those who have an eye to public improvements will look upon the proposal with a considerable degree of disgust. Already a great obstruction to traffic, and an eyesore and public nuisance, Newgate will become more intolerable when the splendid new thoroughfare in Holborn is opened, for its dead walls and grim front will be the most prominent object in view citywards. The sensible thing to do in the matter, and which we suggested when its extension was previously mooted, is to carry off the hideous edifice whither modern experience agrees all such unpleasant institutions should be transported.

ARCHITECTURAL ASSOCIATION.

TERRA COTTA.

THE Architectural Association met on Friday evening last to hear a paper read by Mr. Gilbert R. Redgrave, on "Terra Cotta." Mr. R. Phené Spiers, the president, occupied the chair, and there was an unusually large attendance of members present. The secretary announced that Mr. Keith D. Young, 4, The Grove, Highgate-road, Mr. Frederick Russell, 3, Henrietta-street, Brunswick-square, and Mr. Robert J. Worley, 30, Duncan-terrace, N., had been elected members of the Association. With reference to the prize of five guineas, offered by the Committee for the best title-page design for the "Architectural Sketch-Book," the chairman stated that a number of highly creditable designs had been sent in, and the Committee, finding that they could not arrive at a decision as to which was the best, agreed to refer the matter to an umpire. The selection fell upon Mr. Burges, and that gentleman had declared in favour of the design by Mr. Lonsdale. The prize was accordingly awarded to that gentleman, and the decision seemed to meet with the general approval of the meeting. The various designs, together with a number of Gustave Doré's illustrations to Tennyson, were exhibited on the walls of the rooms. The chairman then introduced Mr. Gilbert R. Redgrave, who read his paper, which will be found on another page. A somewhat desultory discussion followed the reading of the paper.

Mr. ALRIDGE was of opinion that terra cotta was not adapted to construction, but thought that it might be used for the purposes of ornament He had seen it so used in Italy with very good effect, and it might be applied effectually for decoration in London buildings. He considered the subject of terra cotta a very interesting one to architects, and he had great pleasure in seconding the vote of thanks to Mr. Redgrave for his able paper, which had been proposed by Mr. Watson.

Mr. POTTER expressed a similar opinion, remarking that for cornices, string courses, and such like, he believed terra cotta was well adapted, but he doubted if it ought to be used for construction. Even for decoration he advocated extreme caution in its use.

Mr. TRAYNOR PERRY exhibited a specimen of glazed terra cotta intended purely for ornamentation. He remarked that the manufacturer was prepared to supply these ornaments at the price of 5s. a piece. They were 9in. square each, and might be either fixed with screws, or simply bedded in the cement.

Mr. BLASHILL said he would be sorry to advocate the use of terra cotta for ornamentation, if he could not use it constructively. It appeared to him, however, to be more suitable for decoration than stone on a brick building, and he believed it would also be cheaper. It would be an advantage he thought if the material could be obtained with a surface that could be washed. As regarded construction he saw no reason to distrust it, and he would recommend Mr. Redgrave to make some further experiments with it. It would be much better, he conceived, to employ stone for the purpose of strengthening cornices rather than iron, as shown in Mr. Redgrave's drawing. He was sure they were all agreed as to the valuable nature of the paper read, and he hoped it would be published for the information of the members of the Association.

Mr. MATTHEWS objected to terra cotta as a material for construction. One objection to its use would be the difficulty of getting truly horizontal lines, and another, the difficulty of getting the blocks to dry with sufficient accuracy. He was afraid they could not be made so accurate as they ought to be. Very great precaution would be necessary to prevent or to provide for shrinkage. He could not help thinking, with Mr. Redgrave, however, that terra cotta must sooner or later come into extensive use as a decorative material.

A member here asked whether Mr. Redgrave could insure a uniform colour in the terra cotta blocks, as it would present a very bad effect to have different colours in the string-courses of a building. Terra cotta, it was mentioned, had been used at the church in Aberdeen Park, Islington, and the result was not at all satisfactory.

A manufacturer of the material who was present stated that, with regard to the light yellow or white terra cotta, a tolerably uniform colour could be insured, though he thought a little variation in colour would be rather in its favour. It was also remarked that the greater the depth from which the clay was taken, the less it had been found was the shrinkage.

The CHAIRMAN said that the subject was a highly interesting one, but he thought it came to them to a great extent unprepared. They had had very little experience of terra cotta, and were scarcely prepared to understand it fully. He believed that the paper which had just been read would be one of the most valuable of the records of the Association. Terra cotta, he remarked, was as lasting and durable as a rock, being much harder than any stone we had for building purposes, and it possessed this other great advantage, that it was applicable to the highest artistic skill. It was a question whether glazed materials should be used in decoration. A paper had lately appeared in one of the

professional journals in favour of glazed tiles for London buildings. He should be very sorry to see glazed tiles ever introduced, nor could he say he was much in favour of polished granite, as a rule, for ornamentation. It could hardly be said that you got colour from polished granite—it was only reflection.

Mr. REDGRAVE, in acknowledging the vote of thanks, remarked that, as regarded the objections to the use of terra cotta structurally, he thought they had only to look at the buildings for which it had been employed, and to which he had alluded in his paper, to judge of its adaptability as regards both appearance and strength. As far as resisting weight was concerned, he thought it would compare very favourably with other building materials. It was true that terra cotta was, to a certain extent, a treacherous material, and hence the precaution, if not the necessity, of introducing iron, as in the case of the cornice and column which he had described. But the fact was, that the manufacture of this material was at present in a very crude state; he had no doubt the time would come when we should be able to calculate its strength and bearing qualities to a nicety. When it became better known, the architect, as well as the builder, would have no difficulty in dealing with terra cotta.

BREADTH IN ART.

UNDER this heading there is an article in a late number of the "Leader" which says, if we turn from music to architecture (an art which, both in the metaphysical groundwork of its effects, and in its peculiar indefinite yet unlimited power of expression, has strong affinities with music), we shall, perhaps, see exemplified more strikingly than in any other form the "strange disease of modern life," the tendency to elaborate littleness and frittering, the absence of that spirit of self-restraint and concentration in the artist, that expression of calm dignity in the art, which shine with such a lustre through the decaying relics of the Grecian temples. Consider, for a moment, the simplicity of the means whereby the building which more than any other has been the object of universal admiration produces its marvellous unity of effect. The Parthenon has no play of skyline, no picturesque grouping of masses to attract us; only a simple cubical block of building, surrounded by the deep broad shadow of its long colonnade, all the columns of which are precisely similar, and are ornamented just to that degree which enhances the appearance of strength and suitability to their position; and, though of a design which, looking at one column singly, might appear tame and uninteresting, yet striking irresistibly upon us when displayed one after another in long unbroken succession. The same principle of repetition is carried out in the smallest details; the architect, having designed carefully an effective ornament, not disdaining to repeat it all round the building, knowing that he should thus best be securing the consistency of the total effect. The ornament, again, is so placed as not to encumber but rather to emphasise the constructive portions of the building; and even the sculpture is by a certain rigidity and simplicity of line prevented from unduly obtruding itself, and is harmonized with and (to continue the metaphor) brought into the key of the building; which thus exhibits all its parts as subordinate and yet accessory to the total effect, and strikes upon the eye, like a chord of music on the ear, as one complete whole. We would not, for a moment, advocate the revival in modern England of the style of ancient Greece; but it is worth while to contrast the calm repose of such a building with the kind of architecture now most in vogue—the fidgetty, angular, crotchetty designs which are perpetually rising up around us, where the only attempt apparently is to astonish and distract the eye, to cover every part of the building with ill-considered, over-wrought ornament, laid on indiscriminately, without purpose or meaning; while outline is obtained, not as the result of the natural or convenient grouping of the buildings, but is violently produced by twisting the roofs into unmeaning and fantastic forms, and sprouting useless turrets at every angle. Notably, we think, was the disease of art manifested in the late important competition among some of our leading architects for the erection of the New Law-Courts, where all the talent and ingenuity evinced in the drawings and in the treatment of detached portions could not disguise the fact, that not one of the competitors had taken a broad and comprehensive grasp of his subject, all of them covering their defects by a surfeit of applied ornament, and in some instances showing a fantastic babel of towers, domes, and turrets—a studied, and, therefore, repulsive, irregularity and want of symmetry among the different parts—which rendered their designs a sort of Chinese puzzle, in which neither order nor motive could be discovered. And this is but one notable example of the prevailing spirit which is exhibiting itself in nearly all our architecture, which is familiar to all who examine the exhibitions of "competition" drawings, and is filling our streets with grotesque objects on which our descendants—perhaps even ourselves, in a few years—will gaze with mingled feelings of astonishment and dismay.

SLIPPERY PAVEMENTS.

DR. WHITMORE, Medical Officer of Health for Marylebone, calls attention, in his last monthly report, to the condition of the pavements when snow is on the ground. He says the number of accidents taken to the Middlesex Hospital during the past month amounted to 367, of which a very considerable proportion were caused by the slippery condition of the roads and footways. Every one accustomed to daily walking in our public streets, must have felt, during the past fortnight, that he was incurring considerable personal risk; the neglect of many householders in not properly removing snow and frozen mud from the pavement in front of their dwellings cannot be too severely censured, and merits a greater punishment than the law—as it at present exists—has the power to inflict. But even the law, as it stands, is rarely, if ever, properly enforced. After a heavy fall of snow, the policeman knocks at the door, and directs the pavement to be swept; this is probably done, but in so imperfect and slovenly a manner that the risk of falling is materially increased by it; the policeman, however, is not called upon to judge of the efficiency of the operation—his mandate has been obeyed, and he is content. He goes on to say that, "Until the law on this point is rendered more stringent and more compulsory, the evil will continue, an evil, not only fraught with danger to life and limb, but highly discreditable to the municipal regulations of this great metropolis. I have been informed that on the 10th of the present month, 32 accidents (occasioned by the slippery state of the pavements) were taken to the Middlesex Hospital in the short space of two hours."

Dr. Whitmore says nothing about coal plates inserted in the pavements. These are frequently as smooth as glass, and when snow or sleet is falling, the person walking, not seeing the coal plate, slips on it, and frequently slips down. If these plates in all instances were rough, many accidents would be prevented.

BUILDING AND LAND SOCIETIES.

THE progress made by the National Temperance Land and Building Company during the past year looks very encouraging, judging from the report of the directors which was read at the annual meeting on Monday last. During the year the company have advanced upon the mortgage security of freehold and leasehold property the sum of £8,610, making a total of £13,155 advanced since the commencement of the company. A balance of £1,019 on the business account of the year the directors recommended to be appropriated in the following manner:—To the repayment of one-seventh of the preliminary expenses; to carry £110 to a reserve fund; to pay a dividend at the rate of 10 per cent. on the paid-up capital; and a balance of £138 to the current account of the company. The report was unanimously adopted. Messrs. Robinson, Hazelgrove, Malings, and Stringer, were re-elected directors, and Messrs. Crane, Newbury, and Sims, auditors of the company. The meeting took place at the Whittington Club, Mr. H. Robinson, of Lewisham, presiding.

The first ordinary meeting of the shareholders of the Artizans', Labourers', and General Dwellings Company (Limited) was held at 147, Strand, on Monday, Mr. W. H. Bennett in the chair. The report for the year ending Jan. 4, 1868, stated that, although it extended over a period of one year, the practical operations extended over seven months only. The paid-up capital amounted to £502 10s. The loans on deposit have been £817 19s. 5d., of which £312 14s. 11d. had been withdrawn, leaving a balance of £505 4s. 6d. The preliminary and working expenses of the company had amounted to £453 9s. 4½d.; the payment of this amount the board recommended should be extended over a period of five years. The net profit had amounted to £139 18s. 11d. The board had decided upon foregoing their fees for the past year. The company was worked upon the co-operative principle, employing the labour of shareholders in the erection of the dwellings, and the profit realized by the workmen had amounted to at least 40 per cent. over their wages, independent of the company's profits. The chairman moved the adoption of the report, which was seconded by Mr. Lowe and carried unanimously, and a dividend at the rate of 7½ per cent. per annum was declared.

The eighteenth annual report of the National Freehold Land Society, to be presented to the meeting of shareholders to be held to-day, shows that the deposits have exceeded those of the previous year by £176,888, whereas the withdrawals have only exceeded those for the same period by £32,369. The "members' capital" has increased by £210,799. In consequence of the unprecedented influx of money (owing principally to the low rate of interest obtainable elsewhere), the directors felt it necessary, in August, to reduce the rate of interest from 5 to 4 per cent., but this step has not led to any considerable increase in the amount withdrawn. Having regard to the increase in the amount of business, the directors have added £5,000 to the reserve fund, which now amounts to £10,000. A further sum of £27,337 has been added to "convertible securities," increasing that fund to £129,186. Of the net profit brought forward last year (£20,397), the amount added to uncompleted shares was £16,259, leaving a surplus of £4,138. The net profit this year (after deducting the £5,000 carried to the reserve fund) is £21,829, of which the amount added to uncompleted shares will be about £18,800, leaving about £3,029 to carry forward to the next account.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Scandinavian Church at Leith for the benefit of Danish, Swedish, and Norwegian sailors visiting that port, was laid last week. The plans of the edifice, which is to be in modern Gothic style, have been prepared by Mr. James Simpson, architect, Leith, on the basis of a design drawn by Mr. Johan Schroder, architect, Copenhagen, and presented by him to the committee.

St. John's Church, Leeds, was reopened on Sunday last, after restoration, by the Bishop of Ripon. Mr. George Gilbert Scott, in 1865, when consulted as to the advisability of its restoration, stated that in this church Leeds had a specimen of church architecture to which no other town in England could produce a parallel. In distribution it resembled a common and simple type of a mediæval church, being of two equal spans, covered uniformly from end to end with a somewhat high pitched open roof, the two spans being divided by a range of seven similar arches unbroken by a chancel arch, the absence of which was, however, compensated by a very bold and rich oak screen crossing both spans. The restoration has been very thorough and complete, under the direction of Mr. Norman Shaw, of London. A mosaic reredos executed by Signor Salviati has also been erected. The church as altered will seat about 1,000 persons. The works have been carried out at a cost of about £4,000.

A new church dedicated to St. John is about to be erected in St. George's-in-the-East, at a cost (without the tower) of £3,500. The building will be of a plain and substantial character, and all the sittings will be free.

It has been determined to erect a memorial church in honour of the late Dr. John Lonsdale, Bishop of Lichfield, in the town of Derby, which forms part of the diocese over which he so long presided. The new church will be dedicated to St. Luke, and will be erected between the new Uttoxeter and Burton roads, popularly known by the name of "California." It will be constructed to accommodate 650 persons, all the seats being unappropriated and entirely free.

Nidd Church, Yorkshire, was opened on Tuesday last, by the Bishop of Ripon. The present building is on the site of an old church which had fallen to decay, and the foundation stone was laid in August, 1866. The architects are Messrs. T. H. and F. Healey, of Bradford, and the contractors Messrs. Fawcett, of Harrogate. It is built in the Early Decorated Gothic style, with plain simple nave and chancel. The pulpit, lectern, and chancel fittings, are of a more elaborate character. The floors are laid with Maw's Staffordshire tiles.

It is proposed to build a new parish church at Acol, Kent. The site has been secured and the designs prepared by Mr. W. L. Sear, of Margate. The structure will be in the Perpendicular style, and will be built of brick, faced with Kentish rag. It will accommodate 300 persons.

DUBLIN.—The foundation stone of the new church of St. Bartholomew, Elgin-road, was laid in 1865, and the edifice was consecrated in December last. It contains sittings for 550 persons, and has been erected, from the designs of Mr. Thomas H. Wyatt, architect, of London, by Mr. James Scanlan, builder. The style adopted is Early English, and the arrangements partake of the cathedral type. The plan consists of a nave, with open porches at north and south sides; double transepts, each opening into the nave by double arches at each side. The tower is raised over the choir, beyond which is an apsidal chancel; at each side of choir are aisles, forming vestry and organ room respectively. The width of the nave is 27ft., the transepts are 77ft. across and 32ft. wide, the choir and chancel are 18ft. wide, and the total length internally is 128ft. The walls are faced with Dalkey granite, and the dressings are of Hollington stone. The inner faces of all the walls were coated with Stockholm pitch, previous to being plastered, as damp preventive. The columns of porch-doors are of polished Aberdeen granite; the columns in nave and transepts are of Cork red marble, and the internal dressings of Caen stone. The new church has cost about £7,000.

BUILDINGS.

A railway tunnel, nearly 3,000ft. long, has just been completed at Constantia, in Algeria.

A new school has been erected in connection with All Saints' Church, Little Horton-green, near Bradford, from the designs of Messrs. Healey, of Bradford. The building is in the Gothic style, and comprises boys' and girls' schools, each 67ft. long by 21ft. wide, and an infants' school, 60ft. long by 20ft. wide. The cost has been about £6,000.

The new Wesleyan college at Adelaide, the foundation stone of which was laid by Prince Alfred in November—is estimated to cost from £26,000 to £30,000. The college has been named after his Royal Highness, and is to be devoted primarily to the training of youths connected with the Wesleyan Church. The style adopted is the Elizabethan.

A new brewery at Northampton, belonging to Messrs. P. and R. Phipps, has just been completed. The building was erected by Mr. Dunkley, builder, of Northampton, at a cost of £22,000, from the designs of Messrs. Davison and Scammell, architects and engineers, of London.

The foundation stone of a new Corn-Exchange at Luton has been laid. The style of the new building, which will be erected on the site of the old market place, is Venetian Gothic, and the cost will be about £2,550. The architects are Messrs. Messenger and Grundy, of London, and the builders Messrs. Stuart Bros., of Luton.

The new wing at the rear of the City of Dublin Hospital has recently been opened. The building consists of two storeys, 15ft. high; the front elevation affording a good example of hammer-dressed masonry. The works have been carried out by Mr. W. H. Beardwood, under the direction of the architect, Mr. C. Geoghegan, of Dublin.

The Friends' Meeting-House, Kettering, which has been for some time in course of erection on the site of the old meeting house, has recently been completed. The architect was Mr. R. W. Johnson, of Melton and Leicester.

Among the new buildings projected in Belfast, are a new Townhall, the National Bank, the Central Railway Station, a Masonic Hall, and a Working Men's Institute. It appears that the erection of the Albert Memorial here is at a standstill, in consequence of a monetary dispute with the contractor. We understand that the funds are about £500 short.

The new Mechanics' Institution, in New Bridge-street, Newcastle, was opened on Tuesday last. The old building was in Blackett-street, and it had long been felt to be thoroughly inadequate to the requirements. The foundation stone of the new building was laid by Sir George Grey nearly three years ago. Its erection was much interfered with by the protracted masons' strike. The cost of the new building will be about £4,000.

A site has been secured for the new Infirmary and Dispensary at Burton-on Trent, and the Building Committee have selected the design of Mr. Edward Holmes, of Birmingham, which was submitted in limited competition. The works will be forthwith commenced.

In our account of the Ipswich Townhall, last week, Messrs. Bellamy and Hardy, of Lincoln, were described as contractors, instead of architects. Mr. Edward Gibbons, of Ipswich, was the contractor, and Mr. Edward Catchpole, of the same town, the clerk of the works.

WATER SUPPLY AND SANITARY MATTERS.

The sewer authority for the newly formed district of the Scawby portion of Brigg, Lincolnshire, is actively proceeding with the works of drainage for that district. The main culvert (which is 2ft. in diameter) has been laid with very little interference with the buildings, one house only requiring to be tunnelled under. Mr. W. C. Atkinson, of Brigg, is the engineer and surveyor.

The net cost of scavenging the town of Liverpool last year was £54,017, against £40,247 in the previous year, the increase being ascribed to the extension of the borough, the raising of scavengers' wages, and the greater distance to which the scavenging products have to be removed. Nearly 241,000 tons of refuse have been removed during the year, at a cost of 4s. 6¼d. per ton.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—P. and Son.—F. T.—T. D.—I. H.—I. R.—V. & Co.—S. H.—T. D.—W. G. E. B.—W. W.—E. W. G—H. & Co.—T. & Co.—E. W. P.—Jacobus Broox.—R. L. B.—T. G.—I. H. H.—T. B.—A Constant Reader.—R. G.—I. C. I. T.—A Reader of Art Critics.—P. R., the price of "Artizans' Reports" is 2s. 6d.—W. W. P.—T. C.—G. G. R.—R. F. E.—G. W.—S. S. S.—I. H—I. N.—A. W. P.—W. & I. L. C.—I. M.—W. T. & Son.—P. & Sons.—H. & Co.—S. R. T. (sent)—S. W. & Co., numbers sent.—R. E. W.—C. R. P.—W. P. & Co.—C. P. C.—D. V.—M. G.—W. L. P.

M. T. BATLEY.—No.

ASPIRANT.—Write to the Secretary of the Society of Arts, John-street, Adelphi, London.

Correspondence.

SANDGATE TOWNHALL COMPETITION. A CAUTION.

To the Editor of the BUILDING NEWS.

SIR,—In your paper of the 31st ult. appeared an advertisement inviting architects to submit plans in competition for this undertaking, and, feeling a desire of becoming a competitor, I took a run down to Sandgate, which is a pretty little town on the Kentish coast. Having called at the residence of the chairman, who was absent, I made several inquiries of parties connected with the undertaking, but ultimately was directed to a Mr. Pledge, auctioneer, estate agent, chairman of Board of Health, and recently owner of the townhall site, who, being secretary to the company, would be likely to give me any information I required. It is with a view of giving those members of the profession who intend competing the benefit of my interview with the secretary, that I beg a space in your columns for the insertion of this letter. In answer to my inquiry as to on what terms architects compete, I was informed that, in the event of the directors not being able to come to terms with the successful competitor, a sum of three guineas would be paid him, and his plans thereby become the property of the company, who would employ some practical man to carry out the design. On gaining this information, my mind was at once made up, and I saw that the trouble of my journey had been thrown away; but imagine my surprise when, in answer to some questions as to the accommodation required, this secretary of the company informed me that he could scarcely answer such questions as he had himself resolved to become a competitor, and, should he become the successful one, would make his plans a present to the company. But, in answer to one of my questions, he did not mind (as he said) telling me that the large hall would be better at the back than at the front of the building, which, considering him to be a competitor, was rather a smart stroke of policy on his part, as, of all places, the back would be the last an architect would pick, after having examined the peculiarity of the site. My object in writing this letter has been to give intending competitors these facts that they may be on their guard, and judge for themselves whether they had not better devote their time and money to a better purpose than preparing competition drawings for Sandgate Townhall, and if, by so doing, I shall be the means of saving any from entering this most scandalous of all competitions, I shall feel amply repaid for all my trouble, by having benefited members of my own profession. The facts here mentioned ought surely to be sufficient to show the Institute of British Architects that the time has arrived for their interference, and the only thing left them to do is to draw up a code of instructions regulating competitions, and call upon all architects to subscribe their names thereto, thereby pledging themselves to enter no competition where these instructions have not been adopted.—I am, &c. S. S. S.

Intercommunication.

QUESTIONS.

[732]—ELASTIC MOULDS.—Can anyone inform me how to make and use the composition of which elastic moulds are composed?—DIDUS.

[733]—CEMENT AND GRAVEL.—An article, headed "Cement and Gravel," appeared in the BUILDING NEWS of December 13, 1867, page 863, in which the author informs us of a cheap description of building material, but did not state whether Portland or Roman cement should be used, nor the proportion of the same with the gravel that would bear the weight of a wall, say 20ft. high. If Mr. W. May, or any other of your subscribers, would kindly inform me in your next impression, I shall feel much obliged.—PLEBS.

[734]—BUILDING MATERIALS IN NEW ZEALAND.—Can any of your readers give me information as to the building productions of New Zealand, or where I can get information, useful for an intending emigrant, as to the colony generally. Are there any works published about it?—E. T.

[735]—STREET LAMPS.—Can any of your numerous readers inform me, through your valuable "Intercommunication," why the street lamps along Pall Mall have crimson glass crosses placed on them?—INQUIRER.

[736]—RESERVOIR BOTTOMS.—I have occasion to convert a large pond into an open reservoir, capable of holding water to supply the cisterns at a large establishment. Could you, or any of your numerous readers, inform me what would be the best material to form the bottom with, so as to prevent vegetation, and when emptied occasionally could be easily cleaned? The present bottom is formed of puddled clay.—J. W. H.

[737]—CAEN STONE.—This stone is generally objected to by architects for the reason that it will not resist the dissolving power of water charged with carbonic acid gas. I should be obliged if some of your readers would instance any buildings in the metropolis, or elsewhere, where this stone has been largely used and has proved a failure.—PLYMOUTH.

[738]—MILK OF WAX VARNISH.—Can any of your subscribers give me the formula of the preparation of this, I believe, valuable varnish? It is used for spreading over the surfaces of paintings; and I have heard that, to the unchangeable quality of this, or some similar substance, the ancient paintings found on the walls of Herculaneum and Pompeii owe their freshness at the present day.—H. B.

[739]—LIZARD AND FROG.—I have some sketches of columns of some Roman churches, and on the pedestals appear to be sculptured a lizard and frog, or some similar animals. Can any of your readers give me the meaning of this symbol, if a symbol it be?—PHILO.

REPLIES.

[703]—CRACKED BOILER.—If your boiler has any pressure of steam in it, the injury is irreparable, but, if, as I suppose from the case, there is very little pressure, you may caulk it up with iron cement. The following is commonly used for the purpose:—Take by weight one part of sal ammoniac in powder; two parts of sulphur, and eighty parts of iron borings, or filings. You should not allow a greater pressure than 5lbs. to come upon your boiler so mended. As a rule, cast-iron boilers are bad, and always liable to crack, and so become of no use.—A FITTER.

704.]—COMPOSITION FOR FLOORS.—A floor formed with the best Portland cement concrete, composed of rather fine gravel, would answer perfectly well for his purpose. When once set, it requires nothing less than a pick forcibly driven in to break it up. It is also very clean, and a good non-conductor of heat.—L. S.

[713.]—ASHPITS.—Your correspondent is quite correct about the impression he entertains that the ammonia would destroy wrought iron, which it certainly will do, although we have before us the fact that sewage which contains a large amount of ammonia is conveyed over obstacles in wrought iron tubes upon the metropolitan main drainage system. It has not, however, the same injurious effect upon cast iron, which also, by being comparatively thicker when made for the purpose than the other material, can afford to be slightly corroded with impunity. A cast iron frame ought to answer the requirements of J. M.—FOUNDRY.

[717.]—RED PINE GIRDER.—X. last week gave Tarn's formula for flitch girders, which requires that the thickness of the wood be to that of the iron as 20 to 1, so that the resistance to deflection may be the same in both materials. The difference between the breaking weights is not thereby corrected, and a girder so constructed is far from being perfect. Take one 10in. deep and 10ft. bearing, made up in thickness of two red pine flitches, each 5in. wide, and an ¼in. wrought iron plate. According to Mr. Tarn, the permanent load on the middle will be 91·13cwts. Suppose this load to be applied, it will be supported, 45·56cwts. by the wood and 45·57cwts. by the iron, because, by construction, the resistances to deflection are equal; but the safe permanent load for the wood is $c \frac{b.\ d^2}{l} = 100$cwts., and for the iron is 31·25cwts.; and thus it is seen that the wood is carrying over 54 per cent. less, and the iron nearly 50 per cent more than the limit of safety determines.—PURLIN.

[726.]—ZINC.—A thin oxide rapidly forms on zinc when it is exposed to the air. This, however, prevents further action.—ECCE.

[726.]—The thin, compact film of oxide, or rust, with which the surface of zinc becomes coated when exposed to a moist atmosphere, seems to protect it from further oxidation. Hence the value of zinc as a material for roofing, and also for protecting the surface of iron roofs. We may remark that the many valuable properties of this metal are daily becoming better known. At ordinary temperatures, zinc, according to "Chambers' Encyclopædia," is a comparatively brittle metal; but it was discovered that, if heated to between 200° and 300° Fah., its malleability and ductility were so increased that it could be rolled with facility into thin sheets, or drawn into fine wire. Since this discovery was made, about fifty years ago, the uses of the metal, which was formerly employed along with copper to make brass, have become greatly extended. In sheets, it is now used for roofing, baths, water tanks, sponting, and the like; also for covering ship's bottoms instead of copper. A considerable quantity is consumed for name plates, for engraving upon, and for galvanic batteries. Perforated sheets, with various ornamental patterns, are manufactured for screens, blinds, ventilators, light fences, and similar objects. As a material for casting artistic works, zinc possesses the desirable properties of having a low melting point, and of taking a sharp impression from the mould, so as to require little labour from the chaser; it has also considerable hardness. It has, in consequence, become a favourite material on the Continent for making casts of statues, statuettes, and different kinds of ornaments. Now, of late years, it has been applied with great success to the coating of sheet iron roofing, and also for coating various kinds of iron wire, especially telegraphic wire.—R. K.

[729.]—HYDRAULIC CEMENT.—I beg to reply to a reader's query in last week's Intercommunication as to hydraulic cement. If a hydraulic lime be calcined at too high a temperature, the silicate undergoes partial fusion, and will not set afterwards under water. The heat for burning the limestones should, therefore, be just high enough to expel the water from the clay, and the greater part of the carbonic acid from the carbonate of lime. To answer to the other part of your correspondent's question, it is found that the clays best adapted for the manufacture of artificial puzzolana are such as are greasy to the touch. As a general rule clays containing limes and other metallic oxides, especially alkalis, become energetic at low temperatures, whereas the poorer clays will give good results when calcined at a very high temperature, and they have this other disadvantage of being difficult to reduce to powder.—O. F.

WAGES MOVEMENT.

Through the nail-making districts in the neighbourhood of Sedgley, Hants, in consequence of the depression in the nail trade, Mrs. Tinsley (who is said to employ between 2,000 and 3,000 nailers) has reduced the wages of the makers of all kinds of nails 20 per cent.

The slaters of Glasgow have struck work for a rise of wages. Their present wages are 5½d. per hour, and they ask an increase of ½d., thereby, as they state, making the wages uniform with those paid in Edinburgh, Dundee, and Greenock. The agitation for this rise is said to have continued during the last twelve months.

The operatives connected with the building trade of Sunderland have asked their employers for concessions, the chief of which are that the men shall work nine hours a day, and four and a half hours on Saturdays, ending at twelve o'clock; wages to be paid precisely at that hour; walking time of an hour to every three miles, for country work, to be allowed, starting from the Blue House, the Infirmary, or Wheat Sheaf Inn: that the masters provide sheds for the workmen, or pay them one-half for lost time. The master builders have appointed a sub committee to consider the matter.

STAINED GLASS.

Another stained glass window has been added to those already erected in the Guildhall, at York. It represents the history of the city during the Plantagenet period; the principal events delineated being the confirmation of the Great Charter in Parliament, held at York, in 1298, by Edward I. The window was designed by Mr. J. E. Doyle, author of "The Chronicles of England"; and was executed by Mr. Wailes, of Newcastle.

A stained glass window, by Messrs. Hardman, has just been inserted in the east window of the lady chapel of St. Neot's Church. This window is the one chosen out of a great number to receive the silver medal at Paris, and cost £245.

LEGAL INTELLIGENCE.

ALLEGED NON-PERFORMANCE OF CONTRACT.—TIDEY v. SHARMAN.—Both parties to this suit were builders, the plaintiff carrying on business at Bellsize Park, and the defendant in Liverpool-road, Islington. The action was brought in the Court of Common Pleas, to recover damages for the non-performance of a contract. The plaintiff's case was that the defendant had been employed by Mr. Defries to lay down some flooring at the Agricultural Hall to be used at the great volunteer ball. After it was no longer wanted, the defendant authorized Mr. Mabbett to sell upon commission, and this gentleman contracted to sell to the plaintiff 750 squares of flooring at 10s. a square, and 20,000ft. of quartering at a halfpenny a foot. The defendant, however, would not carry out the contract, and the plaintiff calculated that his consequent loss was £379. The defence was that the defendant never had any idea of selling the flooring, and never authorized Mr. Mabbett to sell. Further, that he could not have agreed to sell 750 squares, inasmuch as there were only 272 squares there. There was also a good deal of contradictory evidence as to some alleged statements of the plaintiff, by which he recognised the contract. The jury found for the defendant.

IMPORTANT TO BUILDERS.—BROMPTON COUNTY COURT.—The plaintiff, Bartlet, sued the defendant, Elliott, for 13s. 4d., which he claimed for twenty hours' work at 8d. per hour, which claim defendant disputed on account of the injury sustained through the incompetence and ignorance of the plaintiff. The defendant, it appeared, had to finish a pawnbroker's shop where a well had to be put in through three floors. The plaintiff was told to take up the flooring boards for defendant to see where the trimmers were placed, so that they might not be cut. Next morning when defendant went to see how the well could be put in, he found one of the main trimmers cut off, which, it was alleged, might easily have been avoided. Plaintiff was discharged without being paid for the time claimed, and he brought the action to recover the amount. Judgment for the defendant, the judge remarking that the plaintiff had not taken sufficient care, nor paid that attention to his work which he ought to have done.

CONTRACT WORK.—The Court of Exchequer has reversed a decision of the Court of Common Pleas in the case of Appleby v. Myers. The plaintiff had contracted with the defendant to supply and put up on the defendant's premises an engine and certain machinery, for which he was to be paid a lump sum on completion. When a portion of the machinery had been put up and fixed, but before the whole was completed, an accidental fire broke out on the defendant's premises which destroyed the buildings, and with them much of the plaintiff's work, and the further performance of the contract was rendered impossible. The Court held that the plaintiff was not entitled to recover the contract price of the work or any portion of it—the premises having been destroyed by inevitable accident, and without fault on either side, excused both from the further performance of the contract, but giving a right of action to neither.

PROFESSIONAL CLAIMS.—RANDAL v. GRAY.—The plaintiff, Mr. J. L. Randal, architect, of Shrewsbury, sued the Rev. Loftus S. Gray, late of Pontesbury, now of Sedgeberrow Rectery, in Worcestershire, for the recovery of £50, for professional services rendered and expenses incurred, in carrying out some alterations in the defendant's residence. The case was tried, at the Shrewsbury County Court, by jury. From the opening speech of Mr. Chandler it appeared the items of the account were as follows:—Drawing out of plans, specifications, &c., and the superintendence of the work to completion, £63 13s. 9d.; drawing of additional plans, preparing a description of the alterations, and making an affidavit for obtaining the Queen Anne's Grant, £10 10s.; journey to Sedgeberrow and measuring up of the extra work, taking an account of the "omissions," and examining the work for the final certificate, £9 9s. 6d.; nine journeys, £31 10s.; total, £115 3s. 3d. On account of this sum £60 had been paid, and the balance was reduced to £50 to bring it within the jurisdiction of the court. Mr. J. L. Randal stated that his charges were regulated by the scale published by the Royal Institute of British Architects, a copy of which was produced in court. Mr. W. H. Spaull, Mr. Thomas Groves, and Mr. Edward Haycock, jun., architects, stated that they considered the items charged perfectly fair and reasonable. For the defence, Mr. Buckton urged that £115 3s. 3d., which was the original amount of Mr. Randal's bill, was indeed a large sum for drawing out a few plans and nine days' superintendence of the works. They had nothing to say against the 5 per cent. commission; but to charge £1 1s. per day extra, as was charged and included in the £31 10s, was unfair—it was, in reality, charging twice over. The charge of £10 10s. for preparing the plans to be sent to London was also exorbitant. They were merely tracings of the original plans, and were not worth anything like the money. He believed the jury would agree with him that the £60 which had been paid was amply sufficient for what Mr. Randal had done. Mr. Buckton then called Mr. Burdett, a clerk of works, who stated that the quality of the work did not in some cases correspond with that laid down in the specification. He stated that he did not know whether Mr. Randal had employed a clerk of works, and that when he himself went from home he expected to be paid his expenses and time. The case was then put before the jury, who returned a verdict of £47 1s. 3d.

TWO DAYS' NOTICE TO DISTRICT SURVEYOR.

TOLLEY v. KELK, WARING BROTHERS, AND LUCAS.—In Westminster Police Court, on Saturday last, Messrs. Kelk, Waring Brothers, and Lucas were summoned by Mr. James Tolley, District Surveyor of St. Margaret, St. John, and St. Peter, Westminster, for not complying with the 38th section of the Metropolitan Building Act, which requires two days' notice in writing before any building, or any work in, to, or upon any building, is commenced, to be given to the District Surveyor, under a penalty of £20, to be recovered before a Justice of the Peace. The District Surveyor conducted his own case; Mr. Joyce, instructed by Messrs. Baxter, Rose, and Norton, appeared for the defendants.

From the opening speech of the District Surveyor, it appeared that the defendants, as contractors for the Metropolitan District Railway, had taken down a house, No. 1, Smith's place, York-street, and reconstructed the greater part of what was originally a party wall between Nos. 1 and 2 as an external wall to No. 2, which work, he submitted, required notice under section 38. He then proved service of notice on January 16, calling defendants' attention to their neglect.

Mr. Joyce claimed exemption for the work under the sixth section of the act, and stated that the wall was erected upon ground belonging to the railway company, and, although they were not actually using the wall at present, they could, and probably might, use it for affixing signals or placarding with notices.

The District Surveyor said, assuming it to be a party wall, half belonging to the railway company, that he was entitled to notice for the other half, and begged to inform the learned counsel that he was in error in stating that the ground belonged to the railway company.

Mr. Arnold:—The railway company cannot have the right to cut a hole through the wall into a gentleman's drawing room, for instance.

John Marr Ingall was called and examined by the District Surveyor:—I reside at No. 50, York-street, Westminster. I am owner of No. 2, Smith's place, and the adjoining houses. The railway company purchased No. 1, and caused it to be pulled down. The wall erected is in lieu of the party wall originally existing between Nos. 1 and 2. The wall is entirely on my ground. I produce the deeds with plan annexed.

Cross-examined:—Taking down the wall left the rooms exposed. It was necessary to rebuild it; the house was dangerous without. I believe it is done properly.

The District Surveyor remarked that making it a case of emergency would not help the other side, as section 44 made it a condition that, before the expiration of twenty four hours after such work has been begun, notice thereof shall be given to the District Surveyor.

Mr. Arnold, in summing up, said—I never had a clearer case, and cannot understand upon what grounds the defence was undertaken, except, as the learned counsel has stated, under mistake; but, as this is the first case against the defendants, and in consideration of your request, I think the object sought will be obtained by the infliction of a nominal penalty of one shilling and costs; but, should another case be proved against the same parties before me, I shall feel it my duty to impose the full penalty, viz., £20.

MEETINGS FOR THE WEEK.

MON.—Society of Arts, Cantor Lectures, "Adulteration of Food." Conclusion.

TUES.—Institute of Civil Engineers. Renewed Discussion upon first, "Fresh Water Floods of Rivers;" second, "Floods in the Nerbudda Valley;" and, should time permit, the following paper will be read, "On the Supporting Power of Piles, and on the Pneumatic Process of Driving Iron Columns," by J. M'Alpine, M. Inst. C.E., at 8.

WED.—Society of Arts, on "The Supply of Animal Food to Britain, and the means proposed for increasing it," by W. L. Scott, Esq., F.C.S.

FRI.—Architectural Association, "Symmetry, from a Gothic Point of View," by E. J. Tarver, Esq., A.R.I.B.A.

SAT.—Associated Arts Institute, "On the Practical Value of Theory," by A. H. Wall.

Our Office Table.

The Italian government has granted three privileges for boring wells on the territories of Farnuove, Taro, and Medesanio. Two of them have been given to American capitalists.

Mr. Lyster, the engineer to the Mersey Dock Board, has reported to that body that the amount required to complete the dock works in progress and in contemplation is £700,694.

The Masonic Brotherhood of Philadelphia are about to build a granite structure, 250ft. long by 150ft. wide, with a tower 300ft. in height. It will cost nearly 1,000,000 dols.

A new litany-desk, which the "Ecclesiologist" describes as of unusual beauty, has been presented to the church of St. Andrew, Wells-street, by an anonymous donor. It is from the design of Mr. Burges. On one side, in the upright support, is a well-carved figure of "Zacharias, the son of Barachias," offering incense; on the opposite side is a figure of the prophet Joel. In front there are two open richly-carved arched panels, between which is a figure of St. Andrew. In the spandrels of the two arches are very felicitously designed groups of St. Michael and St. George, each slaying his dragon. The uprights on each side end at the top in particularly graceful figures of angels swinging censers. The idea embodied is, of course, that the litany-desk in a Christian church represents in a manner the "Altar of Incense" in the Temple. In front is the legend, "Libera nos Domine," and the date of the year, inlaid in maple-wood on the walnut; and the surface of the desk itself is admirably inlaid with the emblems of the Passion. We have seldom seen better figure sculpture. It was all carved, we believe, from careful clay models. The work was executed by Mr. Robinson, of High Holborn.

The method employed by M. Chevreul, of Paris, for renovating ancient stained-glass is as follows—the glass is removed from its setting and immersed for several days in a solution of carbonate of soda of a specific gravity of 1·068. It is then washed, and dipped for a few hours in a solution of hydrochloric acid of the specific gravity of 1·08.

A grand International Exhibition of Fine Arts s announced to take place in Berlin in the months of September and October next. Particulars are promised shortly.

Mr. William J. Richardson and Mr. George Leslie have been elected associate painters, and Mr. Thomas Landseer, associate engraver, of the Royal Academy. No architects' or sculptors' names were balloted for at the meeting which took place on Friday.

The local examinations in drawing of the second grade of the Science and Art Department are announced to take place on the 10th, 11th, and 12th of March next. The examinations will be held at South Kensington, and also at the various Schools of Art and night classes established under local committees throughout the country.

As a lasting memorial of the genius of John Philip, R.A., it is proposed, we hear, to endow a prize medal to be named after him, open to triennial competition by the students of the Royal Academy, for the best picture of English domestic life. Funds are now being raised for this purpose, as also for the purpose of enabling his friends and admirers to place a granite slab over the grave of the painter in Kensal green.

The members of the Royal Institute of Architects of Ireland have given a dinner to their president, Sir Charles Lanyon, M.P., who has just had the honour of knighthood conferred upon him. The banquet took place in Dublin yesterday.

At the annual meeting of the Kilkenny and South-East of Ireland Archæological Society, which took place on the 22nd ult., it was unanimously decided to change the name of the Society to that of the Archæological and Historical Society of Ireland. The following gentlemen were elected members: Rev. John Jebb, D.D., Rector of Peterstow, Prebendary and Precentor of Hereford Cathedral; John E. Hassell, Esq., Gowran Castle; Edward Hunt, Esq., Belmore, Thomastown; Very Rev. James Byrne, ex-F.T C.D., Dean of Clonfert and Rector of Cappagh; Dr. Chas. Lyster, William-street, Kilkenny; Dr. J. B. Fitzsimons, High-street, Kilkenny; Rev. J. Henderson, A.B., Silver-hill, Enniskillen; Rev. R. Archer Ffennell, Glebe House, Ballyboy; and James Kiernan, Esq., M.D. Enniskillen.

A medical writer wonders that travellers do not carry with them a little bottle of permanganate of potass, a few drops of which would speedily purify any water. A gentleman who has just returned from India states that he has derived the greatest benefit from its employment. In cases where the water was turbid, and tasting and smelling of decaying organic matter, the addition of a few drops of the solution of the permanganate made it, in a few minutes, as clear and as sweet as spring water.

We have seen a few of the wonders performed by the Genius of circumlocution. We have seen, for instance, a sheet of foolscap which had to be filled with signatures, before it became a sufficient authority to compel an official to pay an account of 6s. We have heard of the existence of a report of 26 pages on the alarming fact of a tenpenny nail having been found without a head in a government dockyard. These, however, are as nothing compared with the latest achievement recorded, and for the truth of which a Sunderland paper is responsible. A lock was wanted on the door of some premises in Sunderland, under the control of the Admiralty. The resident official thereupon applied to their Lordships, at Somerset House, for the requisite order to buy the lock, which was to cost 2s. Four or five sheets of folio inquiries were forwarded to him, which he had to fill up and return. Next came a gentleman from Tynemouth, to "survey" the hole in the door where the lock was to be put. Of course, he came and went first-class, and his fare and expenses doubtless amounted to a good round sum. His report was then forwarded to London, and at last down came the requisite order to Sunderland, authorizing the lock to be bought, and placed on the door.

The first meeting of the year of the Leicestershire Architectural and Archæological Society was held in the Guildhall, Leicester, last week, the Rev. J. H. Hill presiding. Proposed plans and elevations for the restoration of the church of Welham, by Messrs. Goddard and Son, architects, Leicester, were produced and approved. It was resolved that the annual summer meeting of the Society should be held at Kibworth on the last Monday of March next. The Rev. J. H. Hill exhibited two coins found near the Roman camp, at Hallaton, and the same gentleman read the Notes on the Prebendaries of St. Margaret's, Leicester.

"A Competitor" writes us to say that Mr. Smith's plans for St. Andrew's Church, Hertford, were never submitted to the committee; and that it was without their sanction that they were publicly exhibited, or that the engravings were distributed. He says that "Mr. Smith's plans were more expensive than they could afford, and its style was disapproved of by a majority of those present."

We learn that the plans of Mr. Wilson W. Phipson, C.E., have been selected for the ventilation and warming of the Royal Albert Hall of Arts and Sciences, South Kensington. To give an idea of the magnitude of this building, the heating apparatus for the hall alone will be composed of more than 27,000 feet of 4in. hot water pipe, arranged in coils under the arena, galleries, and lower corridor, the fresh air from the outside being distributed amongst them by means of two pans 6ft. in diameter.

The annual soiree given by Mr. William Higgs, builder, of South Lambeth, to his workmen came off on Friday last. About 500 workmen, with their wives and children, assembled in the Crown Works at Lawn-lane, under the presidency of their generous employer. After being regaled with tea and cake, Mr. Higgs, Mr. Spurgeon, and other gentlemen, delivered short addresses to the company on the benefits of such reunions, and their importance as a means of promoting that good feeling and right understanding which are at all times desirable and indeed necessary between employer and employed.

The efforts which were made a few years ago to re-organize the Kidderminster School of Art are now being rewarded by satisfactory results. The annual meeting was held on Friday last. The report read was very satisfactory in every respect, and a long list of prizes was distributed. Votes of thanks were passed to the vicar and mayor for presiding, to Mr. Harvey, the secretary, and to Mr. Kennedy, the able art master. An exhibition of the students' work was open in an adjoining room, and attracted considerable attention after the close of the meeting.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1548 G. HOWARD. IMPROVEMENTS IN THE CONSTRUCTION OF PARQUET FLOORING. Dated May 24, 1867.

This invention consists in forming the foundation, or backing the parquet or ornamental surface of the floor, of any convenient or suitable number of layers of wood, arranged and combined as described. Patent completed.

1560 H. B. BARLOW. IMPROVEMENTS IN APPARATUS FOR COUPLING PIPES. (A communication.) Dated May 27, 1867.

This improved apparatus is applicable in coupling steam, gas, water, and other pipes, having a socket at one end into which the end of another pipe fits. This apparatus consists of four, or other convenient number, of segments, connected together by a hoop; one end of the segments is recessed to fit on the socket of the pipes to be coupled, and to the inside of each segment is screwed a thin steel blade, and these blades are surrounded by a ring or hoop of india-rubber or other packing. The apparatus having been placed on the socket of the pipe, the end of the pipe to be coupled is forced within the blades of steel, thereby expanding them and the packing ring inside the socket; the hoop is then knocked off the segments, and the segments with the blades of steel are drawn out of the socket, leaving the packing ring in its place. By this apparatus pipes can be coupled very expeditiously, and the packing ring is sure to be left in its proper place within the socket.—Patent completed.

1569 H. PETHER. PRODUCING BY A NEW METHOD ORNAMENTAL BRICKS FOR BUILDING PURPOSES. Dated May 28, 1867.

This invention refers to a means of imparting to the faces of bricks a diaper or ornamental pattern, by the following means:—Upon a metallic table is affixed a vertical frame, the inner edges of which are prepared to receive and guide an ascending and descending horizontal frame, which, acting on wedges attached to the sides of a metallic box hinged and secured at the bottom, causes the same to collapse when this horizontal frame ascends, and resume their open or spread position on its descent. Into this box is placed in a firm state the clay intended to form the brick.—Patent completed.

1613 E. J. DEMANET. AN APPARATUS FOR THE PURPOSE OF GIVING SUFFICIENT DRAUGHT TO ANY KIND OF CHIMNEY. Dated May 31, 1867.

This apparatus consists of a square or other shaped chimney or body made of metal or other material, and surmounted by a cap formed of two vertical sides joined by an arched top, the cap being open at the ends. The said two sides are longer than the diameter of the chimney, and thus project beyond its exterior surface. One of the said vertical sides is curved concentric with the chimney, while the other vertical side is half straight and half curved eccentric to the chimney. The cap may have an opening in the top covered by an inclined plate to keep out the rain.—Patent abandoned.

1598 A. V. NEWTON. AN IMPROVED METHOD OF PRODUCING MOSAIC VENEERS. (A communication.) Dated May 29, 1867.

This invention relates to the production of mosaic veneers or surfaces in an economical and expeditious manner, and consists, first, in forming prismatoidal rods of suitable form and colour for producing, when put together side by side, a surface with the required design, by forcing through apertures of the form of the cross section of the intended rods a plastic material, which, after the rods have been formed, will become, or which may be rendered, of sufficient hardness to be used as a veneer. And, second, in uniting such strips so formed into blocks, the cross section of which will be of the form of the surface to be veneered, or of a section thereof. Patent completed.

1639 S. HARWOOD. IMPROVEMENTS IN THE CONSTRUCTION OF WALLS, BUILDINGS, AND OTHER SIMILAR STRUCTURES. Dated June 3, 1867.

This invention relates to certain improvements in the construction of walls, buildings, and other such structures composed of layers of blocks or slabs of material in the nature of cement compositions, whereby complete ventilation is effected, and great strength afforded to the structure, with a less weight and quantity of material than has hitherto been the case. The inventor proposes to form the blocks or slabs by means of moulds, the materials consisting of concrete, pure Portland cement, Roman cement, or any other cement or lime, or lime and cement, or other known compounds suitable for the manufacture of hard and durable blocks of artificial stone, and to build the wall or other structure of a hollow or cellular form by placing or laying the blocks or slabs in courses side by side with a space or interval between the rows, which may be two, three, or other number, and by binding the courses with similar blocks or slabs, either touching each other or with a space between each—Patent abandoned.

1642 M. CAVANAGH. IMPROVEMENTS IN ADJUSTABLE LOCK SPINDLES. Dated June 4, 1867.

This invention has for its object improvements in lock spindles with a view of rendering the several parts thereof more complete and suitable for being applied and accurately adjusted to any thickness of door, and consist in employing with the ordinary tapped square spindle a regulating swivel screw nut, and sliding boss or nozzle, in combination with fixing studs and coupling socket turning upon the mount of the moveable knob or handle, by the arrangement of which, on the said spindle being adjusted to the required thickness of door, through the medium of the swivel nut, the said studs on the boss are caused to take into a notched concentric inner groove in the said coupling socket, whereby the knob or handle is firmly held or retained upon the spindle, in like manner to the bayonet fastening.—Patent completed.

1648 J. M'OWEN. IMPROVEMENTS IN FIRE-GRATES. Dated June 6, 1867.

In house fire-grates of the usual construction there is a grate on which the fire rests, and through which the ashes drop. Now, the nature of this invention consists in the application and use of two grates, the top one of which is a fire-grate for the fire to rest upon, and the bottom one is a coarse grate, and between or under the grates the patentee places a sliding valve which can be opened or closed at pleasure. By these means more or less air can be supplied to the fire by opening or closing this valve.—Patent completed.

1701 R. LOGAN. IMPROVEMENTS IN SECURING AND ADJUSTING WINDOWS, BLINDS AND SHADES, DOORS AND SHUTTERS, AND IN THE APPARATUS EMPLOYED THEREFOR. Dated June 13, 1867.

This invention relates to the regulation of the opening of blinds, and consists in employing one or more racks having ratchet teeth on them, which racks are attached to some convenient part of the framing. The moveable part of the window blind, shade, shutter, or door has one or more ratchet palls fixed to it, and which is or are acted upon by a spring, and by it forced into the recesses of the teeth.—Patent completed.

1732 J. HOLMES. AN IMPROVED COMBINATION OF MATERIALS TO BE USED IN THE MANUFACTURE OF DRAIN-BOTTOMS, FLUE SLABS, BRICKS, AND OTHER LIKE PURPOSES. Dated June 13, 1867.

This invention consists in the admixture of the scale or shale found in clay beds underneath the clay with the clay itself, or the admixture of the scale or shale with the "seat" found underneath coal in its bed as well as with the clay, by preference in the proportion of five-sixths of the former to one-sixth of the latter, the scale or shale having previously been pulverized and mixed with water to render it of a pasty consistency, and then blended or mixed with the clay, moulded to the required shape, and burnt in the customary manner.—Patent completed.

Trade News.

TENDERS.

ERRATUM.—In last week's tender for alteration of houses in Strand and Adam-street, for "quantities supplied by Mr. T. Begg," read "Mr. W. G. E. Baggs."

BRIERLEY.—The tender of Mr. Ridal, of Sheffield, for a new church at Brierley, near Cudworth, has been accepted. Mr. J. S Foljambe, of Osberton, has presented the site, together with £1,000 towards the building, besides providing for the endowment.

FALLOWFIELD.—For the erection of new schools at Fallowfield, near Manchester. Mr. Ernest Bates, of London, and Manchester, architect. Quantities supplied.

Robinson and Son	£1,130
Ward and Co.	1,120
Porteous	1,100
Quillish	1,060
Thornton	1,055
Grimshaw and Co.	1,040
Meadows	1,027
Brown	1,005
Barber and Gibson (accepted)	1,000

HORNCASTLE.—For Mr. Johnson's new buildings in the Market Place:—

Hobson and Co.	£3,380
Close and Co.	3,360
Otter and Co.	3,201
Walter	3,150
Sherwin	2,995
Huddleston	2,850
Bellamy and Jay	2,740
Thompson (accepted)	2,599

KETTERING.—For residence at Kettering, Mr. R. W Johnson, architect, Melton Mowbray, and Leicester:—

Hawthorn	£1,289
Henson	1,277
Barlow and Bullin	1,202
Wilson	1,197

MAY FAIR.—For alterations and reinstatements at No. 5, Shepherds Market, May Fair. Mr. Charles Innes, architect.

M'Lachlan	£464 0 0
Wilcox	429 0 0
Preedy and Son	416 0 0
Thomas and Son	405 0 0
Snowden	398 0 0
Fish	394 0 0
Henderson and Cairns	393 0 0
Sapnell	388 19 0
Nightingale	382 0 0
Perkins	377 0 0

LONDON.—For schools at Vauxhall, by the Rev. George Herbert, Mr. J. T. Knowles, architect. Quantities by Mr. H. F. Oritton:—

Longmire and Burge	£2,897
Holland and Hannan	2,781
Mansfield and Price	2,700
Trollope and Sons	2,634
Colls and Son	2,630

PECKHAM.—For a factory and stables in Peckham Grove, Camberwell, for Mr. Jones. Mr. Coe, architect. Quantities supplied.

Larke	£785
King and Sons	760
Batchelor	739
Johnson	719
Shapley and Webster	673
Smith	658
Mortar	654

TWYWELL.—For house at Twywell, Northants. Mr. R. Johnson, architect, Melton and Leicester.

Wilson	£436 10 0
Barlow	434 12 0
J. Henson	433 0 0
W. Henson	427 10 0
Gunn	420 0 0
Coutts and Fletcher	419 17 10

PROPERTY SALES.

JAN. 30.

AT THE MART.—By Messrs. Chinnock, Galsworthy, and Chinnock.—Leasehold residence, No. 23, Kensington-crescent West, let at £51 per annum, term 99 years from Lady-day, 1822, at £10 10s. per annum—sold for £420.

Leasehold, two houses and shops, Nos. 113 and 114, Great Dover-street, Southwark, and premises in the rear, being Nos. 10 and 11, Eltham-place, and let on lease at £60 per annum, also a ground rent of £5 per annum arising from No. 9, Eltham-place aforesaid, term 70 years from 1821, at £16 per annum—sold for £520.

Leasehold house, No. 13, West Smithfield, let on lease at £140 per annum, also leasehold premises in the rear, known as the Greyhound Inn-yard, consisting of warehouses, stabling, and other premises, let on lease at £140 per annum, term 51 years from Lady-Day, 1832, at £170 12s. per annum—sold for £800.

By Mr. John Dean.—Leasehold 18 houses, Nos. 8 to 25, Three Mill-lane, Bromley, producing £257 8s. per annum, term 99 years from 1858, at £45 per annum—sold for £1,600

By Mr. Thos. Dracott.—Leasehold two residences, Nos. 7 and 3, Rosemount, Wallington, Surrey, estimated value £105 per annum, term 99 years from 1863, at £10 10s. per annum—sold for £510.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. Farber and Price.—Freehold five houses, two with shops, Nos. 2 to 6, King street, Soho, producing £164 per annum—sold for £3,000.

Freehold house and shop, No 3, Moore-lane, Soho, let on lease at £50 per annum—sold for £1,140.

Freehold ground rent of £27 per annum, arising from the New Thirteen Cantons public-house, No. 9, King street. Soho, and a house, No. 8, King-street—sold for £670.

Leasehold house and shop, No. 98, Great Tichfield-street, Marylebone, let at £60 per annum, term will expire on October 11, 1887, at £8 per annum—sold for £520.

Leasehold residence, No. 7, Warwick-gardens, Kensington, let at £65 per annum, term 70½ years unexpired, at £8 per annum—sold for £740.

Leasehold residence, No 9, Warwick-gardens, let at £60 per annum, term and ground rent similar to above—sold for £970.

Leasehold residence, No, 12, Lowther-cottages, Holloway, let at £47 per annum, term 66½ years unexpired at £6 per annum—sold for £450.

Leasehold two residences, Nos. 77 and 79, Bridge road, Hammersmith, producing £65 per annum, term 61¼ years unexpired, at £10 per annum—sold for £850.

Freehold ground rent of £13 per annum, arising from Nos. 1 to 4, Chapel-street, Hammersmith—sold for £280.

Freehold house, No. 2, Bentinck-street, Soho, let at £55 per annum—sold for £850.

Freehold residence, No. 21, Savile-row, Regent-street, let at £85 per annum—sold for £1,620.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

James Buck, East Dulwich, carpenter, February 12, at 12—Francis Davy, St. Paul's Street, New North Road, builder, February 13, at 12—Samuel Reeve, Greenwich, plumber, February 12, at 11—William Sherwin, Hounslow, stonemason, February 17, at 2—William Henry Soar, Vauxhall Bridge Road, plumber, February 13, at 3—Charles Barry, Christchurch, Hants, plumber, February 17, at 12—Robert Deeks, Joshua Street, Bromley, Middlesex, builder, February 19, at 2—Woodward Dudley, Naylor Road, Peckham, painter, and glazier, February 20, at 2—John Ingafill, Knockholt, Kent, builder, February 25, at 12—John Wilston, Great College Street, Camden Town, contractor, February 17, at 11.

TO SURRENDER IN THE COUNTRY.

Edward Cowin, Hulme, joiner, February 19, at 11—John Parry Edwards, Holyhead, contractor, February 14, at 12—John Morgan, Defynnock, carpenter, February 18, at 2—Charles Rolfe, Llanberis, civil engineer, February 17, at 12—Henry Sargeant, Portsmouth, plumber, February 15, at 12—John Thomson, Monkwearmouth Shore, builder, February 19, at 12—William Aston, Brighton le Sands, Lancashire, builder, February 14, at 11—Thomas Barrowclough, Sheffield, joiner, February 12, at 1—Thomas Crage, Weston super Mare, carpenter, February 14, at 11—William Kerslake, Exeter, painter, February 11, at 11—Frederick Lloyd, Bristol, carpenter, February 21, at 12—John Oldham, junr., and Adam Grange Bell, Lancashire, builders, February 13, at 10.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£10	10	£11	10	Archangel, yellow	£11 10 £13 0
Quebec, red pine		9	0	4	10	St. Petersburg, yel.	10 10 11 10
,, yellow pine		2	16	4	0	Finland	7 10 8 10
St. John N.B. yellow		0	0	0	0	Memel	0 0 0 0
Quebec Oak, white		0	0	0	10	Gothenburg, yellow	8 10 10 10
,, birch		3	10	4	10	,, white	8 0 9 0
,, elm		3	10	6	0	Gefle, yellow	9 0 11 0
Dantzic oak		3	10	8	0	Soderham	9 0 10 10
,, fir		2	5	3	0	Christina, per C.,	
Memel fir		3	0	3	10	12 ft. by 3 by 9 in.	
Riga		2	18	3	5	yellow	18 0 22 0
Swedish		2	2	2	7	Deck Plank, Dantzic,	
Masts, Quebec red pine		6	0	7	0	per 40 ft. 3 in.	0 15 1 6
,, yellow pine		5	0	5	0	PUMICE STONE per ton	6 0 8 0
Lathwood, Dantzic, fm		4	10	5	0	OILS, &c.	
,, St. Petersburg		7	10	8	10	Seal, pale	£39 0 40 0
Deals, per C., 12 ft. by 9 by 9 in., duty 2s per load, drawback 2s.						Sperm body	105 0 110 0
						Cod	35 0 35 10
Quebec, white spruce	13	0	19	0		Whale, Sth. Sea, pale	38 0 39 0
St. John, white spruce	13	10	16	10		Olive, Gallipoli	72 10 0 0
Yellow pine, per reduced C.						Cocoanut, Cochin, ton	56 0 57 0
Canada, 1st quality.	17	0	18	10		Palm, fine	39 10 40 0
2nd do.	11	10	12	10		Linseed	34 10 35 0
						Rapeseed, Eng. pale	37 0 37 10
						Cottonseed	32 0 40 0

IRON:—

Welsh Bars in London	per ton	£8	10	£6 15	0
Nail Rod	do	7	5	7 10	0
Hoops	do	8	5	8 10	0
Hoops, Single	do	9	15	10 0	0
Staffordshire Bars	do	7	5	7 10	0
Rars, in Wales	do	5	10	6 0	0
Nails	do	6	10	6 0	0
Foundry Pigs, at Glasg. No 1	do	2	15	3 0	8
Swedish Bars	do	10	0	10 10	0

STEEL:—

Swedish Keg, hammered	per ton	£15	5	0	£16 10	8 2
Swedish Faggot	do	10	10	0	12 10	0 2

COPPER:—

Sheet & Sheathing, & Bolts	per ton	£80	0	0	£82	0 0
Hammered Bottoms	do	92	0	0	0	0 0
Flat Bottoms, not Hammered	do	83	0	0	0	0 0
Cake and Tough Ingot	do	71	0	0	72	0 0
Best Selected	do	75	0	0	80	0 0
Australian	do	80	0	0	83	0 0
Y 1. Metal Sheathing & Rods	per lb	0	0	6½	0	0 7

ZINC:—

English Sheet	per ton	£26	10	0	£27	0 0 2
Bevaux's V. M. Roofing Zinc	do	26	10	0	0	0 0

* And 5 per cent. discount if laid upon the new syst

TIN:—

English Block	per ton	£93	0	0	£96	0 0
do Bar	do	94	0	0	97	0 0 2½
do Refined	do	94	0	0	99	0 0
Banca	do	91	0	0	92	0 0 nett
Straits	do	87	10	0	87	10 0

LEAD:—

Pig, English	per ton	£21	0	0	£21	0 0
,, Spanish Soft	do	19	0	0	0	0 0 2½
Shot, Patent	do	22	10	0	0	0 0
Sheet	do	20	0	0	0	0 0 5
White	do	27	0	0	27	10 0

SPELTER:—

On the Spot	per ton	£20	0	0	£20	5 0 ne
QUICKSILVER	per btl	8	17	9	0	0 0

REGULUS OF ANTIMONY

French	per ton	£28	0		£0	0 0

THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 14, 1868.

ART IN THE THEATRES.

IT is just possible that some one may dispute the existence of art in the theatres, and, if the objector should appeal to facts in support of this counter-proposition, it is more than probable that we should be very hard pressed to sustain our hypothesis. Art, in its true and highest sense, is scarcely to be found on any stage in this country, and perhaps in no other. There is plenty of artifice and a great deal of cleverness, but not much, if anything, that is worthy of the name of art. Mr. Charles Mathews is irresistibly droll, Mr. Sothern dry and comic, Mr. Buckstone funny, and Mr. J. Toole humorous, but it is almost an act of courtesy to call these men artists; while Mr. Phelps, Mr. Fechter, Mr. Boucicault, and others of the more serious school of performers, are even less entitled to rank as artists than the comedy men. Actresses are little or no better. Miss E. Farren, at the Olympic, is the only possessor of a genuine vein of humour, and, notwithstanding the fact that several ladies draw full houses and receive favourable notices from the so-called critics, there is not one who we can unreservedly rank as a true artiste. This is a sweeping assertion, but it is the result of long and careful inquiry; an opinion expressed in a few hurried sentences, but formed gradually and cautiously, in the course of many long and tedious hours spent wearily waiting for a vision of art in the theatres of London and the provinces.

So much for the acting. Unhappily the spectacular portion of our stage performances is not one whit better. Actors and actresses pose themselves with immense purpose. Mr. Fechter is great in facial expression, and bestows wondrous attention on his eyes and mouth; Mr. Phelps, sen., trembles terribly, clutches his hands, and heaves his chest with great ardour whenever an opportunity offers, and not unfrequently when it does not; and Mr. Phelps, jun., disposes the limbs of his Adonis-like figure with infinite grace, baffled only by his hands. The managers of the various theatres parade their utility people and supers with commendable zeal, and, despite the most manifest failures, strive to group them with picturesque effect. Costumiers lavish cloth and colour with a profuse hand, and scene-painters cover gigantic surfaces with the semblances of earth, air, fire, and everything, while stage-carpenters and machinists perform miracles of marvellous intricacy. Nevertheless our stage spectacles are, with here and there a solitary exception, simply atrocious. The result of this state of things is that artists and lovers of art have almost deserted the theatres, and when they do visit one of these establishments generally find their sense of the beautiful and the true grievously offended and strangely scandalized.

Close and accurate criticism of the drama would be a novelty in the metropolis, and might, in the end, work some good and lasting improvement. One share of the work, at least, falls within our province. The setting of pieces—that is, the manner in which they are put on the stage—is a topic which we may treat with some confidence, and we are certainly not indisposed to lend a helping hand. However, our present purpose is limited to a proof of the necessity which exists for a better censorship. Not long since, at Drury Lane, in the "Great City," the world was favoured with a realistic view of Waterloo-bridge, so good, so true, and so thoroughly artistic, that the live horse in the real Hansom, which was to bear away the heroine and her would-be seducer, had to wait patiently on the Strand side of the river, rubbing his nose against the houses on the other side of the water, and the people who paid their halfpennies and passed the toll-gates had to turn off and disappear mysteriously over or under the parapet, because the scene-painter had set his bridge end on, instead of obliquely, before the audience, and so spoilt the whole effect. Nevertheless the scene was considered such a paragon of beauty and truth that it was placarded and paraded all over London as though it were of unparalleled excellence. This is only one out of a multitude of similar examples of wrong doing, by which the cause of art progress suffers loss, and the taste of the people is corrupted. At the Adelphi it has long been the practice to use the oldest and most hideous scenes which an audience can be induced to tolerate. At the Olympic matters are little if at all better arranged. At the Princess's they go in for superior scenery, but seldom evince any great taste or art knowledge. The Holborn has produced some of the most ludicrous and puerile scenery and mechanism which has appeared in the metropolis; while even at the New Queen's, where it might have been hoped that some small attention would be paid to art principles, the horrible and effete system of working by flats is being reproduced, even at considerable inconvenience. In short, it must be evident to every intelligent observer that the manner in which pieces are set on the stage is simply discreditable. Hence the necessity for discriminating and honest criticism.

The setting of a drama, as far as scenery and spectacles are concerned, is of the first importance. Many people fail to see this. They do not recognize the purpose of a scenic representation, and missing this point attach little weight to its truth or harmony. It is curious to note the mistakes which even intelligent and thoughtful people make in the matter of stage spectacles. In the "Echoes of the Clubs," a periodical which professes to meet the requirements of high-class and cultivated readers, a series of papers has been this week commenced on the subject of stage costume. The topic of the first lucubration is "Blunders of the Past." Would it be believed the author entirely ignores the fundamental question whether or not a play should be performed by actors and actresses attired in the costume of the supposititious dramatic epoch or in that of the day, and, leaving this point undetermined, proceeds to abuse the managers who, some fifty years ago, dressed their characters in the garments worn by their contemporaries. It is needless to point out that the astute critic is blundering even more seriously than his victims could possibly have done. The choice of a period by the costumier is one thing; the fidelity with which he reproduces the costume of the period chosen is another. It was to this last topic that the critic should have directed his attention. What he calls the blunders of the past are not blunders. It was always open to the manager of a theatre to choose his period; and, if he elected to dress his people in the costume commonly worn by the men and women around him, he virtually turned the whole performance into an undressed charade, and he was fully entitled to do so without being convicted of a blunder. But this by the way, and only to show how false are premises on which able men reason in their criticisms. There can be no doubt but that it is open to a manager to produce a drama without scenic accessories; but, if he sets it on the stage with the aid of scenery and spectacles, these must be beautiful and no less true. Art principles should govern the whole process of production, and be allowed to determine every detail. Then, and then only, will the setting of a piece be correct chronologically, pictorially, and as a work of real and harmonious art. When the manager's business is transacted on this principle there will be art in the theatres, and not before. Meantime, Mr. Benjamin Webster and Mr. Sefton Parry may chuckle over the amiable gullibility of the play-going public; and Miss Marie Wilton take full credit for the fact that the Prince of Wales's Theatre is almost, if not quite, the only house in London where things are done decently and in something like order.

AID TO ART TEACHING.

IT is satisfactory to be able to note that the great question of technical education is at length beginning to assume a definite form, and to take a practical turn as regards State aid. A new minute setting forth certain provisions which Government are now prepared to make for the aid and encouragement of art schools has been sanctioned. The Government announce that they will give a payment of £3 a-year to the Committee of the Science and Art Department for every artizan who shall submit satisfactory examples of his work, and be recommended by the local committee for a free studentship. This studentship will admit the student to the art school, without payment of any fee for twelve months, and the scholarship may be renewed if the student continue to attend regularly the instruction given in the art school. It provides, in fact, for the free art education of artizans who are willing to work. An additional payment of £5 is also to be made for an art pupil teacher in schools where twenty artizans are receiving art instruction, and in schools where there are fifty artizans and upwards, two pupil teachers will be allowed, so that the payments in future will be either £15 or £30. A proportional payment will be made on the works of artizans which do not come up to the requirements necessary for the full payments of 15s. or 20s. To the head masters of schools of art, where the results and general working are satisfactory, a bonus of £50 will be paid to one master, a sum of £40 each to three masters, £30 each to five masters, £20 each to ten masters, and £10 each to twenty masters. Thus, thirty-nine masters will receive direct payment, provided the schools are in a condition to justify the expenditure. In future, also, the committees of art schools, night classes, and elementary schools will be able to provide themselves with approved examples at a reduction of 75 per cent., and in special cases, where buildings or rooms are permanently devoted to instruction in art, this aid will be extended to provide the necessary apparatus and fittings. This provision is made in order to remove the complaint that the department has not hitherto given sufficient aid towards the purchase of examples. These are the leading features of the new minute. The terms offered are fairly liberal, and local effort and co-operation must determine to what extent they are appreciated.

NEW BUILDINGS IN LIVERPOOL.*

MR. G. E. GRAYSON, who some little time since built a very dignified and palatial-looking block of offices in the Italian style in James-street, has, with true modern eclecticism, faced about, and is going in "heavily," in more senses than one, for Gothic. In Redcross-buildings, now in progress from his designs, there is exhibited a good deal of originality, but accompanied by a good deal of that exaggerated heaviness which characterizes so much of the current Gothic style, especially in the wide spread of the capitals and the disproportion between the small circular shafts and the heavy cubical blocks of masonry which they appear to carry, which in this case amounts to caricature. There is a great deal of clever and effective carving, of the Early French type, about the building; but the placing of dragons and griffins as dripstone terminations is really an absurdity in a modern building for business purposes. The mullions dividing the second

* Continued from page 91.

floor windows have little more than the thickness, and very much of the form and treatment, which would most naturally be given to an iron standard; and, though evidently very carefully built (of brick with stone head and base), *look* far too weak to be satisfactory to the eye. Old Castle-buildings, by the same hand, is another grim and heavy structure, with trefoil-headed windows and a good deal of rather commonplace ornament in the shape of incised circles and lozenges and notching. A very disagreeable effect is produced by some of the pointed windows being so extravagantly stilted, the spring of the arch being about two feet above the cap of the shaft which carries it. We may notice this building, however, as one of the few instances (we think the only one in this part of the town) of anything like picturesqueness of masonry, which in this case is in irregular coursed work scutched, which, we cannot help thinking, if more used, would give greater life to the masses of wall flanking the streets than the rubbed or tooled ashlar with which the new buildings are mostly constructed, and at less expense.

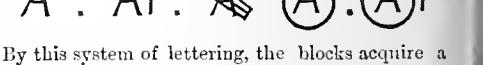
The Alliance Bank, erecting at the corner of Castle-street from the designs of Messrs. Lucy and Littler, scarcely bears out the local reputation which the architects have justly gained from some of their works on the Birkenhead side of the Mersey. It may not be fair to judge of a half-finished building; but the projections and sinkings of the panels and other ornament and mouldings seem singularly flat and ineffective, the ground floor windows (we suppose of the bank) are very tall and narrow, and, though the principal entrance, which is evidently to be the leading feature of the building, shows some bold treatment in the large corbels carrying the balcony over, it is in some degree marred by the ragged-looking naturalistic foliage with which the panels over the door are filled in. A better building, on the whole, is Messrs. Picton and Co.'s North-Western Bank, in spite of the odd "wheel" ornament which forms the finial to it. The bank storey, in rusticated granite, is well emphasized, and there is some very satisfactory and elegant detail in the upper portions. On turning down Lord-street, our attention is attracted by a large block of shops nearly completed from the designs of Mr. H. H. Vale, and in a style that may be called Gothicised Italian. The whole front is of stone very solidly built, and with good deep reveals to the windows; rusticated granite piers being left between each shop window, not so wide or massive as could be wished, but praiseworthy as a protest against the almost universal practice in Liverpool of building shops so as to have the appearance of standing entirely on glass. All the carved ornament is of a quasi-Gothic character, and is for the most part bold and effective, except that the abacus of each capital is too thin and weak; and there is a certain lack of refinement in the details and of unity in the whole design; but, altogether, the building is no doubt a step forward in shop architecture. Of course *the* new shop is Compton House in Church-street, built under the direction of Messrs. Haigh and Co., the contractors (who "keep an architect"). The general aspect of the Church-street front, with its tower, crowned by a high roof at each end, is really very imposing, and the effect of the simply designed first floor windows with their very deep reveals is admirable. But, unhappily, in this large and important building, the old mistake has been made of sacrificing everything in the ground storey to plate-glass, and the whole of the massive stone superstructure is carried on iron columns as carefully concealed as possible in the rear of the window frames. Nor will the details bear close examination—the carving wants sharpness and shadow; the surface decoration upon the alternate quoins of the rusticated pilasters looks like confectionery or "pie-crust" ornament; and the carving under the corbels which support the little oriels at the angles is excessively weak, and has not the slightest appearance of strengthening or supporting the work above it—it is a mere excrescence in fact, while the overhanging of the angle of the main building above the oriels is most unsatisfactory in effect, and when viewed obliquely is positively painful to the eye. It is a pity that such a fine opportunity should not have been made use of to produce a building which might have been pleasing from its refinement of detail and breadth of style, instead of being effective merely from its size and richness of ornament, some of which latter is decidedly "shoppy."

The new public offices in Dale-street are now partially occupied; and the tower, under the auspices of the borough architect, Mr. Robson, has got into the spire stage. That this building has been much improved by getting into Mr. Robson's hands before it was half-way up we have little doubt, especially with regard to the ornamental detail, most of which is very effective and clever, and characterized by great depth of shadow; and the capitals of the columns which form part of the face of the building present some very good and original treatment, the regulation classic outline of the capitals being formed by leaves and details more in the Gothic manner, introducing conventional representations of the fern and other leaves, and each one differing in design, though this diversity is rather overdone, and should, we think, only be carried so far as to be apparent on a close inspection, leaving the general effect, when viewed from a little distance, the same, otherwise a patchy effect is introduced into the building. We presume it is not the fault of the present architect that the stale device of semi-detached columns running up the walls between each window encumbers the building, but he is responsible for the unsatisfactory manner in which the main cornice (over which is a large attic) breaks round each column, so as to leave a broad expanse on the top of the cornice, at the back of which stands a statue occupying far less area than the column below, a great part of which is thus supporting nothing. For the tower also the present architect is responsible, and we confess it pleases us not, so far. We like to see a large tower with a broad and comprehensive design binding together the whole of it as one great feature; but here we have a congeries of small parts—pilasters, panels, and projecting balconies—with no one motive predominating over the rest; and the balustrade surrounding the smaller portion which forms the clock chamber (and from which springs the spire—square on plan) is finished at each angle with a most ugly stumpy pinnacle with large coarse crockets upon it; while from the four corners of the clock chamber project lean, long, and hideous gargoyles of the most mediæval description. There is elegance in parts of the tower, but an entire absence of power in it, taken as a whole. The interior of the building calls for little remark, save that the staircases and passages have that look of cold bareness and gloom which seems proper in official buildings of this class. And here we close our notes for the present.

TERRA COTTA, AND ITS EMPLOYMENT AS A LONDON BUILDING MATERIAL.*

As fitness should be of primary importance in the employment of architectural materials, we may look at the size of our blocks in this light. We want a size which shall admit of easy handling in the manufacture, of thorough firing or admission of the heat of the kiln to all parts of the material, and which, when the blocks have been placed in position, shall distinguish the work at once from stone and brick. Nothing is more hateful than to imitate or counterfeit one material in another, therefore I repeat we must select proportions for terra cotta which avoid the massiveness of stone and the pettyness of brickwork. This size, then, should be in cubes of from one foot to eighteen inches. I am convinced that the dimensions just given are the utmost which can be favourably advocated for terra cotta which has to be much fired. Beyond this limit the blocks twist and sag in drying, and the long lines of mouldings are, when put together, uneven and defective, and the labour of production to the manufacturer is also, as I shall point out later, materially increased.

I shall, then, assume the average size of my blocks for the contemplated building to be one foot cube, and should proceed to space them out as shown in this diagram, endeavouring, as far as possible, to avoid multiplicity of pattern, and to preserve a symmetrical disposition of the blocks. I may here mention the great importance of accuracy in the drawings for terra cotta work, on which depends one of the distinguishing points of this material as compared with stone—namely, that any error in the dimension of stonework may be rectified in a day or two, whereas a falsely calculated or constructed terra cotta block not only renders it useless for the building for which it was designed, but imposes also a delay of from eight to ten weeks, which must elapse before it can be replaced. The seriousness of such an occurrence as this justifies me in impressing upon you the necessity of more than ordinary care in the preparation of the terra cotta drawings. In order to fit the blocks properly in their relative positions and to distinguish the courses from one another, I have found it advisable to mark all the blocks of one course with the same letter, peculiarizing the different patterns of blocks in that course by means of numerals, the external mitre with a cross, and the internal ones with a circle round the letter, thus—



By this system of lettering, the blocks acquire a sort of individuality, and a ready means of communication with the manufacturers and contractors, and of reference to the drawings and models, is secured. The one-eighth full size drawings being ready, and the shrinkage scale having been prepared, the next step is to make full size drawings for the plasterer or the manufacturer from which to construct his models. These drawings must, of course, give the plan, elevation, and section of each block; and I have been accustomed (on account of their size and numbers) to make them on thick lining paper, and to trace them on thin common lining paper, which I was fortunate enough to discover is sufficiently transparent for this purpose. I need not say much with reference to the plaster blocks or models. I have found it convenient to run the simple enriched mouldings, dentils, beads, &c., the full projection in the plaster, and to carve out the enrichments subsequently. For the more complicated enrichments spaces must be left in the plaster for the insertion of modelling clay. Before quitting the subject of the models, it will be as well to state that it is usual for the architect to send the large detail drawings to the manufacturers, who prepare the plaster model. The enrichments are then carved upon it or added in clay, under the superintendence of the architect, and the model is returned to the manufacturer to make his moulds and to carry out the work. This is, at the best, a roundabout process, and for large works I have found it desirable to employ a plasterer on the spot, and have the blocks made on the works, and sent when completed to the manufacturer, the cost of the plasterer's time and material being deducted from the terra cotta account, as the price named in the tender of course includes (unless otherwise specified) the formation of the first models in plaster.

With regard to designing ornament for terra cotta work, I need only say that the material in which the design is wrought is so perfectly adapted to the skill of the modeller, that we may expect the highest efforts of the sculptor's art—in cases where only a few copies of the work are needed they may be actually modelled in the clay which is to be burnt, and we have the artist's own handiwork. When many copies are wanted, with good moulds, and workmen who know how to let the clay alone after it leaves these moulds, we may expect a very near approach to the sculptor's own work, much more so than in stone-carving, where a weak resemblance to the model is obtained in a material whose qualities and methods of working are so essentially different from the sculptor's clay, that a sort of education in the art of interpreting modelling into stone-

* Read before the Architectural Association, 9, Conduit-street, on Friday, January 31, 1868, by Gilbert R. Redgrave, and continued from page 93

work is all important to the stone carver. The motto for the terra cotta modeller should be—"Work in low relief and avoid undercutting."

MANUFACTURING TERRA COTTA BLOCKS.

The clay from which the best white terra cotta is prepared is that which is found alternating with shale in the coal measures, and we have here at once a key as to where and how to procure cheap and good terra cotta—viz., where the coal to fire it is found in connection with the clay from which it is made. Manufacturers who have to procure their clay from one place and their coal from another, cannot now, and I fear never will, be able to compete with those who have coal and clay on their own premises, or in their own immediate neighbourhood.

The clay, as it comes up from the coal fire, is generally very stiff and solid, from the great pressure to which it has been subjected. To prepare it for manufacture it requires to be broken up and ground, and for good work those portions are selected which are most free from shale and extraneous matter. The clay is forced into the moulds by hand, and thoroughly squeezed into all the crevices. The mould, I should tell you, is formed in pieces, and is made of coarse plaster—as it is from 1½in. to 3in. in thickness, it becomes for large blocks a very bulky and unmanageable concern. The mould is open, of course, on one side, and from it is scooped out the substance or interior of the future block. This open side should be at the back, or part opposite to the face, as, if the terra cotta is hollowed on the bed or the upper surface, the openings are liable to interfere with the placing or fixing of the blocks under or above it. Cell walls are left in the interior to support the clay in drying, and to augment the strength of the block, the thickness of the clay being reduced as nearly as possible to an uniform standard throughout to secure the equality of the drying and firing of all parts of the material. Some manufacturers complete the block by filling in the hollow side, and providing merely a number of holes for the evaporation of the moisture, and for the sake of grouting; but I am convinced that this is a disadvantage, and that the open blocks are more certain to be well burnt, and can be better built in and bonded with the brickwork than the solid ones. The average thickness of the terra cotta may vary from 1in. to 1¼in., according to the size of the block. The clay remains in the mould about twenty-four hours, by which time it has shrunk away from the plaster, and, after the cords confining the sides or facets of the mould have been loosed, it is removed from the clay. The workman then finishes up the clay block, adding those parts which are incomplete and damaged, and smoothing the general surface of the materials.

It may be as well here to protest against the so-called finishing as is generally practised by manufacturers, who either spoil the whole surface of the clay and obliterate the finer touches of the modelling, by going over it with a sponge, or who introduce no end of fancy touches and original markings to conceal slovenliness in the moulding. There are, too, those who, at this stage of the manufacture, daub over the work with a wash of some horrid colouring material to make the finished block burn of a pretty pink or other approved tint. Blocks thus finished invariably lose their gay colours after a year's exposure to the weather, and the artificial surface formed by this painting operation lets in the frost in winter, and splits up into innumerable hair cracks. If terra cotta must have the creamy look which is aimed at by this process, it would be far better to give it a coat of distemper before leaving the manufactory (similar to the priming of joiner's work), the first shower would then get rid of the colouring matter without in any way damaging the terra cotta. The burning of the blocks is hardly a question of any moment to the architect. The clay stands from ten days to a fortnight (according to the season) to dry. It is then placed in the kiln and burnt with a steadily increasing heat for five or six days, after which the kiln is slowly cooled, and the finished blocks are taken out ready for use. The final colour of the terra cotta depends to a very great extent upon the intensity of the firing and the moisture or dryness of the clay before it is placed in the kiln.

I can give no certain data to determine from the colour the quality of the terra cotta, but I have frequently found that a pale bilious grey or very light yellow colour denotes insufficient firing, while a rich brimstone yellow or pink is a sign that the material has been burned to the utmost it will stand without vitrifying.

I have no time to tell you of the many dodges and mixtures which some manufacturers inflict upon their clay. Powdered terra cotta, called grog, is very commonly made use of in considerable quantities, for the sake partly of economy and partly to prevent excessive shrinkage when drying; but the use of it is attended with many evils, which I cannot dwell upon now. There can be no doubt that the purer the clay is the better will be the terra cotta.

We have now had a hasty glance at the clay in all the principal stages of preparation, and we will suppose the terra cotta to have been delivered upon the works. The blocks should be carefully fitted together on a floor or even surface to check their aggregate lengths, to try them as to squareness, and to ascertain how they fit to one another. Small inaccuracies may be remedied by rubbing down the edges on a stone (no easy matter by-the-bye with good terra cotta), and for important errors the blocks have to be clipped down with the chisel—this is a dangerous and difficult proceeding, and should be resorted to only as a last alternative. Insufficiency of length may be overcome by widening the joints. It is at this stage of the work that the advantage of keeping the blocks small in size is most manifest. Large blocks twist so much in many cases that it is absolutely necessary to cut and rub away the surface, and this is attended with the unsightly result I spoke of in the early part of my paper. Blocks up to 15in. in length are, as a general rule, very true, and it is only in the greater lengths where cutting becomes necessary. In fixing the terra cotta, care must be taken to fill in the hollows of those blocks which have to carry heavy weights, and the cement grouting with which this filling in is done must be mixed very poor, as I have known the expansion of the cement in setting to burst the terra cotta all to pieces. Eight parts of sand to one of good cement is strong enough for this purpose. The blocks themselves may be carefully bonded in with the brickwork in cement, in the proportion of three of sand to one of cement, the face joints being raked out, and pointed with a mixture of one part of powdered terra cotta to one part of lime.

I have prepared diagrams of some few cases of terra cotta construction, from which you will see that the use of iron is almost a matter of necessity. This I consider to be the only drawback to the extensive use of terra cotta in small blocks. I admit that it is quite possible in the cornice to carry the weight by means of York landings and large slabs of stone tied down by bolts in the usual way, but I incline to think that the construction with iron joists is the more preferable method of the two. In the case of columns, however, there is no choice but to use iron, unless we trust to the terra cotta by itself. Here it will be of interest to bring under your notice the only experiment I know of as to the resistance of terra cotta to compression.

STRENGTH OF TERRA COTTA.

The plan of the 1862 Exhibition was so arranged that the existing south arcade of the Royal Horticultural Society's Gardens might serve as the refreshment rooms, and form the ground floor of a lofty building, and it therefore became necessary to ascertain the amount or weight that the terra cotta columns of the arcade would sustain. In order to arrive at a fair conclusion, Captain Fowke resolved to have one of these columns tested, and the experiment was accordingly undertaken by the late Mr. Wakeford, the clerk of the works for the gardens. Unfortunately the ultimate results were not at all conclusive. Still they are, till others are obtained, of the utmost value. The column, which is in six pieces, including the Bath stone abacus, was put together in cement with plugs in the usual way, on a wooden support or base. It was then enclosed in a frame, the head of which consisted of two deals resting on the abacus and bolted edgeways to the uprights. The column was then crushed by lifting the wooden support on which it stood by means of the piston of a hydraulic ram. The fault of this arrangement was that the abacus, instead of bearing against one rigid body, was forced against the edges of two deals, and the weight was thus unfairly thrown on the cap, which splintered away gradually, and finally caused the fracture of the upper section of the column, with a load, at the moment of failure, of about eighteen tons. The weight of twenty and a half tons had, however, previously been sustained by it, and there can be no doubt that, but for the defect in the apparatus, it would have carried much more. The result I have just given, which is I believe much beneath the actual strength of terra cotta, is nevertheless quite sufficient to prove that this material may be entrusted with all ordinary loads. Indeed, I think that the column I have drawn in my diagram, which is 15ft. high, and 1ft. 6in. in diameter, would carry a weight of twenty-five tons with greater and more permanent safety than the cast-iron column or core, 8in. diameter and 1in. thick, which has been inverted to carry this load.

In all my remarks, where I have used the word terra cotta, I must be understood to refer to the yellow or grey variety. The qualities and properties of red terra cotta are so inferior and so different to the white, that I have not devoted much consideration to it. The clay from which it is made must, in order to produce a fine colour, be a mixture, or it can be but little fired. When pure clay is used, it must be burned with a far less heat than fire-clay, and the resulting terra cotta is consequently soft and wanting in durability. The Fareham brick earth would, I am convinced, be a splendid material for the production of red terra cotta, and I commend it to the notice of manufacturers. The ordinary red clay is a tertiary formation, and becomes, when hard burnt, the disagreeable colour we associate with flower-pots and drain-pipes; but it is possible, by mixing it, to produce terra cotta of a deep crimson hue. As you have already heard my objections to mixed clays, you will understand my reasons for mistrusting red terra cotta.

ADVANTAGES OF TERRA COTTA.

I must now say a few words with respect to the special advantages of the use of terra cotta in London. Mr. Matthews, in his able essay on the "Materials for London Exteriors," speaks in very favourable terms of the application of glazes, in various colours, to the surface of bricks, and looks forward to the time when such glazed bricks will be procurable at a cheap rate. Now, in terra cotta, we have a substance eminently adapted to receive a glaze, and enamelled terra cotta, the Della Robbia ware of the old Italian times, is, I hope, the material destined to beautify and decorate the London of the future. As Paris has become beautiful by its splendid stone, so smoky London will, by its durable (imperishable, I may almost say) and decorative majolica ware. In glazed terra cotta we have, I maintain, the panacea for all the evils which cause the failure or the ill success of our modern London architecture. Victorian architecture relies, to a very great extent, upon colour for its enrichment and for its effect. Up to the present time, the costly city banks, public buildings, and warehouses have, after a few short months of splendour, fallen a prey to soot. It is very humiliating to be obliged to confess this, but I am afraid that we must all admit that, with the solitary exception perhaps of polished granite, every material yet employed in London architecture succumbs, after a brief struggle, to fogs, smoke, and the London atmosphere. Now, I hold that in good terra cotta we have a material which defies our destructive climate, and which, while it answers all the requirements of the architect for building purposes, has also the merit of possessing in itself good rich colour, and of admitting of the application of a glaze of any desired tint. With such qualities as these it has a most brilliant future; and when, by a more extended demand, manufacturers have learnt to produce an article of uniform excellence, and at a cheap rate, there is no knowing how vast may be its employment in London. In that part of his essay which refers to terra cotta, Mr. Matthews adduces most of the arguments in favour of its use which I have already brought under your notice. He also mentions some buildings recently executed in London where terra cotta has been employed. One of his examples, the portico in Great Cumberland-street, is worthy of notice, on account of the small size of the blocks of which the entablature is composed. I cannot but think this to be a defect, and I may add that not only is the cost of the production of the terra cotta thereby increased, and the labour of construction augmented, but the architectural effect is also marred by the resemblance of the upper part to brickwork, which gives it an appearance of weakness and suggests the necessity of some visible arch-form or support. The green hue of some terra cotta, which Mr. Matthews points out as unpleasant, is due to its absorbing and retaining moisture, and is a sure sign of a bad material, as it proves it to have been it sufficiently burnt.

PRICES OF TERRA COTTA.

I shall conclude my paper with a glance at the present prices of terra cotta. Any architect who may happen to have made use of this material, and who has obtained tenders from various manu-

facturers, cannot fail to have been startled at the discrepancy which exists between the prices of the same article from producers in different parts of the country, a variation of 200 per cent. between the highest and lowest tenders being by no means uncommon; and this, alone, is a most convincing proof of the ignorance and uncertainty which prevails with reference to the subject under consideration. I may state, very roughly, that the average price of terra cotta in the neighbourhood of London is from 4s. to 8s. per foot cube, and in the coal districts of Staffordshire and the north it varies from 2s. 6d. to 5s. per foot cube. I feel certain that in a very few years terra cotta of excellent quality, made where coal and clay abound, will be sold in London at from 1s. 6d. to 2s. 6d. per foot, when a considerable number of the blocks of each pattern are required. This last proviso, however, is a very important one as regulating the price of terra cotta, for one of the principal expenses of the manufacture consists in the preparation of the model and the mould, and when only a small number of blocks is required from any given pattern the preliminary expenditure forms, when divided, a heavy item in the ultimate cost of each block. Terra cotta ornamental work contrasts very favourably with stone carving in point of price, the modelling being set down as the same in each case. We have, for stone, to allow a large sum for the labour of carving, while, for the terra cotta, the only labour consists in forcing the clay into the mould and placing it in the kiln. In the South Kensington Museum is an ornamental mullion carved in stone, and the same work executed in terra cotta; the relative prices were put down very accurately, and were as follows:—£5 8s. for the work in Portland stone, and £2 3s. for the same in terra cotta. I have now only to assure you, in conclusion, that I have endeavoured, as far as possible, to explain briefly the modes of procedure with reference to terra cotta in an architect's office; and as so little is definitely known on this point, and as terra cotta is, as far as London office work is concerned, almost a new material, I must claim your indulgence for any errors and misstatements which may have, unintentionally, crept into my paper.

EXMOUTH.*

It is a characteristic of very local historians, and writers of guide books, as a class, that all their geese are swans. Like the late Lord Jeffrey, they are nothing without their adjectives. They seem to see everything through a magnifying glass of exceeding power. The great object of every local Holinshed is to crack up his own particular locality. There are certain favourite parts to be sure, about which everybody is agreed. They are celebrated by universal consent. There are, for instance, few spots in England possessing greater claims on this score than South Devon. It is remarkable alike for beauty of landscape, its delightful climate, and the variety and interest of its historical associations. The roll of Devonshire worthies too is among the proudest in the kingdom. The county has always been regarded as one of the most favoured nooks of England. South Devon deserves all the praise given to it in the work before us. Though the author confines himself more particularly to a description of Exmouth and its neighbourhood, his work is a really valuable history of the county. Its merits, as well as its limits, place it beyond the category of ordinary watering-place guide books. The greater portion of the work is devoted to biographical accounts of the Rolles, the Raleighs, the Courtenays, and other Devonshire families, whose fortunes are so closely linked with the neighbourhood. The biography of Sir Walter Raleigh specially shows great labour and painstaking in the compilation, and is a valuable sketch of the extraordinary career of that celebrated man. Of Exmouth itself we have many interesting particulars. This town is the oldest of Devonshire watering places. It has, however, lost much of the importance it possessed in bygone times. It was in the estuary of the Exe that the small beginnings of a British navy were made nearly a thousand years ago, in the attempt to cope with the Danish invaders. In the reign of King John, Exmouth was one of the chief ports on the coast. In 1348, it contributed 10 ships and nearly 200 seamen to the fleet sent by Edward III. to attack Calais. Subsequently, Exmouth fell into decay until it became a mere "fisher townlet," as Leland describes it. Fortunately for the place, a lord-chief-justice visited it in a very bad state of health, and went away greatly benefited. Exmouth began to be a fashionable resort about 150 years ago, and, though it has not progressed very rapidly, the population of the town has increased considerably during the last fifty years. At the beginning of the century the number of inhabitants was less than 2,000, in 1861 it had reached 5,288. In spite of fog and a moist atmosphere to which Exmouth is to some extent subject, it is, in the opinion of Sir James Clarke, decidedly healthy—agues are almost entirely unknown, and less rain is said to fall here than generally along the coast. It is recommended rather as a summer than a winter residence. The rate of mortality to each 1,000 of the population does not exceed 19, or 6 less than the average of London. The time-honoured but highly inconvenient system of leasing land for periods terminable on lives, it is stated, has been one of the chief causes which have hitherto hindered the growth and development of Exmouth. However the Rolle Estate Act of 1865 gives power to the trustees of that estate to grant leases for an absolute term of years not exceeding 99 years, and every facility is now given, we believe, for building houses of the best character, and for making the capabilities of the situation, and its excellent sanitary arrangements, in the highest degree available. "Building ground," says the writer, "is now amply attainable on sites which add to all the charms of wide and varied prospect, both by sea and land, every needful condition and requirement of a sanitary sort, heretofore far too little regarded in such few and casual extensions of the town as of late years, and prior to recent changes in the management and improvement of the Rolle estates, it had been found possible to make. The improvements now in progress have two main objects—the one, the provision of sites for villas and family houses, with every attractive requisite, quite apart from the commercial quarters of the town, and yet within easy reach of it; the other, the substitution, in that quarter itself, of nineteenth century streets and shops in the place of seventeenth century ones; and the provision besides of all those improved subsidiary appliances and advantages of a watering place, which are necessary to modern comfort and to modern habits of life." It is recorded that Francis Danby, the painter, was attracted to Exmouth, not so much by its charms of climate as by its proverbial local advantages for the study of those gorgeous phenomena of sunrise and sunset which he knew so well how to render.

* Exmouth and its Neighbourhood, Ancient and Modern; Historical, Biographical, and Descriptive. Exmouth: W. M. Bounsall.

CHURCH TOWERS IN SOUTH DEVON.

At a recent meeting of the Exeter Diocesan Architectural Society, the Rev. William Grey read a paper on this subject. He said a paper on this subject was read before this Society in 1842, but it has been thought necessary to revert to it, partly because that paper was somewhat crude and incorrect in its details, partly because the subject is very perplexing, and has constantly proved a stumbling-block to archæologists. The case stands thus: there are a number of church towers in South Devon of a very rude and early appearance. The tower arches have square soffits, they spring from chamfered abaci, and are often nearly semicircular. Rickman conjectured that many of them were Saxon, so rude were they in their character. The windows, especially those of the bell-chambers, look like Norman or Early English work—generally of two lights, with plain uncusped heads, and no tracery. Mouldings they have none, except a chamfer. These towers are often without buttresses, and the walls batter. People call these towers Norman, or Early English, the relic of an earlier building; or they say that these plain features are built in again. To all this there are two answers:—(1) It is not denied that there may be certain examples where these plain tower arches, and perhaps some of the windows, may belong to an earlier church; but (2) such are exceptional cases, and the origin of this plain work must be sought in a certain local fashion which prevailed in the district from about A.D. 1300 to 1550. Thus the belfry windows of Denbury, of the date of 1318, are exactly the counterpart of those at Woodland, which tower was built in 1536. And the reason of this conservatism is, that good freestone was difficult to get, the quarries at Bere being distant; and such substitutes as granite, limestone, and red conglomerate, were of a rough, rugged description, and unsuitable for good mouldings or tracery. Such work as is found at Launceston Church is scarce, and must have been a severe tax on the purse and patience of church builders; and whereas it has been suggested that the perpendicular west windows of these churches have been insertions in older walls, such can scarcely have been the case with the majority of towers under consideration, for the freestone used in these windows was not of a sort to need renewal, as is the case in districts where soft oolite is the common freestone; and besides, later insertions generally leave some mark behind them, which is not seen in these towers. Besides this, plain work is occasionally found in porches, *i.e.*, in those parts of the building where such plainness and rudeness cannot mar the general effect of the interior. Hence the west window, which plays a considerable part in the interior, is not plain, but has the ordinary characteristics of tracery, cusps, &c., which all the other windows of the church possess. An inquiry into the dates of these plain towers shows that, while several of them—as Bovey Tracey, Denbury, Dartington, and Staverton—are of the early part of the fourteenth century, the greater number of them were erected in the fifteenth, and Woodland as late as 1536. If, from a consideration of the dates of the towers, we proceed to classify them, we shall find that, generally, the same outlines by no means indicate similar dates. The towers in question may, for convenience, be arranged thus:—(a) Towers with one stage, walls battering—Stoke Gabriel, Tormohun, about 1400. (b) Towers with two (or in one instance three) stages, walls battering, no buttresses or turret—Ashcombe, Belstone, Bovey Tracey, circ. 1402; Broadhempstone, 1402; Denbury, 1318; Coffinswell, circ. 1440; Dartington, circ. 1320; Hennock, circ. 1470; Lustleigh, Newton Abbot, circ. 1516; Staverton, circ. 1330; West Ogwell, circ. 1320; Wolborough, 1516; Gidleigh, Holne. (c) Towers with two stages, walls battering, no buttresses, an octagonal turret against the north or south face—Bickington, Buckland-in-the-Moor, Dean Prior, Ilsington, circ. 1420; three stages, Kingskerswell, Manaton, Marldon, circ. 1520; St. Marychurch, Woodland, 1536. (d) Towers of two or three stages, angle buttresses, generally with staircase turrets—Abbotskerswell, Antony, circ. 1410; Cockington, circ. 1485; Drewsteignton, Eggesford, Highwick, 1428; Holcombe Burnell, Ken, Moretonhampstead, Newton Bushel, 1443; Powderham, St. Thomas, 1412; Shillingford, circ. 1490; Townstall. (e) Lofty towers with face buttresses set back from the angles—Ashburton, Berry Pomeroy, circ. 1400; Chagford, Christow, Ipplepen, circ. 1440; Kingsteignton, circ. 1480; Littlehemston, 1439; Torbryan, circ. 1440. The result of all this classification is, that it is most evident that there was a great deal of conservatism in the tower building of South Devon; and that we must not argue that, because one tower has the same sort of outline as another, therefore both are of the same date. They may be, or they may not be. From the classification of the towers we go on to note some particular details in them. The plinth in most is a bold chamfer, sometimes, but not often, a hollow. West doorways are mostly exceedingly plain, but a peculiar type occurs at Dean Prior, Cockington, Newton Bushel, Abbotskerswell, Bickington, Torbryan, and Kingskerswell. Mouldings very like decorated are found in several perpendicular towers. This is only the conservatism of the district. West windows are generally of the ordinary perpendicular type, but in several examples (as Bickington, Chagford, &c.) a window with decorated ramified tracery is found—probably the east window of the older church of the fourteenth century. Tower arches are so plain that they are often called Transition Norman, or Early English; but one of this sort is found at Woodland, which cannot possibly be of any earlier date than 1536. Doorways out of the newel of the staircase are found with square lintels, and might be taken for Saxon work, but such work would not be found over work of the fifteenth century. Battlements show the same conservatism which other details do, being found in the early part of the fourteenth century, and in the middle of the sixteenth. The finish of these towers was sometimes a blunt spire, as at St. Petrock's, Dartmouth, and Hennock; sometimes a gabled roof, as at Denbury, Ilsington, Newton Bushel, &c. Probably several towers now covered with lead originally had short spires. There is one great foe which seriously hinders such inquiries as the foregoing—the limestone of the district, in the shape of whitewash inside, and rough-cast outside. One consequence of this is that the beauties of our churches (both inside and out) being obscured, if not altogether hidden,

people will not believe that they have any beauties at all, and cry out for what they call "restoration," which generally means deformation or utter destruction. May not we, as members of a Society whose motto is—*Veteres revocavit artes*, plead for a careful removal of the obnoxious whitewash and rough-cast first of all, before our ancient churches are condemned to undergo the calamity of a so-called "restoration?" Surely it is a little unfair to the memories of our forefathers to do our best to spoil and hide their works of art, and then turn upon them and say that they were utter strangers to art.

Mr. HAYWARD thought they were indebted to Mr. Grey for his paper, and the great research he had made. He thought, however, in some cases he gave later dates to the structures than he really ought. For instance, at Dartington there were traces of an old cruciform church, and in his practice he found the old parts of a church to consist of tower and perhaps a chancel. In the perpendicular period churches required to be enlarged or raised, and then they were built upon either or both sides; and the perpendicular windows were inserted not only in the chancel, but he believed also in the towers; and perhaps, owing to the towers being made to have an increased elevation, they were given the late character they now possessed. But in most cases where they found that the material used was small rubble, and the form a simple battered outline, he thought those towers were of a rather earlier date than Mr. Grey was inclined to give them. It was a question, however, open to consideration, and he had only made these remarks hearing what Mr. Grey had said in his paper. He did not think the evidence of coats of arms was worth much, because they were introduced into the churches at a much later period than they were built.

The CHAIRMAN said it had often struck him that the basements of some old churches were much older than the superstructure. A question he should like to see dealt with was, "What was it that led to the reconstruction of so many churches about the year 1450?" He remarked that there were many churches of that character around Exeter, and there seemed to be an extraordinary spirit afloat at that time.

THE LAWS OF DRAINAGE.

ON January 28th a paper was read before the Institution of Civil Engineers, "On the Relation of the Fresh-water Floods of Rivers and Streams to the areas and physical features of their basins; and on a Method of Classifying Rivers and Streams, with reference to the magnitude of their Floods—proposed as a means of facilitating the investigation of the Laws of Drainage," by Lieut.-Col. P. P. L. O'Connell, R.E.

After referring to what might be termed the first stage of natural surface drainage, subsequently carried on and completed by rills, streams, and rivers, the author observed that streams draining large areas were not subject to sudden floods caused by short smart showers, and that a lake, like the extension of the area of a drainage basin, was a moderator of the flood discharge, resulting from a given rate of rainfall. There were other natural moderators which were more or less effective, as, for instance, a porous, absorbent soil, and the foliage of dense forests, but the latter had apparently the property, in some situations, of increasing the actual amount of rainfall, which counterbalanced its effect as a moderator of river floods. Snow might, according as it thawed slowly or rapidly, be a moderator or the reverse. Again, when a tributary in flood flowed into a large main river, the channel of the latter also acted as a moderator. If a series of natural basins could be found, increasing regularly in area, having physical features as to slope, soil, &c., all tending in the same degree to discharge the rain falling on them, and if the distribution of the rain were the same in all these basins, then, doubtless, the rate of discharge in floods might be described graphically by some regular curve, the abscissæ of which would denote the area drained, and the ordinates the flood discharge per second. This curve would be concave to its base, and the tangent at its origin would have a value representing exactly the maximum rate of rainfall. Such, however, were the diversities of physical features in river basins, and in the distribution of rainfall in the world, that the search after the desired series of natural basins possessing exactly similar characteristics would probably be a vain one. This was to be regretted, for rivers small and great might alike be referred to some such curve, and classified as flood dischargers, according as they took up positions near to or distant from the curve.

To supply the place, as a classifier, of this unknown curve, the author suggested the use of the common parabola, as follows:—Let x, the abscissa of a point in the curve, represent the area in square miles drained by a river, and y, the ordinate of the same point, represent the number of cubic yards discharged per second by that river. Then, in the common parabola, $y = M\sqrt{x}$, where M might be termed the modulus of the river, or of its drainage basin, as a flood producer. When M was large, it would indicate that the physical features were such as to slope, soil, total amount and distribution of rainfall, as to give the river and its drainage basin a high place in the classification. When M was small, it would, on the contrary, show either that but little rain fell on the basin, or that it possessed some of those physical features which tended to moderate floods.

The author had prepared a table exhibiting a few of the physical features of some of the principal rivers of North America, Europe, and India. This table gave the area of the drainage basin of each river in English square miles, the flood discharge of the river in cubic yards per second, with the name of the authority for this statement, the flood discharge of the river in cubic yards per second per square mile drained, and the values of M in each case. The facts so collected were also exhibited in diagrams. After commenting upon the range in the values of M thus recorded, it was observed, that whereas, in the case of large rivers, the parabola expressive of the relation between the area drained and the discharge per second might, without sensible error, be supposed to have its apex situated at the origin of the co-ordinates, in the case of small districts this supposition would lead to error. In the latter instance it became necessary to ascertain, at least approximately, what was the maximum rate at which rain fell in the district, and to place the origin of the co-ordinates at a point in the curve where the inclination of the tangent to the axis of x should correctly represent that maximum rate.

For the sake of illustration, it was assumed that a district existed in which the maximum rate of rainfall was 5in. an hour, and the maximum value of the modulus M was 20. This required that the origin of the co-ordinates should be situated at a point in the parabola where its geometrical tangent was inclined to the axis of x, at an angle whose trigonometrical tangent was 120. If x' and y' were the rectangular co-ordinates of the curve, measured from this point, its equation was $y' = 20\sqrt{x' - \frac{y'}{120}}$, the areas being measured in square miles, and the discharges in cubic yards per second. But as, for small districts, it would be more convenient to measure the areas in acres, and the discharge in cubic feet per second; the formula became, when adapted to these new measurements $y' = 21.4\sqrt{x' - \frac{y'}{5}}$ very nearly, or after the solution of this quadratic equation, $y' = -45{\cdot}726 + \sqrt{2097{\cdot}28 + 457{\cdot}96\,x'}$.

A table, computed by this formula, was then given, showing the discharge in cubic feet per second from districts increasing in size from 10 acres to 5 square miles; and it was stated, while the discharge from an area of 10 acres represented a rainfall of 3·56 inches an hour, that from a district having an area of 5 square miles represented a rainfall of only ·36 of an inch. It was stated, that in rivers whose basins were by no means small, very extraordinary floods might occur in years not remarkable for large totals of rainfall; and, in conclusion, a few statements and quotations were given, as affording examples of flood moderators.

PLASTERERS' WORK IN PARIS.

MR. C. BARTLETT, one of the artizans who reported on the Paris Exhibition, makes the following observations on plasterers' work in Paris. He says in Paris the position of the provincial plasterer is changed very much indeed, as compared with London. He may be a tolerably good hand at his trade in some of the provinces; but he comes to Paris, and he loses, so to speak, some of his trade. Instead of miles of brickwerk fronts covered with cornice, jamb, architrave, scrolls, and other work in Portland, mastic, or Roman cements, miles of buildings, six or seven storeys in height, meet his gaze, built with a cream-coloured stone—stone, too, be it remarked, of good quality, not throwing off scales, blisters, or crumbling to a speedy decay—stone worked into every form of architectural embellishment, the work of to-day standing beside that which has stood for ages, and bidding fair to be objects of admiration for ages yet to come; but we look in vain for those plastered places we see in and around London; in fact, plastering does not exist in Paris, either as to quality or quantity, as with us. If we turn to the outlying districts, we shall seek in vain for the speculating building, in six, eight, and ten-roomed houses, made to sell, and which are such a rough nursery for many of our plasterers, but which are, in many cases, the starting-point of some of our best workmen. The fine buildings of Paris, like our own, are not favourable for acquiring that speed and dash which all must get who work in "field work," where the endeavour is made to give up all, or as much as possible, to the plasterer, as soon as the building is sufficiently forward to take the first coat of lime and hair, or the unknown conglomerate that is made to pass as such.

The French architects use plasterers' work sparingly in their first-rate buildings, and in situations where the presence of plastering would not be suspected. For instance, in the new Imperial Library, the coffers, &c., of the arch springing from the gigantic piers in the reading-room or hall are plasterers' work of first-rate quality; but, from its great height, and the absence of plasterers' work in other parts of the hall, plasterers' work would not be suspected. Again, in that very beautiful erection, the Church of the Holy Trinity, nearly facing Rue de la Victoire, and close to Rue Clichy, the richly-decorated interior of which is of stone, with the exception of some massive pillars separating the galleries from the body of the church—these alone are of plasterers' work, and among the best plasterers' work in Paris; and those columns or pillars harmonize completely with the colour of the stone work, so that even when close to them you would not take them for other than stone work. First-rate plastering is not the rule in Paris, but the exception; more so than with us. In secular buildings, viz., dwelling-houses, hotels, &c., the plasterer has less to do than with us. The ceilings are not enriched so commonly with mouldings as with us—the painter and artistic decorator superseding all others in making blank spaces agreeable to the eye.

The French artizan has less choice of materials than the English. While the latter has many different cements to work with, the Frenchman has very few indeed, mainly working in that plentiful material plaster (gypsum, or sulphate of lime), the coarse being used for rough floating, and for finishing the plaster is sent through a fine sieve. The plaster setting quickly is a great advantage, as it enables them to finish a room off at once, so that one preparation is enough for, say, one room. With us it is very different, as we have to wait for the drying of the different coats, causing delay, besides keeping more in hand at one time, and finishing nothing right off. The style of work seems rather wasteful to an Englishman. The French plasterer, for good work, makes use of rules, or strips of wood cut thin. These he beds, or "sticks" against the ceiling, walls, or partitions, to serve as guides for the floating-rule with which he floats the walls, &c., straight. This adds to the price of the work the time of the carpenter and the cost of the timber. With us the system is to form our lines or "screeds" with the materials with which we may be working in cornices, whether for internal or external work. Our system and theirs are, with very slight modifications, the same.

External work is more often done in plaster than other materials. It would not last, perhaps, more than twelve or fourteen years; but in their more genial climate may possibly last thirty or forty. The work is jointed, veined, coloured, or tinted, sometimes painted to imitate stone; in either case the imitation is generally successful. A casual observer would pass by and think it a stone front that he was passing, the idea being helped by the smooth finish of the work, which is not finished by a wooden float, as with us, but is trowled or worked smooth. In cornices, whether inside or out, the Frenchman uses more tools than we do. We use straight-edges, or joint rules of cast steel, with a few small tools; this is all that is required for our intersections or "mitres;" but there (*i.e.*, Paris) the workman uses wooden moulds, made to the shape of the various members of the cornice he is forming, those said moulds being akin to those used by our masons.

This takes considerably more time than we are in the habit of spending on such work. In plain work they use fewer tools than we do. The principal tool is a rather broad, thick, triangular trowel. With this he lays or spreads on his material, afterwards using one edge as a drag to scrape down all those parts that may be uneven; the work is then finished with a fine coat worked smooth. They are not so particular as ourselves regarding the colour of their plaster. We look with distrust upon high-coloured plaster, well knowing it sets too quickly to be worked properly, with the grave defect of "giving" or softening after it has been laid on for a few hours. Hawk-boys are unknown in Paris. The men are attended by labourers, who frequently become plasterers themselves. The work executed in Portland and Roman cement calls for no special comment.

LEICESTER SQUARE.

"WHEN things come to the worst they mend," they say. Leicester-square is about to furnish an illustration of the saying. Most persons will agree that a more happy illustration would be difficult to find. That long familiar and much ridiculed neighbourhood was thought to be almost past improvement. The announcement, therefore, that an attempt is about to be made—and has indeed been begun—to improve Leicester-square, morally as well as materially, is all the more welcome. It is noteworthy that the initiative in this matter has been taken by a French gentleman, M. Paul Vargnes, the proprietor of the Hotel de Paris and Albion. His praiseworthy efforts, it is said, are being seconded by a number of his countrymen, who are anxious, we hear, to see the wretched square converted into a sort of Palais Royal on a small scale. The first step in the right direction has been taken by M. Vargues, who, out of a miserable place of entertainment at the corner of Leicester-place, has fitted up a handsome hotel at a cost, we believe, of about £10,000. It is well known that powers to deal with Leicester-square have been conferred by a recent Act of Parliament, and the programme of improvements in contemplation embraces, it is understood, the erection of a theatre on the site of Savile House, while the enclosure itself will be occupied by shops and well-conducted restaurants, which would take the place of the questionable establishments which now abound in the neighbourhood. Connected with "Leicester's busy square" are many interesting reminiscences and associations. It was originally named Leicester-fields, from the mansion at its north-east corner, built for Robert Sydney, Earl of Leicester, who died in 1677. Pennant, with happy alliteration, termed this house "the pouting place of princes," because George II., when Prince of Wales, having quarrelled with his father, retired to Leicester House; and his son, Frederick, did the same thing for the very same reason. The Prince died here in 1751; his eldest son occasionally residing here until his accession to the throne as George III., when in front of the mansion he was hailed king. Elizabeth, Queen of Bohemia, daughter of James I., mother of Prince Rupert, grandmother of George I., died in Leicester House, whose last royal tenant was the Duke of Gloucester, grandson of George II. It was here that Evelyn visited Lady Sunderland, who, for his amusement, sent for a famous fire-conjuror, who placed a red hot coal on his tongue, and retained it there while a live oyster laid on it was cooked. In the adjoining house Peter the Great was entertained by the Earl of Carmarthen in 1698. This house afterwards became the property of the Savile family, and was destroyed three years ago by fire. Eastward to the ruin of Savile House in Leicester-place is where Charles Dibdin built in 1796 his *Sans Souci* theatre for his musical entertainments. The premises No. 2, now a hotel, occupy the site of "The Feathers" public-house, frequented by "Athenian Stuart," Scott, the marine painter; Luke Sullivan, the miniature painter, who engraved Hogarth's "March to Finchley;" Captain Grose and Mr. Hearne, the antiquaries, &c. Sir Isaac Newton resided near the square in a house still standing in St. Martin's-street. Hogarth lived in the house afterwards converted into the Sablonnière Hotel, and Sir Joshua Reynolds at No. 47, on the opposite side of the square. In Lisle-street lived Henry Boue, R.A., the enamel painter, who received for an enamel, 18in. by 16in., the enormous sum of 2,200 guineas; in Orange-court, Opie, the painter, resided; and No. 11, Green-street was the residence of W. Woollett, the landscape and historical engraver, who, whenever he had finished one of his masterly plates of Wilson's pictures, used to fire a cannon on the roof of his house. Altogether, Leicester-square and its neighbourhood is one of the most historically interesting spots in the metropolis.

COTTAGE AT HOLLY VILLAGE, HIGHGATE.

WE this week illustrate one of a group of eight detached cottages, which have recently been built at Highgate, for Miss Burdett-Coutts. The cottage consists of a principal and upper floor, and is designed to be occupied by one family and by a lodger, who requires good and at the same time retired apartments, and whose wants can be attended to by the family who let the rooms, without interfering with the privacy of either. The entrance is through an open porch in the west front; a door opposite opens to the lobby of the house proper, and another at the right hand on the lobby of the lodger's apartments. These rooms, which enter from their own lobby, consist of a parlour and bed-room, with water-closet, a coal cellar under the stair, and a pantry. The family house contains, on the ground floor, a parlour, kitchen, wash-house or scullery, and a pantry, with a water-closet entered from the lobby, which is 7ft. wide, and contains the staircase to the chamber floor. This floor contains three good bed-rooms. The style adopted, it will be seen, is domestic English Gothic, carried out with considerable fulness of detail and ornamentation. The internal finishings are executed in the same taste as those of the exterior. The walls are constructed of good stock bricks, the external face work being executed with paviors—a superior kind of stock bricks, which are harder and have a richer and more uniform colour than the common bricks. The plinths, string-courses, door and window jambs, and the ornamental facework, such as lozenges, diamonds, &c., are executed with white Huntingdon bricks. All the corners of the walls, and of door and window jambs, are splayed with a quirked bead. Portland stone is employed for the window cills, detached shafts, moulded parts of chimney heads, and in other situations where brick is not desirable. To prevent damp rising in the walls, the following mixture was laid on them at a level of 6in. above the ground line, viz.—5 pails of dry washed sand, 2½ pails of lime, 4½ pails of gas tar, 4lb. of pitch, and 1¼lb. of tallow, boiled together for four hours and laid on hot. The external woodwork is of Moulmein teak, well varnished, the internal woodwork being of the best Baltic timber. The roofs are first covered with Croggon's patent asphalted felt, which is laid upon rough boarding, and then slated with Cumberland slates of a delicate green colour. The bands and figures are executed in darker shades of slate, Staffordshire blue tile being used for the ornamental ridges. Our illustration gives north, west, south, and east elevations, with plans of the ground and chamber floors, and roof; also, sections and details of the principal features of the building. The cottage is from designs by Mr. H. A. Darbishire, architect.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

AN evening meeting of this society was held at its rooms, 22, Hart-street, Bloomsbury, on Monday last, at eight o'clock, Mr. Henry Campkin, F.S.A., in the chair. Mr. Thomas MILBOURN (architect), Hon. Secretary, read an interesting paper "On the Church of St. Mary Somerset, Upper Thames-street." He observed that this edifice (about to be pulled down) is situate in the Ward of Queenhithe, on the north side of Upper Thames-street, and at the corner of Old Fish-street-hill. It is dedicated to the Blessed Virgin, with the additional epithet of Somerset, from its proximity to a port or haven in olden time called Summers Het or Hithe, resembling that of Queenhithe. It is of early foundation. In 1335-6 the patronage of the living was vested in Sir John de Peyton. After the destruction of the ancient edifice in the Great Fire, the parish of St. Mary Mounthaw was united to the parish of St. Mary Somerset. Mr. Milbourn remarked that of the building prior to the Great Fire but faint record remains, the earliest mention being in the will of one "Thomas Wylforde," citizen and fishmonger, of London, dated 8th November, 1405, by which it appears that some additions to the church was in contemplation; and the few other records go to prove that the ancient building possessed the necessary requisites of an ecclesiastical edifice, and was of no mean size or character. After the Great Fire, the church was rebuilt and finished in 1695, from the designs of Sir Christopher Wren. The plan of the church is a parallelogram, with a square tower, which stands at the north-west corner. The length of the church is 83ft. by a width of 36ft., and 30ft in height. The height of the tower to the summit of the pinnacles is 120ft. After describing the church, Mr. Milbourn proceeded to describe the monuments and inscriptions in the church, observing that those of the present building are but few, but of those in the earlier edifice there has fortunately been preserved some interesting record in the MS. Heraldic Notes taken in 1597 and again in 1611. The list of the earlier monumental inscriptions and arms was a long and particularly interesting one, containing many curious memorials of the old citizens. Of those in the present building he specially mentioned that to the memory of Gilbert Ironside, Bishop of Hereford, who, dying in 1701 at his London residence in the parish of St. Mary Somerset, was buried in this church; but, in consequence of the proposed demolition of the church, the remains of this prelate have been recently removed to Hereford, and interred in the Lady Chapel of the Cathedral. Mr. Milbourn next gave a list of the rectors and patrons of the church, from the earliest to the present time, and concluded his valuable paper by reference to the various charities and benefactors to the parish.

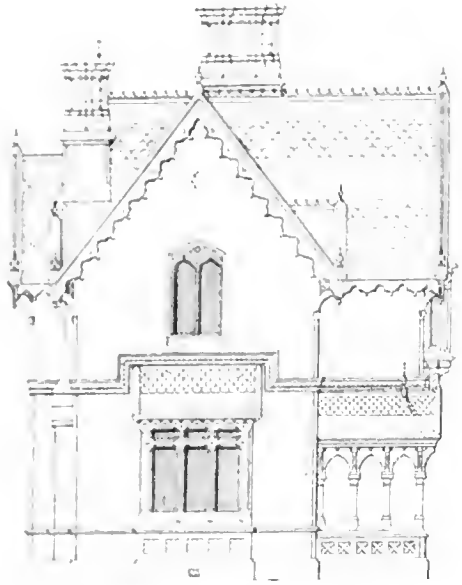
Mr. W. H. HART, F.S.A., exhibited and described four MS. books of "Hours of the Blessed Virgin." The books are in good preservation, and probably as old as the fifteenth or sixteenth century, and the illuminations, illustrating various scenes in the life of Our Lord, and other scriptural subjects, are of beautiful character, the colours and gold employed being almost as bright as when first used. Mr. T. Gunston exhibited Roman antiquities from Tokenhouse-yard, and Mr. John Expeice (director of the evening meetings) exhibited examples of ancient pottery from Old Ford, and fragments of Samian ware, lately discovered in Fenchurch-street, were contributed by Mr. Watts. An interesting discussion ensued on the various subjects before the meeting, in which the chairman, Mr. A. White, F.S.A., Major Heales, F.S.A., and other gentlemen took part, and thanks having been duly accorded to Mr. Milbourn, Mr. Hart, and the Chairman, the proceedings terminated.

THE OXFORD MUSIC HALL.

THE Oxford Music Hall, the largest, we believe, in London, the Alhambra excepted, was destroyed by fire on Tuesday morning. The fire was discovered by the watchman, at about 3 a.m., who found the seats in the right-hand corner of the gallery facing the stage in a blaze. The flames soon spread to the roof and the body of the hall, and in less than an hour the whole of the roof fell in. The destruction fortunately is not so great as in recent fires at similar buildings, and it is stated that there is not a single hole in the flooring caused either by the fire or the fall of the roof. In the cellars beneath the building, an immense quantity of wines and spirits are stored, and had the flames reached these the result can hardly be imagined. The gallery, on which so much material fell, has sustained no essential injury. This is owing to its peculiar construction, which was illustrated some years ago in the BUILDING NEWS. The gallery is constructed on a principle of leverage, the resisting power being the whole weight of the wall, or superstructure over the end pinned into the wall, while a heavy beam acted as fulcrum—so that only a comparatively small portion was overhanging, and it is all but impossible to have been broken down by the falling materials. We understand the plans and particulars are still in the hands of the architects, Messrs. Finch, Hill, and Paraire, and that there need be no delay in restoring the premises—on the other hand, it is stated the directors contemplate doing the work themselves. Whether such a course will prove an advantage to the shareholders has to be demonstrated.

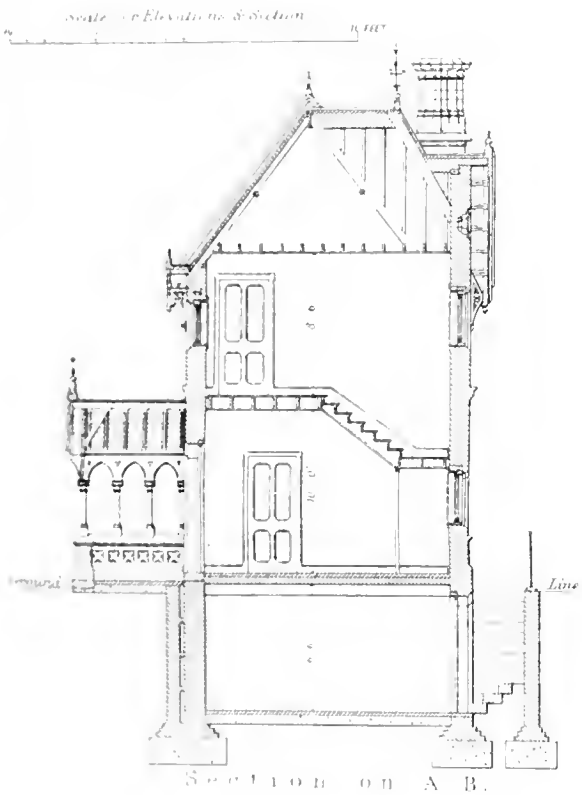
It is not decided that Her Majesty's Theatre should be re-erected. In fact, there is considerable doubt whether it will be, as Lord Dudley and Mr. Mapleson are averse to taking the initiative in the matter.

COTTAGE . HOLLY V

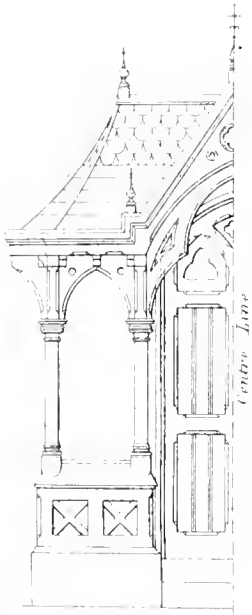


North Elevation.

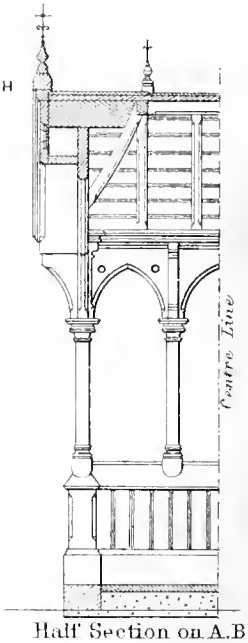
West Elevation.



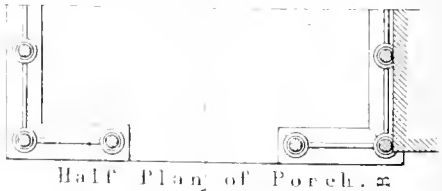
Section on A B.



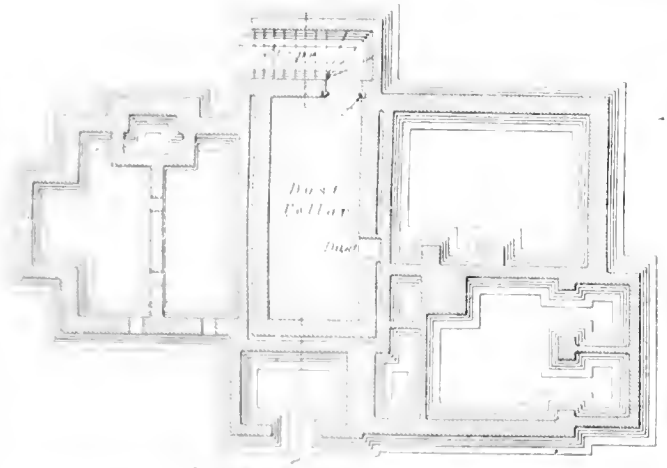
Half Front Elevation.



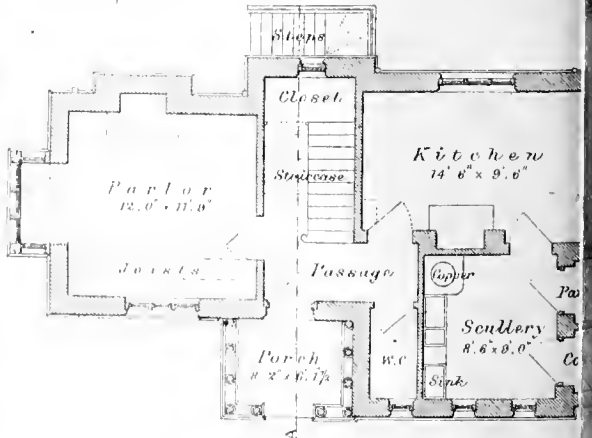
Half Section on A.B.



Half Plan of Porch.



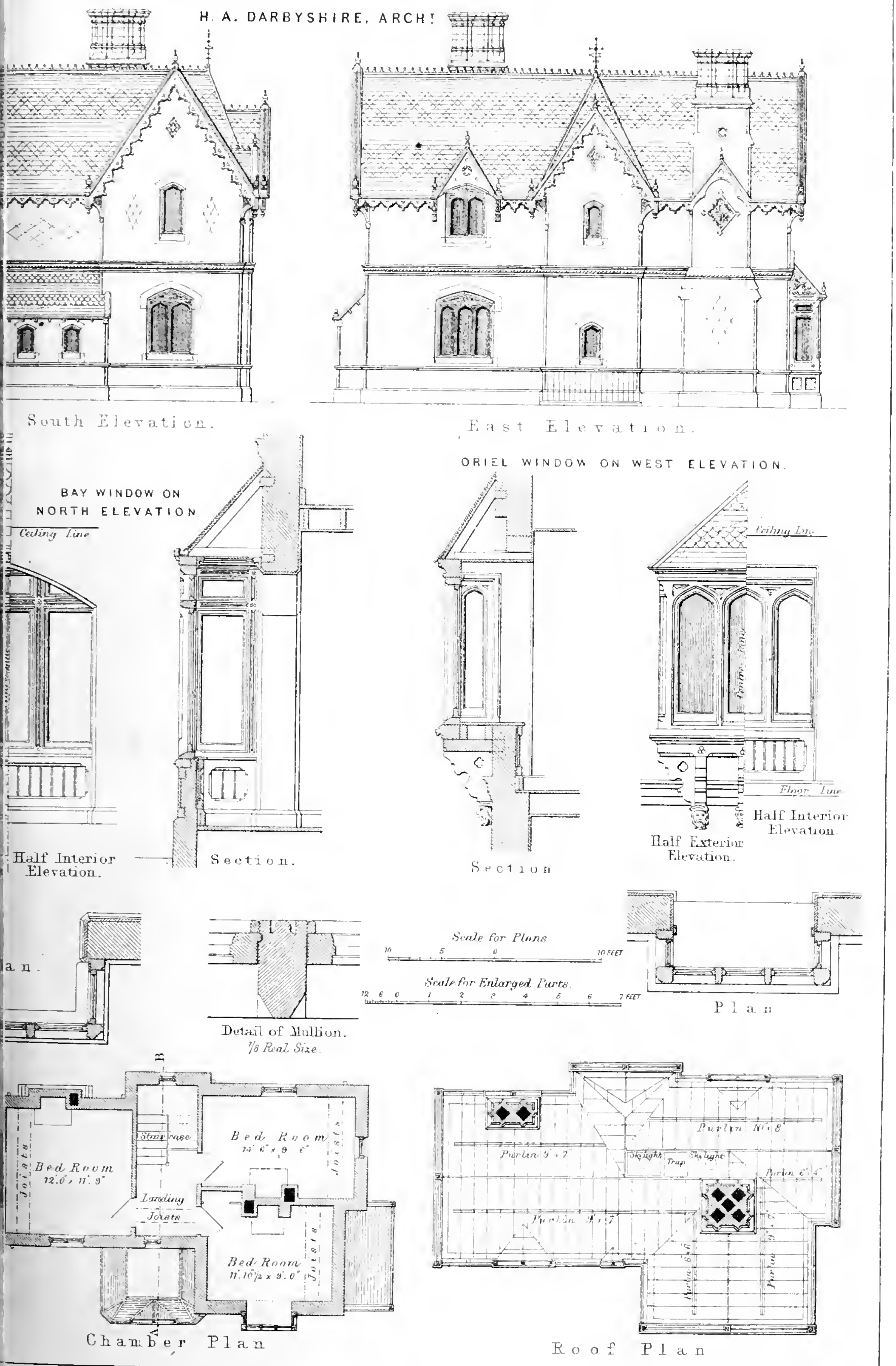
Basement Plan.



Ground Plan

…GE, HIGHGATE.

H. A. DARBYSHIRE, ARCHT



South Elevation.
East Elevation.
ORIEL WINDOW ON WEST ELEVATION.
BAY WINDOW ON NORTH ELEVATION
Ceiling Line
Half Interior Elevation.
Section.
Section
Ceiling Line
Half Exterior Elevation.
Half Interior Elevation.
Floor Line
…an.
Detail of Mullion.
1/8 Real Size.
Scale for Plans
Scale for Enlarged Parts.
Plan
Staircase
Bed Room 12'.0" x 11'.9"
Bed Room 14'.6" x 9'.6"
Bed Room 11'.10½ x 9'.0"
Landing
Joists
Chamber Plan
Purlin 10'.8
Purlin 9'.7
Skylight
Trap
Skylight
Purlin 6'.4"
Roof Plan

Printed by Whiteman & Bass

NEW PHOTOGRAPHIC PROCESS.

WE have recently witnessed, at Hayward and Leggatt's, 79, Cornhill, an assortment of photographs which have been produced by a new process. It is called the "Patent Carbon Process;" and by its aid not only are the photographs rendered permanent, but every drawing, whether it be in crayon, by pen and ink, or by the brush, has every characteristic of the artist reproduced. This is done by carbon being fixed by the action of light passing through a negative, and impinging upon a surface composed of gelatine. There is no doubt of the complete success of the process. The several hundred specimens exhibited at Messrs. Hayward and Leggatt's abundantly demonstrate that a new agent has been subordinated to the promotion of the fine arts. In looking at these specimens one has almost a difficulty in realizing the fact that they are copies. They are, in fact, *fac-similes*, and exhibit all the individuality of touch, and the peculiarity of colour and execution, which characterize the originals. The photographs are taken from drawings or sketches of the old masters, from various Italian, German, French, and other continental galleries. The photographs exactly resemble the originals in size, colour, and artistic minutiæ, and what renders them still more valuable is, they are absolutely permanent. Being cheap, we fully expect that these copies from the old masters will be extensively appreciated and sought after.

NEW TOWNHALL, MANCHESTER.

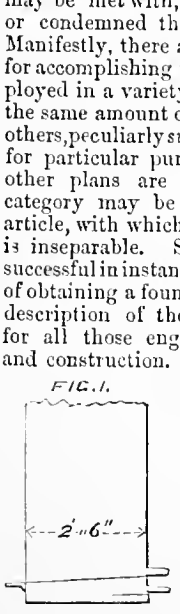
OUR Manchester correspondent says:—"The designs for the final competition are to be sent in to-day (Friday). It will be remembered that, in the first competition, the Council selected eight architects out of the 123 who submitted designs, and awarded £300 premiums to each, on the condition that he prepared a complete set of plans for the final competition. We hear that the drawings are most elaborately got up, and highly finished, and many of them are of great size. They will probably be exhibited shortly, when we may have an opportunity of judging whether or not the selection of the Council in the first contest was the result of influence or of merit. Of course, in any comparison between the selected and the rejected designs, the perspective views ought to be left entirely to themselves, and the geometrical views only placed side by side. Leaving merit, however, out of the question, and weighing the chances of the several competitors in the scale of influence, the race appears to be really between—Messrs. Speakman and Charlesworth; Mr. Solomons; Mr. Waterhouse; Mr. Worthington—who will, if the general opinion in Manchester prove correct, be "placed" in the above order. When the subject comes again before the Town Council it is expected that the supporters of Mr. King's scheme will once more endeavour to carry their amendment, which is a proposal to substitute a square site for the present awkward triangular one. Should they succeed the selected plan will have to be considerably altered, and possibly undergo an entire re-arrangement. It is to be regretted that the question was not finally settled in favour of a rectangular building before the competition took place."

ELEMENTS OF ENGINEERING.

SCREW PILES.

IN the erection of any structure in a locality where the violence of a rapid tideway, or intermittent flood, is combined with the treacherous character of a loose and alluvial substratum, there are two principal difficulties to be succesfully surmounted. The one is to avoid presenting more than the minimum resistance to the fury of the current; the other to obtain so firm a hold in the ground, as to defy all future attempts at scouring or uprooting. Solidity was the distinguishing characteristic of the engineering and architectural works of our ancestors, and it was, doubtless, by a rigid adherence to this guiding principle, that they constructed bridges with spans of dimensions so limited, and with piers of dimensions so enormous, that their total area considerably exceeded the waterway left for the stream. However unscientific the design, it must be yet admitted that the execution was good; and there is not the slightest doubt, but that the architect of old London-bridge would have succeeded in bridging the Jumna, the Ganges, or the Saone upon the same system that he accomplished the spanning of the Thames, although he might have been half a century about it. Fortunately, modern engineers have been spared the task of endeavouring to apply to incongruous examples, the methods of their predecessors. The progress of invention has supplied means for vanquishing each peculiar difficulty as it may be met with, and precedent has confirmed or condemned the utility of their adoption. Manifestly, there are certain general methods for accomplishing results, which may be employed in a variety of instances with nearly the same amount of success, and there are also others, peculiarly *sui generis*, admirably adapted for particular purposes alone, and for which other plans are not suitable. Under this category may be included the subject of our article, with which the name of Mr. Mitchell is inseparable. Screw piles have proved so successful in instances where the usual methods of obtaining a foundation have failed, that a description of them possesses much interest for all those engaged in the art of designing and construction.

FIG. 1.



The ordinary screw pile is represented in elevation in fig. 1, which shows the end portion cast upon Mitchell's principle, to which the upper lengths are bolted. A very usual dimension for the size of the pile is 2ft. 6in. in diameter, but any size may be adopted, provided it is borne in mind that the difficulty in getting it down, varies directly as the area of the flanch. Besides, if a certain dimension be exceeded, the pile virtually ceases to bear that character, and becomes transformed into a cylinder, which constitutes in itself a different system of foundation. The upper lengths of the pile are formed slightly different from that carrying the screw, and are represented in elevation in fig. 2, and in plan in

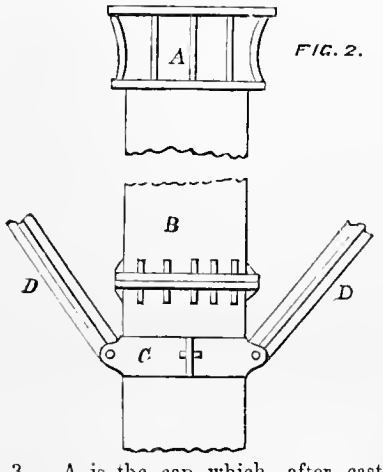
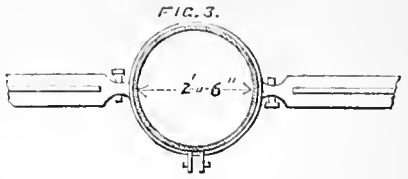


FIG. 2.

fig. 3. A is the cap which, after casting, is turned in a lathe to ensure a true bed for the girder to rest upon, and also to give a finish to the appearance of the pile. The average length of each separate casting is about nine feet, some shorter lengths being always cast in addition, to bring the pile up to the proper level, as it might in some situations be nearly impossible to get it down for another length of nine feet, supposing the preceding length was below the proper level. Owing to the great length of the piles in comparison with their lateral dimensions, they require to be strongly braced together by

FIG. 3.



diagonal ties and struts, so that they should form a complete framework of rigidity and lateral stiffness. This is accomplished by the braces D, which are of the section shown in fig. 4. They are connected to the piles by

FIG. 4.

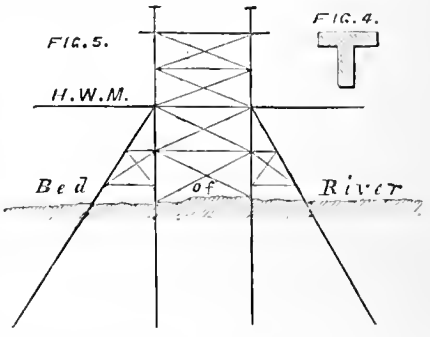


FIG. 5.

means of the wrought iron rings C, which are fixed round their circumference, and are either rivetted or bolted to the extremities of the braces. This arrangement is shown in plan in fig. 3. Flanges are cast upon the ends of the separate nine feet lengths, and they are thus bolted together, as at B in fig. 2. Of all the applications made of the principle of screw piling, the most extensive is that carried out upon the Bombay, Baroda, and Central India Railway. Upwards of six miles of bridges, in the aggregate, have been erected by their aid throughout the line, and it is very questionable whether any other means could have been substituted with the same amount of success and advantage, in an economical point of view. It may be mentioned that the velocity of the floods in rivers similar to the Jumna and Nerbudda reached a maximum of ten miles per hour, with an average depth of fully forty feet. The portion of the pile shown in fig. 2 is that which stands above the level of low water. That below that level, and also the part penetrating the bed of the river, has the flanges, by which the several lengths are bolted together, cast upon the interior instead of the exterior of the circumference, so as to present no impediment to the free descent of the pile through the ground. We have already mentioned that the diameter of the pile should not exceed certain limits, and it is equally apparent that it should also possess a dimension sufficiently large to allow of a man getting inside and bolting the different lengths together. Wherever the current acts in contrary directions, the piles must be strengthened by the addition of others, fixed in an oblique direction, and tied to them at intervals by diagonal bracing. The general arrangement of this description of strutting is shown in the skeleton elevation in fig. 5, and it must be borne in mind that, in consequence of the variable nature of the strains, all the braces must be made of a section suitable for resisting both tension and compression. This is an important point to be attended to, for a diagonal bar that would solely resist a considerable strain of tension, would be of little or no use if that strain were changed to one of the opposite character.

Screw piles are well adapted for obtaining a foundation in situations similar to that of a sandbank, and where the usual means would be unavailable. They have also been much used in the erection of lighthouses, a description of construction probably demanding their aid more than any other, and, by their agency, these safeguards to the vessels and subjects of every nation may be now established in lo-

calities where the difficulties in the way of securing a firm basis for the superstructure were recently regarded as insurmountable. From their light and elegant appearance they would be very suitable for supporting the girders of piers, jetties, and other designs intended more for light traffic than for loads similar to that of a locomotive. There is this drawback connected with their employment in salt water, viz., that cast iron rots rapidly when exposed to the influence of the sea, either in the open, or when the salt water reaches it after mingling with a river. It becomes in some situations so soft that it may be cut with a knife. As an instance of the rapidity with which screw piles may be screwed down, it may be quoted that Mr. Brunel, by the aid of capstan bars, worked by strong hand winches, screwed a cast iron cylinder, 8ft. in diameter, down to a depth of 60ft. in forty-eight hours, the strata passed through being stiff clay, sand, and marl. A distinction must be drawn between screw piles, which we have just described, and what are known as disc piles. The latter are not actually screwed into the ground, but the earth is loosened below them, and an alternating motion being imparted to them, they gradually sink down. They are particularly adapted for getting good foundations in sand, which is loosened by forcing water or other fluid under a strong pressure into it, until it permits of the pile descending to a hard bottom. The disc pile has been very successfully applied in several sandy localities by Mr. Brunlees, who was the first to introduce this peculiar method of sinking them. We must reserve for another occasion the subject of cylinders and caissons, which possess many features of interest in connection with Engineering.

LONDON PERMANENT BUILDING SOCIETY.

THE London and General Permanent Building Society held its second annual meeting on Monday. Mr. Thomas Hughes, M.P., presided. The report stated that the progress of the Society had been such as to warrant the directors in believing it to be unprecedented in the history of building societies. During the past year the sum of £14,000 had been advanced to members for the purchase of houses. The securities taken by the trustees amounted in the aggregate to £18,740. The receipts in the first year from subscriptions and deposits alone amounted to £1,027; in the past year they had been £14,332. To the 31st of December, 1866, 1,141 shares had been issued to 329 members; on the 31st of December last the shares numbered 1,936, held by 517 members. The directors recommended the payment of 5 per cent. interest to all members up to the 31st December, 1866, and for the past year a profit to all at the rate of 7½ per cent. Three retiring directors, Messrs. Hughes, Dunn, and Allan, were re-elected, and a sum of money was voted to the directors for their energy in promoting the business of the Society.

THE LATE GALE.

DURING the late gale which raged over the whole kingdom, a stack of chimneys was blown down at Scarborough. It fell through five storeys, landing on the basement floor, killing one man and injuring four others. At the coroner's inquest the borough surveyor, who attended, stated that not only were the buildings badly constructed, but that very serious discrepancies existed between the work done and the plans deposited before the Local Board. The chimneys should have been erected in double stacks, and would then, in his opinion, have been safe. The walls of the houses were in such a condition that, if the props were taken away, they would speedily fall. The staircase walls, instead of being 9in. thick as stated in the plans were only 4½in. thick, and he believed such a wall, a half brick in width, 48ft. high, was not sufficient to insure the safety of the building. We should think not, and trust that the Local Board will have something more to say on the matter.

A considerable portion of the ancient ruin known as Macduff's Castle, at Wemyss, Scotland, fell to the ground last week, having been weakened, it is supposed, by the late severe storms. The castle is believed to be at least one thousand years old, and some parts of the masonry have been honeycombed to the depth of 5in. by centuries of exposure to the weather.

On Tuesday morning, the inquest was resumed, at the London Hospital, on the body of Mrs. Eliza Thompson, one of three women who were killed on the 1st inst. by the fall of a chimney shaft at a factory at Bow. Mr. James Edmeston, architect and surveyor, of Old Broad-street, who had examined the remains of the chimney, gave it as his opinion that the occurrence was due to the bad state of the mortar, which had deteriorated by age. The action of the heat from the fires, combined with the rains from the west, would disintegrate mortar very quickly. The chimney fell from west to east. Mr. Wilson, the district surveyor, concurred with the evidence of Mr. Edmeston. The jury returned a verdict of "accidental death," and recommended that such shafts should be regularly examined, so that any deterioration in the quality of the mortar might be discovered in time.

DEATH OF SIR DAVID BREWSTER.

SIR DAVID BREWSTER, Principal of the University of Edinburgh, and one of the greatest natural philosophers of his age, died at his seat, Allerley House, near Melrose, on Monday night, in the eighty-seventh year of his age. He was born at Jedburgh on the 11th December, 1781. Fascinated with experimental science, he abandoned the idea of entering the ministry, for which he studied. His first experiments on light were made in 1799, and from that time he studied the phenomena of optics and the properties of light with unwearied industry, obtaining results which, when given to the world, procured for him the highest distinctions. It was in 1811 that he was led (from a proposal of Buffon) to suggest the construction of a lens out of zones of glass, each of which might be built up of several circular segments, and to propose its application to an apparatus consisting of lenses and mirrors, by which the whole light of the sun could be collected into a burning focus, or condensed into a parallel beam of light. This beautiful invention is now in use in every lighthouse in Great Britain and the colonies. Four years later Dr. Brewster's discoveries of the law of the polarisation of light by reflection, and his analysis of solar light, brought him additional fame. In 1816 he invented the kaleidoscope, the patent right of which was evaded, so that the inventor gained little beyond fame, though the large sale of the instrument must have produced considerable profit. To Brewster also belongs the credit of the suggestion which led to the formation of the British Association for the Advancement of Science. His various scientific works are well known and popular. In 1832 Brewster was knighted by William IV., and it may be said of him that he died literally loaded with honours and decorations.

ART WORKMANSHIP.

THE criticisms we freely offered on the specimens of art workmanship exhibited this year at the Society of Arts have been supplemented by a report from the joint action of Mr. Redgrave and Mr. Digby Wyatt. The works of the successful competitors which had obtained prizes were handed round the room, and were much admired. They were ninety-four in all, and comprised specimens of carving in stone, marble, and oak, *repoussée* work in metal, hammered work in brass and iron, chasing and engraving on metals, painting on porcelain, decorative painting, engraving on glass, wall mosaics, bookbinding, and many miscellaneous subjects.

The report says that No. 68, a female head, "Summer," by Mr. Mark Rogers, is a small work of very great merit, carved by the practised artist whose works have already received the utmost recognition and commendation at our hands. Upon the whole the most satisfactory works to which we have awarded prizes in this division have been contributed by Mr. Brangan and Mr. Dugardin—the former, in a good average style of wood-carving, manifests the possession of considerable taste as well as dexterity, the latter, both in wood and plaster, shows specimens of flower carving of peculiar tenderness and delicacy of handling. Mr. Leach's frieze (No. 89), and "A Midsummer Night's Dream," is very clever; and there is a very agreeable *naivete* in Mr. Goddard's "Girl's Head," carved in pear tree (No. 70). Of the works sent in in accordance with the prescribed designs, the most uniform excellence is shown in the various processes of metal working. Mr. Dufour's *repoussée* work is excellent, as is Mr. Hatfield's (senior) chasing of the "Virgin and Child." In the last-mentioned specimen we recognized an element not often to be met with in these competitions—the handicraft was kept in due subordination, and not suffered to divert the spectator's attention from the general scope and artistic purpose of the model. Too often in such objects the chasing of an angel's wing is made more telling than the angel's head; or the flowers trodden on by an amorino's foot may have had infinitely more pains bestowed upon them than has been given to the definition of the foot itself. So the major is often, through the art-workman's egotism, made to hide its head before the minor; but of this solecism Mr. Hatfield, sen., had steered clear with most commendable taste. Mr. Fisher's marble-carving is very satisfactory, since it shows that the sculptor can not only execute but design. His re-arrangement of the subject given, so as to adapt it to fill a lunette instead of a frieze, has been skilfully managed, and in all the slight changes and additions involved through the re-arrangements he has well maintained the spirit as well as the letter of his pattern. The stone and wood carving is of good average quality, but calls for no special remark. In the pierced work in metal, "ornament after a missal cover," Mr. A. E. Milward in silver, and Mr. J. H. Hatfield, jun., in bronze, have attained rare excellence. Mr. E. Milward has made a good wrought brass knocker, while Mr. W. Sendall's, in iron, is first-rate. We were glad to recognize the perfect success with which, in glass-blowing, Mr. Joseph Leicester had reproduced the tazza from South Kensington. Mr. Oppitz's glass engraving and Mr. Genth's binding (especially the specimen in morocco) were excellent. In the application of painting to industry, the specimens of figure-painting on porcelain by Mr. E. Saunders and Mr. W. J. Nunn, and of ornament painting by Mr. Fisher and Mr. Slater, were better than usual. In the class of decorative painting, however, with the exception of the *grisaille* reproduction, after a picture-frame in the South Kensington Museum, the arabesques contributed furnish a very inadequate idea of even the common run of good trade work in decorative painting, the colouring in all cases being inharmonious, and the style of handling laboured and mechanical. In the same way the competition for the prizes for illumination was not what, in these days, when almost every weekly publication is overflowing with clever illustrations, we have a right to expect. There was a total absence of life and spirit in the specimens sent, the best rising only to about the level of neatness. The die-sinking and wall mosaics were not "up to the mark," but the engraving on ivory, by "G. B.," was very good, and shows something better than much we have seen upon pretentious specimens of furniture, which failed only to attain great excellence through the feebleness and occasional scratchiness of the engraving of the ivories with which they had been inlaid. In conclusion, we beg to offer the following suggestions, if not for adoption, at least for discussion:—Firstly, we think the time has arrived when animation might be given to future competitions by a considerable change of programme. Especial prominence might be given to evidence of ability in processes not commonly practised in this country—such as several of those involved in the manufacture of Venetian glass; in the execution of enamelling, both upon earthenware and metal bases; in the application of painting and lacquering, as in Japanese and Cashmerian work; in damascening, both after the Milanese and Oriental systems, &c. From such efforts new branches of national industry might possibly arise; and, at any rate, working men would be induced to exercise their ingenuity, and to acquire that pliability of general aptitude in which, as compared with the French art-workman, the English artificer is now somewhat deficient. Secondly, the apportionment of the money prizes requires revision, so as to bring the rewards offered into better proportion to the labour or outlay risked in the different sections by the workmen entering upon the competition, regard being, of course, had to the special branches of art industry in which temporary stimulants might seem most needed. Thirdly, prizes might be offered for evidences of proficiency in two or three branches of industry not yet included in the society's programme, as

stained glass, jewellery, brass-rule cutting, the application of turning to artistic wood or metal work, &c. Some such changes, and the withdrawal of all hackneyed models, would probably tend to relieve the apparent monotony of the society's competitions; and, after a year or two's interval, the leading features of the present programme might be reverted to with a fresh and lively interest on the part both of the art-workmen and of the public.

SHEFFIELD ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE first or inaugural meeting of the Sheffield Architectural and Archæological Society was held in the School of Art last week. The Hon. F. S. Wortley presided, and the opening address was delivered by Dr. Aveling. In the course of a lengthy and interesting address, Dr. Aveling remarked that they had assembled to inaugurate a new society in Sheffield—one of noblest aims and widest scope. In naming it, they had chosen two words, "Architectural" and "Archæological"—words of the most absorbing interest to mankind. Proceeding to consider the objects of the society in relation to each of these, Dr. Aveling said—It must be the object of our society to cultivate good architectural taste, and it will be our duty to keep a sharp, jealous, critical eye upon all buildings in process of building or restoration. This is an important period in the architectural history of Sheffield. New churches, chapels, and public edifices are rising on every side, and centuries hence we shall be judged by the feeling expressed in them. If future generations find them strong, simple, honest, and beautiful, they will apply those attributes to us; if they find them feeble, flimsy, paltry, and pretentious, we shall as certainly suffer in proportion, and our memories, together with the buildings we have raised, will fall in speedy ruin and lie forgotten in the dust. The architect has in his hands tremendous power for good or evil. To him we look for the production of habitations which shall enable us to have light, heat, and pure air, three things essential to our health and happiness. He must see also that our drains are so constructed that neither our air should be contaminated nor our wells poisoned. Carelessness on either of these points is certain to produce disease. Let the architect's first aim be health, then comfort, and, lastly, beauty—sanitary arrangements, sound construction, and pleasing ornamentation. If he keep these constantly in view he will win credit to himself, and never have to suffer remorse as having been the cause of suffering and death among his fellow-creatures. But ours is an archæological as well as an architectural society. Let us therefore endeavour to define what we mean by the word "archæology," and mark out the boundaries within which we intend to roam. Paleontology might be called a branch of archæology, but we do not contemplate cultivating the science of ancient beings, of fossils, and organic remains. We do not wish to go into the subject of the relative ages upon the earth's surface, nor of the luminous bodies in the sky. The word archæology, as we use it, must be confined to the works of man. The materials of history created by our forefathers are what we have to collect, decipher, and preserve. Out of these we must wring the knowledge of how our ancestors lived and died, what were their hopes and fears, their joys and griefs. We must not be content to have merely found an ancient piece of work, and hug ourselves with the happy thought of possessing it. We must look upon it as a monument, and diligently learn to read its inscription. The meanest object of antiquity is a word in the history of man.

THE HISTORIC PERIODS OF ENGLISH ARCHITECTURE AND ARCHÆOLOGY.

THE fifth ordinary meeting of the present session of the Historic Society of Lancashire and Cheshire was held, recently, in the Royal Institution, Liverpool, Mr. Matheson presiding. Mr. H. H. Vale, F.R.I.B.A., read a paper on "The Historic Periods of English Architecture and Archæology." Confining himself to the first period, the "Romano-British," Mr. Vale gave a most interesting account of a visit to Wroxeter, the ancient Uriconium. We make the following extracts from the concluding portion of his paper:—On approaching Wroxeter, no towers, no columns, no temple walls give you the indication of the remains of a vast city, some three miles in diameter, for the greater part of the area of Uriconium is under the soil, and bears the rich waving harvests, the grassy meadows, the hawthorn hedges, and clumps of woodland, even as the other portions of the Severn valley do, with this exception, that the "black soil" of Uriconium, when only about six in depth, is richer than that of the deeper soil of the surrounding country. No indication of art, excepting in its ruder type, could we discover; simply rows of small square stones, resembling mosaic work, with here and there a bright red line of Roman brick bonding the whole mass together. A little further along the road, which, in fact, proved to be the Watling-street of the Roman itineraries, we alighted, and, entering by a small wicket-gate the enclosure, found ourselves in the presence of the guide to the ruins of Wroxeter. We followed him into a hut or temporary museum, and were shown some jars and ornaments which had only just been unearthed by the excavating party. After inspecting the broken Samian ware, the deer-horns used to make ornaments, pins, &c., the urns, vases, tear or unguent bottles, and coins of the ancient Roman citizens, who, without doubt, had lived and died upon the very area which we now surveyed, our guide leading, we followed him through the silent streets and courts of Wroxeter, and, as he told the wondrous tales of life and death which these exhumations have revealed, we felt a strange, indescribable sense of melancholy stealing over our minds. Here were the baths in which they had bathed, and the courts which their feet had trod; and the shops wherein they had traded, and the houses wherein they had loved and hated, and been merry and gay, were again opened up to the light of day, after lying in the silence of the grave for some thirteen centuries and more. Such scenes could not fail to awaken a train of sad reflections, nor were the other surrounding objects of a character calculated to fill the mind with more cheerful thoughts. No graceful colonnades, no curving arcades, no sculptured friezes, were here displayed to view—no rich ivy-growth, or lichen-dappled wall, to cheer the eye and refresh the heart; but rows of brick piers set in serried lines, and pieces of Roman masonry, without any of the poetry and spirit of mediæval work, and bits of crude mosaic, without the colour and expression of Gothic encaustic, and that great piece of towering, level, horizontal wall with a square breach through its base; neither arch, nor turret, nor soaring gable, to give variety of outline, nor jutting corbel to toy with a sunbeam, nor ivy branch to dally with a breeze; a dead, heavy, severe monotone reigning over these rude Cyclopean fragments of the past. There are, doubtless, many who, with antiquarian zeal, come hither and find much pleasure in exploring these ruins as a matter of scientific information, and who examine with care every coin and tile and scrap of masonry here found; but after lingering in the precincts of some of our Middle Age abbeys and castles, after sketching the delicate traceries, and measuring the shafted piers, and restoring in imagination the perspective of long arcade and shadowy chancel, one here experiences a strange dearth of romantic interest, rendered more apparent by the anticipations that one carries to the place from reading the descriptions of various writers upon the ruins of Wroxeter; yet, despite all these drawbacks, a strange fascination seems to linger about the place, a kind of realistic mystery, a ghostly entity, like a hard-cut shadow on the wall, which moves not, flickers not, changes not, but ever rests there with its dark personation of gloom and awful presentiment of sorrow. Yet, as we said before, this is no region of romance, but a real scene of matter-of-fact Roman life in Britain; perhaps hard, careful, frugal life too—a colony of farmers, doubtless, to whom a coined denarium alone expressed the moulded type of imperial grandeur—practical numismatics, in fact, being the chief fragment of the great realm of Roman fine art with which it was their lot to become acquainted. Certainly some rude flatly carved capitals have been found, but few of them would fit the roughly hewn shafts that lay beside them; their bases bore the type of a low uncultured taste, and inscriptions the lettering of an unlearned race of colonists. The brooches of bronze and pins of the horn of the deer that have been found appear to us to be rude and rough, and their weapons coarse and heavy; the craniums that have been exhumed are flat and small and undeveloped, as though intelligence had been there dethroned and driven from her temple by the hard matter-of-fact exigencies of colonial existence. These strange little tear-bottles (to which name we prefer, in spite of the dicta of the learned, to cling) are the most pathetic things they have found, and a touch of deepest poetry clings to them. Here is one of tiny proportions. Alas! some loved corpse had but one solitary mourner, perchance, to weep over its inornamated ashes; while here again is one of goodly proportions, that would hold the tears of a sorrowing neighbourhood for some great benefactor, whose good life lives even yet in this empty tear-bottle, the evaporated contents of which have long ago ascended up to heaven, with a sweeter perfume than the incense from a hundred Pagan altars.

Building Intelligence.

CHURCHES AND CHAPELS.

The church of St. Peter, Dunboyne, Ireland, has been consecrated by the Bishop of Meath. The style is Early English, and the edifice is from the design of Mr. S. Rawlinson, architect, Chesterfield.

Two hundred years ago the church of St. Catherine, Gloucester, was so battered in the siege as to be rendered unsafe for use, and a year or two after it was pulled down and the materials were converted into a market. For two centuries the parish has had a clergyman, but no church. About six months ago it was determined to build a new church; subscriptions were promised, and the Bishop laid the corner-stone. The church is now nearly completed, and it is to be opened on Easter Monday. It is of brick; and every seat in it will be free. Messrs. Medland, Maberly, and Medland, of Gloucester, are the architects.

Spafields Chapel, Clerkenwell, one of the ugliest buildings in London, has just been partially reconstructed, and a new front added, somewhat after the style of the Tottenham Court-road Chapel. An obelisk of Aberdeen granite, to the memory of the Countess of Huntingdon, has been erected in front of the chapel.

HULL.—An immediate effort is to be made to restore the Church of Holy Trinity, Kingston-upon-Hull. Mr. Gilbert Scott estimates the cost of restoration at £17,000, which, with architect's commission, and clerk's salary, will necessitate an outlay of about £20,000. Of this sum £11,200 has been subscribed. The historical associations and architectural beauty of the edifice render its preservation from ruin a matter of local, as well as of general, interest and importance.

BUILDINGS.

The Morgan Hospital, Dundee, for the maintenance of 100 poor boys, was formally opened on Thursday last. The building is in the French Gothic style, and was designed by Messrs. Peddie and Kinnear, architects, Edinburgh. It has occupied about five years in erection, and has cost about £17,000. After providing for the building, a sum of upwards of £65,000 is left by the will of the late Mr. John Morgan, the founder, for the maintenance of the hospital in all time coming.

A number of improved labourers' dwellings have just been completed at Croydon, from the designs of Messrs. Beck and Lee, architects, Finsbury-circus. There are ninety-two rooms, divided into tenements of from one to three rooms. Each living room is provided with an oven and large cupboard, and every room has a fireplace. Provision is made for all tenants to place flowers in the windows by means of balconets. Every landing has a large sink and water tap; also they are provided with a dust-shaft. The whole of the stone staircases and landings are lighted with gas. A wash-house, with six boilers and large drying-ground, is provided. Messrs. Colls and Son, builders, Moorgate-street, were the contractors.

The rooms formerly known as the "Town Rooms," in Reading, have recently been materially altered, and are now called "The Assembly Rooms." They have been tastefully decorated by Messrs. Green and King, of Baker-street. The walls of the various rooms are panelled with borders and ornaments. The colours chiefly used are Etruscan buff and red, turquoise blue, salmon colour, and light sage green.

The newly built T[illegible] and [illegible] to the Crystal Palace having been completed will be thrown open to the public to-morrow. The erection was undertaken by Mr. Hamilton, Windsor Iron Works Company, Liverpool, under the direction of Mr. E[illegible].

TO CORRESPONDENTS.

To OUR READERS.—We [illegible] obliged to any of our readers [illegible] of works contemplated [illegible].

Letters relating to [illegible] and the ordinary business of the [illegible] addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for [illegible] week must reach the office before [illegible].

NOTICE.—THE BUILDING NEWS inserts Advertisements for [illegible] WANTED, &c., at ONE SHILLING for [illegible] Words.

RECEIVED.—[illegible]—A. W.—[illegible]—E. B.—[illegible]—W.—[illegible]—H. H.—[illegible] W.—[illegible]—W. B.—E.—D.—[illegible] W. M.—[illegible] W.—[illegible]—J. F. W. G. W. P. E. F. M.—[illegible] of the Society of Arts, John street, Adelphi.—[illegible] Secretary of the Architectural Institute [illegible].

Correspondence.

CONTINENTAL JOINERY.

To the Editor of the BUILDING NEWS.

SIR,—I have read with deep interest your remarks, or rather statements, concerning Swedish joinery, and, but for the very forcible manner in which you make them, I should have considered you the victim of a joke. If half be true, we have very much to learn from the Scandinavians' style. They astonished the Romans of old, but their accomplishments in the present day sound like magic to the British. Such a race of fire-eaters must be altogether unearthly, and if they can thus walk over the English joiner, who has hitherto been second to none, what will they do with the mason, bricklayer, and labourer? To be on a par with the joiner, this last must have wings to fly upon the scaffold with, and a back that will bear a thousand of bricks at a time. The English joiner is generally a steady, reasonable man, a ratepayer, and the father of a family, and if his death is premature—and, as a rule, it is—it is from exhausted nature. He is invariably lantern-jawed and lean, his hands are horned, and his back humped by work. What, I ask, must these Swedish joiners be like? They must certainly feed upon sawdust, and clothe themselves with shavings; yet their labours equal that of Hercules. According to your statements, Mr. Ekman will sell a superior made window of selected wood of the average size of such in England for seven shillings, or, in other words, 12 superficial feet of sashes and frame at sevenpence per foot. Let us see what the poor joiner will get out of this, and see whether or not our consciences will let us sleep after purchasing one of Mr. Ekman's "seven shilling windows."

"It [illegible] wear [illegible] out,
But [illegible] lives."

		s.	d.	
1.	The selected wood	2	[illegible]	(in Sweden)
2.	[illegible]	[illegible]	9	
3.	Rent, supervision, &c.	[illegible]	3	(little enough.)
4.	Carriage to the port	0	[illegible]	
5.	Sweden to England	0	[illegible]	
6.	From the port to the wharf here	0	[illegible]	
7.	Rent, salesman and booking	0	6	
8.	Profit, [illegible] per cent	0	[illegible]	
	Total	6	0	

	s.	d.
Selling price at the City road	7	0
Cost, without labour	6	0
Balance for labour	1	0

Now, 3½ hours at 3½d. per hour is 1s. 0¼d., and this must be done to earn 3s. 6d. per day of 11½ hours. It is well known that not one in twenty joiners can do this in four times 3½ hours, and I know of no instance in which it has been done for a wager in twice 3½ hours. One hour at the very least is required to sharpen the tools, and when it has been done in 8 hours the man has looked like one of the Oxford eight after they have won the race, or the winner of the Derby at the "post."

I do not think it necessary to analyze any of your other statements, but I can assure you that the prices quoted are only the average prime cost of labour in London. It follows that these Swedes will cut the ground from under our feet if these prices will pay them, and we shall have to go back to the calling of our mediæval forefathers—the soil, for it would be madness not to let the Swedes do all the joinery.—I am, &c.,

A JOINER.

["A Joiner" appears to forget the important fact, that the joinery specified by us last week is produced by elaborate machinery, moved by a 100-horse power steam engine.]

Intercommunication.

QUESTIONS.

[7[illegible].]—KAMPTULICON.—I have a lobby which is flagged, and oilcloth rots upon it, so I propose to put down kamptulicon cloth; but I am told that it is impossible to keep kamptulicon clean, as it will not bear soap and water, but can only be brushed over. Will some of your readers please confirm or refute this, and tell me if kamptulicon is really more difficult to clean than oilcloth or tiles?—H.

[741.]—GOTHIC WINDOWS.—Will some of your correspondents kindly inform me what is the present practice of London quantity surveyors with regard to the tracery of Gothic windows? Do they take the cube of stone, and the circular, and other labour separately, or do they merely give the superficial area, and state thickness, giving a sketch? JUVENIS.

[742.]—CRAYON DRAWINGS.—Can any of your readers give a recipe for fixing crayon drawings, so that they can be safely bound or put in a scrap book?—T.

[743.]—VENTILATING TIMBER.—Could any of your readers inform me of a cheap and effectual mode of ventilating chamber floor timber?—R. S.

[744.]—HOLLOW BRICKS.—The following is copied from a daily paper:—"It has been found by actual experiment that cottages, damp-proof, can be built at 25 per cent. less than the present cost by using hollow machine made bricks, each brick being the size of twelve ordinary bricks." I shall feel obliged if any of your correspondents will inform me where the bricks can be purchased, or who is the maker of the machine.—H. R. C.

[745.]—CEMENT FOR AQUARIUMS.—I have tried several different cements for my aquarium, but none of them has answered so well as I could wish. If some of your readers know of a good cement, and will send the recipe to your Intercommunication, I should be obliged.—S. L. G.

[746.]—TO POLISH AND CLEAN MARBLE.—Perhaps some of your readers would favour me with a few hints on the subject of polishing and also cleaning marbles. Such books as I have been able to consult, say nothing on these points.—P. S.

[747.]—REMOVING MATERIAL.—I should be obliged by some one giving me a definite answer to the following question: Can a contractor after delivering material upon the site where he has contracted to erect a building, remove such material, or authorise its removal, without the consent of the proprietor or his architect? By removal of course I mean taking it away from the premises. Your kind attention will oblige—C. W.

REPLIES.

[714.]—ROOF CONSTRUCTION.—Without a plan it would be difficult to comprehend the exact drift of the first part of Inquirer's question. With respect to the second, for a 6ft. bearing, the scantling of the purlins should not be less than 6ft. by 4in.—J. M.

[716.]—TRANSVERSE STRAIN.—There is no rule for the distance to be adopted between bearings in experimenting upon the transverse strain of beams, girders, and bars. Each experimenter selects his own span according to circumstances. Thus, Mr. Hodgkinson selected 4ft. 6in. for some cast iron bars he tested to the breakage point; while 7ft., 9ft., and greater lengths, have been chosen in experiments upon timber. In an experiment made upon a long rod for the purpose of ascertaining the effect of continuity in beams, the span was nearly 20ft. About 5ft. would be a good distance for a bar of iron, as it would be long enough to allow deflection to come into play without permitting it to exert too great an influence, owing to the lateral dimensions of the bar being comparatively small.—GIRDER.

[725.]—ZINC.—"R. K." and "Ecce" are both correct in their replies so far as regards the insoluble and hard protecting oxide which forms upon sheet zinc; but it should be made clear that the sheets must, above all, be thick enough to enable this oxide to form without going through; and that, therefore, thin sheets—and, above all, the thin plating upon sheet iron—reap no benefit from this protecting coat, as they are destroyed in its formation.—E.

[727.]—QUANTITY SURVEYORS' LIABILITIES.—The question of "B. B." appears to me superfluous. Unfortunately, it is but too common a practice in the present time for the architect or designer of the work to pay the surveyor but a portion of his proper per centage, although the latter is equally to blame for the arrangement. There is no question, however, that such an arrangement would never stand legally, and the person who endorses the bills of quantities would be held responsible for them by any jury in any court.—A CLERK OF WORKS.

[733.]—CEMENT AND GRAVEL.—In reply to "Plebs," respecting my system of cement concrete block construction, he need not fear of the blocks bulging or crushing, for they will set as hard as a rock in a very short time. He may thicken his walls to go any height; but he can carry up his 20ft. wall, without the least fear whatever, as I stated in the BUILDING NEWS of December 13th. If "Plebs" wil send me his name and address I will put him in the way to carry out his job in every practical way.—W. MAY, jun., Northfleet.

[734.]—BUILDING MATERIALS IN NEW ZEALAND.—I have recently come from the South Island, and from fourteen years' colonial experience feel myself qualified to give practical information. I have seen the various timbers, stones, clays, &c., of the islands, and can safely say I know of no field in the southern hemisphere to vie with the islands of New Zealand. I hope to return and spend my remaining days there. My time is fully occupied from nine till five daily, but I should be pleased, after that hour, to meet the advertiser anywhere he may appoint, in the City or in Greenwich, should I not have a previous engagement.—R. H. DREW, 16, Park Road-terrace, Forest-hill.

[737.]—CAEN STONE.—The new façade of Buckingham Palace, erected in 1846, in the opinion of Mr. Gwilt, is the most remarkable failure of Caen stone. It is not advisable to employ this stone in situations where water is likely to lodge, or even to be taken up by capillary action, unless the projecting parts be protected by metal. The projections of Mr. H. T. Hope's house in Piccadilly, built in 1850, were protected by lead or slates, and this house is considered one of the best specimens of the employment of Caen stone in London, as it has stood well. In upright walling above the plinths and in the sheltered portions of the cornices, this stone may be employed when judiciously selected, and in internal work with safety and economy. In Caen itself, the basements of houses are executed in granite or Crenilly stone, which is particularly non-absorbent. Sea air is particularly destructive to Caen stone.—M. M.

[738.]—MILK OF WAX VARNISH may be thus prepared:—Melt in a porcelain capsule a certain quantity of white wax, and add to it while in fusion an equal quantity of spirits of wine of sp. gr. 0·830; stir well and pour it on a large porphyry slab. The granular mass is to be converted into a paste by the muller, with the addition from time to time of a little alcohol. As soon as it is sufficiently smooth and homogeneous, water is to be introduced in small successive quantities to the amount of four times the weight of the wax. The substance is to be then passed through canvass to separate any particles imperfectly incorporated. The varnish thus prepared should be spread over the surface of a painting, allowed to dry, and then fused by passing a hot iron over the surface. When cold, rub with a linen cloth to bring out the lustre.—X. X. X.

[739.]—LIZARD AND FROG.—Batrachus and Saurus were two architects of Laconia. The name of the first signifies a frog, and that of the second a lizard. They perpetuated their names on many of their works by the allegorical representation of these animals sculptured upon them. The churches of St. Eusebius and St. Lorenzo fuori le Muri, at Rome, still contain some columns whose pedestals are sculptured with a lizard and a frog, and they are probably the subjects of Philo's sketches.—POLLIO.

WAGES MOVEMENT.

The operative masons of Halifax have sent a six months' notice to the masters that they will require an increase of 2s. per week.

The master builders of North Staffordshire have given notice of a slight increase in the working time of their men, thus deviating from a mutual arrangement entered into by arbitration in May last. The men have determined to retain the present code of rules by every legitimate means in their power. By a subsequent resolution they have empowered delegates to settle the dispute to the best of their judgment.

The labourers, two hundred in number, employed in excavating the ground for the construction of the new graving dock at Limerick, for which the Treasury has granted £20,000, have struck for an advance of wages, from 9s. to 12s. per week.

At Chester, the journeymen painters having given notice to their employers for an increase of wages, to commence in three months, the officers of the Local Association of Builders are arranging to take the matter into consideration.

The Association of Operative Plasterers at Bath have given notice to the masters, demanding an advance of wages to 28s. per week, to commence from the 2nd of May. Two of the masters have sent answers to the Association, refusing compliance with the request.

STATUES, MEMORIALS, ETC.

Two monuments are to be erected on the battle-fields of Alsen and Duppel to commemorate the Prussian victories in the late Danish war. The style of both will be Gothic, somewhat after that of our Eleanor crosses, and they will be each about 60ft. high. The one at Duppel is to cost about £5,800, and that at Alsen about £4,500. Both are to be executed in sandstone, and will be embellished with figures representing various branches of the service.

A monument to the memory of Alexander Smith, the Scottish poet, has been erected in Warriston Cemetery, Edinburgh. It is in the form of an Iona, or West Highland Cross, 12ft. high, set in a square base 4ft. high. In the centre of the shaft is a bronze medallion of the poet, by Mr. W. Brodie, R.S.A. The shaft and cross are elaborately carved. In the centre is a large boss, and the four arms are covered with Scottish thistles. A harp, crowned with a poet's wreath, is sculptured on the upper part of the shaft. The work has been executed by Mr. John Rhind, sculptor, from the design of Mr. James Drummond, R.S.A.

A statue of the late Prince Consort is about to be erected in the People's Park, at Hull. The requisite funds are being raised by public subscription. A marble statue, by Earle, of Her Majesty, already adorns the park.

LEGAL INTELLIGENCE.

NUISANCE FROM SMOKE.—The plaintiff (Crump) is the owner of two houses at Walsall, and occupies one of them. The defendants (Lambert) had recently erected a factory on land adjoining the plaintiff's property, where they smelted iron for the purpose of their business, and also employed a considerable number of men in hammering iron bars. The plaintiff alleged that the smoke and effluvia issuing from the chimney of the manufactory, and the sound proceeding therefrom, were a nuisance, and he instituted this suit to restrain it. The Lord Chancellor held (affirming the decision of the Master of the Rolls) that the nuisance arising from smoke alone, unaccompanied by noise, or from noise alone, or effluvia alone, might be the subject of substantial damages to a plaintiff in an action at law, and that, wherever a jury would give substantial damages in respect of any such causes of action, the Court of Chancery would grant an injunction to restrain a continuance of them. The injunction in this case was, therefore, made perpetual.

A HOUSEOWNER'S LIABILITY.—At the Manchester County Court, on Monday, before Mr. E. Ovens and a jury, Mr. Thomas Lomas, corn merchant, Ardwick, sued Mr. William Smith, of Bowdon, for £50, being the amount of damage done to a cottage in Melbourne-street, Rochdale-road, and expenses incidental thereto, by excavations made upon the adjoining premises of the defendant. Mr. Corbett, of the firm of Corbett and Raby, surveyors, said that, in consequence of deep excavations made in the cellar of the defendant's house, and the raising of that house two additional storeys, there had been a subsidence of the ground, causing the gable wall of the plaintiff's cottage to bulge and other walls to crack. The tenant in consequence left, and the cottage was let at a lower rent. In addition to the actual cost of the repairs a claim was made for damage to light and air by the building of a wall. Mr. Corbett said there must have been negligence on the part of the defendant's contractor or workmen to have caused the subsidence complained of.—For the defence Mr. Bird, architect, was called. He said the plaintiff's cottage was 30 or 40 years old. A sewer made by the Corporation in a passage 4ft. wide separating the properties of the plaintiff and defendant had weakened the foundations, causing a subsidence, which had been increased slightly by the defendant's excavations. The damage complained of was unavoidable; but 10s. would have been sufficient for its repair.—Mr. Thomas Taylor, architect, also described the damage as insignificant.—The jury returned a verdict for the plaintiff; damages, £9 5s. 9d.

SINGULAR DECISION.—BROWN V. TRUETT.—This case was tried at the Bow County Court on Friday last, before J. B. Dasent, Esq. The plaintiff, a builder, sought to recover the sum of £4 16s., being the balance for extra works in connection with certain alterations to defendant's premises at Limehouse. The contract sum was £158, the extra works amounted to £14 16s. The defendant had paid the builder £168, being the contract amount, and one of the items of extras, but denied his liability to pay the others, although the fact of their execution was not objected to, upon the ground that his surveyor had not acquainted him during the progress of the works with the fact that any extra works had been ordered beyond the one above mentioned. Mr. Harris, called by the plaintiff as a witness, stated that, in his capacity of surveyor to the works he had seen the advisability of having these extra works executed, and had consequently, on defendant's behalf, given the orders (verbal ones), and had subsequently certified the builder's account. He also produced the contract, which specified that "the works were to be carried out according to the plans and specification signed by the parties thereto, or according to any alterations or additions which should be from time to time set forth in writing by the surveyor and delivered to the said Charles Brown;" another clause also provided that the surveyor shall arbitrate and settle any difference or dispute that might arise between the parties in relation to the contract, either as to the quality of the work, or payment for the same. His Honour decided that the plaintiff not having written orders for the extra works, as provided by the contract, was not entitled to recover. Verdict for defendant accordingly.

It is stated that Mr. Clutton will be the architect of the Roman Catholic Cathedral to be erected in Westminster.

COMPENSATION.

THE DUKE OF BUCCLEUCH V. THE METROPOLITAN BOARD OF WORKS.—This was an important action before the Lord Chief Baron, and a special jury in the Court of Exchequer, to enforce payment of a sum of £8,325 as the amount of compensation awarded to the Duke of Buccleuch, by the decision of Mr. Charles Pollock, Q.C., to whom the case had been referred as umpire, in consequence of the injury done to his occupation of Montague House, Whitehall, and the depreciation of the value of his interest in the property by the construction of the Thames Embankment. The case presented a number of points of considerable interest. The claimant had demanded a sum of £10,000, and one of the surveyors examined on his behalf had assessed the injury to the estate at £18,000. However, the compensation having been thus assessed by the umpire, the Metropolitan Board refused to pay the money upon the ground that the umpire had been influenced in making his assessment by taking into the account items of calculations which were not properly admissible. For example, compensation was allowed because of the annihilation of a certain jetty extending into the bed of the river from the garden wall, by which the occupants of the mansion had been in the habit for many years of receiving the family washing, ice, and fruit in transit by the river from the duke's residence at Richmond, and likewise coals. It was contended, first, that the claimant had no right by way of easement to the use of the jetty; and, secondly, if he had, that its destruction was not matter for a compensation in money, but the board should have been compelled to make a fresh jetty. In the next place, it was endeavoured to be established that the umpire in awarding the amount of compensation had taken into account that the claimant's view of the river from the lower windows of the mansion would be interfered with by the creation of a roadway along the embankment, and that the value of the property was proportionately depreciated, and such interference with a prospect did not form a foundation for a legal claim, and consequently if the umpire had been so influenced his assessment was wrong. Mr. C. Pollock, Q.C., on being called as a witness, said that the claimant held under a lease granted to him by the Crown in 1854, for a term of ninety nine years, at a rent of £800 a year, in consideration of an expenditure of £20,000 on the building of a mansion. (Counsel stated that £100,000 was the amount actually expended). In arriving at a conclusion as to the amount to be awarded as compensation, he had assessed the loss of the jetty at £200, the structural damage to the walls of the mansion at £50; the capitalised rent of the garden to be created by the appropriation of the land at the disposal of the board between the roadway and the present terrace of the mansion, supposing his grace disposed to lease it from the board, £2,475. Next, the expense of laying out the garden he put down at £600; and, lastly, he assessed the depreciation in the letting value of the mansion at £5,000. In arriving at a conclusion as to the depreciation in the value of the mansion consequent upon the formation of the embankment, the learned umpire would not allow that he had been influenced by the idea that the prospect from the house would be interfered with. He had considered, however, that its privacy would be, and that was a consideration of great weight with many people, and he had also taken into account the injurious effect upon furniture and the articles of vertu stored in the mansion, which the contiguity of a great public thoroughfare would cause. A great deal of evidence was heard on both sides. At the close the Chief Baron directed a verdict for the plaintiff, reserving leave to the defendants to move the court above on the points of law argued on their behalf. Amount of award £8,325, interest, £208; costs of award, £356 11s. 5d; total, £8,889 11s. 5d.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers, "On the "Panama Railroad," and the "Darien Ship Canal," by Dr. Cullen, 7 30.

TUES.—Institute of Civil Engineers, "On the Supporting Power of Piles, and on the Pneumatic Process of Driving Iron Columns as practised in America," by J. M'Alpine, M Inst. C E., 8.

WED.—Society of Arts, "On the Supply of Animal Food to Britain, and the means proposed for increasing it," W. L. Scott, F.C.S.

SAT.—Associated Arts Institute. "On some Thought and Experiments in Reference to a theory of Colour," by U. C. Thomas.

Our Office Table.

The Irish papers state that the Treasury has granted £100,000, for the purchase of the Exhibition Palace, the site for the Royal Irish Institute of Art; also similar sums for the improvement of Cork harbour, and for the construction of a harbour in Belfast Lough.

It appears that the Vestry of Bermondsey having been put to the expense of £150 in repairing stones in front of the public-houses in their parish, have come to the determination to prosecute all draymen known to land their butts on the street pavement. The Vestry offers a reward of 5s. to any person giving information which shall lead to a conviction.

We are requested to state that the voluntary architectural examination (Royal Institute of British Architects) will be held in the second and third weeks of May. Applications for examination and all preliminary work must be delivered on or before 31st March next. The examination of the present year will be held, if the application of even one candidate be approved by the council. Copies of the regulations, &c., may be had of the Assistant Secretary at the Institute.

Though not finished, the new Opera-House at Paris narrowly escaped destruction by fire on the 19th ult. The fire broke out in one of the couloirs leading to the salle, and was caused, it is presumed, by a stove chimney, which serves to heat the ateliers of the modellers. It was fortunately speedily extinguished by the pompiers.

One of the late uses of paper is its application in the manufacture of pails, wash-basins, pans, spittoons, &c., by the American Papier Maché Manufacturing Company, of Greenpoint. The paper from which these articles are manufactured is rendered impervious to the action of water or acids; the utensils can be placed in an oven till the water will boil in them; placed in the sun at the hottest season, or exposed to the severest cold, without the slightest effect on them. Where wood would rot and iron rust, these articles are unaffected, and with proper usage would be as good as new. In pails there is an advantage, that water will not taste of the material and will never soak, and they will not fall to pieces; they are lighter than the wooden pail, and, being a non-conductor of heat, will keep water cool. The articles are coated with a vegetable composition, which, even if it does wear off, does not affect their durability, or injure them, except in appearance.

The Somerset Archæological Society will hold its next annual meeting at Williton, in September, under the presidency of Sir A. A. Hood, Bart., M.P.

At a meeting of the Worcester Archæological Club, last week, Mr. Binns was re-elected president, Mr. B. Woof, vice-president, and Mr. J. Severn, secretary. A paper on "The traditions of Worcestershire" was read by Mr. Edwin Lees. Mr. Baxter exhibited a rare specimen of Worcester book-printing in the shape of a Prayer-book, printed in 1552, by John Owen, who lived in High-street. The book belongs to the Chapter library.

It is mentioned by the "Pall Mall Gazette" that the cost of distilling water at Annesley Bay, Abyssinia, is 2s. a gallon, and the daily needs of the men and animals collected there average 40,000 gallons a day. Therefore, the water supply alone of that station is costing the British taxpayers at the rate of £1,520,000 a year.

A fire, which nearly resulted in the destruction of St. Nicholas Church, Liverpool, the other day, appears to have been occasioned by an act of gross negligence. A number of plumbers, who were employed in repairing the lead on the roof of the church, incautiously left a quantity of lighted charcoal in a grating used for the purpose of melting lead. Some of the coal fell upon the roof, which became ignited, and the fire speedily extended to the rafters and spread rapidly. The roof being a ceiled one acted as a sort of flue for the fire. Nearly the whole of the north portion of the roof has been destroyed, and the organ has also been completely damaged. The casualty furnishes a warning to thoughtless workmen.

A curious fact has transpired with regard to the effects of pipe-clay on human life. A fine young fellow, named Soloman, a bandsman, died at Aldershot last week. He had complained very much respecting the constant use of wet pipe-clay to his tunic, which always gave him cold, being obliged to wear it sometimes wet, not having time to dry it for duty; and also of the constant dusting of the tunic to take out the pipe-clay, as being bad for the lungs. This case has led to the suggestion that the fashion of having white tunics in the service for our bandsmen might well be done away with.

Tenders are advertised for the erection of new National Schools at Tynemouth, and several improvements are intended to be made in "the Brighton of the North," in the course of the spring, to make it more attractive to the crowd of visitors who throng its beach, pier, and promenade every summer.

During the last ten days the Camden Town Omnibus Association has worked with complete success a patented system of issuing tickets to all passengers on one line of their conveyances. The public, by this arrangement, are protected from overcharge in the payment of fares; and in the event of leaving property behind in an omnibus, the numbered and dated ticket materially facilitates recovery. Another result, it is said, is a considerable increase of the earnings which find their way into the company's treasury. It is under consideration to have the conductorship filled by commissionaires.

Dean Milman is engaged in writing the "Memorials of St. Paul's Cathedral." The work, we believe, will be of a similar character to Dean Stanley's interesting "Memorials of Westminster Abbey."

The iron framework of the Paris Exhibition building was sold on Saturday last for £60,000, to a society of contractors and builders. The "Figaro" remarks that the building has taken more time to disappear than to construct.

Mr. Laffin, a provincial architect, was recently employed by the Belgian Government to execute some works at the ruins of the castle of Creve-Cœur, rendered necessary in consequence of recent giving way of the soil and masonry. In the course of the work he discovered some mines, placed there it is supposed by the troops of Henry II. of France, when, under the command of the Duke de Nevers, they besieged the town on the 7th July, 1554. The earthbags containing the gunpowder are reduplite decayed, and the pieces of wood laid around them are almost intact. The supposition is, that the intention was to blow up a portion of one of the conical towers which is still standing, and from the top of which, as the story runs, the three ladies of Creve-Cœur threw themselves into the Meuse.

People are laughing at a rather characteristic anecdote of the Bishop of Oxford. It is said that Mr Alfred Pye has been employed to design a gateway for the palace of Cuddesdon; and when it was finished, the Bishop liked it so much that he suggested placing his own initials over one pillar, and those of the architect over the other. But when it was proposed to put "S. O." on the right column and "A. P." on the left, the Prelate objected that that would never do, as it palpably spelt "Soap."

The United States' Statistical Bureau, attached to the Treasury Department, reports that there were in that country at the close of 1867, 54,325 miles of railways, of which 38,005 miles were completed, and the aggregate cost of the roads and their equipments was 1,651,050,799 dollars. Pennsylvania is the leading railroad State, with 4,192 miles completed, costing 221,947,857 dollars. Ohio has 3,397 miles; Illinois, 3,221; New York, 3,182; and Indiana, 2,306 miles.

A special general meeting of the Royal Scottish Academy of Painting, Sculpture, and Architecture, was held in the Academy Library, at Edinburgh, on Monday, to supply from among the Associates a vacancy in the list of the Academicians, caused by the decease of the late Horatio Macculloch, Esq., R.S.A.; when Mr. Arthur Perigal was duly elected.

The report of the Paris Exhibition Architectural Committee will be presented to the meeting of the Royal Institute of British Architects on Thursday evening next, by Mr. Beresford-Hope, M.P., the chairman of the committee. Mr. George Grove will afterwards read a paper on "The Exploration of Jerusalem and the Holy Land."

So many diverse opinions have recently been expressed with regard to the solution of the problem of the education of the working classes, that the Council of the Society of Arts has resolved to call a meeting of the leading representative men of those classes in order to ascertain their views upon the question. The meeting, or rather conference, will be held on Wednesday, the 4th of March, in the great room of the society at John-street, Adelphi.

Another public meeting has been held at the Shoreditch Townhall for the purpose of adopting measures for obtaining an equalization of the metropolitan poor-rates. The vicar of St. Leonard's, Mr. Samuda, M.P., Mr. Ayrton, M.P., Colonel Thompson, and the Rev. Septimus Hansard, were among the speakers. Resolutions declaring that the present system of rates, by which an undue share of the burden is cast, with crushing effect, upon the poorest parishes and ratepayers, is impolitic and unjust, and that an equalization of the whole charge of the maintenance of the poor is an urgent necessity and a just demand, were unanimously adopted, and a deputation was appointed to wait on the Poor-law Board, to represent the opinions of the meeting.

To-morrow evening, at the Metropolitan Association of Medical Officers of Health, Mr. McCullagh Torrens, M.P., will introduce the subject of a Bill "to provide better dwellings for artizans and labourers," and Dr. Letheby will read a paper on the Cholera Epidemic of 1866.

Though there have been fifty-one fires at theatres since the year 1835, only eight theatres have been burned down, including the recent destruction of Her Majesty's. Most of these buildings, too, had paid much more than their value in fire insurances, and one theatre in particular had paid in premiums a sum which, at interest, would have amounted to four times what the insurance company had eventually to pay. Of these fifty-one fires, eighteen were caused by gas; of sixteen the causes were unknown, and four arose from smoking tobacco. Yet of all these fires forty-three were harmless.

Many months ago we called attention to the condition of the Cobden Memorial at Camden Town. We remarked that everybody wondered when it was going to be finished. The wonder now is whether it will ever be finished. The forlorn pedestal on which the statue of the great Free Trader is intended to rest is fast becoming dirty and soot begrimed, and will be anything but a pleasant or appropriate object when the prospective inauguration day arrives. The ragged-looking hoarding which surrounds it has, of course, been turned into an advertisement stand, for which its position admirably adapts it. We can only hope that the St. Pancras authorities are making a good thing out of it for the benefit of the unfortunate memorial. But, really, something ought to be done to have the monument completed. The whole affair is very discreditable to everybody connected with it.

Mr. F. C. Sumichrast Roussy, F.E.I.S., has been exhibiting to the Scottish Architectural Association, Edinburgh, a collection of photographs of the pictures in the Dresden Museum. The photographs, most of which were taken direct from the original paintings, are 350 in number, and report states that they are finished in a highly artistic style, all of them being choice pictures. Among the photographs which attracted most attention at the meeting were the —"Madonna di San Sisto," of Raphael; "The Madonna and Child," of Murillo; the "Portrait of a Young Woman," after Rembrandt; "The Fortune-teller," of Mieris; and "The Tribute Money," after Titian.

At the meeting of the British Archæological Association on Wednesday evening, Mr. J. R. Planché in the chair, Mr. Holt exhibited an exquisite carving, by Albert Durer, representing the visitation of the Virgin, executed in 1494. This was carved out of a piece of mahogany brought over on his first voyage by Christopher Columbus, and given by him to his friend Martin Boehm, of Antwerp. Martin left it in the care of his brother John, at Nuremberg, who was a friend of Albert Durer's. John Boehm gave it to Durer to carve for him, and it afterwards formed a part of the collection of Mr. Heinlein, passing afterwards through two other hands into the possession of Mr. Holt. Mr. Gordon M. Hills gave an account of a new work on Irish round towers, by Mr. Marcus Keane, which, he said, was an addition to the confusion and mystery already spread over the subject by Irish antiquaries. Mr. Holt also exhibited a silver medal of Martin Luther, by Albert Durer. Mr. Cuming read a paper on Roman bronze statues found in London, and exhibited a hand found in Gracechurch-street, which he judged to have been of the first century. The meeting adjourned to the 26th inst., when Mr. Ralph Carr is to read a paper on the St. Cadwan stone; Mr. G. M. Hills, one on Roman remains at West Hampnett Church; Mr. Vere Irving on the seals of Lanark; and Mr. J. W. Grover on the Roman villa at Chedworth.

Speaking of the Manchester Townhall competition designs, a correspondent says:—Two of the designs have been imported from Paris, and drawn and finished by Frenchmen. As a political economist, don't you think they should be rattened? Scott's lot is high in the market, odds freely taken for place. Only one design will be Italian, or perhaps two, but the flat has gone forth that Gothic is to win, in fact the Mayor says so.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1739 S. TUDDENHAM. Improvements in the Construction and Manufacture of Iron or Metal Rail Rods or Bars for Balconies. Dated June 14, 1867.

The patentee claims, first, producing ornamental bars or rods of the kind mentioned in the title by twisting prepared bars or rods having their surfaces so prepared or ornamented as to produce a twisted bar or rod of a given ornamental section or surface, as described. Second, the use of machinery constructed and arranged as described for the purpose of twisting metal bars.—Patent completed.

1745 J. QUIN. A New or Improved Fire Escape. Dated June 15, 1867.

This apparatus consists of a support and ladder. The support is constructed of a rectangular horizontal frame, similar in principle to the boards used by painters, which rests on the window cill or frame, and is formed of strong iron bars strengthened by cross pieces. To the two side bars of this frame are fixed two longitudinal pieces or bars to form guides or slides for receiving in a suitable position two vertical iron bars, adjustable at any part of the guides by means of pins attached to chains, and passing through holes in the guides and vertical bars or uprights.—Patent abandoned.

1761 J. H. JOHNSON. Improvements in Wood Screws, and in the Means Employed in their Manufacture. (A communication.) Dated June 17, 1867.

This invention relates, first, to wood screws, and particularly to those known as gimlet-pointed screws, and consists in forming in the shank of the screw one or more longitudinal grooves, flat sides, or indentations, which extend upward from the point of the screw, and are transverse to the thread of the same. The second part of this invention has reference to the tools for cutting the threads on the improved or other wood screws, and consists in the employment for that purpose of a cylindrical or other suitable curvilinear form of tool, whether a complete cylinder or only a segment of the same.—Patent completed.

1790 J. COPPARD. Closing of Doors, Windows, and other such Apertures with a Spring, when necessary to Close them by such Means. Dated June 19, 1867.

This invention consists in making a ring made of india-rubber or other elastic substance as a substitute for the ordinary spring used for the purposes mentioned in the title, which said springs may be either round, square, or flat; but the patentee prefers them flat.—Patent completed.

1800 F. G. N. PERRETT. The Self Regulating Balance Blind Pulley. Dated June 20, 1867.

In performing this invention the patentee passes a cord over the wheel or sheave of the curtains or roller blinds in the ordinary way, and then passes the same under a wheel, roller, or sheave fixed at the upper end of a balance weight of any required shape or size enclosed in an outer case of metal, this outer casing being made open at both ends, so that the weight can work up or down through the same, and by its weight alone retain the curtain or roller blind cords at one uniform tension.—Patent completed.

Trade News.

TENDERS.

BARNET.—For house at Barnet. A. Rowland Barker, architect:—

Smith and Son	£1,248 10 0
Brown and Son	1,165 0 0
Scrivener and Stephenson	1,160 0 0
Stringer	959 16 4

BRIXTON.—For building two houses and shops in the Brixton-road, S., for Messrs. Nicholls and Sainsbury. Mr. C. H. Driver, architect. Quantities by Mr. R. O. Harris:—

Nixon	£4,448
Maxwell	4,018
Manley and Rogers	3,948
Taylor	3,897
Jackson and Shaw	3,837
Axford	3,790
Thompson	3,770
Perry	3,635
Nutt and Co. (accepted)	3,440

CAMBERWELL.—For repairs to thirty-nine houses in Albany-road, Camberwell. Mr. Lewis H. Isaacs, architect:—

Cohen	£1540
Simpson and Son	1384
Langmead and Way	1375
Butler	1360
Phillips (accepted)	1287

IVYBRIDGE.—For Independent Chapel, at Ivybridge, South Devon. Messrs. Ambrose and Snell, architects, Plymouth:—

Condy, Brothers	£950
Brimblecombe and Triggs	800
J. Brimblecombe	757
Marshall	742
Hurrell	736
Jenkins	729
Clarke	717
Dyer	715
Crispin	705
Channon	685
Cornish	640

LONDON.—For alterations, &c., to Nos. 1 to 8, Winchester-court, Monkwell-street, for Messrs. James and Williams. Mr. B. Tabberer, architect:—

Bostel	£1,338
Palmer and Son	1,229
Heaven	1,150
Prince	900
Larke (accepted)	874

LONDON.—For building two houses at Stratford New Town, for the Temperance Building Society. Mr. William Price, architect. Quantities supplied:—

Nightingale	£425 0 0
Perkins	419 0 0
Snowdon	356 10 0
Wheeler	338 0 0
Pierce and Booth	320 0 0

LONDON.—For building new workshops in Griffin-court, Shepherd's market, for Mr. Wolmershausen. Mr. Joseph S. Moye, architect:—

Foster	£735
Sapwell	728
Fish (accepted)	690

LONDON.—For a Factory and Stables in Peckham-grove, Camberwell, for Mr. Jones. Mr. Coe, architect. Quantities supplied:—

Larke	£785
King and Sons	760
Batchelor	739
Johnson	719
Shapley and Webster	673
Smith	658
Mortar	654

LONDON.—For erecting Tavern and Shop in Old-street, St. Luke's, for Mr. A. Bowden. Mr. J. T. Rill, architect:—

Brown	£3,307
Chesman	3,134
Sabey	3,049
Perry	3,016
Moreland and Burton	2,995
Rivett	2,953
Webb and Sons	2,769
Enner	2,651
Henshaw	2,629

LONDON.—For proposed New Workhouse for the parish of St. Mary, Islington. Mr. R. H. Burden, architect:—

Heath	£98,000 !
Hill and Keddell	80,073
Simpson	79,950
Foale	79,600
Piper and Wheeler	79,100
Kirk and Parry	78,730
Jackson and Shaw	78,850
Patman and Fotheringham	76,596
Higgs	76,350
Palmer	74,360
Myers and Sons	74,280
Manley and Rogers	73,510
Carter and Son	73,385
Mansfield and Price	72,347
Mansbridge	72,269
Bracher and Son	70,500
Perry	69,875
Executors of John Adams	69,194
King and Sons	68,885
Hart	68,793
Webb and Sons	68,350
Lacey and Flaxman	66,476
Henshaw	66,400
Nutt and Co.	61,800
Sawyer	43,586 !

PLYMOUTH.—For two houses in Notte-street, Plymouth. Messrs. Ambrose and Snell, architects:—

Finch	£946
Gloyn	910
Condy, Brothers	825
Clarke	815
Verren	795
Elford	791
Channon	787
Marshall	785
Call and Pethick	769
Elliott	768
Price	759
Reed	749
Slade	705

PROPERTY SALES.

AT THE MART.—By Mr. Haynes.—Leasehold residence, No. 29, Devonshire-road, Hackney, let at £30 per annum, term 79½ years unexpired, at £5 per annum—sold for £285.

FEB. 5.

AT THE MART.—By Messrs. Rogers and Chapman.—Leasehold residence, No. 59, Gloucester-street, Warwick-square, annual value £80, term 64 years unexpired, at £8 10s per annum—£490.

Leasehold residence, No. 6, Denbigh-place, South Belgravia, let at £60 per annum, term 79 years from 1848, at £9 per annum—£645.

FEB. 6.

AT THE MART.—By Mr. C. S. Barker.—Leasehold house, No. 50, Sharsted-street, Kennington Park, annual value £40, term 99 years from 1865, at £6 per annum—£350.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Baldwin, Ann's Terrace, Cambridge Heath, builder, February 25, at 11—Robert William Bell, Tring, builder, March 2, at 12—William Miller, Lewisham, builder, March 2, at 12—George Prince Vallas, Bayham-street, Camden Town, plumber, February 25, at 2—Thomas Bryant, Bromley, Kent, builder, February 25, at 1—George Hutt, Walbrook, and Brentford, iron merchant, February 26, at 12.

TO SURRENDER IN THE COUNTRY.

Henry Barrett, Bradford, painter, February 18 at 9.15—George Button, Hull, engineer, February 18, at 11—Christopher Coney, Bournemouth, builder, February 21, at 11—Daniel Coleman Field, Broadwater, Sussex, carpenter, February 22, at 11.45—Thomas Groves, Appleby, builder, February 21, at 12—Hugh Prichard, Leeds, engineer, February 18, at 12—Aaron Robinson and Charles Tomkinson, New Wortley, near Leeds, bricklayers, February 24, at 11—Thomas Cox Stretton, Old Basford, builder, March 10, at 11—Robert Williams, Rhyl, builder, February 20, at 11—Myers Abrahams, Dover, glazier, February 22, at 12—Edward Bartle, Great Hortou, painter, February 25, at 9.15—Thomas Watkins Copner and David Allen Jones, Birkenhead, timber merchants, February 24, at 11—John Crake, Southport, joiner, February 22, at 11—Patrick Farrell, Salford, builder, February 27, at 12—John Sanders, Aston-juxta-Birmingham, builder, February 21, at 12—William Stone, Cromford, Derbyshire, builder, February 25, at 11—Robert Williams, Chester, stonemason, February 24, at 11.

BANKRUPTCIES ANNULLED.

William Brooks, Clarendon-road, Notting Hill, builder, February 8—William Hutchinson, Salford, engineer, February 3.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

March 12, C. H. Clothier, Woolwich, builder—March 23, R. Sbortridge, Plymouth, plumber—February 28, R. Foster, Liskeard, engineer—February 27, J. Abbot, Newton Heath, builder—February 19, J. Edmonds, Worcester, builder—February 18, J. H. Milnes, Leeds, plumber—February 18, J. Stafford, Leeds, blue slater—February 18, W. Broughton, Leeds, plasterer—February 18, G. Broughton, Leeds, plasterer—March 11, T. Lewtass, Blackpool, brickmaker—March 16, G. Simpson, Stamford, painter—February 25, T. Richards, Old Basford, bricklayer—February 15, C. G. Allen, New Romney, painter—March 9, T. Johnson, Towcester, bricklayer—February 20, J. Fawcett, Stokesley, plumber—February 21, E. Jenkinson, Skelton, brickmaker—March 9, G. Gaskin, Banstead, builder—March 4, J. Ashworth, Doncaster, painter—March 4, T. Hesketh, Manchester, builder—March 10, R. M. Penn, Blakeney, carpenter—March 3, J. Scott, Halifax, joiner.

DIVIDEND.

February 27, H. J. Ledger, Hulme, builder.

SCOTCH SEQUESTRATION.

John Masson, Dunbar, land surveyor, February 19, at 12.

PARTNERSHIPS DISSOLVED.

Whittle and Platt, Wrightington, Lancashire, stone merchants—Carr and Co., Allerton and Hove Edge, Yorkshire, stone merchants—The Tyne Asphalte Company—Bavington and Co., Hauley, parian manufacturers—Chaplin and Co., Dowgate Hill, and Weston-super-Mare, contractors—Frodingham Iron Company.

DECLARATION OF DIVIDEND.

J. Thomas, Bicester, builder, div. 1s. 7½d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	0	12	0	Archangel, yellow	£11	0	£12 0
Quebec, red pine		3	0	4	10	St. Petersburg, yel.	10	10	11 10
,, yellow pine		2	15	4	0	Finland	7	19	8 10
St. John N.B. yellow		0	0	0	0	Memel	0	0	0 0
Quebec Oak, white		5	5	5	15	Gothenburg, yellow	8	0	10 0
,, birch		3	10	4	10	,, white	8	0	9 0
,, elm		3	10	5	0	Oefle, yellow	9	0	11 0
Dantzic oak		3	10	6	0	Soderham	9	0	10 10
,, fir		2	5	3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	12	0	15 0
Memel fir		3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1 6
Riga		3	0	3	5	Pomick Stone pr ton	6	0	8 0
Swedish		2	5	3	7				
Masts, Quebec red pine		6	0	7	0	OILS, &c.			
,, yellow pine		5	0	6	0	Seal, pale...per tun	39	0	40 0
Lathwood, Dantzic, fm		4	10	5	0	Sperm body	106	0	110 0
,, St. Petersburg		8	0	9	0	Cod	34	10	35 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, Sth. Sea, pale	38	0	39 0
Quebec, white spruce		13	0	19	0	Olive, Gallipoli	72	0	0 0
St. John, white spruce		13	10	15	10	Cocoanut, Cochin, ton	55	0	55 10
Yellow pine, per reduced C.						Palm, fine	39	10	40 0
						Linseed	34	10	35 0
Canada, 1st quality		17	0	18	16	Rapeseed, Eng. pale	37	10	38 10
2nd do.		11	10	12	10	Cottonseed	38	0	41 0

METALS.

IRON:—					
Welsh Bars in London	per ton	6 10 0	6 15 0	5	
Nail Rod	do	7 5 0	7 10 0		
Hoops	do	8 5 0	8 10 0	2½	
Hoops, Single	do	9 15 0	10 0 0		
Staffordshire Bars	do	7 5 6	7 10 0		
Bars, in Wales	do	5 10 0	6 0 0	3	
Nails	do	5 10 0	6 0 0	net	
Foundry Pigs, at Olasg. No 1	do	2 15 0	3 5 6	2½	
Swedish Bars	do	10 5 0	10 10 0	net	
STEEL:—					
Swedish Keg, hammered	per ton	15 5 0	15 10 0	2	
Swedish Faggot	do	10 10 0	12 10 0	2	
COPPER:—					
Sheet & Sheathing, & Bolts	per ton	80 0 0	82 0 0	5	
Hammered Bottoms	do	82	0 0 0		
Flat Bottoms, not Hammered	do		0 0 0		
Cake and Tough Ingot	do	71 0 0	72 0 0		
Best Selected	do	75 0 0	80 0 0		
Australian	do	80 0 0	83 0 0		
Y. l. Metal Sheathing & Eods	per lb	0 0	0 0 7		
ZINC:—					
English Sheet	per ton	26 10 0	27 0 0	5	
Devaux's V. M. Roofing Zinc	do	26 10 0	0 0 0		
* And 5 per cent. discount if laid upon the new system					
TIN:—					
English Block	per ton	0 0	96 0 0		
do Bar	do	0	97 0 0	2½	
do Refined	do	0 0	99 0 0		
Banca	do	91 0 0	92 0 0	nett	
Straits	do	0 0	90 10 0		
LEAD:—					
Pig, English	per ton	21 0 0	21 0 0		
,, Spanish Soft	do	19 0 0	0 0 0	2½	
Shot, Patent	do	22 10 0	0 0 0		
Sheet	do	20 0 0	0 0 0	5	
White	do	27 0 0	27 10 0		
SPELTER:—					
On the Spot	per ton	20 0 0	20 5 0	nett	
QUICKSILVER	per btl	6 17 0	0 0 0		
REGULUS OF ANTIMONY					
French	per ton	28 0	0 0 0		

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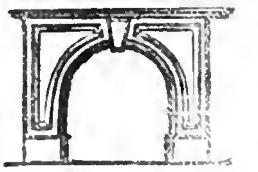

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 21, 1868.

THE PUGIN-BARRY PAMPHLETS.

WHEN the good-natured Sir Roger de Coverley was pressed by a pertinacious bore to give his opinion, unwilling to offend and unable to agree, he remarked, that "much may be said on both sides." The pamphlet of Mr. Pugin, published November, 1867, against which an injunction was immediately obtained, has at length been permitted to circulate simultaneously with the reply of the Messrs. Barry. The public are, notwithstanding, still left at liberty, nay, perforce compelled, to come to the conclusion that, in spite of all that has been advanced, much may yet be said on both sides. In the BUILDING NEWS of November 15, 1867, the pamphlet of Mr. Pugin was noticed at some length. It contained our views of the controversy, as far as it had gone, in the daily and weekly press, and it certainly seemed, unless the *ex-parte* statements of Mr. Pugin could be broken down, his case was a good one. The matter in dispute —namely, who was the art architect of the Houses of Parliament?—has by both sides been submitted to the verdict of the public. What that verdict will be time alone will show; this much, however, is certain, the friends of the Messrs. Barry will hold with them, and the admirers of Mr. Pugin will cleave to him, both parties paying their own expenses without leave to appeal to a higher court. In thus appealing to the public rather than to the profession, Mr. Pugin has shown sufficient discernment, although he offered to leave the matter to professional arbitration, if his missing documents—in short, his principal witnesses—were produced by the other side, in whose possession he implied them to be. To this point allusion will presently be made. The Messrs. Barry exhibited at least equal astuteness in insisting on terms which they knew Mr. Pugin would not accept. They insisted on arbitration. He demanded his papers; a deadlock ensued; hence the appeal to the public. Mr. Pugin's courage, or rather his confidence in his cause, must have been of no ordinary kind when he agreed to submit the matter to the Council of the Institute. His father's case would not have been tried by his peers. That he knew the disadvantages under which he laboured is evident when he says:—"I would not now shrink from fighting single-handed, if need be, against men whose possession of inherited honour, position, and patronage, *is alone sufficient to hold back witnesses from my side.*" Those who are conversant with the extreme difficulty of getting the truth out of unwilling witnesses, whether in the Court of Chancery in England, or the court of Judge Lynch in the colonies, will allow that it was a bold thing to confide his cause to a tribunal without jurisdiction of any kind, without power to compel the attendance of persons or the production of papers, without even the power of administering an oath, or putting a witness on his word of honour. Yet this was what Mr. Pugin did, upon the sole condition that his papers were returned to him. So much for the cause of the appearance of the pamphlet—now to the manner of its appearance.

Mr. Pugin has been blamed by many for want of taste, in bringing forward his father's claims at this late hour. This charge of want of taste is a very convenient one, and is often used to put down a young, a poor, or an ill-used man. The prosperous and firmly seated of the community have an instinctive horror of the man who knows the rottenness of the lower rounds of the long kicked-away ladder by which their position has been attained, and, if his facts cannot be gainsayed, his taste, forsooth, is called in question. There can be no doubt that Mordecai showed uncommonly bad taste in refusing to be polite to the well-to-do Haman, but his ultimate elevation was the consequence. As long as human nature remains what it is, so long will want of taste be laid to the charge of those who simply want justice, which it is inconvenient to bestow. Those who read the "personal explanations," some sixteen pages which form the preface to the pamphlet, will see that he had good reasons for keeping silence so long. When his father died he was under eighteen years of age: what could a youth in his teens expect to do against one whom he thought to be a wily antagonist, one who had certainly kept aloof from his family during their affliction, had refused to take him into his office, and whose manifest desire seemed to point to a cessation of all intercourse? That this was Sir C. Barry's desire we do not assert, but there is a certain pathos in Mr. Pugin's statement, which assures us that he at least thought so. Rightly or wrongly, but in fulfilment of what he thought a sacred duty, he waited his opportunity. That opportunity did not come during the lifetime of Sir Charles, and for a certain period after his decease he felt it would be indelicate to intrude his cause on the public. With what may have been his real reasons for delaying for so long a period the vindication of his father's memory we have nothing to do. His own statement, while it affords reasonable grounds for thinking that he acted without *arrière pensée*, does not preclude the possibility of his having been actuated by merely selfish motives. The exhibition of the drawings of the Law Courts competition was unseasonable, and his comments on the competitors unseemly. In a delicate position he acted with more vigour than discretion, and, though he thereby secured immediate and wide-spread attention, his well-wishers must regret that he has laid himself open to the charge of puffing himself under pretence of vindicating his father's memory. That this idea entered his head we are far from asserting or implying, but the unfortunate selection of time and opportunity has given this handle to his adversaries. He has entered the lists of his own free will—if the public spy a defect in his harness and attack him in that point he has no one but himself to blame. The public are his judges: for our own part we are neither judges nor advocates.

So much for his motives—now for the pamphlet itself. He lays claim for his father to the design of the "elevations and all details;" and in this he has gone too far, though, perhaps, unintentionally. To those who know anything of the works of Barry and Pugin it must seem that the outline and general disposition of elevation is Barry's and not Pugin's. The symmetry of the parts must have been as abhorrent to the one as they were dear to the other. It is a Gothic building, designed with an Italian feeling, and Pugin had no Italian feeling whatever. At the same time the details show a good knowledge of the Perpendicular style of architecture, and are delicately conceived. They would most probably have been better had Barry not meddled with them, as all his son's eager witnesses are never tired of assuring the reader was his practice. That Barry's judgment and undoubted taste may have prevented Pugin from running into extravagancies is very probable, but that Barry should have advantageously altered a detail is impossible. The one had spent his life in mastering the details of Gothic architecture—the mass he never successfully grappled with; the other had spent his life in a totally different study, and was imbued with the spirit of horizontal lines and the formality of the Classical school. We believe that a true student of Gothic architecture could point out almost every instance where Pugin's or Barry's influence was dominant. That Pugin's position was subordinate, no one doubts, but no one can positively affirm that the work would have been better had he had the entire charge. A zealot of the romantic school was scarcely to be trusted thirty years ago, and it is more than likely that the restraint Barry exercised over Pugin was beneficial to the work. The exact nature of the assistance rendered by the latter will never be ascertained, nor do we think it of any great moment that it should. They are now indifferent to fame. In their lives they were friends and fellow workers, each according to his light, and their joint work is their monument. What gives dignity to the structure is the work of Barry, what gives charm and delicacy is from the hand of Pugin; but it must not be forgotten that the arrangement of a succession of bays was Barry's idea, and that Pugin confesses himself a convert to the idea. As to the evidence which Mr. Pugin adduces, it is in some respects conclusive, but much of it is mere hearsay; and it may be recollected that his extreme youth must have precluded him from being a very reliable witness. His explanations of his father's reasons for writing letters disclaiming responsibility, and stating that he was under Barry's control, must be read in the pamphlet—they are too long for quotation, and should not be mutilated. Whether they are conclusive or no the public must judge. It is certainly unfortunate that Pugin kept no regular diary or copies of letters—had he done so this dispute, if it ever had arisen, would have terminated long ago; much ill-feeling would have been avoided, and many hard words spared. A shifty correspondence would not have been entered into, qualified admissions and unworthy evasions would have found no place in the dealings of either. The fair fame of two men who are dead would not be in question, and their sons would be satisfied in giving honour where honour is due, instead of being more or less obliged to cast obloquy on one side to save the credit of the other. To give merely a synopsis of the pamphlet is impossible in anything like the space at our disposal. Letters without end would have to be quoted and commented on, dates and memoranda compared, evidence sifted, hypotheses examined; in short, an array of work as formidable to the writer as it would probably be tedious to the reader; besides which it has already, to a certain extent, been done in the BUILDING NEWS of November 15 last. With the remark that the pamphlet seems to have been prepared in some haste, we will proceed to examine what the Messrs. Barry say in defence.

As Dr. Alfred Barry edits the pamphlet, which we presume is the joint work of the three brothers, we shall, in alluding to the authors, simply mention his name. This pamphlet is of about the same bulk as Mr. Pugin's, but is more carefully prepared. For many reasons a defence has an advantage over an attack, particularly where cross-examination is not permitted; it may, for instance, be met by direct contradiction on every point, or by proof of error in a few strong or even weak points, and the gravity of these errors may be so strongly urged as to go far to destroy confidence in the other portions of the attack. Again, if the attack has been conducted in an impetuous manner it is wisdom to reply very deliberately, but these are, after all, mere tricks, and are effective only with the superficial reader. When, in addition to these advantages, the defence is conducted by three individuals, each wary and cunning of fence, the difficulties are greatly increased. We must also recollect that few will readily allow their long-accepted beliefs to be upset, and that the Messrs. Barry represent an existing state of things, a comfortable, easy-going, optimist condition upon which Mr. Pugin's imperative demand for what he conceives to be mere tardy justice must have burst like a small Clerkenwell explosion. That a defence was necessary seems to us obvious, though Dr. Barry commences his pamphlet by giving two reasons, and then, curiously enough, a third—why a reply is "almost needless." The first is the "extraordinary lapse of time since the events on which this attack is based, &c." The

second reason is Mr. Pugin's unwillingness to bring his assertions and evidence before a proper tribunal. "Besides these reasons, which might seem to render controversy needless, there is another which makes us reluctant to enter into it. This third which makes him reluctant to enter into it is, that Mr. Pugin "has not been able to carry on the war in one newspaper only," but has gone from paper to paper, and that "this course is clearly proved to be calculated to excite odium against Sir C. Barry and the Institute, but it is as clearly the worst of all methods for obtaining the truth." Now these three reasons for not entering into it strangely enough are neutralized in the eighth succeeding line, by the remark "that it is evidently necessary that the pamphlet should not be entirely passed by, lest it should be thought to be unanswered because unanswerable;" besides which architect's assistants would become too bumptious unless Mr. A. W. Pugin's claims were disposed of. Having given three good reasons for declining the conflict, he enters into it with spirit, calling witnesses, sifting evidence, doing everything, in short, except producing the letters which Mr. Pugin so much covets.

These are, indeed, alluded to, or rather form the subject of the appendix, but we cannot say that the matter is cleared up beyond doubt. It is unlikely that Mr. Pugin would make a direct and deliberate false statement—that he lent seventy-six letters to Sir C. Barry, under promise that they should be returned. It is more unlikely still that he should reiterate the statement. It is quite possible that they might have been accidentally destroyed; and it is quite possible they may have contained nothing that would have been prejudicial to Sir C. Barry's claim to be whole and sole architect. It clearly seemed to us, however, while watching the controversy, that the letters were in existence, and the Messrs. Barry would by no means produce them. If such an idea has got abroad, as it most certainly has, it is entirely the fault of the Messrs. Barry, who scarcely alluded to the letters, except to say that they were the joint property of the correspondents. The letters are destroyed—peace to their ashes. The witnesses that Mr. Pugin could *not* call having been disposed of, we are introduced to the principal witness that he could summon, Mr. Talbot Bury. This gentleman contradicts flatly the statement he was expected to confirm—namely, as to how Pugin was engaged at Salisbury, from September 12 to October 2, 1835. Mr. Pugin is possibly mistaken as to the entries in his father's diary, which was kept in a very loose way, and which seems, in other instances, to have deceived him, and of his own knowledge he can know nothing of many events of which he speaks.

To Mr. Talbot Bury, succeed a cloud of witnesses, old friends of Sir C. Barry, old pupils, old superintendents, old practical superintendents, model makers, modellers, carvers: in short, "Blanche, Tray, and Sweetheart," in full cry on the track of the noble game, to whose hunting it is a privilege to be invited. Some have a strong interest in maintaining their late master's or employer's fame, whence in great measure they derive their own; but some appear to do it in such a manner as to throw doubt on their motives. With one exception they all prove too much: the exception is Mr. Clayton, of the firm of Clayton and Bell. The rest either "damn with faint praise," or eagerly bear testimony to the very subordinate position which Mr. Pugin held, in their estimation at least. This part of the evidence is painful to read; the witnesses may have spoken the truth, but the truth would, in cross-examination, appear very different. The tone of some of the letters is perfectly contemptuous towards Pugin, and, after reading them, one is inclined to wonder why Barry should have kept about him so insignificant and useless a creature. His work, by the witnesses' showing, had all to be done over again, and, if the testimony is absolutely and literally true, Pugin's assistance must have been anything but a help. The evidence must be read in full, as it all bears on the point at issue. Ossa is piled on Pelion, and Pelion on Ossa. If written testimony could destroy Pugin's claim, his case were poor indeed, and his advocate must needs become his apologist. Fortunately for him—for against this written testimony it is not easy to make head—his works remain. The Houses of Parliament were not his only works. Other books he wrote and illustrated, besides caricatures under the name of "True Principles;" and other judges he has than the pigmies who have presumed to estimate his capacity by their own measure. We say no word against Sir C. Barry. We see no tittle of evidence against him. On the contrary, his genius was, in a different line, greater than that of Pugin; his ideas of art were more catholic, in itself a proof of a superior mind; his education better qualified him to produce a really great work, and we are not "ignorant of the extraordinary capacity of growth in his mind." That he was a truly great man must be acknowledged by everyone with the slightest acquaintance with art; but that he was the architect of the Palace at Westminster is contradicted by his early training, his ordinary practice, and, above all, by his previous and not long antecedent works. We cannot see in what respect his memory could suffer if the full extent of Pugin's services were acknowledged—without him neither exterior nor interior would be what they are, and with him neither the finish of the Victoria Tower, nor the improvements in Palace-yard, would be what they are. When comparisons can be so easily made, people will draw their own conclusions. If Mr. Pugin had set bounds to his ambition, and claimed less for his father, he would have gained more. If Messrs. Barry had conceded more it would have been better for their cause. To pooh-pooh or ignore the claims of either of the great men in question is as unwise as it is unjust, and yet the argument has been practically conducted on that line. The representatives of both have appealed to the public; they must now abide the issue.

DEAN STANLEY'S "MEMORIALS OF WESTMINSTER ABBEY."*

THE middle of the eleventh century saw three large churches constructed, two in England, and one in Normandy, whose history, equally with that of their founders, is intimately interwoven with the greatest political changes recorded in the annals of our country. These churches are, first, St. Peter's at Westminster, founded by Edward the Confessor; second, St. Etienne, at Caen, by William the Conqueror; and that of the Holy Cross at Waltham, which owes its existence to the munificence of our last Saxon king. Of these three buildings, only a few fragments remain at Westminster; the abbey at Caen has been more fortunate, for very considerable portions of the Conqueror's work are still in existence; while as to Waltham Abbey, antiquaries have hardly yet ceased fighting over the remains which have come down to our time. At present the question is undecided, but there are very good reasons for believing that a good part of the present nave at least may be attributed to Harold. Equally varied has been their fate in the matter of historians, for while little has been written about Waltham or Caen, Westminster, as might be expected, has almost a redundance of chroniclers, although, curious to relate, several of the most important materials for its history, such as the accounts of Flete and Sporley, the Charters of Salcardus, and the Consuetudines of Abbot Ware, remain still in manuscript. It is really a great pity that in these days of Early English Text societies, Chaucer societies, and Camden societies, some one of them cannot be prevailed upon to publish these documents, so curious and so necessary to a really complete account of our great national monument. The latest historian of Westminster Abbey is no less a person than its Dean, the Very Rev. Dr. Stanley; M. Bouet* has just published a most excellent account of St. Etienne, Caen; but Waltham Abbey still waits for a more careful historian than old Fuller, who, by the way, once held the living.

Now, if we compare the respective books of Dean Stanley and M. Bouet, it is almost impossible to find two things which differ more essentially. The Dean's work, as might be expected, is very eloquent, and, as William of Malmsbury would have said, "adorned with choice flowers of rhetoric." When, however, we peruse it a second time, and look carefully into its contents with our eyes less dazzled with the brilliant periods of the talented author, we shall find that there is very little additional information to recommend it to the student, while, from haste in composition or from some other cause, there are not a few positive errors. It is to be hoped that these will be corrected in another edition, and we may thus have a standard popular account of the abbey, which will interest the general public, and induce the student to continue his researches.

M. Bouet has taken the opposite way—his book is essentially one for the student. The history of the abbey is divided into centuries. Each chapter begins with a chronological table of events relating to the building; then follows the peculiarities of the workmanship of the epoch, such as the tooling of the stones, the pointing of the stones, &c.; and, lastly, we have the author's own observations. As I hope, on some future occasion, to return to the very excellent book of M. Bouet, there is no further occasion to refer to it; and I only do so now to show how very differently two authors can treat similar subjects. In one word, M. Bouet has written for architects and students, the Very Rev. the Dean of Westminster for the public generally.

There is one fact mentioned in the preface to the Memorials which will certainly delight all lovers of the arts, more especially those of the Middle Ages. Those who have read Pugin's "Contrasts" (and who has not?) will remember that he bitterly inveighs against the neglect of our royal tombs; and, if I remember rightly, strongly advocates their restoration.

Of course, we know better now; but how narrow an escape we have had may be judged when we read that, among the estimates of the House of Commons, in 1854, was a sum of £4,700, for the restoration of the royal tombs. "But, in the interval, the subject was more maturely considered by a commission of eminent antiquaries, who decided against any such attempt. It was then thought that their venerable aspect, and the marks of antiquity and of history which they bear, pointed not to reparation, but to preservation." It is to be hoped, for their own sakes, that the report of the commission of eminent antiquaries went one step further than this. It is true that it is desirable to preserve the monuments for their venerable aspect, and for the marks of antiquity and of history which they bear; but have they not far greater claims on us, as being landmarks in the history of art, not to say that some of them are objects of the very highest art, and such that would tax the utmost energies of the best sculptors in this unartistic age to rival in the least degree? Now, all this is apparent to the student, but it is not so well known to the general public, and might, therefore, have well been insisted upon by the author, who goes on to recommend the restoration of the 16th and 17th century monuments, some of which are comparatively inoffensive, while others deserve to be classed

* "Historical Memorials of Westminster Abbey," by ARTHUR PENRHYN STANLEY, D.D., Dean of Westminster. London: John Murray, 1868.

* "Analyse Architecturale de l'Abbaye de St. Etienne de Caen," par G. BOUET. Caen: Leblanc-Hardel, 1867.

with those of the last and present century, which everybody who regards Westminster Abbey as a building dedicated to the mysteries of the Christian religion, and not a Walhalla, would willingly see (at least the most offensive ones) turned out of the place into the cloister which we are told "it has often been proposed should be erected, communicating with the abbey by the chapterhouse, and continued on the site of the present Abingdon-street, facing the palace of Westminster, on the one side, and the College Garden, on the other. Such a building, the receptacle not of any of the existing monuments (which would be yet more out of place there than in their present position), but of the graves and memorials of another thousand years of English history, would meet every requirement of the future without breaking with the traditions of the past." If we are to have a Walhalla it does not very much matter where we have it, so long as the most beautiful building we possess is not used for the purpose. As to the removal of the present objectionable specimens, the Dean, as a Christian Churchman, can hardly be expected to desire the retention of such works as those which are thus described in Neale's "History of the Abbey"—"a fine statue of Britannia seated on her pedestal, her right arm extended and grasping the thunder"—"to reward his heroism, Victory is descending with her wreath and palm branch"—"a figure of Death plunging his dart into the breast of a youthful female, whose shrinking frame is supported by an angel pointing to the joys of heaven"—"a large urn with the figures of Wisdom and Poetry"—"it exhibits a noble figure of Hercules, distinguished by his lion's skin and club, near which is a beautiful statue of Navigation"—"a statue of Fame placing a laurel wreath on the brow of the admiral"—"a medallion of the gallant admiral supported by the infant Hercules"—"on the basement is a majestic figure of Neptune reclining on a sea horse, and directing the attention of Britannia." It would be useless to multiply these quotations, suffice it to say that we meet with death personified by the figure of a youth leaning on an extinguished torch, the club of Hercules, statue of Victory, statues of Health and Longevity, the staff of Esculapius, and the cup of Hygera, a sitting figure of Minerva, History in a reclining attitude, Anarchy in chains, a weeping Genius, Britannia represented in the character of Pallas, Minerva, Hercules, &c., not to mention the very repulsive Nightingale monument. The worst of the matter is, that this sort of thing has been going on until comparatively a late period, for we read of a gallant soldier killed in Scinde in 1841 commemorated by a mural tablet "representing a Roman helmet and dagger on an altar."

It is to be hoped that the day will not be far distant when, at least, these pagan monuments may disappear from a Christian church. If people wish to be commemorated in Westminster Abbey there are plenty of ways in which they may be so, without interfering with the architecture or unity of the building. There are very many windows ready for stained glass. The beautiful southern portals, and, indeed, almost the whole of the exterior, would be the better for careful restoration, or rather rebuilding, for nearly every foot of it has been destroyed. The hinges of the doors, the lectern, the font, the statues on the altar screen and in the southern portals all afford subjects for memorials. A small inscription might be attached, which would tell the intent of the donor and not interfere with the object itself. Such memorials would be far more in harmony with the building than busts or statues in white marble. Under its present accomplished architect and historian Westminster Abbey has gradually resumed its lost jewels. The Eleanor grille (a historical piece of ironwork if ever there was one), displaced by no less a person than the late Sir F. Chantry, has been re-fixed; two of the enamelled shields of the tomb of Edward III. have also been restored to their place; the altar screen has been transmuted from plaster into alabaster; parts of the Confessor's choir have been discovered; also some of the figures of Queen Philippa's tomb; also portions of an unknown slab decorated with mosaic. The last discoveries are portions of the original grisaille glass which once filled the chapel windows, and remains of the terra cotta angels which decorated the high altar of Henry VII.'s chapel, and are the last known works of Torrigiano in England.

If ever there was a period in which a restoration of the southern portals and of the eastern end could be attempted, it is the present. At present we are good imitators—probably the world has never seen an age which has so completely imitated the letter (we will say nothing about the spirit) of a preceding architecture. Fifty years hence we may, perhaps, have drifted into some style of our own—it may produce better or worse works than we have at present—but there is also the chance that our successors may have very different ideas regarding restoration to which we have. At present there are sufficient remains of the original to make a very good restoration, under the direction of a skilful architect.

Nobody doubts the ability of Mr. Scott. The expense of the work would not be very great, for, beautiful as is the design of the portals, it is very far from equalling Chartres or Rheims in the richness of its sculpture. The only difficulty would be with the statuary, still good figure work has been produced (although somewhat rarely) in the present day. Let us hope, therefore, that, before the expiration of the next ten years, the south portals of Westminster Abbey may cease to be the ugliest and most degraded architectural work in London. Such, then, is the building to which Dean Stanley has devoted an octavo volume of 500 pages. I hope to show how he has achieved his task in another article.

W. BURGES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary meeting of this Institute took place on Monday evening last, Mr. David Brandon, vice-president, in the chair, when Mr. G. F. Jones, of York, and Mr. E. F. Law, of Northampton, were elected fellows. Mr. C. F. Hayward, hon. secretary to the Paris Exhibition Architectural Committee read the report of that committee, in which some interesting details and statistics were given with respect to the British section of that department of the late Exhibition in Paris, and which we hope to lay before our readers in a future number of this journal. It was announced that the election for the Pugin Travelling Studentship had fallen upon Mr. Charles Heuman, from amongst eleven other candidates.

The paper announced for this evening was "On the Exploration of Jerusalem and the Holy Land," by Mr. George Groves, hon. secretary to the Palestine Exploration Fund; and, as might be supposed, so attractive a subject brought together an unusually large audience, including many gentlemen who have taken an active interest in the researches now being carried on in the Holy City.

Mr. GROVES remarked, that he believed there was very much in the investigations of the society which he represented that was of the deepest interest to the members of the institute, and might be encouraged and supported by them with great benefit to the progress of architectural and archæological art and science. The Palestine Exploration Fund, he said, was founded in 1865, with the object of exploring systematically and exhaustively all the various branches of inquiry connected with the Holy Land. It was known generally that the geology of Palestine was very remarkable, that the natural history and meteorology united the features of the tropical, temperate, and arctic zones, and that the ethnology contained traces of a very large number of successive races. Then, with regard to the connection of the country with the Scriptures, of course, before the correspondence between the land and the document could really be tested and brought out, there must be accurate and detailed maps, with the vernacular names of places and spots very carefully ascertained. It seemed most natural that a country so densely inhabited as Palestine was for many hundred years should abound in material traces of its inhabitants—of their modes of building, their domestic and their warlike arts; but, with regard to every one of those branches of inquiry, it was a remarkable thing that nothing can really be said to have been known in an accurate and trustworthy manner till within the last year or two. Travellers in the Holy Land were not prepared for anything like scientific or systematic observation and record, and they had not the time or money to devote to the task. Not only have we no knowledge of the styles or modes of building of the ancient Jews, but the absolute dearth of the articles of life was truly remarkable. A few coins of the probable date of the Maccabees are all the relics known of the nation. We know that they were a warlike race; that they had pottery, jewellery, metal work, and other arts of life; and yet, strange to say, not a fragment of any of these things exists—not a fragment of gold, silver, or brouze is to be found in any museum of the Western world of which it can be said—"This was the product of the nation of Israel during their prosperous period." We, however, dismiss the subjects of natural science, and even of topography, and consider what the Palestine Fund has done, and hopes to do, in exploring the architecture and archæology of the old inhabitants of the Holy Land.

In the winter of 1865, Captain Wilson, of the Royal Engineers, who had in the preceding year distinguished himself by his survey of the city and environs of Jerusalem, under the orders of the Director-General of the Ordnance Survey, and at the cost of Miss Burdett-Coutts, was despatched to Beyrout in charge of the first expedition. He took with him Lieutenant Anderson, R.E., an able and practised surveyor and photographer. They landed at Beyrout in December, and remained in the country till May, during which time they worked gradually down the country to Jerusalem, fixing the latitude and longitude of the chief points, making more or less detailed explorations at the most promising spots, and ascertaining generally what might be advantageously attacked by future exploring parties. The positive results of the expedition consisted of materials for a map of a major portion of the country north of Jerusalem; 164 photographs, many of them of architectural subjects; and of plans and drawings of about 50 temples, synagogues, churches, tombs, &c. [The illustrations alluded to were distributed in the room for inspection.]

The second party went out in the beginning of 1867, under the charge of Lieutenant Warren, R.E., who is still in Jerusalem; and he might now say we were in possession of materials for a really complete map of the Holy Land. But Mr. Warren's chief results had been obtained in Jerusalem, and it was to them he wished to draw the attention of the institute. Having described the topographical features of the city as it at present exists, and pointed out the various spots on the map, Mr. Groves remarked that, whether the temple occupied the whole or a portion of the area generally ascribed to it was immaterial to his present object, but there undoubtedly was the centre of the art and architecture of Jerusalem and of the Jewish nation, and, accordingly, Mr. Warren directed his attention to the southern wall of the harem area immediately after his arrival. After a little opposition from the Turkish authorities he began to sink a shaft on the face of the hill, 40ft. from the south-east corner; and here he immediately came upon a wall, of the existence of which no one had any suspicion. Descending to the foundations of this wall he discovered that that side of the hill was covered with 60ft. of made ground, so that the depth of the wall of the harem is hidden. The wall at the corner, if bared, would stand about 130ft. high, the masonry of which appeared to be the same below as above ground. A shaft, 40ft. east of the south-west angle, revealed a still greater depth, namely, 87ft. from the surface to the wall, so that the depth at the corner must be 100ft., and the whole height of the wall 160ft. or 170ft. Mr. Warren's last letters described the discovery of the western pier of Robinson's arch, two courses and part of the third of which are standing. It is built with some attempt at economy, with upright piers and long lintels. Between the pier and the wall is a flat pavement probably resting on an inferior arch, and upon this pavement are still lying the vonssoirs of the arch apparently exactly as they fell when the arch was destroyed. The structures which Mr. Warren had come upon in the six

shafts which he has sunk across the valley in the line of Robinson's arch it is presumed can hardly have been portions of the ancient bridge or viaduct—these therefore remain yet to seek, but further north, there is a similar arch called after Capt. Wilson, who has the credit of having first found it or first made it public. Here also Mr. Warren has met with encouraging success. He has found two arches contiguous to Wilson's arch, each arch lower than that east of it, thus implying that they supported a sloping roadway. Underneath will be found with them is a system of tanks and aqueducts, which Mr. Warren is now exploring. As to the intention of these remains it would be premature to speculate until more facts were known, but that these remains existed in abundance and comparatively good state of preservation were facts which he desired to impress upon his audience.

Returning to the south wall of the harem area, Mr. Groves mentioned the fact, that the floor of the vaults which occupy the south east corner is many feet above the level of the rock, which led to the supposition that there may be a second set of vaults below those which are now accessible, Mr. Warren having already discovered a passage 12ft. high, running northward for 60ft. at a depth of 20ft. below the floor of the present vaults, and he was waiting for an opportunity to make further explorations in these vaults, which are very difficult of access. Inside the harem area no doubt they should penetrate before long, and then they would be able to complete the system of sewerage and water supply, and obtain an accurate section of the hill.

The sepulchre or catacomb in which David and the kings of Judah were buried was an object eminently worth searching for. It was the only tomb allowed to be within the walls of the city, and it must have been a very spacious one, since at least twenty persons were buried there from first to last. There could be little doubt it was still to be found under the rubbish of the modern city, and the discovery of where "the city of David" was would be of immense gain in the topography. To the members of the institute as a body, the most interesting question was the light which these investigations may throw on a period of architectural art of which comparatively little has been hitherto known. Herod was eminently a building prince, and Jerusalem was his chief feat. Did he employ Roman architects and builders on his works? and what influence did the climate, the materials, the circumstances, or the traditions of the country exercise on them? These were questions which he took for granted were interesting to the body he addressed, and they could not but receive much light from the investigations which he represented. Of earlier epochs than the Herodian he confessed he dare not say anything. Herod probably demolished what remained of the earlier structures when he began his own work; there might be something still to find, but he could not hope for much from this.

In conclusion, Mr. Groves stated that the committee of the Palestine Fund were about very shortly to consider the desirability of extending and hastening this branch of their operations by sending out more workmen, so that Mr. Warren might be able to attack more points at once: and he ventured to suggest that it would be highly advantageous to the undertaking, and very gratifying to the committee, and would help to give the investigation that national and dignified character to which it had aspired, if this Institute would afford the committee that countenance to its operations and, he would add, that advice which no other was so able to give. Such a step, he added, would also have the effect (which he himself most heartily desired) of removing this most interesting spot—the City of Peace, as its name implied—from the confined arena and bitter conflict of theological debate in which it had hitherto struggled, into the open air and serener sky of artistic and archæological investigation.

The Rev. Mr. SMITH read extracts from letters of recent date received from his brother, a captain in the Indian army, confirmatory of the information communicated by Mr. Warren, and expressing the most hopeful anticipations of the satisfactory results which would attend these explorations.

A discussion took place with reference to the enormous accumulation of debris of rock, &c., in the locality spoken of, and the geological phenomena of the district, in which Mr. Chas. Barry, Prof. Ansted, Mr. Digby Wyatt, Mr. Walter Morrison, M.P., and others took part. A feeling highly favourable to the prosecution of these interesting researches was expressed, to which was added the hope that the publication of the information already collected would give a stimulus in the shape of additional subscriptions towards that object. It was stated by Mr. Groves that the cost of the explorations he had explained had been about £1,700, and the expenditure had been at the rate of about £200 per month. That expenditure, he said, might be doubled with great advantage, and he hoped to see the fund placed beyond its present temporary and spasmodic condition by annual subscriptions, commensurate with the importance of the objects they had in view.

The cordial thanks of the institute were voted to Mr. Groves for his very able and interesting communication, and the Chairman, on behalf of the council, assured that gentleman that the co-operation of the institute would be given in every possible way to promote the objects which the committee of this fund had in view.

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting was held at the rooms of the Association on Friday last, Mr. Ridge in the chair. The minutes of the last meeting were read and confirmed, and Messrs. T. Cole, A. Bobbill, and B. A. Mayhew were proposed and elected members of the Association.

VENTILATION.

Mr. MATHEWS, one of the honorary secretaries, then made a few remarks to the meeting illustrating a system of warming and ventilating that had suggested itself to him. He proposed to utilize a great portion of the heat proceeding from kitchen ranges and lost up the chimneys. He would introduce an open chamber at the foot of the kitchen range, and carry it right up through the house closed at the top. Into this he believed all the heated air would enter. He would then construct pipes of the dimensions of a brick, communicating from this air-chamber with the various rooms, and from which, by means of valves, the heated air might be let into the rooms when desired. He believed that by this means the present uncomfortable temperature of our bedrooms might be materially raised. With regard to ventilation, he thought the present chandeliers were great mistakes. Hammond's patent chandeliers were the only ones he knew of admitting of any ventilation, and they were very heavy and expensive. He suggested a trumpet-mouthed flue of glass or mica, through which the supply pipe might descend from the ceiling with a number of jets at the end enclosed in a glass dish. The advantages of this plan would be a great increase of light, owing to the total absence of shadow, and all the heat would ascend through the flue into the air-chamber constructed as he had described in the building. He had not fully worked out the ideas he had given to the meeting, but he thought, if well followed up, there might be found something in them.

Mr. E. J. TARVER then read a paper on—

SYMMETRY FROM A GOTHIC POINT OF VIEW.

Should not the study of Gothic or English architecture, he would ask, be undertaken with as much attention to symmetry as the study of Classic? Were the Classic styles necessary or right to be adopted in England? If not, should we give up the application of the symmetrical principle to Gothic? Was it not to the total neglect of this principle that we are indebted for the many vagaries that had appeared since the modern revival of Gothic art? Modern Classic buildings chiefly consisted of four classes: first, imitations of antique temples, like the Madeleine at Paris; second, combined imitations like St. Pancras Church, a very handsome building, with its two little temples of different orders placed on the top of one another by way of a steeple; third, the Italian; and, fourth, those modern buildings, really Classic by birth and education, yet, finding themselves in the neighbourhood of differently designed structures, had quietly submitted to distortions of every description. Classicists gave the human form as their pet example of symmetry. But when the body was put into motion what then became of its symmetry? He referred to an enlarged elevation of the palace of the Archduke Michael, at St. Petersburg. It was a purely Classic building, and one of the best modern erections in that style he was aware of. The two wings of the building were externally exactly alike, but, on consulting the plan, one wing consisted of a spacious apartment occupying nearly the whole of it, while the other comprised a number of small rooms. This was certainly not true symmetry. By analyzing the terms "balance," "proportion," and "symmetry," he pointed out that the first referred to an instrument for testing the relative weights of *two* bodies, as, for example, to a centre flanked by twin masses in equipoise, and so to the design of most Classic buildings; that "proportion" dealt with single features, or as much as could be comprehended in one glance; but that the term "symmetry" meant literally "measuring together," and might be taken in a more comprehensive sense than the others. He thought that balance was right where there was no reason to the contrary, but that we should recognize the fact that symmetry should not be confined to the sub-division of a façade into two equal halves, or even to façades at all, but that it is the principle which should guide the distribution, form, and size of every limb and feature of a building.

Mr. MATHEWS said Mr. Tarver had pointed out the want of true symmetry in Classic buildings, but he had not told us where it existed in Gothic. He would also like to know by what rule we were to judge of the symmetry of a building. He inferred from Mr. Tarver's paper that a correct eye was the only criterion, and he thought that this could not always be trusted to.

Mr. LONSDALE said it had struck him that the Classic idea of symmetry might be well illustrated by the ordinary scale, in which two equal weights counterpoised each other. The Gothic notion, on the contrary, resembled the steelyard, in which the balance was maintained by two masses of unequal size but of similar weight.

Mr. GILBERT REDGRAVE remarked that Mr. Tarver had been very severe upon Classic architecture, and especially on the unfortunate church of St. Pancras. He believed, however, that the style of steeple introduced by the architects was not altogether without precedent in ancient times, although he could not then quote the example.

Messrs. Potter, Birch, and Quilter joined in the discussion, and, Mr. Tarver having replied, a vote of thanks to him for his paper was unanimously carried, and the proceedings terminated.

MR. GLADSTONE ON TRADES' UNIONS

ON Tuesday last, a deputation from the London Trades Societies waited, by appointment, on Mr. Gladstone, for the purpose of refuting certain alleged incorrect statements made by him, in his speech at Oldham, on the 18th of December. In the course of his remarks, Mr. Gladstone stated:—The question I wish to raise is whether certain of these restrictions are beneficial to the labourers. The whole body of labourers of the country go further than the limit of each trade union. I will not undertake to say that some of these restrictions are beneficial to the carpenters considered as carpenters, or to the bricklayers considered as bricklayers. I look at the whole of the wage-receiving population of the country, and I own it appears to me as a general rule that regulations in restraint of labour go to diminish the aggregate amount of the fund which constitutes the whole wages of the country. Of course there is a difficulty in drawing a line with precision. I may be told that the argument, if it were taken without limitation, would imply that every man was to slave from morning to night, seven days in the week, without any consideration for his health or his mind. I have not a word to say against limitations imposed with a view to the preservation of health and social considerations. Do not let me be understood as saying that society at large has any reason to complain. It is difficult to raise questions between class and class. Of course society has reason to complain of all unreasonable and excessive use by any class of its privileges; but that is a point very difficult to define. It is not the bearing of certain restrictions that prevail more or less in trades' unions upon society that I shall animadvert upon, nor their bearing upon employers. The restrictions imposed upon employers in many cases have had a most powerful effect in stimulating invention, and the introduction of machinery might have been less rapid but for the fact that in some businesses employers have found themselves hard driven by what they have thought the restraints imposed upon them. Let me refer for a moment to the rules against women, boys, and men. There was a rule, of which I have often heard in the porcelain business in the Potteries, which appears to me to be a very

strong one, that a woman was not allowed to paint porcelain with a rest for her wrist. The practical operation of that I understand to be that no woman can do fine work on porcelain where that rule is observed. Of course it may be said that the labour of women competes with the labour of men, that women can work cheaper than men, and that the men are thrown out of employment. My answer to that is, I cannot look upon women as a class of beings alien and separate from men. If they do compete with the men, they are the wives and daughters of the men; and, if their labour is cheaper than that of the men, it is for the benefit of the men themselves as a class—that is to say, the aggregate earnings of the labouring class in the community, and in that particular trade, are greatly increased. With regard to the boys, it is exactly the same thing. The boys whose entrance into trade is more or less fettered and barred—sometimes by limiting the number of apprentices, and sometimes by forbidding them to labour except as apprentices—do not come into the world of themselves. It is said that apprentices have small wages, and that that is a reason for limiting their labour. If that is the fact, the question is whether it is not desirable that they should work as unapprenticed boys, and obtain the best wages the market would afford. It was objected by some one who wrote to me that skilled men were expected to instruct apprentices. Now I should not complain in the least if the skilled man said to his employer—"It is one thing to do work for you; it is another to teach others." And if I were a skilled workman asked to teach apprentices, I should consider whether I was not fairly entitled to make a charge for it. Then we come to rules affecting men. First, it rules against piece-work, and prescribes for each man the mode in which he shall actually perform his labour. I have heard of a rule in the bricklaying trade in Lancashire against working down the raw material at the place where it can be done best and cheapest. Just let me ask what would be the effect in Lancashire of attempting to lay down a rule with regard to the number of apprentices in the cotton manufacture. It is there, in the great staple trade of the country, that the labour of the young is the most free, and it is there that upon the whole the labouring men of this country enjoy the most independent and solid position, as was proved by the manner in which they were enabled to meet the terrible calamity of the cotton famine. I believe there are rules among masons to the effect that the stone which is quarried may not be "dressed," as it is called, in the quarry itself, but must be taken to the place where it is to be put in the building. Now is it possible, as a matter of reason, to denounce too strongly such a rule as that? It is a rule worthy of savages. There was nothing in the Corn Law that was a bit worse than that. It is a waste of human labour. It is refusing to make God's gifts go as far as He intended them to go when you require labour to be done by such a useless regulation. I do not know whether that is a trade union regulation or not. [Mr. Potter and some of the members of the deputation stated that it was not.] I am glad to hear it. I now come to rules with reference to unskilled labour. I have here a printed paper containing a regulation passed by the operative bricklayers in Liverpool. It says:—"Dressing off has been done on a system similar to tiling. There are individuals who have each a son or two, whom they bring up to it only, and yet while young they attained such a proficiency in the style that it is permitted to be done, and the lads are able to earn good wages by it, but at a price that no master would accept who has to pay experienced men at the current wages." I understand that to mean that dressing-off is a thing which boys can do, that boys are taught by their parents to do it, and can do it in a competent manner, and earn good wages. The complaint is that the wages are lower than the men's. Now, it appears to me that all attempts to limit the labour of those boys are attempts to limit the aggregate of the wage fund of the country. Other cases have been sent me. Here is a resolution of the National Association of Operative Plasterers, dated Jan. 23, 1868:—"That we, the operative plasterers, having viewed with deep regret the encroachments made on our trade by unskilled labour, more particularly in lime-washing, resolve that on and after the 1st of March, 1868, all lime-washing be executed by plasterers as per working rules, and in the event of any employer attempting any infringement of the said rule, the members of this association will cease to work in his employ." The question there raised is not that lime-washing cannot be done by these unskilled men, but that they compete with the plasterers. All that I call part of a war against labour.

THE SUPPORTING POWER OF PILES.

A PAPER "On the Supporting Power of Piles; and on the Pneumatic Process for Driving Iron Columns, as practised in America," by Mr. W. J. McAlpine, M. Inst. C.E. (of New York), was read at the Institution of Civil Engineers, February 18, 1868, Charles Hutton Gregory, Esq., president, in the chair. The first part of this paper related principally to the experience gained in driving six thousand five hundred and thirty-nine piles, an average depth of 32ft., for the foundation of the Government Graving Dock at Brooklyn, N.Y., when the support was mainly derived from the adhesion of the material into which the piles were driven, and slightly from their sectional area. The piles were in rows 2½ft. apart, and at transverse distances of 3ft., all from centre to centre, intermediate piles of tough second-growth oak being frequently employed. The main piles were chiefly round spruce spars, very straight, from 25ft. to 45ft. long, and not less than 7in. in diameter at the smaller end, and on an average 14in. in diameter at the larger end. From a record kept during the progress of the work, it was ascertained that it took two and one-third blows to drive each foot of pile, and that the distance moved uniformly diminished from the first to the last blow, ranging from 8in. at the beginning to no movement at the end, the average distance moved by the last five blows being 1in. A considerable number of the piles were driven by a Nasmyth steam piling machine, with a ram of 3 tons, and a stroke, or fall, of 3ft., and making from sixty to eighty strokes per minute. The other machines were generally operated by steam power, giving an average of a blow per minute; but occasionally the hammers were hoisted by manual and horse power. The rams in the latter machines were of cast-iron, swelled out at the bottom to concentrate the weight at that point, and weighed about 2,200lb. each, though some were used of 1,500lb.; the fall being 30ft. It was observed that the heaviest ram, when striking blows of the same effect as lighter ones, did the least injury either to the head of the pile or to the protecting iron ring, and this injury was still less with the Nasmyth hammer. It was also found no advantage was gained by the fall of the ram being more than 40ft., as the friction on the ways then prevented any increased velocity to the ram when falling from a greater height. With the Nasmyth hammer, piles were driven 35ft. in seven minutes, while with the other machines similar piles required one hour, or more, to drive them the same distance.

Experiments were made at different times to ascertain the weight which the piles would sustain. For this purpose a long lever of oak timber was employed, with which a number of the foundation and coffer dam piles of nearly the same size, and driven under exactly similar conditions, were withdrawn. It was thus ascertained that a weight of 125 tons was required to move a pile, driven 33ft. into the earth, to the point of ultimate resistance, with a ram weighing 1 ton, and falling 30ft. at the last blow. These trial piles averaged 12in. in diameter in the middle. From a number of other experiments, it was believed that the extreme supporting power of the pile, due to its frictional surface, was 100 tons, or 1 ton per superficial foot of the area of its circumference. From an analysis of the experiments, the following general laws seemed to have prevailed in these cases:—First, that the effect of lengthening the fall of the ram was to increase the sustaining power of the pile in the ratio of the square root of fall. Second, that by adding to the weight of the ram, the sustaining power of the pile was increased by 0·7 to 0·9 of the amount due to the ratio of the augmented weight of the ram. Third, that a pile driven by a ram weighing 1 ton, and falling 30ft., would sustain an extreme weight of 100 tons The formula based upon these data, as applicable to rams weighing from 1,000lb. to 3,000lb., falling from 20ft to 30ft., was

$$X = 80\ (W + 0{\cdot}228\ \sqrt{F} - 1),$$

in which X was the supporting power of a pile driven by the ram W, falling a distance F; X and W being in tons, and F in feet. The author was of opinion that, under the most favourable circumstances, the pile should not be loaded with more than one-third of the result given by this formula; and when there was any danger of a future disturbance of the material around the pile, or when there was any vibration in the structure which might be communicated to the piles, the load imposed should not exceed one-tenth.

The bearing support due to the sectional area of the pile had not been considered in the preceding inquiry; but numerous experiments had been made, which gave results of from 5 tons to 10 tons per square foot.

A NEW CLASS DIRECTORY.

MESSRS. WYMAN and SON, of Great Queen-street, have announced a new class directory, which promises to supply a long felt want. It is to be called the "Architects', Engineers', and Building Trades' Directory for 1868;" and will be a business book of reference for the various industries connected with the arts of construction throughout England, Scotland, and Wales. But why Ireland should be left out of the question we cannot imagine. Ireland is a far more important part of the kingdom, as far as architecture is concerned, than Wales. The directory will also contain a concise sketch of the professional career of all the leading persons engaged in architecture and engineering. If this new annual realizes what it promises—and we see no reason why it should not, but many reasons why it should, considering the respectability and experience of its projectors—then may we soon expect from their hands an invaluable book of reference.

ROMAN HOUSES AND VILLAS IN BRITAIN.

SO little beyond the mere substructure of Roman houses has been discovered in Britain (says Mr. Henry Godwin, F.S.A., in his valuable "Handbook to English Archæology," just published), that antiquaries have doubted whether the walls of brick or stone extended up to the roof, or whether the walls were only raised a little above the floor, to support a substructure of wood. "Perhaps the safest conclusion," says Mr. Wright, "is, that in houses of people of wealth and importance the walls were of masonry; while, in the more ordinary houses, the masonry of the walls may have risen only two or three feet above ground." An almost solitary instance in which the walls, built of stone, are still standing at an elevation above the doors and windows, occurs in the neighbourhood of Hadrian's Wall. In forming an opinion of the general appearance and elevation of these houses we are, however, somewhat assisted by the drawings in very early manuscripts. An Anglo-Saxon MS. (Harl. No. 603, doubtless from some classical prototype) presents a view of a house with arched windows and a tiled regular roof. For ground plans, and the general arrangement of the lower apartments, we have abundant materials. Separate houses in Roman-British towns are of the greatest rarity. One example has been found at Lympne, in Kent, of which the ground plan seems perfect. It has what seems to have been an almost invariable peculiarity of Roman houses in Britain—a semicircular projection from one of the rooms. It stood north and south 30 feet, exclusive of this southern wing, and extended about 50ft. east and west. The arrangement of houses in streets, generally narrow and irregular, has been traced at Aldborough (Isurium), where a row of connected houses occurs; at Chester (Ciluruum), exhibiting intricate alleys; at Caister (Durobrivæ), in confused masses; and in London interruptedly. The excavations at Wroxeter (Uriconium) promise more satisfactory results. The Roman villa was an establishment of enormous extent, having large courts, around which the buildings were grouped. The largest and most magnificent yet discovered in England is that at Woodchester, Gloucestershire, which, although not fully excavated, covers an area of 550ft. by above 300ft. It had two courts lying nearly north and south, one 150ft. square, and another 90ft. square, surrounded by a gallery or cryptoporticus. The principal apartment was 50ft. square, and had a splendid tesselated pavement, probably based on a hypocaust, with a fountain in the centre. The ruins of another villa, hardly inferior to that at Woodchester, have been discovered at Bignor, near Arundel, in Sussex. In many respects the villa at Bignor was the more splendid, for the courts and crypto-

portici were larger, and the baths more extensive. The two courts of the villa extended north-west and north-east. The inner court was a parallelogram, somewhat imperfect, from the southern side being a little longer than the northern. The court crypto-porticus measured 137ft. 9in. in length and 10ft. wide. It is computed that not fewer than one hundred Roman villas have been discovered in England, and that they form but a small portion of the whole. The most magnificent have been found in the south-west districts.

NEW METROPOLITAN PROJECTS.

FOR the information of the Commissioners of Sewers of the City of London, Mr. W. Haywood, engineer and surveyor to the commission, has issued a report upon the various projects of the railway companies and other bodies applying to Parliament during the present session for powers to enable these projects to be carried out.

The following schemes, plans, and bills have been deposited by the promoters :—

The Eastern Metropolitan (Underground) Railway Bill is for the formation of an underground railway commencing in the city by a junction with the Metropolitan Railway in Aldgate High-street, east of St. Botolph's Church; from that point it is to be carried along the Whitechapel High-street and the Mile End-road to a junction with the Great Eastern Railway at Bow. The entire line is to be subterranean. By exchange stations at Bow and at Aldgate High-street passengers will be carried from the west to the extreme east of London without leaving the railway system, if this proposed railway is carried out.

Another Bill is to enable the formation of a railway between Little Moorfields and the Essex-road, Islington, at a point near to the Agricultural Hall. The line is to be on a viaduct, starting at a level of 30ft. above the pavement in Little Moorfields; Tenter street is to be crossed by a bridge 22ft. high, White-street by a bridge 21ft. high, and Reynolds-court by a bridge 19ft. 6in. high. The viaduct is to be formed of wrought and cast iron. The line appears to have been projected with the view to secure that traffic which it is anticipated would go from Islington to the city by means of the projected new line of thoroughfare from Upper-street, Islington, to Fore-street, which was reported on by the engineer in October, 1865.

A third project is for making a junction railway between the Metropolitan Railway at Smithfield Market, and the London, Chatham, and Dover Railway. The junction with the Metropolitan Railway is to begin at the Meat Market; it is then to be carried beneath the new street now being formed from Farringdon-road to the western side of the market, and thence by a curve beneath St. John's court, to a junction with the London, Chatham, and Dover Railway at Snow-hill. The line will be entirely subterranean.

Next, we have a proposal for the formation of a subway beginning at Tower-hill, a little to the north of Lower Thames-street and the Tower Dock, crossing beneath the river, and terminating on the southern side near to Pickle Herring-stairs, in the parish of St. Olave, Southwark. A description of this project appeared in the BUILDING NEWS, November 29, 1867. Says Mr. Haywood, "Of the utility of any safe, quick, and cheap means of crossing the river at this spot, there can be no doubt, but what is imperatively demanded is a new bridge across the river, with suitable approaches on either side, and, if that were constructed, this subway would be unnecessary."

To these may be added a Bill promoted by the Corporation of the City of London, with the view of supplying the citizens with gas of an increased illuminating power and greater purity, and at a lower price than it is already supplied. The gas is to produce from an argand burner consuming 5ft. of gas per hour, a light equal to that of eighteen sperm candles of six to the pound, each burning at the rate of 120 grains per hour, whereas the illuminating power of the gas supplied to the citizens is, according to the Metropolis Gas Act of 1860, only equal to that of twelve sperm candles. The charge is to be not more than 3s. 6d. per 1,000 cubic feet of gas, the present price being 4s. per 1000 cubic feet for gas of inferior illuminating power. The site of the proposed gas works is on the northern banks of the Thames at North Woolwich to the east of Silvertown, from whence the leading mains are to be brought by the principal roads to the city. The total area, including public way, scheduled within the city for the several projects reported upon, is about 1¼ acres, which the report states is very much less than has been scheduled annually for many years past.

DETAILS FROM HEREFORD CATHEDRAL.

HEREFORD Cathedral, though small, has many charming details which are well worth the attention of the architectural student. We give this week two illustrations from the Lady Chapel. No. 1, an unglazed opening between the chapel and the south aisle, is a curious mixture in style of Semi-Norman and Early English. No. 2 is pure Early English at its best period, and the arch mould is a fine example of enriched moulding. No. 3, on the same page is a pinnacle from Peterborough, exhibits the same mixture of Norman and Early English in its detail as No. 1.

WORKS IN NEWCASTLE.

WE have received the reports of the Surveyor of the borough of Newcastle for the years 1865-6-7. A comparison of these reports shows that the number of new streets sewered last year was 49, a corresponding number being flagged and paved. In the previous year, the number was 31, making altogether 83 new streets completed since the adoption of the new Act, besides others in progress. The average number of streets annually completed under the old Enactment did not exceed 11, which shows the very marked results that have followed the application of the recent new Act. Forty-one new streets have been built upon during the past year, while the number of houses built was 370, or an increase of more than three times the number built two years ago. A large portion of these houses, it appears, consists of the class called flats; they are substantially built, but an objectionable feature, says the surveyor, exists in the arrangement of the bedrooms.

In the upper flat they are too small, seldom exceeding in cubical contents 600 feet. This small breathing space must be prejudicial to health, and the surveyor has done well to call attention to it. There have also been built 3 schools, 1 church, 1 chapel, 1 theatre, 1 parsonage, and 5 warehouses during the year. As to drainage we note that 473 branch drains have been laid down to old houses, and to new houses, under the building regulations, there have been 382 drains, making a total of 855 houses drained during the year. There are now 11,395 houses altogether drained within the borough. The total length of sewers constructed in the course of the year was upwards of 5½ miles.

STOGURSEY SCHOOL, SOMERSET.

THESE handsome schools have been recently erected at Stogursey, or Stoke-courcy, in the diocese of Bath and Wells, by Sir P. P. F. P. Acland, Bart., of Fairfield. The principal room, 65ft. by 20ft., is fitted up for boys and girls, and a spacious class room is in the rear, opening into it by means of a pointed arch. The lobbies are formed of wood framing, and are easily removed on occasions of anniversaries of school treats. Opposite the class room is a projection, appropriated for boys' and girls' cloak rooms, the whole forming a Greek cross on plan. These cloak rooms are fitted with fireplaces, and are used by those children who attend from distant hamlets, where no schools exist, for dining rooms. The great room is fitted with desks and benches, so made as to serve as adult sittings upon occasions of village lectures, &c. At the junction of the school with the house is a Belvidere tower, with stone staircase ascending to the open belfry, the windows of which are fitted with wide stone slabs for telescopes to command views of the extensive range of Quantocks on the south side, and of the Bristol channel and Welsh hills on the west. Glades have been cut through the Fairfield woods, so as to bring in the schools as an architectural feature. Mr. Merrick, of Glastonbury, executed the dressed stone work, Sir Peregrine's own men doing the hard stonework under the direction of Mr. Millard. The walls are built of a hard sandstone, from the Quantock hills, of a pale pinkish red, each stone squared and dressed to a fine face, which contrasts well with the cream coloured dressings from the Bath quarries. The windows are filled with rolled cathedral tint glass, with stamped borders, by Messrs. Powell, of Whitefriars. There is a heating apparatus, besides open fireplaces. The whole buildings have been erected, at a cost exceeding £3,000, by the munificence of Sir P. P. F. P. Acland, Bart., of Fairfield, who also gave the site, and form a conspicuous block, grouping with the conventional Norman church and the remains of the mediæval castle. Mr. Norton, of 24, Old Bond-street, London, was the architect, from whose designs, and under whose superintendence, the whole of the works have been carried out.

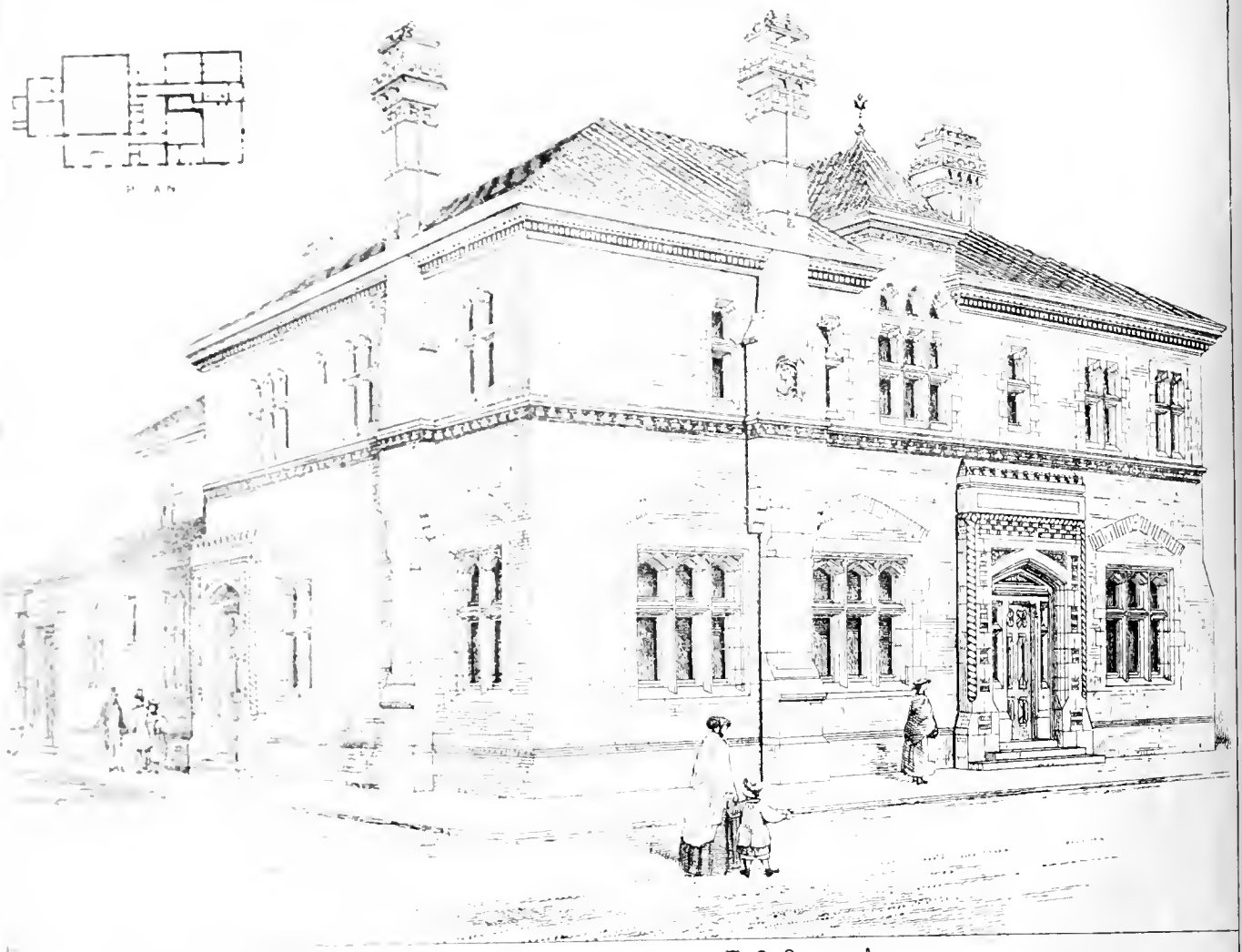
NEW COUNTY COURT, BRIGHTON.

THE subject of our illustration is being erected in Church-street, adjoining the Old Infantry Barracks, and contiguous to the Pavilion. It is designed to provide adequate accommodation for the increasing business of the County Court, and contains a public office, 31ft. 6in. by 20ft.; bailiff's office, 18ft. by 10ft.; registrar's office, 20ft. by 17ft.; judges' room, 17ft. by 18ft.; court, 41ft. by 35ft.; with open timber roof, 34ft. high; with the requisite retiring and consulting rooms, &c. Cellars are provided in the basement, and additional offices and apartments for the residence of the office-keeper on the first floor. The structure will be of red brick, with selected Bath stone dressings, and covered with tiles; the doors, sashes, and the principal part of the joinery will be of Stettin oak. The buildings generally will be warmed by warmed fresh air in large volume, with adequate provision for the extraction of the foul air from the various rooms. Ten tenders were submitted for the erection of the building, varying from £6,246 to £5,395, which sum, that submitted by Mr. J. T. Chappell, of Steyning, was accepted. Mr. Thomas Charles Sorby, of Brunswick-square, London, is the architect.

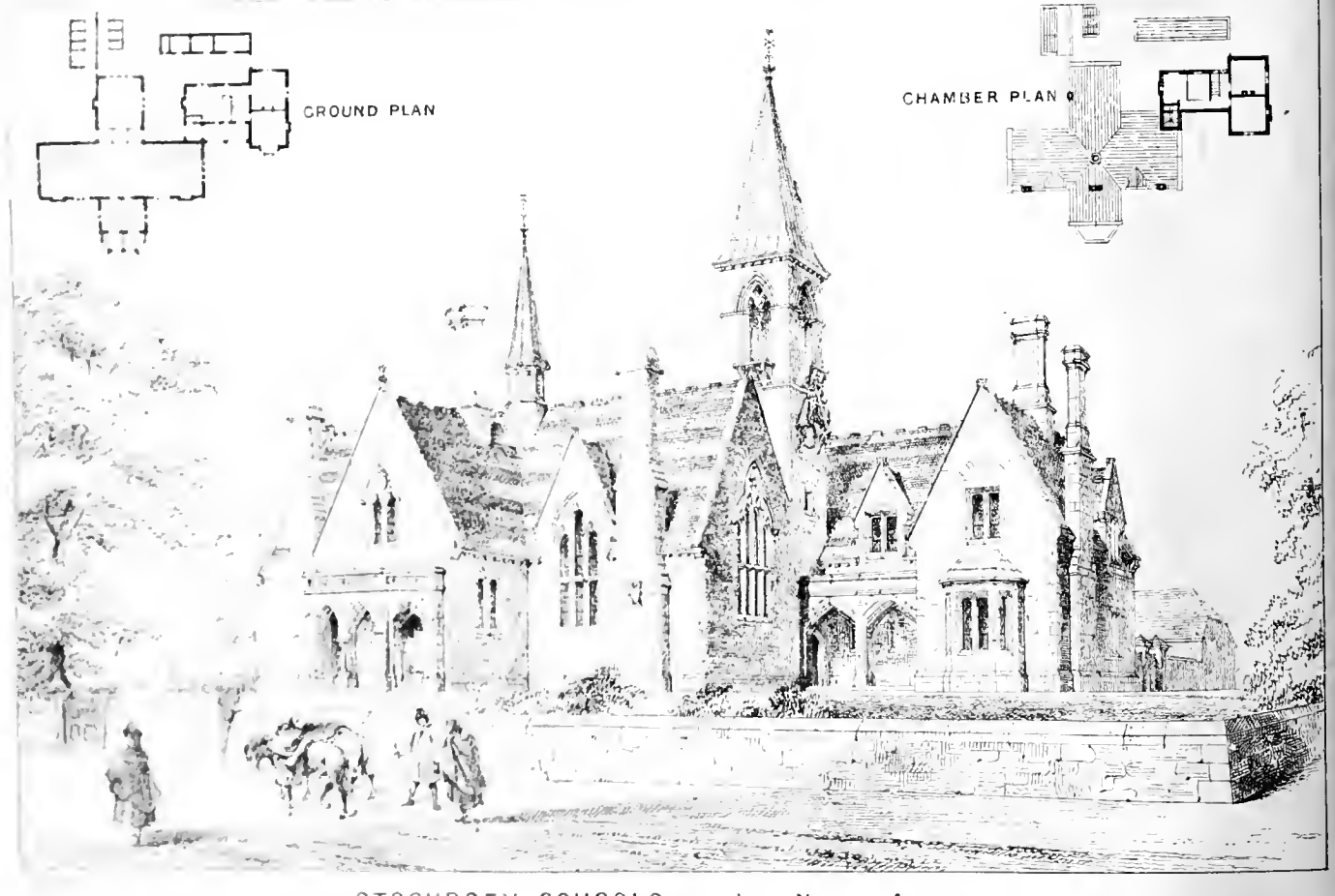
THE PEABODY TRUST.

IN accordance with the wish expressed by Mr. Peabody that a report of the application of the funds given by him to the poor of London (with receipts and expenditure) should be laid before the public once in each year, the trustees have just issued their statement for 1867. The account shows that the original fund has been increased by rents and interest on unexpended capital to the extent of £20,042 6s. 4d., making the sum total at the end of December, 1867, £170,042 6s. 4d. The buildings at Spitalfields and Islington continue fully occupied, with increasing demand in anticipation of vacancies. At Shadwell, the four ranges of buildings forming Peabody-square, and containing 195 tenements, were completed and ready for occupation at the close of the year 1866; but, owing to the depression of business and the consequent suspension of employment in that part of London, they have been somewhat slow in filling. At the commencement of the present year 175 families are resident, and the number is gradually increasing. The total population in all the buildings erected by the trustees is 1,583. The sanitary condition of the dwellings continues highly satisfactory, and the houses, well ventilated, open to free air, and kept with scrupulous cleanliness, appear to secure exemption from diseases incident to crowded localities. The deaths during the past year were seven adults and eighteen children, all from ordinary diseases.

A number of men employed in a ballast pit on the Brechin (Scotland) branch of the Caledonian Railway lately came upon some interesting remains. The principal of these is a large circle 66ft. in circumference, in the centre of which is a grave, from which have been excavated human remains which had evidently been burned. Within twenty yards of these interesting relics, other graves containing human remains have been found, and in one of them was discovered part of an implement. Antiquarians who have visited these places are of opinion that the place once was the rendezvous of a party of Druids.

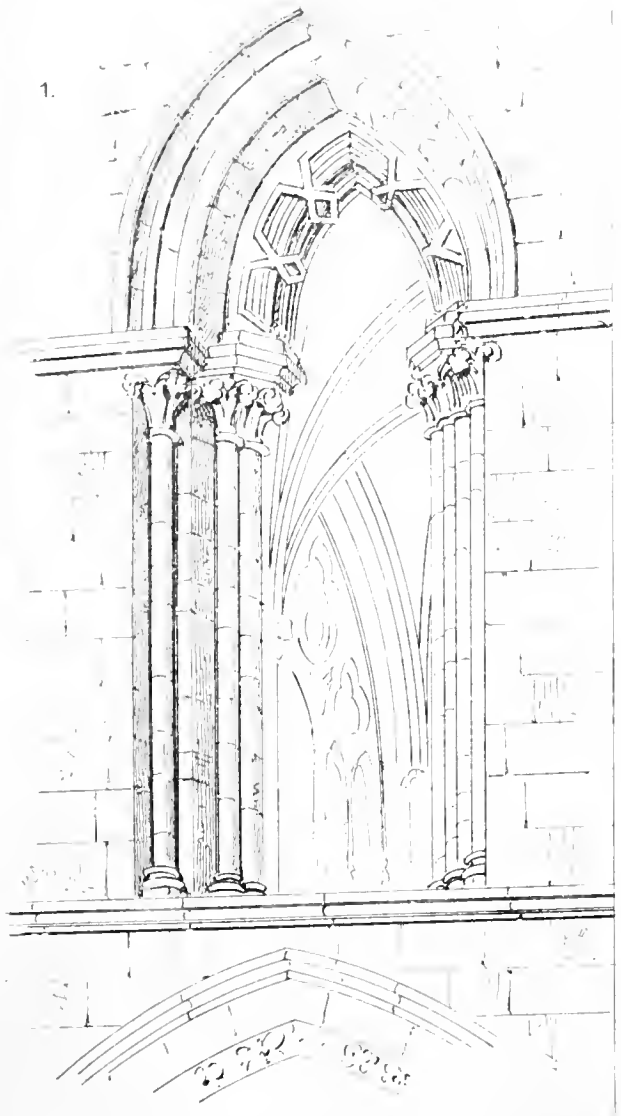


BRIGHTON COUNTY COURT — T. C. SORBY, ARCHT.



STOCURSEY SCHOOLS — JOHN NORTON, ARCHT

1.



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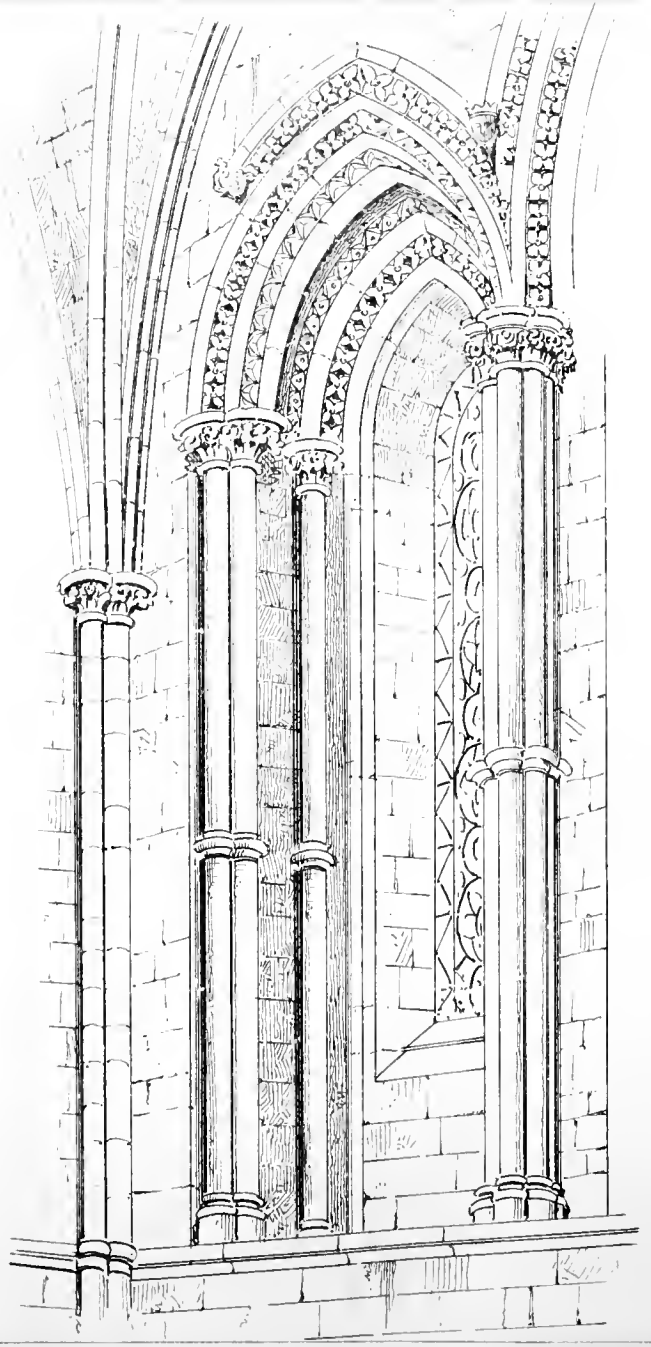
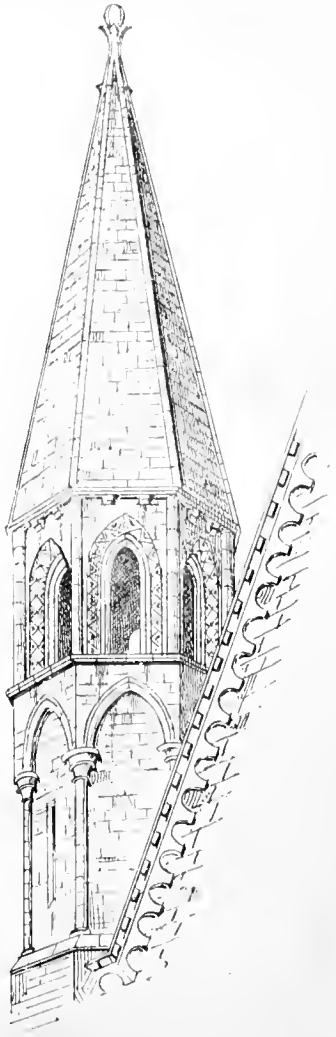




Hereford Cathedral:

1. Opening between Lady Chapel and S. Aisle.
2. Lady Chapel N.E. Corner.

Peterboro' Cathedral.

Pinnacle S.W. Transept

E. Wrabridge, lith.

MAL-ADMINISTRATION OF THE PEABODY TRUST.

MR. GEORGE PEABODY, with an amount of wisdom and forethought which we could wish always accompanied sincere benevolence, provided that the trustees of his magnificent gift to the poor of London should annually render an account of their stewardship. The account for the past year has accordingly just appeared, and it is with regret we feel constrained to say, that it does not show the wise and economical management which so generous a donation deserves. The trustees evidently desire to take credit for effecting some considerable amount of good, they speak of the exemption of their tenants from diseases incident to crowded localities, of their good order and and general contentment, their peaceful deportment, and the improved order within their apartments, the healthy aspect of the children, the neatness and tidiness of their dress, and their inoffensive happiness at play in the ample and secluded playgrounds. Altogether they draw a picture which we should rejoice to see realized universally among the crowded and ill-lodged poor of London. We do not desire to remark on this portion of the subject, further than to say that such results are no more and no less than have been achieved in every case of improved dwellings for the last 20 years, and that knowing how carefully, in all such cases, the tenants are selected, in the first instance, from the number of applicants, we do not attach much importance to them. While "model dwellings" are few in proportion to the great demand, the trustees can always select "model tenants, and secure a "model result." The great point of public interest is, to know if the fund is being made the best use of. All else is of minor consequence.

In the first place, we observe that no progress whatever has been made in building for nearly two years past. In December, 1865, it was reported that £9,487 5s. 3d. had been paid for two sites at Chelsea and Bermondsey, and these are reported still as unbuilt upon, and figure in the present account for £9,525 18s. 9d., having been retained at an actual expense to the fund of £38 13s. 6d. We should like to know where these two sites of building land precisely are, and what has caused the increase of £38 13s. 6d. in their cost. Are they now covered with houses, and if so where are the rents of those houses? Or are they vacant building plots, and if so why, having money to build on them, permit them to remain vacant? A balance of £44,000 remains in railway debentures and at the bank. Surely it is not good management to leave such a sum so long unemployed, and particularly as money has been realizing so little interest for some time past. While improved dwellings are in such urgent and great demand, all delays are inexcusable. We observe that a further sum of £2,101 has also been paid on account of a site at Westminster, although it is said in the body of the report that the trustees are "negotiating" for it. Let us hope there is some mistake here that may hereafter be explained, and that the trustees have at least brought their negotiations to a tolerably secure stage before paying so much as £2,101 on account. Altogether, this policy of buying up plots of land to be afterwards left vacant, incurring additional expenses, appears to be neither advantageous to the fund nor beneficial to the poor of London. We certainly think a little more explanation is due than has yet been vouchsafed, respecting these unproductive amounts.

Let us now look at the portion that is productive. It stands as follows :—

Amount placed at Interest.	£	s.	d.
London, Brighton, and South Coast Railway Debentures	30,000	0	0
Expense Fund	1,144	2	8
Cash balance in the Bank of England	14,686	3	6
	£45,830	6	2

Amount producing Rental			
Land and Building at Spitalfields	27,215	11	3
" " at Islington ...	40,397	2	1
" " at Shadwell ...	44,972	3	1
	£112,584	16	5

With respect to the amount at interest, it is right to observe that the trustees do not state that the amounts of the expense fund, and the large balance at the bank, do actually bear interest. We think they ought to do so, and give the trustees the benefit of the doubt. On this and several other important particulars the accounts are far from clear. Several discrepancies exist between this and the two former reports, and it is only after a close analysis that we have been able to arrive at a clear estimate of their real value and significance. That analysis we have, however, thought it our duty to make, not only in the interest of the poor to whom this vast fund belongs, but also as affecting the great problem of dwellings improvement, which cannot fail to be very much influenced by the course taken in its expenditure. As affecting the poor, we find that houses have been erected to accommodate 452 families in about 800 rooms, and the cost (making every allowance for some shops in Spitalfields) is at the rate of £130 per room. Now, the Metropolitan Association builds houses at a cost (including value of the land) of £52 per room. The Industrial Dwellings Company do the same at £53 per room, and the Corporation of the City of London (which we consider extravagantly dear) built upon a too costly site, the value of which alone is equal to £30 per room, at the total rate of £90 per room. Hence it follows that, if either the Metropolitan Association or the Industrial Dwellings Company had expended the same amount, they would have accommodated 1,130 families of the London poor, being 668 more than the Peabody trustees have done, and even the City Corporation would have accommodated 664, being 212 more. With these facts staring us in the face, it is impossible to feel satisfaction at the report of the trustees. We are grateful to Mr. Peabody for his gift, but we cannot be grateful to his trustees for its management. That 452 families are better accommodated is a pleasing fact, but how about the much larger number that are not better housed, and ought to have been with the same money? This large expenditure cannot be explained away by any reference to substantiality of building, or increased comforts, because the buildings of the Metropolitan Association are equally substantial, and have better comforts, inasmuch as the rooms are generally larger and neater, and each family possesses its own scullery and domestic conveniences exclusively to itself, accommodations shared only in common by twenty or thirty families in the Peabody buildings. The same remarks apply to the other buildings referred to. The open corridor system, which is that adopted by the trustees, has many serious drawbacks; it ought, however, to have the advantage of cheapness, and we are at a loss to conceive how the enormously extravagant expenditure could have been incurred upon it. If the trustees, before commencing another block, will only consult experienced men, they may be instructed how to build houses at considerably less than an average of £130 per room.

The bearing of their proceedings upon the general question of dwellings improvement is hardly less important. We have not yet got beyond the stage when every new building of the kind is looked upon as a "model." That our poor should ever be entirely housed by charitable gifts, the efforts of associations, or even by public grants, is neither to be expected nor desired. After all, our main hopes of improvement go only towards the attraction of capital in this direction. When it is shown, as we are sure it might be shown, that improvement will pay, the great difficulty is solved. This, we contend, has been shown both by the Metropolitan Association and the Industrial Dwellings Company. The family dwellings of the former have always produced a clear rental of 5 per cent. those of the latter pay better still, and the shareholders have received several dividends of 5 per cent. upon their unproductive as well as productive capital. We are not forgetful that Mr. Peabody's donation is not to be laid out primarily for profit; but we are at the same time aware that it was far from his intention to lessen the feeling of honest independence in the persons benefited by his gift. They were to be well housed, and to pay a fair rental; and, as a matter of fact, they do pay the full value for their apartments. Their rents, considering the equivalent accommodation, are no less than they would pay in other improved dwellings; but the amount of profit to the fund is much less, being for the past year only 1·9 per cent. This fact goes far to neutralize the honest efforts of others. Beside their buildings, worthy of all imitation, the Peabody trustees have managed to erect others, which can only scare away capitalists, and be looked upon as "models *to be avoided*." This is disastrous, because of the great public interest taken in so splendid an act of benevolence. We know of no other way that its ill effect can be neutralized than by pointing, as we have done, to the source of the evil in the outrageously extravagant first expenditure. One half of Mr. Peabody's gift yet remains to be expended, and we hope the trustees will adopt a wiser course with that amount, and invest it in a way which shall be at the same time more economical and give more extensive benefit to the poor of London. They will thus, in some measure, retrieve their past errors; and, instead of retarding, as they now do, they may give increased impetus to a general improvement in dwellings.

THE COLOSSEUM.

MELANCHOLY is the only word that fitly describes the appearance of the once celebrated Colosseum, in Regent's-park. Those who can remember the varied glories of this establishment twenty years ago will look upon its present appearance at least with regret. Whilom one of the chief attractions, and most favourite places of entertainment of which the metropolis could boast, the Colosseum is now dreary and deserted. The Glyptotheca, once so much extolled, is now as silent and lifeless as the stone statues which formerly adorned it; the picturesque Gothic aviary, and the beautiful Arabesque conservatory, are no longer fashionable lounges; the pretty Swiss chalet is a dismantled ruin, and the Temple of Vesta and the Arch of Titus wear almost as ancient a look as the famous relics which they are meant to represent. The whole scene is one of desolation, and calls to mind the lines—

> Cypress and ivy, weed and wallflower, grown
> Matted and massed together, hillocks heap'd
> On what were chambers, arch crush'd column strewn
> In fragments, choked by vaults, and frescoes steep'd
> In subterranean damps, where the owl peeps,
> Deeming it midnight.

The glory of the place has departed. Possessing so many and varied attractions, the repository of a host of objects of beauty and curiosity, some of them perfectly unique in their way, it is rather surprising that the Colosseum should have turned out the complete failure it has. The inconvenience of its situation may have had something to do with its want of success. Bad management may have contributed to bring about the result. But, whatever the cause, the failure is clear. The Polytechnic has beaten the older institution out of the field. The money expended on the Colosseum, from first to last, has exceeded the cost of a royal palace, and its fortunes have been of the most fluctuating kind. The building was designed by Mr. Decimus Burton, the architect; the idea, however, belonged to Mr. Horner, a land surveyor, for whom the building was erected. It was

begun in 1824, and completed in 1827, Messrs. Peto and Grissell being the contractors. It did not receive its name from any architectural resemblance to the Colosseum of Rome, but on account of its colossal size. In reality the edifice is a miniature of the Pantheon, and bears a still greater likeness, it is said, to the Roman Catholic church at Berlin. It is a polygon of sixteen faces, each 25ft. in length, making the circuit of the building 400ft. The walls are 3ft. thick at the ground, and to the glazed dome the height is 112ft. The building is entirely lighted by this dome, there being no side windows. The entrance portico at the west front has been described as the finest and best proportioned portico in the metropolis. It is composed of six Grecian-Doric fluted columns, full-sized models of those of the Pantheon. At the time of their completion the various internal features of the Colosseum were lauded in language which may seem somewhat extravagant in these phlegmatic and hard-to-please days. A quarter of a century ago the edifice was deemed simply a triumph of architecture—a thing wonderful in the way of public buildings. Much of this praise was undoubtedly deserved. Among its attractions are two deserving of special mention. These are the Museum of Sculpture, and the panoramic view of London. The Museum or Glyptotheca, as it is called, occupies the basement of the Rotunda. It has an Ionic colonnade, the columns and entablature being richly gilt, several thousands of feet of embossed glass being spread from the cornice and entablature. The frieze is enriched with basreliefs of the whole of the Panathenaic procession from the Elgin marbles, modelled by Henning. This occupies the whole circumference of the hall, nearly 300ft. Twenty fresco paintings of allegorical subjects appear above. Beyond the circle of columns is one of an equal number of pilasters, dividing and supporting arched recesses. This Museum contains numerous works of art by British and foreign sculptors. As to the panorama, it will always be considered as a marvel of art, as well as a monument to the prodigious labour and perseverance of the artist. The view of the metropolis was taken from several feet above the summit of the cross of St. Paul's Cathedral, the sketches having been begun in 1821, by Mr. Horner. It was completed in 1829. The picture covers 46,000 square feet, or more than an acre of canvas. The circumference of the horizon from the point of view is nearly 130 miles, and the dome on which the sky is painted is 30ft. greater diameter than the cupola of St. Paul's. Of this curiosity of London, Mr. Timbs gives the following particulars—"Excepting the dome of St. Paul's Cathedral, there is no painted surface in Great Britain to compare with this in magnitude or shape, and even that offers but a small extent in comparison. It is inferred that the scaffolding used for constructing St. Paul's cupola was left for Sir James Thornhill, in painting the interior; and his design consisted of several compartments, each complete in itself. Not so this panorama of London, which, as one subject, required unity, harmony, accuracy of linear and aërial perspective; the commencement and finishing of lines, colours, and forms, and their nice unity—the perpendicular canvas and concave ceiling of stucco was not to be seen by, or even known to, the spectator, and the union of a horizontal and vertical surface, though used, was not to be detected. After the sketches were completed upon 2,000 sheets of paper, and the building finished, no individual could be found to paint the picture in a sufficiently short period, and many artists were of necessity employed; thus, by the use of platforms slung by ropes, with baskets for conveying the colours, temporary bridges, and other ingenious contrivances, the painting was executed, but in the peculiar style, taste, and notion of each artist. To reconcile or bring these to form one vast whole was a novel, intricate, and hazardous task which many persons tried, but ineffectually. At length, Mr. E. T. Parris, possessing an accurate knowledge of mechanics and perspective, and practical execution in painting, combined with great enthusiasm and perseverance, accomplished the labour, principally with his own hands, standing in a cradle or box, suspended from cross-poles or shears, and lifted as required by ropes." Describing the Gothic aviary already alluded to, a gushing writer of the period says, "It is superbly fitted up with gilt carved work such as Isabella of Castile might be supposed to have constructed amidst the relics of a Moorish palace, or Abu Abdallah, with true Arabian gallantry, to have conjured up for the solace of some fair Christian captive within the enchanted halls of his own Alhambra." The original projector having failed, the property passed into the hands of trustees. It was subsequently (1843) sold to Mr. David Montague for the sum of 23,000 guineas. By the enterprise of this gentleman the fortunes and character of the establishment were retrieved. Considerable additions were made to the Colosseum in 1845 by the late Mr. W. Bradwell, formerly chief machinist at Covent Garden Theatre, who designed the arched corridor, in the style of the Vatican, which forms the eastern entrance in Albany-street. The same gentleman in 1848 designed and erected the theatre, which at the time was thought very highly of. It is decorated with colossal Sienna columns, copies of some of Raphael's cartoons, and allegorical groups of a gorgeously painted character. It was here where was exhibited for the admiration and delight of a former race of juveniles, the Cyclorama of Lisbon, "depicting in ten scenes the terrific spectacle of the great earthquake of 1755, the uplifting sea and o'ertopping city, and all the frightful devastation of flood and fire; accompanied by characteristic performances upon Bevington's Apollonicon!" This cyclorama, by the way, is said to have cost £20,000. It was added to the establishment by Mr. Turner, whose property the Colosseum became about thirty years ago. When in 1855 the building was put up to auction, it transpired that Mr. Horner, its projector, had expended £23,000 on it, and subsequently above £100,000 in decorations. He held a lease of it from the Crown for ninety-five years, thirty of which had expired. The ground rent was £262 18s. The lease was sold in 1836 to Messrs. Braham and Yates, who laid out £50,000 in additions and decorations to the building. It then passed into the hands of Mr. Turner. The Colosseum, it will thus be seen, has cost upwards of £200,000. The property was not sold on the occasion in question, only £30,000 having been bid for it.

What is to be done with it? There was a rumour some time ago, that it was to be converted into a club house, for the convenience of young men engaged in business. As we have heard nothing further of this scheme, we presume that it has been abandoned. It is a matter of surprise to us, that no speculator has come forward to make one more venture with the edifice, for it may be said that there are few buildings in the metropolis that could be so easily converted into almost any purpose as the Colosseum.

ARCHITECTURAL SOCIETIES.

THE Yorkshire Architectural Society held its annual meeting at York, last week, the Rev. Canon Hey, in the chair. The report congratulated the members upon the satisfactory condition which it had maintained during the past year. The members had continued to increase, and the finances were also in a prosperous state. The committee, however, found matter for regret in the fact that they had met with no response to the offer of prizes made by the society to art workmen competing in articles of wood carving. They recommended a further trial during the present year, retaining the same subject. The want among workmen of power to appreciate the meaning of the architect, and to carry out his wishes, was generally acknowledged. One exception was found, in Mr. Holmes, of York, whose ironwork pulpit, in the new church of Selby, had, in the opinion of the committee, proved him to be capable of advancing to the foremost rank of art workmen. The report was adopted, and the officers of the society were re-elected.

On Tuesday the annual meeting of the Northern Architectural Association was held at Newcastle, Mr. John Green, the president, in the chair. The tenth annual report was read by the secretary, Mr. Thomas Oliver, F.R.I.B.A., and unanimously adopted. A letter from the secretary of the Architectural Alliance was then read, stating that the next meeting would be held in July, and asking the Association to continue their connection with the Alliance, and to send a delegate to the meeting, as on previous occasions. A resolution to this effect was proposed and carried. On the motion of the president, seconded by Mr. F. R. Wilson, it was resolved that Mr. G. G. Scott be made an honorary member. A donation of five guineas to the Architectural Museum was duly voted. The president then read his annual address. Mr. F. R. Wilson then read a paper on "Dangerous methods of Construction in the North." The Secretary then said he wished to speak of a subject which he thought was a proper one to bring before that meeting. Most of them knew that they were going to lose one of the domes from the Exchange Buildings, Grey-street. He believed that they would do well to pass a resolution appointing a deputation to wait upon the Town Improvement Committee, or the Town Council itself, to request that the insurance company, who were rebuilding the premises, should be required to restore the building in its integrity. It was a shameful thing that these people, for the sake of a few hundred pounds, should destroy the proportions of one of the most handsome buildings, he might say, in the world. After some discussion the resolution was agreed to, and the meeting terminated.

PARLIAMENTARY NOTES.

IN the House of Commons on Friday, two questions were asked relative to the proposed New Law Courts—whether an architect had yet been appointed, and whether the proposition of Lord Justice Cairns, the effect of which would be to abolish all the law courts in London, and to have only Courts of Appeal in London, was under the consideration of Her Majesty's Government. Mr. Hunt, the Secretary to the Treasury, said, in answer to the first question, that no architect had been appointed. The present position of affairs was this: In consequence of what passed in this House during the short session a communication had been made from the Treasury to the members of the commission, and the commission had replied by a suggestion to the Treasury that the opinion of the Attorney-General should be taken on the subject of what would be the legal effect of the recommendation of the judges of designs. The Treasury had adopted that suggestion, and a case was now being prepared for the opinion of the Attorney-General. As to the other question, put by the hon. member for Dundalk, the commission had not reported the communication to which he referred to the Government, and, therefore, the Government was not in a condition to take the subject into consideration.

The East London Museum Bill passed through committee on Monday, on which Lord Redesdale seized the opportunity of remarking, in his well-known leave-things-alone style, that it would lay the foundation for claims from every large town in the kingdom. Dublin, he said, was already petitioning, and he could not see why museums might not be just as well established at the public expense in Dublin, or in Lambeth, or in Manchester, or in Leeds, or in Bethnal-green. Neither do we, and we really don't see what there is to alarm any one in the thought, except inert and narrow-minded persons like Lord Redesdale.

WATER SUPPLY AND SANITARY MATTERS.

It is mentioned in the report of the London General Water Purifying Company, which was read at their fourth ordinary meeting on Monday, that the Government has adopted the company's filtering apparatus at the Broadmoor Criminal Lunatic Asylum, where, at the comparatively small cost

of £200, the entire daily supply of 60,000 gallons of water is filtered to the entire satisfaction of the authorities. The report further states, that, although the first nine months of 1867 showed a considerable increase over the same period in 1866, the last three months of 1867 were the worst the company have experienced, caused, without doubt, by the general depressed state of trade. Notwithstanding the example of the medical profession, who, by their use of the company's filters, evince their opinion of its importance in a sanitary point of view (one-seventh of the company's filters sold and hired being to members of the medical profession), of the general public a relatively small proportion only avail themselves of the same advantages, excepting under pressure of some serious epidemic.

On Wednesday week the water was successfully laid on to the town of Houghton-le-Spring, near Newcastle, by the Local Board of Health, under the powers contained in the Public Health Act. The water is procured from a shaft twenty-six fathoms in depth, sunk near the Houghton Colliery, and is forced by a powerful engine to a height of 170ft. through a 9in. rising main into two reservoirs, each capable of containing 250,000 gallons. These reservoirs are formed in the solid rock, and lined with cement and brickwork. Mains varying in size from 2in. to 6in. in diameter, and five miles in length, distribute the water over the whole town and district over which the Board have control. The reservoirs were constructed by Mr. George Bailey, contractor, of Newcastle-on-Tyne. The whole of the works were designed and carried out under the direction of William Cooper, Esq., M.I.C.E., Durham.

Building Intelligence.

CHURCHES AND CHAPELS.

A reredos has just been erected in the lately enlarged church of St. John the Baptist, Helidon. It is the work of Mr. Butterfield, the architect of the church. It comprises a centre filling the space behind and above the Holy Table, and two wings on a level with the table, extending to the north and south walls of the sanctuary. The wings are filled with a zigzag pattern in Minton's tiles and Bath stone. In the central portion is a background of Bath stone inlaid with a cross of red Languedoc marble, resting on a slab, under which is a base of blue marble, and encompassed by circlets in green tile ware. Rosettes in coloured tiles fill the spaces on either side of the cross, with the addition of the letters Alpha and Omega in circles of blue and red marble. The whole is flanked north and south with a pinnacle of red Kenilworth stone.

Sampford Spiney Church, situated at Horrabridge, on the borders of Dartmoor, was reopened last week, after restoration. The building consists of nave, south aisle, west transept, chancel, tower, and porch. The old gallery has been removed, and the church entirely reseated. The chancel has been rebuilt, and a granite chancel arch has been added. The chancel is laid with red and black tiles. The total cost of the work was £650. Mr. A. Norman, Plymouth, was the architect, and Mr. R. Dingle, Stonehouse, the contractor.

The old church of St. Mary, Castlegate, York, having become much dilapidated, measures have been taken in order to its restoration. Mr. Butterfield, of London, has prepared plans for this purpose.

St. Andrew's Church, Blunsdon, has been reconsecrated, the restoration being nearly completed. The style is Early English. A new exterior roof has been added, still preserving the internal character of the old one. A new porch has been erected on the north side. Mr. W. Morris, of London, was the architect, and Mr. Smith, of Highworth, the builder.

A new chapel, erected by the members of the United Methodist Free Church, was opened at Parkgate, near Rotherham, on Sunday. The chapel is built entirely of stone, in the Early English style of architecture, and surmounted by a tower and spire. The total cost of the erection has been £2,600. Messrs. Blackmoor and Mitchel Withers, of Rotherham, have been the architects, and Messrs. Askew, Brothers, of Parkgate, the builders.

The fine old church of Wath-upon-Dearne is now undergoing restoration. The workmen recently discovered a monumental brass in good preservation, containing the following inscription:—"Orate pro ãia Alexandri Mountenay Génsi qui obiit x,viij. diè December, A.D. M.C.C.C.C.V." Besides the brass many cross incised slabs have been brought to light.

The parish church of Puddlehinton was reopened last week by the Bishop of Salisbury. The building has been thoroughly restored and a new north aisle added at a cost of £1,050. Mr. Christian was the architect employed.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its monthly meeting on Monday, at the Society's house, No. 7, Whitehall, S.W., the Right Rev. the Lord Bishop of Llandaff in the chair. There were also present the Right Hon. the Earl of Romney, Sir Walter C. James, Bart., the Venerable Archdeacon Wordsworth, Revs. Canon Nepean, A. Borradaile, William Reyner Cosens, and Henry Howarth; Messrs. John Boodle, George Cowburn, J. F. France, Edward Hussey, Arthur Powell, F. S. Powell, M.P., William Rivington, and Rev. George Ainslie, M.A., secretary. Grants of money amounting to £840 were made in aid of the following objects:—Building new churches, viz., All Saints, in the parish of St. Peter's, Coventry; All Souls, in the parish of Holy Trinity, Coventry; Helsby, in the parish of Frodsham, Cheshire; and Windhill, in the parish of Calverley, near Leeds; rebuilding the churches at Llangunllo, near Newcastle Emlyn, Caermarthen, and Swinton, near Manchester; enlarging or otherwise increasing the accommodation in the churches at Ashwell, near Baldock, Herts; Dilhorne, near Cheadle, Staffordshire; Farnborough, near Bath; Kinnersley, near Hereford; St. Wendron, near Helston, Cornwall; and St. Wenn, near Bodmin. The grants formerly made towards building a church at Coxhoe, in the parish of Kelloe, near Ferry Hill, Durham, and enlarging the church at Normanby, near Market Rasen, Lincoln, were each increased.

BUILDINGS.

A new grammar-school is now in course of erection at Tamworth, from the designs of Messrs. Spragg and Joyce, architects, of Stafford.

The eastern wing of the New Dead Meat and Poultry Market, Smithfield, is now completed, and workmen are employed in constructing two cupolas, one at each angle of the eastern front which runs parallel to Charterhouse-street. The interior of the shops or warehouses in this wing are being fitted up in readiness for occupation by salesmen. Similar cupolas or domes are to be constructed at each angle of the west front, facing the west side of Smithfield. The underground railway in connection with the Great Western and Midland Railways passes beneath the market to a subterranean terminus midway between St. Bartholomew's Hospital and the market, which has been opened by the Great Western Railway Company as a goods station for the arrival and departure of trains. At present there is a circular incline to ascend and descend to and from the station, but it is understood to be the intention of the company to have a hydraulic lift to expedite the delivery of goods, &c.

The new Congregational schools in Stapleton-road, Bristol, are now finished, and will be occupied shortly. The contractor was Mr. J. P. Stephens, builder, of York-street, St. Paul's. The cost of the schools was about £1,100.

A large warehouse has been erected in Leeds, for Messrs. Constantine and Co., upholsterers. It is in the Italian style, and is built of Harehills stone. It has a frontage of 81ft. and is 86ft. deep. A peculiarity is that the ceilings of all the rooms are covered with pitch pine boards, panelled to prevent dust falling on the goods. Messrs. Dobson and Chorley, of Leeds, were the architects, and Mr. J. H. Thorp, the contractor.

The new cattle market, Southampton, which the town council have had laid out on The Marsh, close to the docks and railway station, was opened on the 8th inst. The cattle stalls are formed by means of two wrought-iron rails and cast-iron posts, 3ft. 6in. in height, bedded in concrete. The flooring is of concrete coated with Portland cement, and drained into stone channelling running the whole length of the stalls, thus securing cleanliness. The market is from the designs of Mr. Lemon, C.E., the borough surveyor, the contractors being Mr. John Cox for the drainage, and Messrs. Hill and Smith, Staffordshire, for the ironwork.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—R. J. T.—J. T.—W. J. G.—O. N. S.—I. J.—A and C. B.—G. S. C.—E. W.—W. T. P.—A. H. H.—T. E. E.—G. B. F.—W. F.—F. W. R.—I. I. and F. W.—W. I. T.—B. W.—I. H.—E. O. P.—W. G. W.—B. H. S. K.—G. I. and Sons—T. and A.—G. I. A.—I. B.—A. P.—E. W. N.—Lieut.-Col. S. W.—S. H. L.—H. H. S.—Z. M.—W. S.—T. T.—E. H. L. B.—T. S.—Dr. C. D.—F. G. A.—T. B.—T. S.—G. I. F.—W. H. T.—B. W. W.—W. C.—Colonel Stall—T. N.—G. S. L., too late, next week.

"Sessional of Royal Institute of Architects and Fine Arts" The writer did not send his name.

W. C.—Edinburgh, 2s. 6d.

F. S.—Birmingham, cases for binding the BUILDING NEWS are ready, 2s. each.

Correspondence.

A FEW THINGS WORTH IMPROVING.

To the Editor of the BUILDING NEWS.

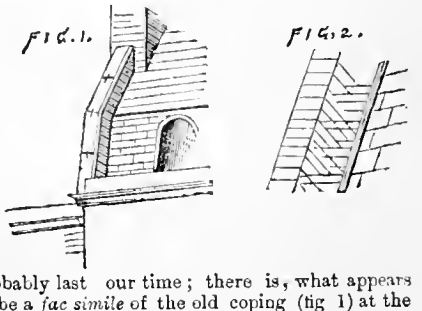
SIR,—Why should architects not be allowed to design a proper and more elegant soldier's-box than those ancient examples at Buckingham Palace and elsewhere? Why do the Post-office officials put up such monkey-looking letter-posts at the corners of the streets, and in pretty villages disfiguring their ancient churches? Can anyone inform the public residing at Belgravia the reason the rich parish of Saint George will not put a six-foot centre paving down the gravel pathway in Eaton-square (*vide* the Marquis of Westminster), and paving on the side of the Palace in Arabella-row? May I ask, in so great a square as Eaton, how it is the plantation near St. Peter's College is allowed to decay, and not kept up like the other portions? When will Sir Richard Mayne instruct his men to prevent ignorant people and children from throwing orange peel on the pavement to the danger of Her Majesty's subjects?—I am, &c.,

Chelsea. G. T. I.

DANGEROUS PARAPETS.

SIR,—At the height of the gale on Saturday, the 1st. inst., the stone coping of a party wall rising above the roofs of some five-storey houses, suddenly shot down upon the footway of the most crowded part of Gresham-street, City. Curiously, nobody was killed. A vacant patch of ground seemed to have been reserved for the purpose, and into this the little avalanche deposited itself with a roar and a splash, but people started back with scared faces, shaking the dust off their hats and coats, and thinking of their exceeding nearness to that condition of which the coroner takes cognizance. One in particular had fumbled somewhat in closing the door of his office, through which piece of clumsiness he came to miss that accident by perhaps a yard or two, and there was no victim.

So it was quite a mean accident, and they have put up new stones as before, which will



probably last our time; there is, what appears to be a *fac simile* of the old coping (fig 1) at the opposite side of the same building, and thousands of the same class upon other curb roofs which wait only for a sufficient degree of dilapidation and a favouring gale. Now the kind of flagging which, being cut out and roughly thrusted, is made to do duty as coping is commonly found to be

base, and only maintained in its position by the force of gravity, and, although some kind of cramps are generally found in such parts as are peculiarly dangerous, these soon burst or loosen the stonework, and if their condition is not discovered their fall is only a question of time. It seems therefore worth considering, whether it would not be better to dispense altogether with this apology for masonry, and use the ancient manner of terminating a brick gable fig. 2 or raking parapet—that which is still in common use on all kinds of buildings in those districts in which brick is the only building material, but which is hardly ever attempted in London, except where some kind of "effect" is aimed at. Such work well set in cement would suffer little from the weather, and could be easily repaired by the bricklayer. When we have a compulsory periodical inspection of the tops of houses, and when the owners are made responsible for such accidents as the last few weeks have produced in unusual plenty, this and similar subjects will receive the amount of attention to which they are entitled.

OBSERVER.

TO WHAT BASE USES HAVE WE COME.

SIR,—I send you an advertisement that appeared in this morning's issue of a Hull newspaper. What numberless letters have been written on the subject of architectural competitions! Now, men of years and experience are invited to task themselves for weeks in designing churches and other buildings, to be erected for small sums of money, and to receive for their trouble either no premium or one merged into the commission, if the works are carried out; still, surely my enclosure is the climax of our degradation. Will the next step of these guardians be to advertise to solicitors for a clerk to the Board, who will draw out their contract deeds for the least money?—I am, &c.

Hull, Feb. 19, 1868. ANIMUS.

SCULCOATES UNION.—TO ARCHITECTS.—The Guardians of the above Union, being desirous of making certain Alterations and Additions in the Workhouse, will, on Tuesday next, be prepared to receive TENDERS, stating for what sum ARCHITECTURAL PLANS of such proposed Alterations and Additions will be Prepared. The Premises may be viewed, and instructions for the Plans received from the Committee, who will be in attendance at the Workhouse, from ten to twelve o'clock, on Thursday next.

The tenders must be delivered at the Board Room before ten o'clock on Tuesday the 25th instant.—By order.

WM. CHATHAM, Clerk to the Guardians.

Board Room, Beverley road, Feb. 15, 1868.

ART WORKMANSHIP.

SIR,—Knowing your love of fairplay, and your determination to "sift" everything that looks suspicious, I take the liberty of calling your attention to the awards of prizes at the late competition at the Society of Arts, in the hope of drawing out some explanation of the following. You are doubtless aware that, for the prizes offered for hammered work in iron, brass, or copper, three specimens were sent in, two in brass and one in iron, numbered respectively in the Catalogue, 14, 15, and 16.

Now, to any practical man, No. 15 is certainly the best specimen of workmanship, and the most correct to the pressribed design (a photograph of which is exhibited with the specimens), and, in support of this, I would call your attention to Mr. Burges's report on these specimens in your issue of the 24th ult. He there pronounces "No. 15 incomparably the best, the back-plate of No. 14 being so beaten up as to be practically useless, while the back plate of No. 16 is not beaten up at all and turned out of too thick a plate, whereas the photograph distinctly shows the back plate to be slightly beaten up from a thin plate." But, in the face of all this, the judges have awarded the first prize to No. 16, and the second to No. 14! It would seem from this that to work strictly to the prescribed design was fatal, and the more clumsy and inartistic the effort of the workman the greater his chance of success.—I am, &c.,

T. W. K.

SIR,—In the report of Mr. Redgrave and Mr. Wyatt on the works sent in competition for prizes offered by the Society of Arts, as published in your paper last Friday, the name of Fisher is, by mistake, appended to a piece of marble carving done by me, which was very kindly noticed, and gained the first prize. The mistake destroys the value to me of your publication of so favourable a report.—I am, &c., JOHN BIRD FISHER.

61, Arundel-street, Sheffield, February 18, 1868.

Intercommunication.

QUESTIONS.

[738]—BORING GLASS.—Will the editor give me directions for boring a hole 1in. in diameter through a pane of plate glass 3-16in. thick?—B

[739]—ILLEGIBLE INSCRIPTIONS ON SILVER COINS.—I should feel greatly obliged to any of your correspondents who will inform me how to read illegible inscriptions on some silver coins I have in my possession, but cannot decipher.—J. C. M.

[740]—SCENE-PAINTING.—Scene-painters mix their colours with size and whiting. Can any of your numerous readers inform me, through Intercommunication, of what the size most suitable is composed?—AMATEUR.

REPLIES.

[734]—BUILDING MATERIALS IN NEW ZEALAND.—I, in common with "E. T." and undoubtedly numerous others of your readers, should like information respecting the building productions of New Zealand, and general state of the Colony. Now as Mr. Drew's 14 years colonial experience warrants the assumption that he is fully capable of imparting the required useful knowledge, I trust that he may be induced to publish the same in a short article in the BUILDING NEWS, as, of course, it is quite out of the question that he can extend the same privilege to all inquirers as that offered to "E. T." Allow me also to reiterate "E. T.'s" query—"are there any works published on the subject?"—F. St. G.

[742]—CRAYON DRAWINGS.—"T." may fix crayon drawings effectually by dipping them in milk.—P. B.

[743]—VENTILATING TIMBER.—In answer to the question by "R. S.," as to the best method of ventilating the timbers of chamber floors, I have seen the following method recommended, which appears a very practicable one, viz., nailing battens transversely to the joists, nailing the laths to the battens, and inserting air bricks in the walls.—R.

[745.]—CEMENT FOR AQUARIUMS.—I send the following for the benefit of your correspondent "S. L. G.;" I think he will find the recipes worth a trial. Mix boiled linseed oil, litharge, and red and white lead together to a proper consistency, always using the larger proportion of white lead. This composition may be applied to a piece of flannel, and fitted to the joints. A more powerful cement is composed in the proportion of two ounces of sal ammoniac and four ounces of sulphur, made into a stiff paste with a little water. When the cement is wanted for use, dissolve a portion of the paste in water, rendered slightly acid, and add a quantity of iron turnings or filings, sifted or powdered, to render the particles of uniform size. In a short time the cement will become as hard as stone.—R. M. C.

[745]—For cementing rockwork into aquaria—pure Portland cement. For cementing the sides together, the same cement should be used as is used by makers of slate cisterns, made of litharge, boiled oil, white lead, and red lead.—B.

[745]—I would advise "S. L. G." to mix a solution of eight ounces of strong glue and one ounce of varnish of linseed oil, or three-quarters of an ounce of Venice turpentine. Boil these together, agitating all the time, until the mixture becomes as complete as possible. The pieces to be cemented ought to be kept in junction for forty-eight or sixty hours.—NORTH BRITON.

[746.]—TO POLISH AND CLEAN MARBLE.—The following hints in regard to marble may be of service to your correspondent "P. S." The substance used in the polishing process is the sharpest sand, which must be worked with till the surface becomes perfectly flat; then, a second, and even a third sand of increasing fineness is to be applied. The next substance is emery, of progressive degrees of fineness, after which tripoli is employed. The last polish is given with tin putty. The body with which the sand is rubbed upon the marble is usually a plate of iron, but for the subsequent process a plate of lead is used, with fine sand and emery. The polishing rubbers are coarse linen cloths or bagging wedged tight with an iron planing tool. In every step of the operation a constant trickling supply of water is required. To clean marble, the following has been found to answer well:—Take two parts of common soda, one part of pumice stone, and one part of finely powdered chalk. These are to be sifted through a fine sieve and then mixed with water. Rub this well all over the marble and the stains will be removed. Afterwards wash the marble over with soap and water, and it will be as clean as it was at first.—A.

WAGES MOVEMENT.

The Master Builders' Association of Bristol, says the "Daily Press," have perfected a scheme for the registration of non-union workmen connected with the various branches of the building trade, so that non-union men will now be enabled to get employment, and employers to get non-union men, if they prefer them, with much greater facility than heretofore. It is the intention, we further learn, of the Masters' Association, should the scheme prove a success, to establish a benefit society in connection with the registry, and, in fact, to use the best endeavours to place non union workmen in a position which shall in every respect be not inferior to that of the union men.

The bricklayers of Walsall are seeking a rise of wages, and the masons have intimated their intention of endeavouring to obtain a new code of rules.

A great deal of excitement has been occasioned at Brynmawr and neighbourhood in consequence of the great iron-masters, Messrs. J. and B. Bailey, giving notice of the closing of their Nantyglo works, at which nearly 8,000 men are employed.

STAINED GLASS.

A stained glass window has just been erected in Leintwardine Parish Church by Messrs. R. E. Edmundson and Son, of Manchester, and is one for which they received the jurors' medal at the late Exposition in Paris. The style is Perpendicular, and the window is composed of four main openings and tracery.

Mr. William Holland has just fixed a memorial window, 22ft. high and 11ft. wide, in the Decorated style, in Lady Huntingdon's Church, Tunbridge Wells.

LEGAL INTELLIGENCE.

NUISANCE CAUSED BY BRICK BURNING.—ROBERTS *v.* CLARKE.—This was a suit before Vice-Chancellor Sir W. P. Wood for the purpose of restraining an alleged nuisance from brick-burning carried on in the neighbourhood of Hackney-downs, at a distance of about 250 yards from the house occupied by the plaintiff. Various defences were raised; among others, that the defendant or his predecessors in title, by having burnt bricks on the particular spot ever since 1825, had acquired a prescriptive right with which the plaintiff, a new comer into the neighbourhood, could not interfere; and, in any case, that the complaints of nuisance and annoyance to the plaintiff and his family were grossly exaggerated. In reference to these defences the plaintiff, on the other hand, contended that there had been a total cessation of brick-burning in the defendant's field between 1845 and 1865, when it was again renewed, and also that, bad as brick-burning was at the best, the evil was in the present case intensified and rendered intolerable by the circumstance that refuse and rubbish of the foulest description, including putrid remains of fish and excrementitious matters, were shot upon the ground, and burnt up together with the clay used in making the bricks. The Vice-Chancellor, without hearing a reply, held that the plaintiff was entitled to an injunction. The defendant, in his voluntary answer, talked of brick-burning having been continuously carried on at the field in question without interruption from 1825 down to the present time, except when there had been some temporary interruption. It turned out, however, that one of these same temporary interruptions had lasted quite 20 years, and upon the law of the case he agreed with those learned Judges who held that, when there had been a cessation of a right of this kind, the person asserting it was bound to show that it had at least been exercised in the first and last year of the period of 20 years in order to preserve it from being lost. This had not been done by the defendant, who consequently failed to establish as of right this easement or privilege of sending foul smoke over his neighbour's land. The rest of the case presented no difficulty whatever. Upon the defendant's own evidence there could be no doubt of the existence of a nuisance. It was not necessary for the plaintiff to prove that any special sickness resulted to himself or his family from the brick-burning, nor that the vapour was more than usually injurious or offensive. It was an axiom of law that brick-burning carried on in the ordinary way was a nuisance to persons living within the limit affected by it, and 250 yards was no extreme limit for the smoke and fumes to reach. A nuisance, therefore, against the continuance of which this Court would grant relief, had plainly been created, and there must be an injunction to restrain the defendant from burning bricks so as to occasion damage or substantial annoyance to the plaintiff, his family, or tenants.

Our Office Table.

The Edinburgh Architectural Association met on Wednesday, last week, Mr. John C. Hay, president, in the chair. Mr. William Beattie, architect, read a paper on "A tour in Belgium in the summer of 1867." Mr. Beattie gave a brief review of Belgian architecture, past and present, and the numerous remains of mediæval civil and domestic buildings in nearly every town were pointed out. The cities of Brussels, Antwerp, Ghent, and Bruges were described at some length, including the many treasures of art to be seen in their museums and upon the walls of their cathedrals. The paper was illustrated by a large collection of drawings and photographs.

We are enabled to state that, pending the report of the commission appointed to inquire into the best plan for facilitating the business of the Courts of Common Law and Equity (of which Lord Justice Cairns is chairman), no further steps will be taken towards appointing architects for the new Palace of Justice. In connection with this subject it may be stated that the recommendation in favour of Messrs. Barry and Street was arrived at before the accuracy of the estimates of those gentlemen had been tested by competent surveyors.—*The Owl.*

A correspondent says:—"In one of your articles last Friday allusion was made to an architect in Liverpool changing his style. That is quite easy. I know of a case where an architect changed his style from Classic to Gothic, the reason being that formerly he had a Classic draughtsman, and now he has a Gothic one!"

Messrs. Bates, Hendy, and Co., of 4, Old Jewry, have sent us a "Handbook and Diary for India and the Colonies," for the present year. It comprises a directory of the leading English manufacturers, and furnishes other information of a kind specially adapted to the use of merchants and traders abroad. They will find the publication a handy and useful business record, and to all such we recommend it.

For several days during the month of January, says Dr. Whitmore, the Marylebone Medical Officer of Health, the Thames water when drawn from the mains of the Grand Junction Company was somewhat turbid and of a yellowish appearance, indicating the presence of earthy matter held in suspension, and showing that it had not undergone its usual careful filtration. This may, no doubt, be accounted for by the late heavy rains which flooded the valley of the Thames, causing thereby a large quantity of clay to be washed into the river, and which, owing to the increased rapidity of the current, did not subside, but was conveyed in a condition of unusual turbidity into the subsiding and filtering beds; the latter becoming in a very short space of time overcharged with earthy impurities, failed to remove all the matter held in suspension, and hence the absence of that clearness and brightness so usually observed in our Thames water.

The following prizes are offered by the Société d'Encouragement of Paris: — A grand medal, value 10,000f., for the application of fine arts to industrial purposes. A prize of 5000f. for the employment of boracic acid and borax. Prizes of the value of 1000f. each for the following subjects—Water-power motor for small workshops; gas jet regulator; a new application of any abundant mineral substance; the disinfection and clarification of sewage water; the application of endosmose of liquids; the application of the endosmose of gases; heating and ventilation of rooms; preservation of food; improved method of making vinegar from wines; and a memoir on the state of industrial art as shown at the late Universal Exhibition in Paris. A detailed programme is to be had by application to the secretary of the Society, 44, Rue Buonaparte, Paris, and all models, plans, and documents are to be sent in on or before the first day of March.

At the fifteenth annual meeting of the Lambeth Permanent Benefit Building Society, which took place last week, the chairman congratulated the meeting on the prosperous state of the Society generally, remarking that, although the advances made during fifteen years had been very large, there had not been one single transaction by which the Society had lost a shilling. The result is certainly highly satisfactory. The three retiring directors, Messrs. A. Wentzell (governor of the Incorporated Society of Licensed Victuallers), C. Hubert, and W. Batchelor, were re-elected, Mr. R. Simmons, jun., of Putney, being elected to fill the fourth vacancy.

A correspondent calls attention to the manner in which the discussions are carried on at the meetings of the Architectural Association. He thinks the Association must be very poor in speakers, or the same names would not always occur, and that the speakers must be very poor in material, or they would say a little more worth listening to when they are on their legs. Each speaker, he says, generally manages to thank the lecturer at the beginning, in the middle, and again at the end of his speech. Each speaker rings the changes on the same ideas. He thinks that an improvement might be effected in conducting these discussions if the speakers would acquaint themselves a little more with the subjects to be discussed before they attempt to enlighten their brother members.

Mr. W. Herapath, F.C.S., the well-known chemist and toxicologist, died last week, at the Manor House, Old Park, Bristol. He was one of the founders of the London Chemical Society and the Bristol School of Medicine, and Professor of Chemistry and Toxicology in the last named institution. Mr. Herapath was in his 72nd year.

A correspondent says:—"Your criticisms on Liverpool architecture may to some appear severe, but they are true. The architecture here is in general poor and vulgar in character. I have found this impression in the minds of all London and Manchester architects whom I have met. In walking about Manchester one meets with some very "violent" Gothic, but in the main the buildings there show a feeling for architectural effect and style that is unknown in Liverpool."

It is proposed, we hear, to form a new town in the Isle of Wight. It will be similar to that of Bouldner, and is to be carried out at Totland Bay, a place which, for its beautiful views, and its excellent sea-bathing, is unparalleled in the Isle. There has long been a desire expressed to bring visitors to the west end of the island, as well as to the eastern part. A number of workmen are already engaged for the erection of brick kilns in order to commence operations.

The largest pendulum in existence is that which regulates the new clock at St. George's Church, New York. The pendulum in question is 35ft. long, and vibrates in three seconds. The "bob" weighs 390lbs., and is 4ft. long, by 7in. in diameter. The clock has but three wheels in the going train. The pendulum of the Clock Tower in the Houses of Parliament is only 15ft. long.

Mr. Morton, the manager of the Oxford Music Hall, attributed the fire which consumed a portion of the building last week, to the cocoa-nut matting having caught fire by a lighted fusee. Mr. Treloar, the manufacturer, states that cocoa-nut matting is uninflammable, and he is right. We have during the week tested the flammable qualities of cocoa-nut fibre, and find that Mr. Treloar's statement is correct.

A canal embankment at Horsley, near Birmingham, gave way on Friday last. The canal was drained for nearly a mile, and considerable damage was done by the rush of the water. The accident, it is conjectured, was caused by mining operations underneath the embankment.

The Metropolitan Traffic Regulation Act passed towards the end of last year contained certain provisions against removing dust and ashes, and unloading brewers' drays in the streets between the hours of 10 a.m. and 6 p.m. Notwithstanding, we notice that the practices are still continued in various parts of the metropolis. The police, we believe, have been spoken to individually, and have stated that they have received no instructions on the subject, so that one of the most beneficial clauses of the Act seems likely to remain in abeyance for the want of some authority to enforce proper attention to its requirements.

Mr. E. W. Pugin has sent us a long letter on Dr. Barry's pamphlet, but it reached us too late for insertion. The letter contains the following enclosure which throws some light on the missing letters which Mr. Pugin sent to the late Sir Charles Barry:—

"Dear Pugin,—In reply to your letter asking me what I remembered about the late Sir Charles Barry's letters to your father, I can state that in the year 1860 the whole correspondence which you have now made public, together with the letters given to Sir Charles Barry, were for a time in my hands. These letters I had examined and put aside for the purpose of writing, as you remember, a biography of your father; the idea of which I only gave up on hearing that Mr. Ferrey had already a portion of his 'Recollections' in type.—Yours sincerely, EDMUND S. PURCELL."

Another of the old landmarks, so many of which have disappeared recently to make way for modern improvements, is doomed. The Saracen's Head, in Snow-hill, has been closed up and will shortly be demolished. This was a very famous hostelry in the old coaching days. A former house on the same site is described by old Stowe as "a fair and large inn for the receipt of travellers."

The study or at least the use of the science of heraldry seems to increase. In the financial years 1855-56 the tax produced in Great Britain only £53,769; in the year 1865-66 it produced £65,034. A return which has been issued shows that last year the tax was paid by 55,603 persons; 15,077 of them, keeping four-wheeled two-horse carriages, paid a tax of £2 12s. 9d. each, and the other 40,526 paid 13s. 2d.

The Government has consented to include in the estimates for the current year an additional sum of £800 to the Royal Irish Academy. The increase in the annual grant was recommended by a Committee of the House of Commons some time ago.

The fifteenth anniversary of the London Association of Foremen Engineers was held on Saturday evening, at the City Terminus Hotel, Cannon-street, Mr. Whitworth, LL.D., F.R.S., in the chair. Mr. E. J. Reed, Mr. Samuel Smiles, and others spoke during the evening. The society is in a flourishing condition.

Ludgate-hill is gradually being widened. Two houses on the left hand side going up are being pulled down, and the new buildings will be considerably set back. Three more are to follow. The corporation have been treating for the frontage to throw the extra strip into the public way. That of the two already coming down is 50ft. by 15ft. 6in. deep, 775ft. superficial area, and the British Prudential Assurance Company, who are the owners, ask only £28,720.

A correspondent gives us an instance of architectural restoration in Italy which shows that we English are not alone in our perpetration of shams. The Archive Office at Pisa is being restored with great taste, and the finished portions of the work display considerable archæologic study, and reflect great credit upon all who had a hand therein. But it was decided that the work was not to look like a restoration, but should wear the appearance of a genuine relic of antiquity, and so the artists employed were directed to anticipate the injuries of time by smudging their work here and there, by chipping pieces every now and then out of the new walls, by toning down their tints, and by introducing artificial discolourations, purporting to be the result of age and damp.

The Council on Education at South Kensington have promised to supply a series of works of art of the highest interest and value to the Leeds National Exhibition, to be exchanged at intervals for others from the museum of the department. The colleges of Oxford and Cambridge supply some rare specimens of plate of the fourteenth and sixteenth centuries, presented by the founders. Mr. W. Bragge will supply a choice collection of illuminated MSS., and a selection from his interesting collection, illustrating the history and use of tobacco in all countries, &c. The Earl of Chesterfield will send the celebrated Chelsea vase, companion to that in the Foundling Hospital, jewelled cabinet, plate, &c. Several of the city companies have consented to allow their early loving cups, and other objects of interest, to be exhibited. There will also be a display of civic insignia from Oxford, Chester, York, Lincoln, Leeds, Scarborough, Richmond, (Yorkshire), Preston, Shrewsbury, and other municipal towns.

A remarkable sacrilege was discovered on Tuesday at Bolton, where a new church is being erected, at a cost of £30,000. The foundation stone was laid in April, and, as is customary, a number of coins and documents were deposited in a cavity prepared for their reception. Yesterday morning, however, it was found that, with the help of a large crowbar, the stone and brass plate below which covered the cavity were removed, and the articles deposited abstracted. Then the thief appears to have replaced the plate containing the inscription in its original position, and carefully mortared it in, so as to conceal the robbery. A description of this church, which is from the design of Mr. Paley, of Lancaster, appeared in the BUILDING NEWS of May 3, 1867.

The Hotel de Porta-Vecchia at Desenzano, in the province of Brescia, Italy, built upon piles on the shore of the Lake of Garda, is gradually sinking at the rate of about six inches a day; the ground floor has already disappeared. This immersion is taking place imperceptibly, and without any shock. Every means of preventing it have been employed, but without avail. Numbers of persons have come from a distance to witness this singular spectacle. The proprietor of the hotel, who was at first in despair at his misfortune, at length determined to charge a fee for admission to the house, and has already received a sum of money which will go far to compensate him for his loss. A scientific commission is about to visit the spot to open an inquiry.

Traces of a large and ancient town near Castranova, in Sicily, high up on the plateau of the Cassera Mountains, have been discovered, and excavations are to be set on foot without delay. Professor Cavallero, director of the Archæological Museum, has had a minute topographical plan of the ruins prepared, and it is confidently believed that discoveries of considerable interest will be made.

MEETINGS FOR THE WEEK.

TUES.—Institute of Civil Engineers,—1. Renewed discussion on "On the Supplanting Power of Piles," and 2. "On the Manufacture and Wear of Rails," by Mr C. P. Sandberg, Assoc. Inst. C.E.

WED.—Society of Arts, "On a Daily Mail Route to India," by Hyde Clarke, Esq., D.C.L.

Wed. Geological Society.

FRI.—Architectural Association, "The Architecturesque," by Professor Kerr, F.R.I.B.A.

SAT.—Associated Arts Institute Conversazione and Exhibition of Students' objects. "Twilight" and "Hamlet," Shakespere.

Trade News.

TENDERS

BAYSWATER.—For rebuilding 22, Queen's road, Bayswater. C. Bates, architect:—

John Clemetson	£2195
Dawson	2176
Aldred and Doulton	2167

BARNET.—For the building of a rectory house at Berkeley, near Grimsby. Messrs. Thomas C. Hine and Son, Nottingham, architects:—

Hobson Brackley	£2450
William Tickelpenny	2398
F. T. Kidd	2198
Thomas Enderby	2164
Rand T. Hollingsworth	2100
Simpson and Lyham	2072
J. Barker	1999
William Lillor	1995
J. Ellis	1985
Riggall and Howins	1979
Coulson and Haywood	1871
J. M. Thompson	1824
R. Young (accepted)	1730

BRIXTON.—For building two houses and shops in the Brixton-road, S., for Messrs. Nicholl and Sainsbury. Mr. C. H. Driver, architect. Quantities by Mr. R. O. Harris:—

Seton	£4118
Maxwell	4018
Manley and Rogers	3948
Taylor	3847
Jackson and Shaw	3837
Axford	3790
Thompson	3779
Perry	3655
Nutt and Co. (accepted)	3440

DULWICH.—For the erection of a detached residence in the Underhill road, Lordship lane, Dulwich, S., for Mr. L. L. Toll:—

Mitchell (accepted)	£1137

ESSEX.—For restorations, &c., to Chrishall Church, Essex. Joseph Clarke, Esq., F.S.A., architect. Quantities by Mr. Rackstell:—

Hunt, Hobbleston	£3267 0 0
Gibbons, Buntingford	2500 0 0
Runacles, Halstead	2415 3 0
Roberts, London	2410 0 0
Bracher and Son, London	2300 0 0
Glasscock, Bishop's Stortford	2100 0 0
Bell and Son, Saffron Walden	1960 0 0
Grimson and Whitehead, Royston	1906 15 0
Brown, Lynn	1895 0 0
Tooley, Bury St. Edmunds	18 0 0 0
Mason and Green, Haverhill	1700 0 0

LONDON.—For alterations and repairs to house in Charlotte street, for Mr. M. Gabriel. Mr. W. A. Baker, architect. Quantities furnished by Messrs. Richardson and Waghorn:—

Brown	£588
Ward	565

LONDON.—For the erection of two shops in Euston-road, for Mr. Woolridge. Mr. W. A. Baker, architect. Quantities furnished by Messrs. Richardson and Waghorn:—

Hutchman	£1807
Williams	1787
Eaton and Chapman	1769
Cooper and Cullum	1660
Scrivener and White	1624
Kelly, Brothers	1614
Mitchell	1495

LONDON.—For alterations and repairs to three houses, Charlotte street, and No. 1, Berners-street, for Mr. Watson and others. Mr. F. F. Hedgworth, architect:—

Matthews	£1940
Bywaters	1859
Hackham	1868
Kelly	1863
Manley and Rogers	1799
Cars and Murdoch	1436

LOWER NORWOOD.—For the alterations and additions about to be carried out at the Parish schools, Lower Norwood, Surrey, for the Board of Guardians of the Parish of St. Mary, Lambeth. The quantities were taken out by Mr. Gould, of 20, Great George street, Westminster:—

Wardle and Baker	£3050
C. Fill	2987
Davies	2937
Prebble Brothers	2930
Henshaw	2921
J. Thompson	2920
Carter and Son	2898
Grammon and Son	2777
Lacey and Flatman	2700
Nixon and Son	2647
R. Eustace	2640
W. W. Stevens	2633
George	2602
Knight	2598
Nutt and Co.	2521
Patton and Smith	2415
Cooper and Cullum (accepted)	2359

LONDON.—For dwelling house in Portpool-lane and Half Moon-yard, Gray's Inn road, for Mr. W. Jarvis:—

Langmead and Way (accepted)	£2,000

NORMANTON.—For the erection of villa residence at Normanton, near Derby, for Charles Brentnall, Esq. Messrs. Thomas C. Hine and Son, of Nottingham, architects:—

E. Thompson	£1577
C. Humphries	1506
R. Bridgart	1492
J. W. Thompson	1433
G. Lilley (accepted)	1429

WIMBLETON.—For the Dog and Fox Tavern, Wimbledon, for Messrs. Young and Bambridge. Mr. George Adam Young, architect. Quantities by Mr. C. J. Shopple:—

Mason	£3550
Axis and Son	3395
Nicholson and Son	3336
Adamson and Sons (accepted)	3160

WISBEACH.—For building the Primitive Methodist Chapel. Mr. James Kerridge, architect:—

Bennett	£1586 8 3
Girling (accepted)	1546 0 0

WORCESTER.—For New Schools and Chapel-keeper's House, Sansome Walk. Mr. G. Johnson, architect:—

Hemming and Son	£1500 0 0
Beard	1500 0 0
Kendrick	1397 0 0
Higgs	1390 14 0

PROPERTY SALES.

FEB. 11.

AT THE MART.—By Messrs. Foster, Leasehold residence, No. 21, Albany street, Regent's-park, term 32 years unexpired at £12 per annum—sold for £660.

Freehold, 5a. 0r. 15p. of building land, situate in Station-road, Colney hatch—sold for £1,610.

By Messrs. Elgood and Son.—Leasehold residence with stabling, No. 6, Montagu-square, let on lease at £135 per annum, term 33 years unexpired at £21 per annum—sold for £1,400.

Leasehold residence, No. 53, Montagu-square, let on lease at £120 per annum, term and ground rent similar to above—sold for £1,330.

Leasehold ground rent of £21 per annum for 33 years derived from No. 8, Montagu-square—sold for £350.

Leasehold ground rent of £21 per annum for 33 years derived from No. 9, Montagu-square—sold for £340.

Leasehold ground rents amounting to £70 12s. per annum for 33 years, derived from seven houses in Park-place, Regent's park—sold for £1,100.

Leasehold ground rents, amounting to £29 8s. per annum for 33 years, derived from four houses in Park-place, Regent's-park—sold for £480.

Leasehold, four houses and premises, Nos. 24 to 27, Buckingham-place, Fitzroy-square, producing £180 per annum, term 20 years unexpired, at 2s. per annum—sold for £1,820.

Leasehold ground rent of £5 per annum, for 20 years, derived from 381, Euston road—sold for £50.

FEB. 12

AT THE MART.—By Messrs. Vigers.—Freehold, two plots of building land situate at Herne hill—sold for £300.

Freehold building land, fronting Poplar walk, Coldharbour-lane, Camberwell, and a lease for 1,000 years of a railway arch—sold for £520.

Freehold, two plots of building land, situate as above, and a lease for 1,000 years of four railway arches—sold for £310.

Freehold plot of building land, fronting Coldharbour-lane, Camberwell, and a lease for 1,000 years of four railway arches—sold for £430.

Freehold cottage, No. 6, Avenue-cottages, Avenue road, Camberwell, let at £15 12s. per annum—sold for £300.

Freehold, seven houses and shops, Nos. 138, 140, 144, 146, 148, 168, and 170, Camberwell road, producing £265 per annum, also a plot of building land in the rear—sold for £6,480.

Freehold residence, No. 6, Charlotte street, Sutherland-square, Walworth road, let at £26 per annum—sold for £450.

Leasehold residence, No. 13, Sutherland street, Walworth-road, let at £26 per annum, term 70 years from 1841, at £4 11s. per annum—sold for £310.

Freehold, two plots of building land fronting Wellington-street, Brandon-row, Newington-causeway, and a lease for 1,000 years of a railway arch—sold for £420.

Freehold plot of building land fronting Brandon-row, and a lease for 1,000 years of a railway arch—sold for £410.

Freehold, two plots of building land fronting Tiverton-street, Newington-causeway, and a lease for £1,000 years of a railway arch—sold for £400.

Freehold house, No. 36, Tiverton-street, and lands adjoining, with lease for 1,000 years of two railway arches—sold for £400.

Freehold two plots of building land fronting Newington-causeway, with a lease for 1,000 years of nine railway arches—sold for £430.

Freehold house, No. 3, Hill street, Wellington street, Blackfriars—sold for £230.

Freehold, house, No. 60, Great Suffolk-street, Blackfriars—sold for £420.

FEB. 14.

AT THE MART.—By Messrs. Farebrother, Lye, and Wheeler.—The valuable literary property, known as the "Evening Mail" newspaper, having an extensive British and foreign circulation, and which has produced during the five years ending December, 1866, an average net income exceeding £1,200 per annum—sold for £2,000.

By Messrs. Winstanley and Horwood.—Freehold mercantile premises, being No. 28, Friday-street, and 50, Bow-lane, Cheapside, estimated to produce £670 per annum—sold for £7,720.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

C. G. Braxton, Portsea, builder, Feb. 26, at 1. K. Chandler, jun., Claude road, Peckham Rye, builder, Feb. 26, at 1. Thomas Gilbert Bell and John James Elphinston Robertson, Charing-cross, surveyors, March 2, at 2. Frederick Chadwick, Croydon, surveyor, March 4, at 12. Charles Jupp, The Triangle, Mare street, Hackney, builder, March 2 at 11. George Knight, Great George street, Westminster, contractor, March 4, at 1. Joseph James Rawlings, Melbourn, Cambridgeshire, engineer, March 4, at 2.

TO SURRENDER IN THE COUNTRY.

Samuel Gaunt, Hulme, painter, Feb. 29, at 9.30. John Roskilly, Wendron, Cornwall, mason, Feb. 22, at 10. John Prince Busby, Risborough, plumber, March 12, at 11. John Coleman, Ewell, surveyor, Feb. 29, at 12. Francis William Vigus, Exeter, timber dealer, March 4, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

March 9, G. Hayward, Hawkhurst, plumber. March 9, T. Adams, Ore, Sussex, builder. March 11, G. W. Weatherhogg, Horton-in-Lindsey, engineer. March 16, W. Aston, Great Crosby, Lancashire, builder. Feb. 24, J. Smith and J. L. Ibbotson, Barrow-in-Furness, joiners. March 13, D. Gaved and W. H. Rakett, Penge, builders. March 17, H. Hughes, Hanover street, Carlton road, Kentishtown, builder. March 16, W. Vaile, Birmingham, builder. March 11, J. Fitchett, Manchester, plumber. March 5, T. Barrowclough, Sheffield, builder. March 18, J. Parsons, Plymouth, builder. March 19, H. W. Hulbert, Cirencester, painter. March 5, J. B. Stone, Brighton, painter.

DIVIDEND.

March 17, F. W. Mowbray, Leicester, engineer.

SCOTCH SEQUESTRATION.

William Macnab, Duncan M'Callum, and Robert M'Nab, Greenock, engineers, Feb. 25, at 12.

PARTNERSHIPS DISSOLVED.

W. and R. Bullows, Castle Bromwich and Erdington, builders. Sutcliffes and Co., Bradford, Yorkshire, plumbers. Smitbers and Co. Great Horton and Brighouse, slaters.

DECLARATIONS OF DIVIDEND.

S. C. Anning, King's-cross road, gasfitter, dividend 5d. J. J. Myers, Southampton, engineer, dividend, 2s. 8½d. Bennett and Higuett, Liverpool, timber merchants, 8½d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	0	12	0		
Quebec, red pine		3	0	4	10		
,, yellow pine		2	15	4	0		
St. John N.B. yellow		0	0	0	0		
Quebec Oak, white		5	6	5	15		
,, birch		3	10	4	10		
,, elm		3	10	6	0		
Gantzic oak		3	10	6	0		
,, fir		2	5	3	0		
Memel fir		3	0	3	10		
Riga		3	0	3	5		
Swedish		2	2	2	7		
Masts, Quebec red pine		8	0	7	0		
,, yellow pine		5	0	6	0		
Lathwood, Dantzic, fm		4	10	6	0		
,, St. Petersburg		8	0	9	0		
Deals, pr C., 12 ft. by 8 by 9 in., duty 2s per load, drawback 2s.							
Quebec, white spruce		13	0	19	0		
St. John, white spruce		18	10	16	10		
Yellow pine, per reduced C.							
Canada, 1st quality.		17	0	18	10		
2nd do.		11	0	12	0		

Archangel, yellow		£11	0	£12	0		
St. Petersburg, yel.		10	10	11	10		
Finland		7	10	8	10		
Memel		0	0	0	0		
Gothenburg, yellow		8	0	10	0		
,, white		8	0	0	0		
Gefle, yellow		9	0	11	0		
Soderham		9	0	10	0		
Christiania, per C., 12 ft. by 8 by 9 in. yellow		12	0	15			
Deck Plank, Dantzic, per 40 ft. 3 in.		0	16	1	0		
PUMICE STONE pr ton		6	0	8	0		
OILS, &c.							
Seal, pale	per tun	39	0	40	0		
Sperm body		105	0	110	0		
Cod		34	10	35	0		
Whale, 8th. Sea, pale		38	0	39	0		
Olive, Gallipoli		72	0	0	0		
Cocoanut, Cochin, ton		55	0	55	0		
Palm, fine		39	10	40	0		
Linseed		34	10	35	10		
Rapeseed, Eng. pale		39	10	0	0		
Cottonseed		41	0	42	0		

METALS.

IRON:—

Welsh Bars in London	per ton	£6	10	£6	15	0	5
Nail Rod	do	7	6	7	10	0	
Hoops	do	8	5	8	10	0	2½
Hoops, Single	do	9	15	10	0	0	
Staffordshire Bars	do	7	5	7	10	0	
Bars, in Wales	do	5	10	6	0	0	5
Nails	do	5	10	6	0	0	net
Foundry Pigs, at Glasg. No 1	do	2	15	3	5	6	2½
Swedish Bars	do	10	0	10	10	0	net

STEEL:—

Swedish Keg, hammered	per ton	15	5	15	10	0	2
Swedish Faggot	do	10	10	12	10	0	2

COPPER:—

Sheet & Sheathing, & Bolts	per ton	80	0	82	0	0	
Hammered Bottoms	do	92	0	0	0	0	
Flat Bottoms, not Hammered	do	0	0	0	0	0	
Cake and Tough Ingot	do	71	0	72	0	0	
Best Selected	do	75	0	80	0	0	
Australian	do	80	0	83	0	0	
Y. L. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7

ZINC:—

English Sheet	per ton	£26	10	£27	0	0	2
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0	

* And 5 per cent. discount if laid upon the new system

TIN:—

English Block	per ton	93	0	96	0	0	
do Bar	do	94	0	97	0	0	2½
do Refined	do	94	0	99	0	0	
Banca	do	91	0	92	0	0	nett
Straits	do		0	90	10	0	

LEAD:—

Pig, English	per ton	20	0	21	0	0	
,, Spanish Soft	do	18	0	0	0	0	2½
Shot, Patent	do	22	10	0	0	0	
Sheet	do	20	5	0	0	0	5
White	do	27	0	27	10	0	

SPELTER:—

On the Spot	per ton	20	0	20	6	0	nett
QUICKSILVER	per btl	6	17	0	0	0	

ERGULUS OF ANTIMONY

French	per ton	28	0	0	0	0	

THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 28, 1868.

ARCHITECTURE AND "INDEPENDENT DISSENTERS."

"Some fell upon stony places, where they had not much earth, and forthwith they sprung up, because they had no deepness of earth; and when the sun was up they were scorched, and because they had no root they withered away."

NOTHING could more justly describe the state of meeting-house architecture, as set forth in the Congregational Year Book for 1868, than the words just quoted. In the whole field of modern art there is no patch so utterly worthless, because of its superficial deceptive character, as that occupied by Nonconformists. If we compare for a moment the current Year Book with former years, we cannot hesitate to return a verdict altogether against the present, and altogether in favour of the past. The seed of the architectural revival was sown for Dissenter as well as Churchman. The Year Book at first gave evidence that the seed had been received with joy; but lately the evidence is just as conclusive that this joy had no real enduring root. In a word, there is no feeling in their architecture, or nothing, to put it in another way, which corresponds to what the Churchman understands by the word "symbolism." This is the first cause of that barrenness, and those abortions which are worse than barrenness, so manifest in most of the buildings which owe their origin to Nonconformists. But it may be said, "buildings may be good, and yet have nothing to do with symbolism. The market-house, the railway station, and the bank, may be decent buildings enough, and yet not possess a spark of symbolism. Engineering works, possibly, but not necessarily barren or monstrous." This is undoubtedly true, and suggests at once the second force which operates with such a depressing tendency on what is called "chapel architecture." This, broadly stated, is pride. If Dissenters and their architects could be content with the practical business questions of, first, how to seat a given number of people so that all should see and hear the minister well; and, second, how to do this at the least possible expense compatible with one thing only, viz.—the dignity of religion, we might have plain but well proportioned buildings erected, the grand simplicity of which might frown down the weak fritterings of both Anglican and Roman buildings, and could not but have most beneficial effects upon the architecture of the future; but this, the Congregational Year Book shows us, is not the policy of the "Independent Dissenters." In architecture, as in some other things, they seem to have a strong desire to be mistaken for Anglicans, or, at any rate, to possess all the privileges, architectural and otherwise, of the National Church. Thus, out of twenty-one meeting-houses twelve have towers and spires; one has nave, aisles, and transepts, all outwardly expressed in flank as well as in front; and all the others are mere variations of a mean compromise between the one span roof demanded by his conditions of arrangement, and that idea of an Anglican church (nave and aisles) which is so essentially the Nonconformists' idea, and beyond which it seems impossible for them to reach. The most churchy of these works are described as "English Congregational Church, Swansea," and "New Congregational Church, Tenby," both by Messrs. Paull and Robinson. Mr. Pritchett follows closely in their wake. His towers and spires are 120ft. high, and that at Ilkley, we are informed, "is handsome, with no doors or windows in the spire to mar its beauty and its symmetry." What a pity this principle was not applied to the rest of the building.

We have mentioned these architects because they really do appear, in one or two of their works, to have learnt something of the art of architecture somewhere or other. So, too, there are many worse buildings than Mr. Moffat Smith's slight and unpretending round arched work at Builth Wells; whilst Mr. Sutton, in his "Chapel, Pembroke Dock," has gone near to one fair solution of the problem with which the architects of "Nonconforming churches" have to contend, by adopting a design of two storeys, and thus accentuating externally the internal arrangement of a galleried hall. Messrs. Innocent and Brown would have deserved our highest praise for their architecture, but, unfortunately, they have confounded boldness with coarseness, and have followed a trifle too closely upon the track of Mr. Bentley. Of the other designs it is almost impossible to write. Mr. W. F. Poulton, of Reading, seems to be the most popular or the most pushing, for we find his name attached to four designs, one the frontispiece. Like Mr. Sutton, this architect has got sense enough sometimes to confess externally the two storeyed nature of the building; but here we must do Mr. Sutton the justice to say all likeness ceases. There probably does not exist in Europe an architect who could equal Mr. Poulton in combining the height of pretension with the worst of proportions and the weakest of details. We say this most emphatically, not merely upon the evidence in the Congregational Year Book, but from the evidence of the works themselves. Of Mr. Poulton himself we know absolutely nothing. Of his works, unfortunately, we know too much; and we have no hesitation in selecting their author as the representative of the most barren patch in the whole estate of modern architecture. If Mr. Poulton, like Mr. T. C. Clarke and many other architects who now and then equal him, had but an ordinary share of work, we should have had very little to say. There are, however, men upon whom, from some cause or other utterly foreign to art, opportunities to do something for art thickly crowd, but ever with abortive results—men whose works are so plentifully scattered that they (the works) must either become a general joy or a general nuisance. Mr. Poulton bids fair to be one of these, if he has not already secured that proud distinction. Of course every one knows "success" is a shield. Of course every one also knows that "success" means money, or the outward sign of it. An architect who we know has ten times his share of work, who possesses a private secretary, and is always in a railway carriage, may after all be comparatively poor; but his "success," to all appearance, is the same, whether he leaves his eldest son penniless, or the heir to rich estates. We have nothing to do with anything but the works executed. We know very well that some so-called architects hold their professional services so cheaply, that rather than lose a building they would do the work for nothing; whilst many receive 2½ per cent., 1½ per cent., nay, even a five-pound note. And some get known as "subscribers" to all places of worship, their subscription varying from 2½ per cent. to 5 per cent.! However, these are matters of professional practice with which we are not at present concerned, and we only mention these ways of doing business to show that the "success" does not always mean *real* money, but that the "success" itself is as often a sham as the means whereby it has been achieved. Real success in any art pursuit must be owing to real art merit, and that alone. With all other kinds of success we are at open war, convinced that it only wants open war and fearless speaking to show the rottenness of the shield behind which men skunk, and the rustiness of the armour in which they encase themselves. We fully believe the success of many architects to be intense shams. Bullying an ignorant public, pandering to a grasping committee, or buoyed up by the merits of a never-mentioned clerk, some men ride architectural greatness. Others, avoiding the meannesses of life, but having presentable persons, with a good deal of *savoir-faire* and a *soupçon* of *savoir-vivre*, ride by their sides—a goodly company, and richly dight. If you would find the artist—the architect who lives for art, whose power is in his own right hand, and who has neither shield nor breastplate—you must seek him in bye-ways and in quiet valleys, and not in the crowded thoroughfares. You may hear of him in country houses, but his name is unknown upon notice boards or placards. You say, "It is all very fine to find fault, and easy enough to be a critic. Show us a remedy." This is precisely what we propose to do. A meeting-house, if it means anything at all, should be as distinct from a church as the Separatist or Nonconformist is from the Churchman. This is not the place to enter upon matters of faith, doctrine, or discipline; but any child knows that, whilst the model Churchman takes delight in all kinds of art which can add glory to his church—in colour, everywhere, on wall, window, and vestment; in the goldsmith's art, on cross and chalice and retuble; in the embroiderer's art, on cope and chasuble and altar; in the illuminator's art, for his gospels and his psalter; in painted figures on glass and walls; in carvings and sculptured figures; in storeyed floors of encaustic tiles or rich mosaic—the model Nonconformist turns away from these things, and more or less despises them. In the one case, it is the altar and its service; in the other, the pulpit and the preacher. This is the central idea—*a pulpit and a preacher*. The thing desired is—place for a given congregation, so arranged that they may be disposed round about the central idea, all hearing and seeing well the preacher. Now it is manifest, first, that all—no compromise, but all—pillars, no matter what size, are more or less in the way. Second, that galleries, in cases where large congregations have to be provided for, are indispensable. It will be easily seen that any plan which is at all founded on the principle of nave and aisles, is radically wrong. We go further, and say that any plan founded on the Basilican type is wrong. The logical outcome of making the pulpit the nucleus of the building is, to put it broadly, that the main angles of the seated space should fall as near as possible on the semi-circumference of a circle, whose centre is the pulpit. The laws of acoustics will enable us to make certain modifications, more or less assimilating to the ordinary theatre type, by elongating the semicircle, or by breaking in upon it, as in the Théâtre Historique, Paris. Some Early Domical churches also afford most suggestive types for buildings adapted to what is called Congregational worship; for example, the churches of Sta. Fosca, Torcello; St. Lorenzo, Milan; St. Front, Perigeux; and our own Templar churches. We are bold to say that, even the adoption of the ridge and furrow principle of roofing on a square or nearly square plan, with deep iron girders, and windows high above the galleries, arranged somewhat as at the Duomo at Ferrara, would be incomparably better than the foolish shams and paltry parodies of Roman and Anglican architectural forms now in vogue. To continue such a puerile practice can only end one way. We may be called hard names, we may be rebuked for being too severe, we may have all sorts of unkind motives attributed to us, but we care not. The condition of modern architecture shows more clearly every day that it is high time we left off mincing matters. We have spoken boldly to our Nonconformist readers, feeling earnestly assured that the course they are pursuing only tends to bring down upon them the ridicule, if not the contempt, of all artists and art-educated men.

MARKS ON DEALS AND QUALITIES OF TIMBER.

CONCLUDING REMARKS.

WE have now to notice the qualities of timber in connection with the process of conversion. Hewn timber is mostly prepared with the axe in the neighbourhood of the forest; but with Memel or Dantzic timber we are familiar from the saw. Their qualities are decided by their outward appearance: if taken in a large body of new clean wood (avoiding the heart or central portion), it will show few imperfections; but, if it bespeaks a robust tree, with many branches, it will figure up coarse and inferior; if the knots are dead, and have been covered with an outer covering of new wood, only to show its imperfections under the process of sparing, so much the worse, as these dead knots may often bespeak decay at the heart; loose or tender hearts, ring shakes, and an abundance of soft wood may cause logs to be branded seconds or thirds quality. With some shipments size is the leading feature. Crown, or first quality, logs are free from all outward imperfections, still they may have numerous evils in the interior, such as decayed knots and diseased or wandering hearts. By this last remark we imply those logs where the heart does not run straight from end to end, but will traverse from one side to the other; such logs are to be avoided where strength is required, and may easily be detected by their outward appearance—thus No. 1 would open

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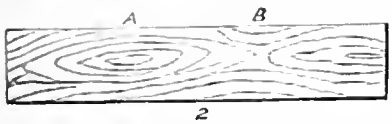
straight, and No. 2 would have a wandering heart. It is not an easy matter, when judging from one side only, to say with certainty



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whether the heart is nearing or receding from the surface; perhaps the best rule is to observe the conduct of the sap. If sap is present at the edge at B, and the edge at A is heartwood, we have proof that the heart is nearing the surface at the latter point, and the opposite case if the relative position of the sap is changed. Sawn or converted deals are far less liable to become a loss in the hands of the builder, as they are reduced to the required size, and may be inspected upon all sides. When under the process of conversion from the tree, the logs may be cross cut to the required length, or the trees may be cut up the whole length. The latter plan was formerly adopted, and the butt ends of the planks were cut off as far as they were perfect, or would hold their width without imperfect or wavey edges. In this case the planks would be laid flat upon one another, and passed through the sawmill again to be edged or taken to a parallel width, thus producing 11in., 9in., or 7in. planks. In some of the common shipments of Swedish and Canadian goods, this edging is done with the circular saw; of late years the principal makers have adopted the plan of cutting the logs to the required lengths and taking them to a width before cutting into planks—this principle enables them to convert the slabs into narrow battens or boards which are shipped as small as 5in. by 2½in. and 5in. by 1in., still preserving their distinctive qualities. The conversion of the heartwood, which should be the best portion, is a matter of the greatest concern. Where 4in. deals are manufactured, a plank of this thickness is generally taken from the centre, the next cutting producing 3in. deals, and the outer portions thinner deals and boards. As a rule, 1in. deals are always heart planks, and 2in. or 2½in. deals are free from heart. As we cannot rule the qualities of timber, nor set aside the laws of Nature, we are compelled to have shakes and faults with the heartwood, and with the sound or outer wood we have another evil to contend with, in the shape of sap. With the Russian shipments, the standard is 3in. by 11in. and 3in. by 9in. deals; 4in. or 2½in. deals are scarcely known. We have thus the heart and outer wood all mixed together, which will explain their liability to come to our hands in a shaked condition. In selecting the qualities of these goods, the seconds and thirds deals are rarely fit for boards, whereas the Swedish goods of the same quality may be sound, and branded common from being coarse and wavey. With the Swedish goods we have the inner and outer wood converted into different classes of goods; hence their preference by practical builders. 4in. deals are never fit for boards. Knowing this, the foreign makers never brand them as best quality. Although they may be sold as best and seconds by our merchants, they are shipped as seconds and thirds. Not so with the 2½in. and 2in. deals, which are always from the outside or clean wood, and are branded in the usual manner. The best are selected for their cleanness and freedom from sap. The seconds may be a little coarse, and the thirds be distinguished by being coarse and sappy. For house purposes, common sense implies that these thin deals are superior to any other class. With Quebec goods the 2in. pines are far better than the 3in., and with the best Swedish shipments 2½in. and 2in. planks are the best goods that we find in the market. This principle of shipping thin deals and planks is new to our builders, and, as they deviate from the old-fashioned sizes they are accustomed to, they will not purchase them. This is another old-fashioned prejudice that should be exploded. Every builder raises his voice against the shaked quality of broad deals; and here is a class of wood selected for its freedom from hearts and shakes, neither of which may be found in a hundred deals, and he will not buy it, simply because it will not cut up so well as 3in. wood. That this prejudice exists we need no better proof than the fact of 2½in. and 2in. deals being 20s. per standard cheaper than 3in. A knowledge of the principle of conversion ought to teach our builders that they would occupy their true place if 20s. dearer than the ordinary class of deals. We would strongly recommend those in the habit of buying and using wood to give these thin deals or planks a trial. In Canadian shipments they are commonly known. In Swedish goods they are shipped from Gefle and Malmö, but from Russia they are seldom seen. A demand for them would soon cause a more plentiful supply, and, if the Russian makers could thus be led to adopt the Swedish, mode of conversion, we should have less fault to find with their shipments.

Qualities of timber are ruled, in some instances, by its manufacture. If the deals are hand-made—that is, sawn upon the side, and either chopped or sawn on the edges—they cannot be sold as best goods, as they have to be brought into competition with mill-sawn goods of true and regular make. Of late years the shipments of hand-sawn goods have been falling off, and mill-sawn goods have increased. This has centralized the trade, and it is now pursued mainly by machinery. The introduction of sawmills has caused great poverty in the rural districts of Sweden and Finland, and hand-sawn deals are becoming a thing of the past.

The qualities of timber, as defined or branded by the foreign makers, is not a binding law upon our merchants. They are subject to such a variety of evils, from leaving the sawmills to the time they are delivered into the hands of the builders, that their qualities or value may be materially changed. The goods we see in our home yards could scarcely be recognized by their makers; with the exception of their brands, they may have so changed in outward appearance as to lose their nationality. As the subject of "qualities of timber" possesses so many ramifications, each one being of sufficient importance to warrant a separate chapter, it is impossible to treat them as they deserve in the present series, we must, therefore, be content to skim over the surface, leaving the various details for our future numbers. With us the quality of timber is materially influenced by the presence of sapwood, and in good shipments of deals we often wonder where the makers' eyes were when they branded such-and-such a deal best quality. We must bear in mind that sapwood cannot be distinguished from heartwood when the trees are first felled. Perhaps of the two we should then prefer the sapwood, as it would possess the brightest colour, from the active state of the resin which would immediately exude from the pores, whereas at the heart all would be dead and opaque. From the time of the tree being felled to being conveyed to the sawmills for conversion the sapwood undergoes no change, except it may be at the end of the log, where light, heat, and moisture has acted upon it. In this case it will become green and stand out in bold relief from the heartwood, which maintains its natural colour. This discolouration of the sap is only superficial, and carries no influence with the deals when the log has passed through the sawmills. At this stage, from the fact of the sap being the same colour as the heartwood, it naturally follows the selection lays more with the knots and shakes. Shakes are not easily to be detected in newly sawn wood. Deals that will dry with open shakes may, when newly sawn, be overlooked, as these objectionable features assume no greater importance than a fine line, only to be detected by close observance. Deals in this newly sawn condition are piled in the yards or carted to the shipping stations, which in some cases are many miles distant. These piles are increasing in size during the whole of the winter, and are shipped after the ice is cleared from the rivers. There are generally two shipments from each port, called the first and second, or the May and September shipments. The interval between May and September being only four months, the amount of goods manufactured in that space is nothing compared with those made when the ports are closed. This winter season extends over eight months, or from September to May in the following year. In January and February the draft stock notes are sent to this country, and our brokers are then made aware of the quantity of stock which will then be ready for first and second shipment, and sales are accordingly effected. In the contracts it is always stipulated "that the goods shall be shipped in good condition." This is an important clause, and explains its own meaning. If the goods have been close piled at the sawmills or the shipping stations, and they have experienced a rainy season, then they are in a bad condition, as the sap has become discoloured. They are from thence stowed away in the hold of the vessel, and are transported to other lands in the warmest months of the year. Deals so shipped will be delivered from the vessel with the sap permanently discoloured and the goods reduced in quality. This change in the sapwood may be thus explained. The sapwood is the living portion of the tree, and is highly sensitive to the influences of light, heat, and moisture. When in a converted form, and piled damp in the yards, the moisture in the sap is as active as in the standing tree. As it is not able to expend itself in the branches of the tree or pursue its action to the formation of flowers and leaves, it assumes a low form in the scale of vegetation, and the pores become filled with fungi, which feed upon the volatile portions of the wood. The blue or green colour of the sap is nothing more than a low form of vegetation which has seized upon that portion of the wood in which life still lingers. It

may be set in motion by a shower of rain upon a summer's day, or it may insinuate itself throughout the tissue of the wood if the deals are piled one upon the other and no air space allowed between them. It does not follow that the goods may be kept in perfect condition if piled under sheds, but, generally speaking, they are best where so covered. If deals are sawn and piled in dry weather and are shipped in good condition, they may come to hand perfect in quality, with the sap as white and fresh-coloured as the heart. We are often presented with illustrations of this fact in the Finland goods. This is partly owing to its being a harder class of wood than we have shipped from Sweden. The sap is closer grown and more compact in its tissue, and is thus less liable to fall a prey to this secondary form of vegetation. To obtain deals in perfect condition they should be kept under cover and stripped for the free circulation of air, from the day they are sawn at the mills until they are delivered to the hands of the builder. Goods that are landed in this country in bad condition or which have—to use a shipper's term—"heated in the vessel," are somewhat lowered in quality, and it is no uncommon thing for a claim under this head to be made upon the foreign maker who could not have shipped them in good condition, agreeable with the terms of his contract.

The vicissitudes that timber is subject to cannot be said to end at this stage. They may be received in perfect condition, and well piled in the open yards, still a great portion of them may be damaged or deteriorated in quality as the same action will take place at the top of the piles and work itself down to a considerable depth. Such is the frequency of damage arising from this cause that it is a common excuse with timber merchants when goods are complained of that "they were the tops of the piles." Builders who are conversant with this fact will often buy their parcels of goods from the bottom of the piles. They will brand them with their own mark, and say "I'll take that lot when you get down to them."

Goods landed in bad condition may be somewhat improved by good piling, if they are received by the first or early shipments, as they have the warm days of summer to dry them; but if they are the second shipment, it is not possible to dry them in the winter season. During this damp, cold, rainy season the goods are absorbing all the moisture that comes upon them. Not only is the sap becoming discoloured, but the heart-wood is turning brown in patches with laying together. This is also the work of a fungus, which is spreading its gauze-like form between the timber and feeding on its very vitals. Goods so damaged are called "tender," foxey, tainted, or old deals, and before they are delivered into the hands of the builders are swept clean of this destructive fungus. When afterwards dry, this brown portion may be disturbed by a scratch of a finger nail, and, being only of a superficial character, it is little cared for. It is placed in work probably as bond, wall plating, or ground-floor timbers, where it may go on absorbing moisture. The half-destroyed fungus will again take action, and we are at a loss to explain how the building timbers in our new house have taken the dry rot. Taking but a cursory view of the present mode of management in the timber trade, we are convinced that great reforms are needed. The principal holders of stocks in this country care not to shed their timber, and the smaller merchants only have a care upon their best goods, whereas the common goods have need of the most shelter to keep them in a saleable condition.

Another condition in which goods may be sunk below the value implied by their brands may be noticed in the deck cargoes of the vessels. Converted timber is a light cargo, and when the hold of the vessel is full she is able to carry more weight. Goods are consequently piled upon the deck, and in that position are subject to many evils. It may be noted that deck loading is a condition imposed by the captain or owner of the vessel, who insists upon chartering to carry more timber than his vessel will hold. It is always a rule to make the deck cargo out of common goods, as they do not sink so much in value as good quality deals. These deck cargoes are in a wretched state when discharged, being wet, dirty, or discoloured by the sea water. They are generally piled and sold separate, at a reduction of ten to twenty shillings per standard, as they would spoil the general cargo if mixed amongst them.

We have spoken of the principal features connected with the qualities of timber, and, in conclusion, we may allude to a few exceptional matters which bear upon this point. As the timber trade is one of great magnitude, requiring a vast number of vessels in its service, we may naturally suppose that disasters are numerous. In one respect, timber is the safest cargo that a vessel can carry, for so long as she will hold together the cargo will cause it to swim. Hundreds of vessels, with their hardy crews, owe their ultimate safety to this fact, as, after weeks of suffering, they may be towed into some harbour with the hold full of water. In this condition they are called "waterlogged." In stress of weather the first step is to lighten the vessel by throwing the deck cargo overboard. If the vessel strains and springs a leak it is kept down by the pumps; but when once the hold fills with water, and the cargo begins to float, pumps are of little service. It is not our office to follow up these scenes of hardship and danger, as we have only to deal with the cargo. Deals, in a waterlogged vessel, will float from side to side, and grind themselves to pieces with the sand and ballast from the bottom of the hold. Their beating against one another will round off the sharp edges, and their incessant motion against the bow or prow of the vessel will destroy the square form of their ends. Goods so landed are in wretched condition, and scarcely saleable; but in many instances they are very little damaged, except by the water and other impurities attendant upon such a condition. In this case they are scarcely distinguishable from deck loaded goods, and they occupy the same position in point of value. Other goods are damaged by being cut to lie in the vessel; a corner may be chopped off, or a piece cut away for one of the ribs, &c. This is especially the case from ports where the timber is shipped large. Baltic and Canadian goods may be loaded without much damage, and the spaces between the ribs filled in with tramway sleepers, lathwood, or mining props. In this case it is termed "broken stowage." With distant ports, such as Georgia, Savannah, and Pensacola, from whence we draw our supplies of pitch pine, there is no broken stowage that they can profitably carry. The deals and logs are therefore damaged in being fitted into the hold of the vessel, and are consequently reduced in value.

DEAN STANLEY'S "MEMORIALS OF WESTMINSTER ABBEY."*

(SECOND NOTICE.)

THE Dean tells us in his preface that the work was undertaken in consequence of the kind desire expressed by many friends, chiefly his colleagues in the chapter of Westminster, on the occasion of the eighthundredth anniversary of the dedication of the abbey, that he should illustrate its history by memorials, similar to those he had published in connection with Canterbury Cathedral. With regard to the latter edifice, he "had the advantage of four marked events, of which one especially, the murder of Becket, whilst it was inseparably entwined with the whole structure of the building, was capable of being reproduced in all its parts as a separate incident. In Westminster no such single act has occurred." These historical memorials ought to be, in fact, the "History of England in Westminster Abbey;" this would have been a very extensive scheme, but the Dean has, to a certain degree, carried it out, as may be seen by the titles of the chapters of his book—Chapter I., "The Foundation of the Abbey;" chapter II., "The Coronations;" chapter III., "The Royal Tombs;" chapter IV., "The Monuments;" chapter V., "The Abbey before the Reformation;" chapter VI., "The Abbey since the Reformation," and an appendix, which is not the least interesting part of the book, inasmuch as it contains some new and very curious information. There are also one or two woodcuts, of which those at the end of the book, representing the position of the coffins in certain vaults, might well be omitted in a subsequent edition, for they are not cheerful subjects, and the book is eminently a cheerful and gossiping work. In the preface the Dean first of all gives a list of those of his friends to whom he is under obligation for aid afforded, and then a list of his authorities. Among the former the name of Mr. Burtt, of the Record Office, should be especially noted, as we find that he is now engaged in a thorough investigation of the archives of the abbey, which reach nearly as far back as the charters of the Saxon kings. The other manuscript authorities are the Chapter books, extending from 1542 to the present time; the Consuetudines of Abbot Ware, of which only the fourth part has come down to our time, but dreadfully defaced by the fire in the Cottonian library, A.D. 1731; the burial registers; the Precentor's book, and the MS. history of Flete. The chief printed authorities are the works of Camden, 1600; Keepe, 1683; Crull; Dart, 1723; Widmore, 1750 (the most correct of all as regards the history); Ackerman, 1812; Neale, 1818; and Mr. Scott's Gleanings, 1863; besides sundry other works, which, like those of Gough and Carter, treat of only portions of the edifice.

In Chapter I. the Dean relates, in a most charming manner, the old legends which attach to the various foundations of Lucius, Sebert, and the Confessor, in Thorney Island. The story of the Temple of Apollo, invented by the monks, as a counterbalance to that of the Temple of Diana, on Ludgate-hill, is not forgotten. No more are the wonderful legends of the Hermit of Worcester; of Edric, the fisherman, who witnessed the miraculous consecration of Sebert's church; or of the Confessor and the Pilgrim. The following description of the Confessor is extremely lifelike, and shows what archæology can do in the hands of an eloquent writer like the Dean:—"We know the Confessor well, from descriptions preserved by his contemporaries. His appearance was such that no one could forget. It was almost that of an Albino. His full flushed, rose red cheeks strangely contrasted with the milky whiteness of his waving hair and beard. His eyes were always fixed on the ground. There was a kind of magical charm in his thin white hands, and his long, transparent fingers, which not unnaturally led to the belief that there resided in them a healing power of stroking away the diseases of his subjects, &c." Now, this is the place where an antiquary would naturally wish to have the *ipsissima verba* of the original authorities. Unfortunately the only information contained in the footnote is, "Longis et interlucentibus digitis (Harleian Life, 240);" and it requires a further reference to the special authorities enumerated at the beginning of the chapter to find out that the Harleian Life is one of the lives of Edward the Confessor, published by the Master of the Rolls, under the editorship of Mr. Luard; and that it is the only one of the four that has any claims to be considered as almost contemporary. It should also be observed that both the date and the publisher's name (both essential for reference) are omitted. Chapter I. concludes with a woodcut of the abbey, as shown in the Bayeux tapestry. Could we have any faith in its accuracy it would almost lead us to believe that there were no aisles to the choir. Although this would

* "Historical Memorials of Westminster Abbey," by ARTHUR PENRHYN STANLEY, D.D., Dean of Westminster. London: John Murray, 1868.

seem to be contradicted, from the well-known passage from the Harleian Life, quoted by Mr. Scott, in his Gleanings, certain it is that the bases of one of the original choir piers, discovered last year by Mr. Scott, had certain peculiarities which were rather puzzling to account for, if we suppose it to have belonged to a detached pier.

Chapter II. commences with a vivid account of the Conqueror's coronation, and the doleful termination of the ceremony, when the Norman soldiers outside, alarmed at the shouts of the people, set fire to the abbey buildings. "Before the high altar, standing on the very gravestone of Edward, was the [illegible], crowned by William, the exact contrast of the sensitive, transparent king who lay beneath his feet. On either side stood an Anglo-Saxon and a Norman prelate. The Norman was Geoffrey, Bishop of Coutances; the Saxon was Alred, Archbishop of York, holding in his own hand the golden crown of Byzantine workmanship, wrought by Guy of Amiens." Now, two things in this description are apt to induce inquiries from the antiquary—and for neither are authorities quoted. Firstly, did William stand upon the tomb? The general authorities make him stand at the side of it. Most probably the said tomb was a raised one, with a bevelled top, more especially as we read of his presenting two palls to cover it, which could hardly be done if it were merely a flat stone. I think the authority in this instance is Sulcardus. The second point is, how the crown of Byzantine workmanship could have been the work of Guy of Amiens. That the crown to a certain degree resembled the Byzantine ones is apparent from the descriptions of the regalia made by order of the Commonwealth, before their sale or destruction; but we should remember that the species of crown in question appears to have been very common all over Europe at that time, and even later, as in the instance of the Crown of Constanza, the wife of Frederick II., found in her tomb, and now preserved in the sacristy of the Cathedral of Palermo.

The successive coronations, from William I. to Queen Victoria, are all described, interrupted only by the legend and history of the Stone of Scone, concerning which additional information is given in the appendix, with a woodcut, together with a geological account by Professor Ramsey. In 1865 the stone was withdrawn from the chair, carefully examined, and some particles subjected to chemical tests. The result of the Professor's investigations appears to be that it is a calcareous sandstone, probably of the old red sandstone formation; that it agrees with the rocks about Scone; and does not agree with those of the hill of Tara, or of Iona, or of Bethel, to all which localities its origin has been attributed. Chapter III., which treats of the Royal tombs, is by far the most interesting part of the book to the antiquary. We have part of an account of Henry III., and the motives which induced him to rebuild the abbey, and to rival that of St. Denis. But both architects and archæologists will protest against the paraphrase we find at page 127 of the following passage from Fordun:—"*In medio tumuli summitate Sti Edwardi reliquiæ conduntur et circa tumulum regis.*" Of course this means that the reliques of the Confessor were placed where they are to be found at the present day, viz.—on the top of the stone basement or tomb. The Dean, however, refers it to the raised floor of the Confessor's chapel, forgetting that in mediæval Latinity tumulus means a tomb, and not a mound of earth. The following is the passage:—"A mound of earth, the last funeral 'tumulus' in England, was erected between this the altar) and the Lady chapel, and on its summit was raised the tomb in which the body of the Confessor was to be laid." If we read the lives of St. Edward we shall also find that the arches underneath the shrine were for patients who came to be cured of other diseases than the "king's evil." Again, it is rather too bad to quote the "Gleanings on Westminster Abbey," page 150, in support of the very common and erroneous assertion that William Torel, the artist of the statues of Henry III. and Queen Eleanor, was an Italian, when two pages further on in the same work the following passage occurs:—"On the top of the Purbeck tomb is the *chef d'œuvre* of William Torel, goldsmith and citizen of London, who, for the honour of our country, appears to have nothing whatever to do with the Italian family of Torelli, as the name Torel occurs in documents from the time of the Confessor down to the said William; in fact, the attempts of various art critics to prove that the artist of this beautiful figure was an Italian are perfectly inexplicable, for, if we look at the contemporary Italian work at Pisa and elsewhere, we shall find that the English and French, so far from being behind the Italians in the thirteenth century, were, if anything, in advance of them." But there are two other slips of the pen which ought certainly not to have appeared in the work of a dean describing the monumental treasures of his own church. The first is the assertion that the ten knights who accompanied Edmund Crouchback to the Holy Land are carved upon his tomb. Now, the fact is that they were painted, but are now entirely obliterated. The carved figures, on the other hand, are all crowned, and probably represent his royal relations. The other slip occurs in page 169, where we are told, respecting the tomb of Henry V.—"Aloft are hung his large emblazoned shield, his saddle, and his helmet, after the example of the like personal accoutrements of the Black Prince at Canterbury. The shield is gone." Unfortunately for this assertion, both the saddle and the shield in question are actually engraved on the title-page of the book. They are represented as resting on the stone seat beside the coronation chair, a position they occupied a year or two ago, although they have probably been returned to their original place over the chantry of the king.

Concerning Henry's successor, we have in the appendix the depositions of the witnesses in the time of Henry VII., touching the arrangements made by Henry VI. for his tomb. He appears to have made sundry visits to the abbey for that purpose, and finally to have selected a spot between the Confessor's shrine and the tomb of Henry III., which spot was marked out by the mason. The Dean omits to tell us whether any of these marks are visible at the present day, but we learn that the reliques which stood on that identical spot were removed "to the place where they now stand, on the baksyde of the hyghe aulter." The curious part of the story is that in the archives of the abbey £500 are actually put down as having been paid for the removal of the body of Henry VI. from Windsor to Westminster.

Soon after this latter event, if it took place, we come to the building of the gorgeous chapel of Henry VII., an epoch which the Dean very rightly calls the beginning of modern England. Then we find foreigners invited over, and the beautiful bronze tombs cast by Torrigiano, which close the Middle Ages.

The Dean continues his work through the lines of the Tudors, the Stuarts, the Commonwealth, and the House of Hanover, ever telling his stories in the most pleasant manner; nor does the interest of the general reader at all slacken in Chapter IV., which treats of the monuments as distinguished from the Royal tombs. They are divided into groups, and each group affords fresh opportunities for anecdotes or eloquent passages, either from our best authors, such as Fuller and Macaulay, or from the Dean himself, who proves himself well worthy to take his place among them.

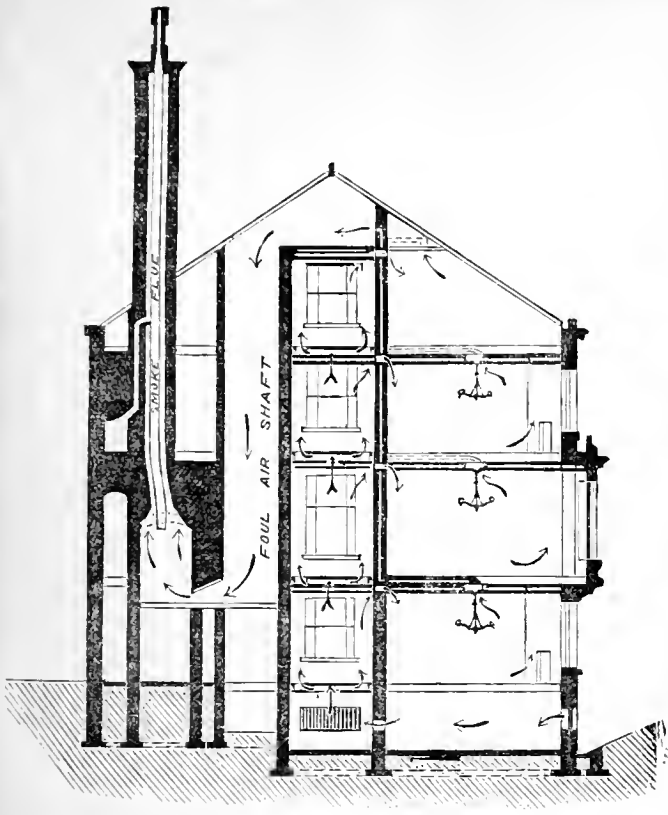
Of course this part of the work possesses very little interest to the architect or archæologist, but it really forms a very large portion of the whole book, and to the general reader will be quite as attractive as the former chapters. The work concludes with some chapters describing the conventual buildings, under the title of "the Abbey before the Reformation;" and another which treats of the events which have happened since that change of religion. The last chapter contains remarks respecting the changes of public sentiment towards the abbey, the various uses of the abbey, and the continuity of worship as practised in it. To sum up, Dean Stanley has produced a very eloquent and a very readable book upon the church of which he is so bright an ornament; but it is emphatically a book for the general reader and not for the archæologist, and there are also a few errors besides those mentioned above which will doubtless disappear in a second edition.

W. Burges.

THE LATE GEORGE GUILLAUME.

We regret to record the death, on the 15th inst., of Mr. George Guillaume, architect, of Morland-place, Southampton, a gentleman who ranked high as a provincial practitioner for nearly thirty years. Though confined to his house for many years past from a species of chronic rheumatism, brought on from the superintendence of sewerage works in an exposed situation, and an overtaxed constitution, Mr. Guillaume was to the last an actively-minded member of his profession. His earlier works, chiefly in Hampshire and the adjoining counties, attest an advanced taste in ecclesiastical architecture, an inventive mind, and a fertility of design that soon found a large field of local patronage. Curdridge Chapel; Sarisbury Church; Church of the Holy Trinity, near Owslebury; the reseating and partial restoration of the Priory Church at Christchurch, Hants; Church of the Holy Saviour, Bitterne; besides numerous additions and restorations, show an untrammelled mind and a correct taste. In the design and erection of residences for the nobility and gentry of the county, Mr. Guillaume had a large share of practice. Holly-hill, the seat of Lord H. Cholmondeley; Moorfields, the residence of E. Lomer Esq.; the offices of the Peninsular and Oriental Company, Southampton, &c., &c., indicate a varied practice in domestic and modern Classic design—all characterized by careful planning and general grouping of parts. In 1845 Mr. Guillaume obtained the surveyorship of the Marsh Estate, his plan for laying it out for building purposes having been selected in competition. Sewering and reclaiming a swamp from periodical overflows of the tide presented a difficulty not easily overcome. Mr. Guillaume's inventive powers were called into requisition, and by a self-acting system of tidal floats and flaps, together with reservoir sewers, the land became valuable building land, and is now the most valuable of the Corporation properties. From its funds the Southampton Corporation purchased other common fields in the centre of the town and laid them out as a public park. The design for this also was selected in competition, and Mr. Guillaume's plan was carried out. Mr. Guillaume's pen, no less than his pencil, was employed. He is the author of an "Architectural Restoration of Netley Abbey, illustrated by views and details:" a small work entitled "A Definition of Man;" besides other contributions of a mathematical character contributed to this journal. He was the inventor and patentee of a hydraulic oscillating and rotary machine, economic building bricks, &c. Of a kind and gentle disposition, and an active mind, his loss will be felt deeply by a large circle of friends.

Mr. J. J. Mechi writes to ask whether "Chimney pots are not a great mistake." He states that a heavy wind lately blew the pot off the chimney of his dining room without his knowing it. He was greatly surprised at the increased draught and consequent brightness of the fire, and subsequently removed the other chimney pots with a like result. He is satisfied that it is a mistake to have a large chimney for the escape of the smoke, and then by contracting its opening to neutralize the upper space. The narrowest portion of a chimney should be near the fire, where the rarefaction of the air is most intense, and the upward passage most rapid, and the chimney should rather increase than diminish in size upwards. He strengthens his assertions by adducing the experience of makers of railway engines, who now make all engine chimneys funnel-shaped or bell-mouthed.



NEW SYSTEM OF VENTILATION.

AT a recent meeting of the Liverpool Architectural Society, John W. Hayward, M.D., read a paper treating of some of the essential conditions of house building from a medical and sanitary point of view. After dwelling upon the importance of fresh air and sunlight, a cheerful lookout, good drainage, and thorough ventilation, Dr. Hayward proceeded to describe the practical carrying out of his ideas, which had been done in a house which he had erected for himself. He remarked that one of the greatest difficulties he met with was to obtain a site. He could not obtain a piece of land in a suitable neighbourhood with either an elevated position, a dry foundation, a south or south-east aspect, or with an inviting prospect. At length Dr. Hayward settled on a piece of ground on the east side of Grove-street, Liverpool. The great feature of his house, he went on to remark, was its ventilation.

I made the following arrangement of the plan of my house, which consists of basement, ground floor, and first, second, and third floor, viz. :—The basement is devoted altogether to the collection and warming of the fresh air. The ground floor is mainly store rooms and cellars, with stable and carriage house, &c, merely occupying the front with two professional rooms, a small cloak room and water closet, and the main entrance, with vestibule and stairs lobby, and servants' entrance and lobby. The first floor is my living floor ; on this is a drawing room, with ladies' dressing room and water closet ; a dining room, with lady's pantry and closets ; and a kitchen, with cook's pantry, larder, scullery, and butler's pantry. The second floor is the family bed rooms (four), with breakfast room, housemaid's closet, bath room, and water closet ; and the third floor is the servants' bed rooms (four), with children's play room, store room, and two water-cistern rooms. And above, beneath the ridge of the roof, is the foul air chamber, into which the foul air of all the rooms of the house is collected, and from which it is drawn by the kitchen fire, by means of a shaft passing down to the ground floor, and then ascending behind the kitchen fire and up the kitchen chimney stack round the smoke flue.

The principal part of the house consists of a front and back block, each of about 33ft. by 20ft., with a lobby 9ft. wide between them, running north and south. This central lobby is the warmed air corridor or ventilating lobby : it is lighted by a window at its south end, and it is shut off at its north end from the main staircase, vestibule, and front entrance by vestibule doors, which is essential to the keeping of it warm. Out of it open all the principal rooms of the house, so that it matters little whether the doors are open or shut. The front entrance, with vestibule and main staircase, are placed, not in the centre, but at the north end of the house. The main staircase runs between the vestibule in front and the kitchen stairs behind, and is lighted by an ample skylight. The servants' entrance and lobby are from the south, behind the ventilating lobby, and the servants' stairs run up between the main staircase in front and the kitchen behind. By this arrangement there is an easy approach from the kitchen to the dining room and drawing room, and to both the front and the side door ; and the lobby into which opens the door that lets in the cold air by being frequently opened, is shut off from that out of which the living rooms open, and which could not be if the entrance were in the middle of the front. The entrance should indeed always be at one side or end of the house ; otherwise there is no obtaining a central corridor, nor any possibility of keeping the lobby warm, or preventing the cold air let in by the open door from rushing directly up to the bed rooms. The entrance in the centre, is, I think, one of the greatest architectural mistakes I have met with, and a sure sign of an unevenly warmed house. The central corridor is an essential part of the house, and serves very important purposes ; it serves, of course, as lobbies to the rooms on each floor, and, by the introduction of gratings into ceiling and floor of each storey, it also serves as an open corridor from basement to attics. The only objection I know to this arrangement is that it necessitates the placing of some of the chimney-breasts in the external walls, and sometimes one in the front elevation. This is but little more than an architectural eyesore and a loss of heat.

Along the centre of the ceiling of each storey of the central corridor is an ornamental lattice work, two feet wide, and along each side of the floor above is an iron grating, one foot wide ; these allow the warmed air to ascend from the lobby beneath to the lobby above, but check it for the supply of each floor, and prevent it from rising directly to the top one.

Along beneath the opening in the ceiling of the basement of this corridor run five coils of Perkins's inch diameter hot water pipes. Fresh air enters into the lower part of this basement, and, rising, is heated by the heated pipes, and then passes through into the lobby of the ground floor, and thence into the lobby of the first floor, and thence into that of the second floor, and thence into that of the third floor, so that the central corridor is filled from the ground floor to the attics with fresh warmed air. Above the attic floor this corridor is continued to the slates and made into an air-tight chamber, under the ridge of the roof, to receive the outlets of foul air flues from the different rooms of the house. Out of this central corridor all the principal apartments of the house open ; and out of it, and out of it only, they receive their supply of fresh air. The cornice round the ceiling of this corridor, and that of each of the rooms opening out of it, has a lattice central enrichment, seven inches deep, and the wall between these two cornices is perforated by as many seven inch by five inch openings as the joists will allow, so that the fresh air has a free passage from the corridor into the rooms, even when the doors are shut. The drawing room has nineteen of these seven by five inch openings, making an inlet for fresh air of over four and a half square feet, distributed along the whole length of the wall of the opposite side of the room to the fireplace. The dining room has fifteen of these openings, making an inlet of considerably over three and a half square feet. Over the gaselier in the centre of the ceiling of each room is a perforated ornament, covering a nine inch square opening into a zinc tube, nine inches by four and a half inches, making an outlet for the foul air of forty and a half square inches. This zinc tube goes along between the joists of the ceiling into a nine inch by four and a half inch flue in the brickwork of the wall, between the corridor and the room above, where it is regulated by a valve. This flue rises up inside the wall and opens into the foul air chamber formed under the roof of the corridor. The flue from each room opens separately into this chamber ; and there is a similar flue also from the cloak room, the dressing room, the breakfast room, the bath room and the kitchen, and from all the water closets, even from the servants' in the basement : there are eighteen flues of nine inches by four and a half inches, making an inlet into the chamber of three feet four and a half inches square. Out of the north end of this chamber goes a brick flue or shaft, six feet by fourteen inches, taken from the back staircase, making an outlet of seven square feet.

This outlet or shaft goes straight down to below the first floor, and then crosses eastward and rises up behind the kitchen fireplace ; it is then collected into a square shaft of the same area. Up to the centre of this square shaft runs a circular earthenware smoke flue of 15in. diameter from the kitchen fire, leaving a foul air shaft of at least five square feet surrounding the kitchen smoke flue ; and these, together, form a large chimney stack, which is carried up to a greater height than any other chimney of the house, so as to secure a long syphon and strong draught. An intermediate foul air chamber, into which the flues from all the rooms of the house enter separately, and which is exhausted by one capacious syphon, is essential to the obtaining of an equal suction from each room ; otherwise the nearest flue would receive the most powerful suction, and the furthest perhaps little or none.

As I have pointed out, all the systems hitherto brought before the public have been defective in some of the points essential to efficiency and success, such as providing an inlet as well as an outlet, protecting the outlet against back draught, providing for the tempering of the air before it comes into the apartments, or some other point essential to efficiency and perfection, and they have deserved rather the name of "starvation" than "ventilation." This is not the case now, however, for I am convinced that the system carried out in my house is both theoretically perfect and practically effectual, and applicable alike to dwelling houses, hospitals, infirmaries, churches, schools, lecture rooms, concert rooms, manufactories, and every and any other building of whatever kind and for whatever purpose where ventilation not involving starvation is required, by simply making part of the basement a heating chamber and part of the roof a foul air chamber, and making the smoke flue of the heating apparatus act as a foul air exhausting shaft ; then, the outlets being in the ceiling, and especially if assisted by sun burner gas lights, they would take off the foul air more effectually at the time when the building is in use than at any other ; and the persons sitting near the doors or under the ventilators would not, as they are now, be in a cold draught, subjecting them to colds, rheumatisms, neuralgias, &c. ; and, by an arrangement to shut off the heating apparatus from the furnace, the fire may still be used for the foul air suction in summer, as well as in winter, and the foul air would be drawn away whether the gas was lighted or not, and without the building itself being heated when not required to be.

The expense involved is no great item, and will be less as builders become familiar with it : it is, of course, proportionate to the size and complexity of the building.

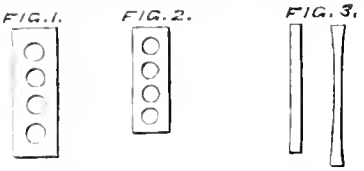
Mr. AUDSLEY thought the Society was very much indebted to Dr. Hayward for his admirable paper. It was certainly the most perfect scheme of ventilation he had ever seen brought forward. He might mention, as a curious coincidence, that, in designing a school upon which he was at present engaged, he had adopted much the same principle as that advocated by Dr Hayward for carrying off the foul air. Mr. Boult feared that very few clients of architects would be as liberal as Dr. Hayward. He hoped that at the end of twelve months Dr. Hayward would inform them of the results of his experience, for that information would be more satisfactory than the most sanguine anticipations beforehand. Dr. Drysdale said he had a house built upon the same principle as that of Dr. Hayward, in 1861, and, having let it since, the rent yielded a return of six per cent. upon the cost, including the land. The house was very much approved of by the persons who occupied it.

It was mentioned that the estimate was £3,300 for Dr. Hayward's house, including the stables.

PECULIAR PROPERTIES OF IRON.

TO assert that a bar of iron, after being subjected to a severe strain, is not only as strong, but actually stronger than it was previously to undergoing the infliction, appears at first sight to be contrary to the dictates of common sense. But, notwithstanding the apparent paradoxical nature of the assertion, it is perfectly true, and the statement, moreover, holds good, whether the material in question be acted upon by a strain of a compressive or of a tensile character. In the first place, let us consider the strain belonging to the former description. If a weight be placed directly upon a piece of iron, suppose so many tons upon a cylinder of iron 3in. high and 3in. diameter, the immediate effect of the compression upon it, produces a shortening of the cylinder, accompanied or unaccompanied, according to the magnitude of the weight and other circumstances, by a bulging out or spreading of the lateral dimensions. There is no absolute necessity for any bulging to take place, as experiments have demonstrated that cylinders tested in this manner to the breaking point, have sometimes fractured by a wedge splitting off at an angle, which is constant for the same material, without evincing any increase in their bulk. The shortening of the cylinder under the weight is *quam proxime* proportional to its amount, double the weight producing double the diminution in height and so on. When the weight placed upon the cylinder approaches near that which would crush the material, this proportion is not quite true. When a new, or hitherto unstrained, rod or pillar of iron is submitted to a heavy weight, it suffers a shortening which is partly temporary and partly permanent. Upon the removal of the load the pillar returns nearly to its original length, but not quite; in other words, the temporary shortening disappears but the permanent remains. The difference is termed the "permanent set," and may be expressed mathematically as follows:—Calling H the original height of the rod or pillar, and H' that which it retains after the removal of the load, and putting S for the "permanent set," we have $S = H - H'$. If the same load be now again placed upon the pillar, it not only causes a smaller compression than it did at first, but also produces no permanent change in the condition of the material. Upon the removal of the load the pillar is found to have received no second "permanent set," but to have returned to precisely the same height it had upon the removal of the load for the first time. Any further repetition of imposing and removing the weight produces no change in the pillar, so that, practically, it resists the action of the weight infinitely better, the second or third time of its application than it does at the first. Accordingly, as the amount of shortening, when a rod of iron is exposed to a compressive strain, or the amount of elongation, when it is under a tensile one, or the amount of deflection, when it is subjected to one of a transverse nature, has always been regarded as a measure of its strength, so, when the same weight produces no change in one pillar, while its effect is plainly observable in another, the former must be considered the stronger of the two.

It is not difficult to account for this somewhat curious fact, more especially if we assume that there is a certain distance between the molecules or component atoms of the material, at which they exert their maximum powers of resistance. If this distance, which will vary with the amount of the load, be greater or less, the full resisting power will not be called into play. In fig. 1, let us suppose the molecules of the cylinder to be at a certain distance, corresponding to that of their unstrained state, and not at that enabling them to exert their greatest resisting force. When a weight is placed upon the pillar it is compressed, and the atoms are driven closer together until that distance is attained, when the resisting power balances the compressive force, and there is equilibrium produced, as in fig. 2. The sum of the separate intervals, through which the atoms have been squeezed closer to one another, gives the total shortening or permanent set of the pillar. This state



being reached, it is easy to see that any repetition of the weight will not produce any permanent effect, though there will always be a small temporary compression, since the atoms have arrived at that relative position which places them in equilibrium with the force tending to displace them. Should a heavier load be placed upon the pillar there will then occur a second permanent set due to the action of that load, and the atoms in consequence must assume a fresh position, that is, one nearer to each other, in order to resist the increased amount of compression brought upon them. It must not, however, be imagined that this process of strengthening pillars, if we may so call it, can proceed *ad infinitum*. So soon as the weight laid on is sufficiently great to injure the "limit of elasticity" of the material, instead of any increase of strength accruing to the pillar, it is rapidly and seriously deteriorated in its powers of resistance. There should never be a load greater than one quarter of the crushing weight placed upon any piece of ironwork, and in many instances, this would be too near an approach to the ultimate strength of the material.

The property of acquiring strength by exposure to strain, is still more clearly and remarkably evident in rods and bars subjected to a tensile strain, than in short pillars submitted to direct pressure only. A similar explanation to the former can be given, but in this instance the molecules increase their distance from one another instead of decreasing them, in order to arrive at that particular limit, enabling them to exert the maximum resisting force against a tensile strain of a certain amount. Moreover, a diminution in sectional area attends the elongation of the rod, which remains together with the permanent set after the load has been removed. Fig. 3 shows the change of form occurring in an iron rod, after it has been heavily strained. It conducts itself in a precisely analogous manner to a pillar under compression, only the effects are visible in the opposite directions. The rod is lengthened, not shortened—the lateral dimensions are diminished, not increased. The diminution of the sectional area of the bar is a very important feature, and strongly illustrative of the fact under consideration. If we take two bars of exactly the same length and sectional area, although the former dimension may be varied without any difference being occasioned in the result, and strain one of them first so as to elongate it to a certain extent, and consequently reduce its sectional area at the centre, and subsequently strain them both to the breaking point, the bar previously strained will bear the same weight as that unstrained, although the latter must have a greater sectional area, as it was not reduced like its fellow. Since the strength of any bar, rod, or other form of iron is directly in proportion to the amount of material it contains, that is, to its sectional area, the bar that underwent a preliminary straining, and had its area reduced, must evidently be the stronger, when it bore the same breaking weight that fractured another bar having more metal in it. Whatever has been previously mentioned respecting the "limit of elasticity" applies to bars under a tensile strain also, although the value of the limits in the two descriptions of strain are very different. These values vary considerably with the quality of iron employed, and to a much greater extent than the ultimate strength of the material, which depends a good deal also upon the perfection of the manufacture and the purity of the process.

From what has been remarked it would appear, therefore, that, previously to employing any iron bars, rods, pillars, or other forms, it would be advisable to subject them in the first instance to an initial strain, nearly equal in amount, and of the same description as that to which they would be in future submitted. That this plan might be open to objections there is little doubt, chiefly from the fear of overdoing the thing, and injuring the material by too severe a strain. There is also in addition the labour, expense, and loss of time that would be entailed in following out such a course. Imagine what it would cost in these three items, to submit every bar in the Charing-cross or Blackfriars Railway Bridge, to a preliminary strain. The end attained, would certainly not warrant the means to ensure it. At the same time, it is admitted that the tubular bridge over the Menai Straits would have undergone less deflection, had it been feasible to bring the top and bottom flanges into a state of heavy preliminary strain, before rivetting them up to the solid sides.

COMPETITIONS.

At the Darlington Board of Guardians' fortnightly meeting on Monday, the plans, of which there were eighteen or twenty, for a new Workhouse, were reported upon by the committee appointed for the purpose of selecting the best. The committee were assisted by Mr. William Lee, of London, and reported in favour of the plan marked "Nota Bene" for the premium prize of £40; the second, "Economist," was awarded the second place, £30; and the third, "Suum Cuique," £20. On opening the letters accompanying the plans, the premium prize was found to be Mr. Charles Adams, architect, Stockton; the second, Mr. George Slyan, of York; and the third, Mr. Robert Eland Dixon, architect, Darlington. The carrying out of the plan of Mr. Adams will entail a cost of £9,000. We believe this is the third important competition in which Mr. C. J. Adams has been lately successful, the two others being Hartlepool Town and the Middlesborough Exchange.

A meeting of subscribers to the Austin Memorial Workmen's Club and Institute, Madeley, Salop, took place on February 3rd, in the Infant's School Room, Madeley, for the purpose of selecting from the collection of designs and plans sent in for competition the one most suitable for the purpose. It may be remembered that in the particulars issued to architects it was specified, that the building should be of the red brick of the neighbourhood, with white stone dressings, and that it should contain the following accommodation, namely, workmen's common hall, or club room, youth's common hall, or club room, kitchen to supply refreshments, a smoking room, a reading room, committee and class rooms, a residence for hall-keeper, a large hall for concerts, lectures, &c., retiring rooms, lavatories, &c. These requirements appear to have been well kept in view by the competitors. The subscribers selected three designs, from the collection of upwards of fifty sent in, and submitted them to the decision of G. Maw, Esq., with a request that he would in the course of a fortnight select what he considered the best. The subscribers met on Wednesday last to receive Mr. Maw's report, and ascertained that he was in favour of the design bearing the motto, "Well Considered," by Mr. John Johnson, architect, of 35, Moorgate-street, London. The cost of the building will be about £1,400.

Is the Liverpool Corporation also going to do the unhandsome thing? It looks like it, we confess. For some reason which we are unable to explain, the architect who succeeded in obtaining the first premium of £3,000 in the recent Labourers' Dwellings Competition, has, we hear, been paid off and dismissed, and the plans of another competitor have been purchased for £100. Builders are now invited by advertisement to tender from these plans, without quantities or any assurance that any tender will be accepted, nor will any allowance, they are told, be made for tenders. As our readers are aware, these buildings have already been twice tendered for. What does all this mean?

THE POWER OF TRUTH.

ONCE more we have a word to say on the Pugin v. Barry controversy. If any of our readers should think this a profitless controversy, or that it is merely a personal squabble between Mr. E. W. Pugin and the Messrs. Barry, we beg to say, in vindication of our persistence in investigating the subject, that on its solution depends to a great extent the relative position of the man who supplies the ideas in art matters and the man who trades with them. A short time since a well-known architect said to us, "If you prove that Pugin was the principal designer of the Houses of Parliament, where will the matter end? We architects shall have others springing up in our offices and asserting claims prejudicial to our reputation and our interests." We said that if they can make good such claims, let them, in the name of justice, do so. We don't know why an architect should have the privilege of creating a reputation by virtue of designs furnished to him any more than an author should make a name by subsidizing another man to write his books.

It will be remembered that Mr. E. W. Pugin's pamphlet had a frontispiece consisting of a photograph of a "chateau," which was designed and drawn by A. W. Pugin in 1833. One could see at a glance that the character, spirit, and details of this design were similar to those of the Houses of Parliament. The two works bore the same unmistakeable stamp of individuality and resemblance, and one could scarcely resist coming to the conclusion that they sprang from the same origin. Dr. Barry, determined not to be outdone, imitated his opponent's plan, and gave as a frontispiece to his pamphlet a photograph of a drawing of the Throne in the House of Lords. Under the photograph it was stated, "This photograph is from Sir Charles Barry's drawing." The author goes on to say that the drawing is defaced and dirty, and that it had been difficult to obtain a clear photograph from it. This, undoubtedly, was the most remarkable point of evidence that had been submitted in Sir C. Barry's favour. Here is a drawing purporting to be in Sir C. Barry's hand, and it presents the selfsame characteristics as those which particularly distinguish the drawings of A. W. Pugin. Many said at once that, if Sir C. Barry could produce such a drawing, he had the ability to design the Houses of Parliament. But the idea naturally and spontaneously arose in thoughtful minds, how singular—in fact, how wonderful, that two men so essentially dissimilar in character and feeling, in education and purpose, should produce designs so similar and life-like. It was something like unearthing evidence to show that Cromwell had composed one of the books of "Paradise Lost." Here then, was a paradox—we may say, a contradiction. A week had scarcely passed away when new light began to break upon the matter. Mr. E. Pugin, in his answer to Dr. Barry, just published, says, "Of one thing I am certain, that the present structure (the throne) was entirely my father's design. I saw the various original sketches made, I saw them worked into shape, and Mr. Burton, to whom I have appealed, and who was then engaged by Mr. Hardman at Birmingham, distinctly remembers that the three designs of which I have spoken were taken to Birmingham, lost at the Railway Station, and subsequently found. He remembers my father's distress at the loss, carefully examined the drawings, and knows that they were his."

Mr. E. Pugin goes on to say—

> As regards the photograph itself, given in Dr. Barry's pamphlet, who will question my statement that Sir Charles copied my father's style, even to a dot? But for this evident imitation I should say that the photograph was not only after my father's design, but also drawn by his own hand—nay, I cannot admit even this qualification, for I boldly affirm that it is my father's own drawing or at least copied from one of his. In confirmation of this, I may refer to a series of drawings made by my father for the Earl of Dunraven, which in style and handling are a facsimile of that under consideration. Should the suspicions, not only of myself, but of all with whom I have come in contact, prove correct, without any wish to be offensive, I must say that it is the greatest piece of effrontery I ever met with.

Here, then, is an important revelation. Mr. E. Pugin speaks from positive knowledge, he calls a living witness, and he establishes a comparison between this drawing and a series made by his father for the Earl of Dunraven, which are a facsimile of the throne drawing. But to make the evidence complete and irresistibly conclusive, Mr. Herbert, R.A., whose reputation is European, and whose character for veracity is unimpeachable, says, in a letter that will be found in another column—"I was at the Grange when your father made the drawings for the throne. I was at work on the same board with your father when the post brought a packet from the then Mr. Barry. It was a drawing of the throne made by your father, treated as a pointed shrine, as if to enthrone Royalty." He goes on to say, "Why I so well remember this was that your father turned to me, and, with an unusual quiet sadness, said, 'He spoils everything I do.' These are the exact words, and I shall never forget them. He then went to the study place, and remarked 'Barry wants a *testa*.' Some days after this, he was engaged upon the throne by my side, and I saw him make the design exactly for the present throne." Without exaggeration, perhaps this is one of the most remarkable instances of complete change of evidence on record. The principal witness, Dr. Barry, the defendant, was called into court, and gives irrefutable evidence for the plaintiff. Of the completeness and conclusiveness of this there can be no doubt Augustus Pugin designed the throne, and Dr. Barry says that the drawing now in his possession is by his father's hand. Thus Sir C. Barry must have copied Pugin's designs, and palmed it on the world as his own. Posterity, which is no respecter of persons, and which looks at facts through the calm and severe atmosphere of justice, has a right to ask why the many hundreds of letters which passed from Pugin to Barry were disposed of, why the thousands of drawings furnished by Pugin to Barry were destroyed, and why almost every fragment of evidence which would throw light on the question has been removed? If the drawings were by Sir C. Barry's hands they would be treasured up as heirlooms for his children. But they don't exist. Something, however, does exist. The churches erected by Barry about the time he submitted the competition designs for the Houses of Parliament may be seen in London, and we have no hesitation in stating that they differ from the Houses of Parliament as much as chalk differs from cheese. They differ from the Houses of Parliament as much as a Greek lute differs from a cathedral organ. The evidences of Sir C. Barry's originating genius are indestructible. On the other hand may be seen evidences of Augustus Pugin's inventive ability in innumerable drawings, in furniture, in churches, in halls. "The man," says Mr. Gladstone, when looking at the tower of Scarisbrick Hall, "who designed this tower in all probability designed the clock-tower of the Houses of Parliament, only the Scarisbrick Tower is a more beautiful and living work." Between the Houses of Parliament and the works of Sir C. Barry there is an irreconcileable antagonism. Between the Houses of Parliament and the other works of Augustus Pugin there is a unique and indisputable relationship. Both the internal evidence and the external records tend to the same point—namely, that Augustus Pugin's hand was the main instrument in producing the Houses of Parliament. We have not spoken so positively before, but the accumulation of facts is so rapid and certain that we are compelled to give no uncertain sound in the matter. Another question will by-and-bye come up, and that will be, not about the authorship of the designs for the Houses of Parliament, but about the honesty and righteousness of Sir C. Barry's conduct. We are well aware that, even in hinting such a thing, we shall evoke a sneer from the superficial, and call down a frown from the powerful. But, as we have no prejudice to preserve, no friendship to vindicate, and no personal object to promote, we shall feel secure in our desire and our intention to defend the right. There is one thing which presses itself on our attention in this controversy, and that is that truth is by far the mightiest weapon in this world. The more a true statement is investigated the more it makes itself manifest. Everything appears to conspire in its favour. The strong may league themselves together to put it down, but they may as well try to quench the sunlight. Blundering journalists may do their best to hide it with a cloud of words, but the cloud will pass away sooner or later, and the true statement will remain. Prejudice may unwittingly misrepresent, and partizanship may diminish or magnify, but that which is in its very nature true—knows nothing of passion or of party, will survive. It makes not a particle of difference to us personally who was the art architect of the Houses of Parliament. If we thought, by virtue of the evidence presented to us, that Sir C. Barry was the man, we would do our best to beat Mr. Edward Pugin's pretensions into the dust, and range ourselves by the side of the Barrys in their righteous endeavours to vindicate their father's name. But after an impartial investigation of the evidence, we can, in obedience to the inexorable claims of truth, do no other than assert our opinion that Augustus Pugin's brain conceived and his hand executed the principal drawings for the Houses of Parliament, and, though he, during his eventful and stormtossed life, was satisfied to be unrecognized and comparatively unrewarded, posterity, the arbiter of individual fames, will assuredly do him full justice.

COCOA NUT FIBRE.

WE last week alluded to the uninflammability of cocoa nut matting, and we will now lay a few facts before our readers in relation to the extensive use of cocoa nut fibre. This substance, now so familiar to British eyes, has only been applied to industrial purposes in this country about a quarter of a century. It was first introduced into England by the late Captain Wildey. Mr. Treloar, the well-known manufacturer of Ludgate-hill, became his partner, and to him right fairly belongs the chief merit of developing the use and application of the material. A new industry, in fact, has been introduced into the country through its instrumentality, as may be seen from the following, among other purposes, to which it is applied:—It is used for stuffing mattresses and sofas, and, in fact, for all purposes to which curled horsehair is applicable. In another column will be found a letter showing that it is peculiarly adapted for this purpose on account of its coolness, cleansibility, and uninflammability. It is used for making brushes and brooms, and for all purposes to which bristles are applied. It is used in the manufacture of cables and cordages of all sizes, and lines for fish nets, being, like gutta percha, singularly durable—in fact, almost indestructible—when submerged in salt water. It is made into sheep-folding nets, into yarn for thatching, for tieing up trees, and other agricultural uses, as it bears exposure to the weather for a long time without damage. It is used for making cloths for oil pressing, stearine candle pressing, cider pressing, &c.; for ships' fenders or buffers, for floor matting, and for door and carriage mats in endless variety. It is manufactured into nosebags for horses, into hassocks and kneelers for church use. When we come to inquire into the matter, it is surprising how diversified are its applications and how extensively it has been subordinated to human use. Even the

very best or refuse from the manufacture of [illegible] is a valuable material to mix with the soil of strawberry beds, to fill trenches in which cuttings are to be planted, and other horticultural uses, because it possesses the property of being always moist but never wet, and continues in the same state without rotting, and no insect will harbour in it. We have been induced to inquire into the nature of this material, and to record some of its valuable uses, because Mr. Morton, a [illegible] when speaking in the public papers of the cause of the fire at the Oxford Music Hall, made the singular mistake of stating that cocoa-nut fibre is flammable. We can speak from experience and demonstration that it is not so. It possesses peculiar capabilities, and is the basis of a great and a growing industry. A Liverpool magistrate a short time since said that petroleum was a gift of Providence, but that its use was accompanied with great danger. We regard cocoa-nut fibre as a gift of Providence unaccompanied by danger in its use, and therefore an unmixed blessing to man. The bulk of the raw material is imported from Ceylon, a little from the West Indies, and some from Singapore. Its total annual value when in the raw state, before being manufactured in this country, is about £[illegible]; and the number of persons employed in its manufacture is estimated at about 3,000, besides a still larger number of prisoners who are constantly occupied in making the commoner kind of mats in our prisons.

THE ARCHITECTURAL EXHIBITION.

ONCE more as the spring time comes round we beg to call attention to the Architectural Exhibition. All who have anything worth sending, let them prepare for sending it. For years past this exhibition has not been what it ought to be, and what it might, by an organized effort, be easily made. Many of our chief architects stand aloof. They are too indifferent about the matter. Better, we say, to have no exhibition at all, than to have one that misrepresents the ability of the profession. There was an evident step in advance, as far as classification was concerned, in the exhibition last year. But there were many drawings hung that ought not to have seen the light at Conduit-street. It is far better to have a dozen good subjects than twelve dozen bad ones. If the committee will have the courage to exclude all unworthy drawings or designs they will raise the character of the exhibition. But then, it may be said, "what can be done with the space? it would never do to have bare walls." Our reply is, "Why confine yourselves to architectural drawings? why not admit art furniture? why not admit art manufactures?" We see no reason why an architectural exhibition might not include specimens of wood and stone carving. We hear that designs for fresco painting and mosaic decorations are expected. The council also expect a collection of valuable drawings of architectural works by foreign architects. This will undoubtedly prove a source of attraction to many. The council are prepared, as they were last year, to receive a limited number of paintings and drawings of an architectural character for sale. They have made arrangements with Messrs. Cundall and Fleming, whereby members of the society may have their works photographed at considerably less cost than that usually charged for such works. We are sorry to find that there are to be no lectures this season, because the lectures of last year, "although given conjointly with the Architectural Museum were not sufficiently well attended to warrant their continuance." Architects and others are reminded that drawings, models, &c., for the forthcoming exhibition must be sent to Conduit-street, on Wednesday or Thursday, the 8th and 9th days of April next, after which no drawings can be accepted.

ON PATENTS FOR INVENTIONS.

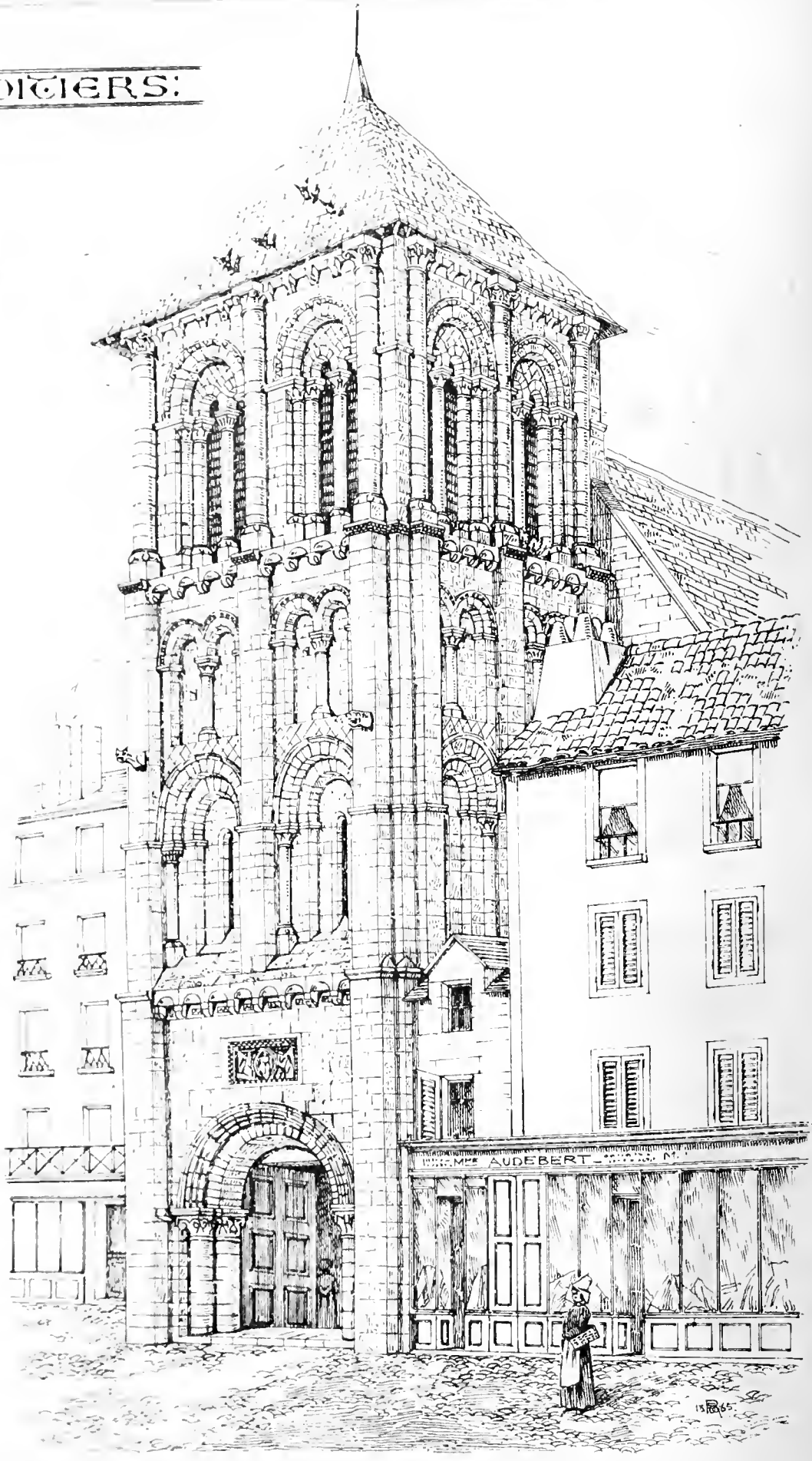
WHATEVER facetious writers may say about the dry-as-dust, intensely matter-of-fact, and eminently unromantic character of Blue Books, their value and utility as public records are beyond dispute. We have before us a batch of these publications of an unusually interesting kind, which have just been printed by order of the Commissioners of Patents, under the supervision of Mr. Bennett Woodcroft, the indefatigable Clerk of the Commissioners. The volumes consist of abridgments of specifications relating to the various patents for inventions deposited in the Patent Office. It is explained, in the brief preface which introduces each Blue Book, that the indexes to patents are now so numerous and costly as to be placed beyond the reach of a large number of inventors and others, to whom they have become indispensable. To obviate this difficulty, short abstracts or abridgments of the specifications of patents under each head of invention have been prepared for publication separately. These are so arranged as to form at once a chronological, subject matter, reference, and alphabetical index—a fourfold index, in fact, to the class to which they relate. Our readers may form some notion of the multifarious nature of the contents of the Patent Office, from the fact that the number of specifications printed and published up to this time amounts to 61,000. These volumes, therefore, cannot but prove of the greatest service to scientific men, for only by their assistance can they get any true idea of what has been done, and is continually being done, in the fertile field of invention. To each book is given an introductory chapter on the general subject treated—a sort of historical sketch or *resumé* of the main contents. One of the books, we find, is devoted to mechanical contrivances for raising, lowering, and weighing heavy bodies, more particularly those appliances invented since the year 1617. This is prefaced by a very interesting account of the machines or improvements employed for such purposes in the very earliest times, so far as they are known to us. Our information on this point, however, is extremely limited. It has always been a subject of speculation and wonder as to how the Egyptians and other nations of antiquity were enabled to raise the enormous masses of material which they used in the erection of their temples and monuments. Our oldest books, as Mr. Woodcroft remarks, give us no information, nor do the paintings and sculptures of antiquity—in many respects so illustrative of art and science, as understood and practised at the periods at which they were executed—show anything calculated to give us a correct idea of the means employed by the architects and mechanics of those periods in raising and lowering heavy bodies. The only illustration found in the sculptures of Egypt which is worthy of notice, represents a mode of raising water by means of a bucket suspended from one end of a pole, which is mounted horizontally upon a fulcrum, so as to serve as a lever; the other end being raised and lowered alternately by hand, so as to cause the end carrying the bucket to alternately lower the bucket into, and raise it from, the water. This "dodge," it is hardly necessary to remark, is in use at the present day. That the Egyptians were also familiar with the rope and pulley, the discovery of these articles some years ago proves. It is, indeed, believed by many that they were in possession of all those contrivances for raising and lowering which were certainly known to the Greeks and Romans. The use of the inclined plane, the pulley, and the screw was clearly enough understood by Archimedes, as appears from his writings, though we may well doubt some of the extraordinary mechanical feats with which the father of the science is credited, as when the safety of his native Syracuse was in danger from the Roman fleet. In the works of Vitruvius, again, we have the antiquity of the capstan, the crane, and the windlass clearly established. The balance beam and scales were likewise known to the ancients. We have the first mention of the former in the Book of Genesis; and in one of the sculptures found at Thebes there is the representation of a pair of scales, of which "the beam is suspended by rings from a short arm projecting from an upright pillar, the scale being connected to the beam by three cords and a pointer projecting downwards from the centre of the beam, by which, in conjunction with a plumb line, it can be seen that the scales are evenly balanced." Some years ago a steelyard was found in the ruins of Pompeii, which was provided with the points of suspension, as may frequently be seen at present. The important addition to the windlass of the "pauls," for preventing the barrel from running backwards in case of the weight being raised proving too great for the strength of the men employed, appears to have been made about a century ago, but by whom, or the precise date of the invention, is uncertain. The supposition seems a natural one, that previous to the great invention of printing many inventions were lost to the world for want of some more efficient means of preserving them than was then available. It may be that we are so much the poorer in consequence, though it is doubtful whether the inventive faculty was as active and strong among former generations of Englishmen as it has shown itself in these latter days. A bare list of the names alone of contrivances belonging to the class of inventions we are considering, which have made their appearance during the last two centuries, fills an index of several pages. They include hydraulic and pneumatic pressure, the buoyancy of balloons in the air and of pontoons under water, with almost endless combinations of levers, wheels, racks, screws, and pulleys, as well as a host of machines for weighing ponderous articles, such as steam boilers, locomotive engines, and other structures unknown to our forefathers, and of which they had no conception. Another of these issues is devoted to railways, and improvements relating thereto, from the year 1770 to 1865, a third to hydraulics, and a fourth to the preparation and combustion of fuel, on all of which subjects these Blue Books afford a ready and valuable reference.

CHURCH OF ST. PORCLAIRE, POITIERS.

WE give this week an illustration of the fine old Romanesque Tower of this church. It will be remembered that some time since we illustrated the church of St. Radiugode in the same remarkably interestiog town. Upon comparing the two towers the details will show how closely in date they must have been erected. We extract the following from Mr. Inkersley's "Inquiry into the Chronological Succession of Styles of Romanesque and Poiated Architecture in France," as giving good evidence as to the date of the tower of St. Porclaire. "We first find mention of the Monastery of St. Porclaire in a chart of the year 1068, and, though this document furnishes no direct proof of the epoch of the construction of the church. the close analogy to other Romanesque edifices of the province approachiog this date displayed in the tower and doorway beneath, which still exists, affords good grounds for believiog that these portions were not replaced at a more modern period." Poitiers is very rich in Romaoesque architecture, and there are some remains of domestic work of an early period well worth study; in fact, it is a place full of iostruction to architects as well as antiquaries. Our illustration is from a sketch by Mr. Fred. W. Roper, architect.

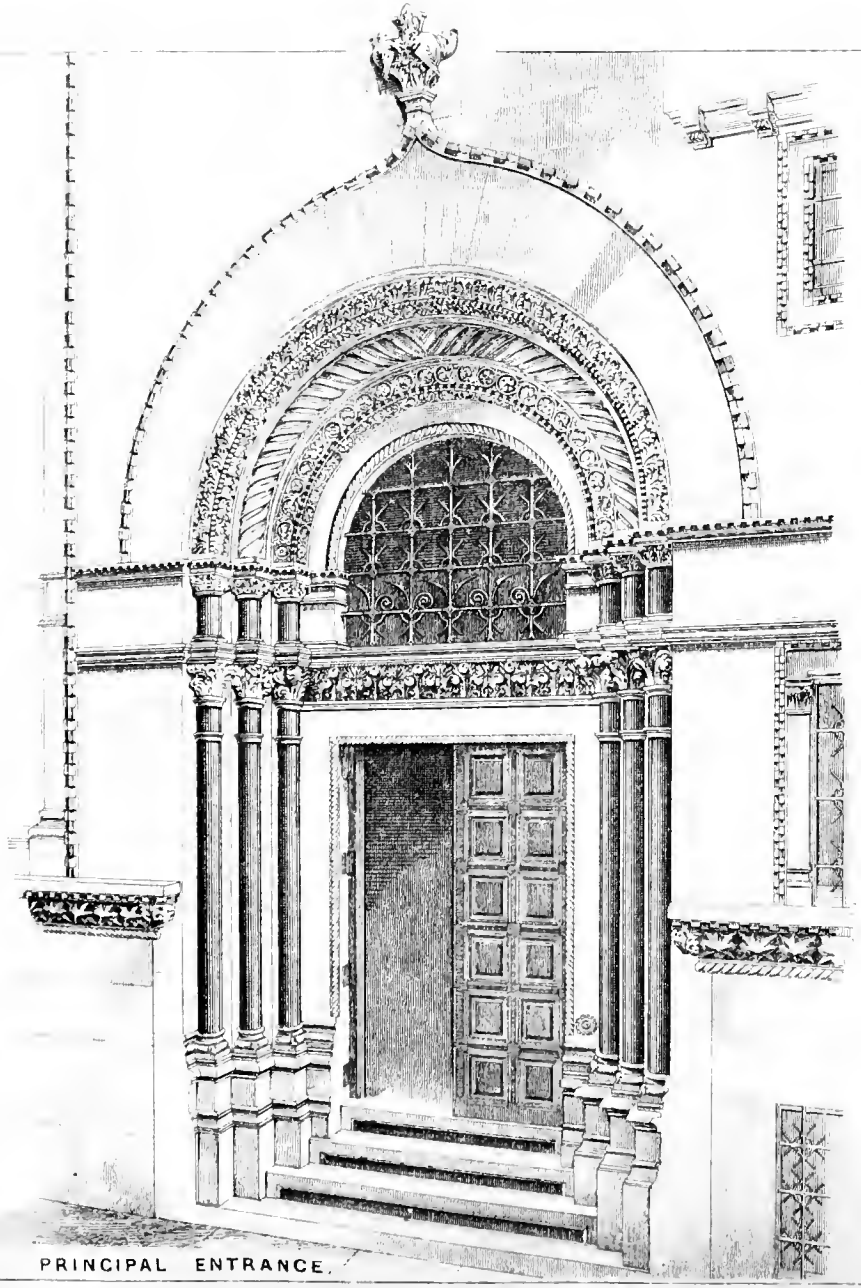
What has been very often recommended in our pages has been done at last; the Mansion House has been washed down, and now the group of the Mansion House, the Bank, and the Royal Exchange, look as fair as if in Paris.

POITIERS:

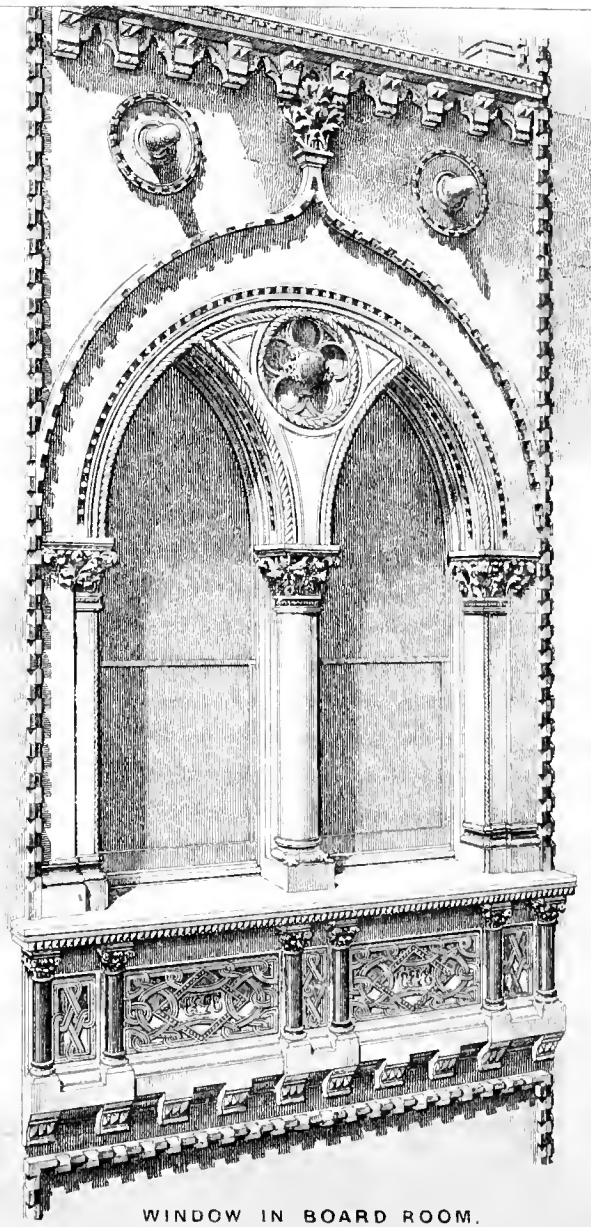


THE TOWER OF THE CHYRCH OF S. PORCHAIRE

DRAWN BY E.W. ROPER



PRINCIPAL ENTRANCE.

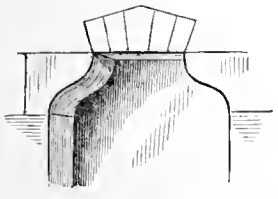


WINDOW IN BOARD ROOM.

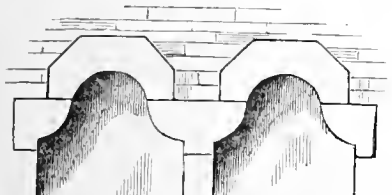
Details of General Credit and Discount Company's Offices, Lothbury.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. XII.

THE constructive and decorative capacity of the arch, and its applicability to both Classic and Gothic design, we have already glanced at. Window and door heads, as essential and prominent features of our architecture, have, in the diversity of treatment they have lately received, sufficient interest for us to devote some further remarks to them. I have shown that the square-headed, no less than the circular and pointed forms of the arch, can be constructively used, and are adaptable under a variety of forms—square, trefoil-headed, cant-headed, &c. One or two varieties of great simplicity, and well adapted to our modern sash and casement lights, are subjoined. These forms are always preferable in use and economy, and are pleasing in their effect, either when separately adapted or enclosed under an external arch, which latter can be frequently carried up to any height over the ceiling levels, thereby insuring strength, relief, and boldness of elevation. The enclosed heads, or tympana, thus formed can be relieved by carving, foliations, or simple piercings—figs. 4 and 5. The upper angles of square-headed openings can be varied by hollows or ogees, strength and effect being thus combined. Classic and Gothic, or at



least our modern adaptation of them, have so interchanged their distinctive peculiarities, that flat-headed openings are no longer the exclusive property of either style; and the



architect has simply to consult his taste and judgment in making the prevailing lines of his structure harmonize or contrast with the outline of these features. It is, however, of the constructive adaptability of these forms, rather than of their æsthetic effect, we here speak, and every practical designer will, by a preference bought by experience, select the most rational features for his work.

DETAILS OF GENERAL CREDIT AND DISCOUNT OFFICES.

HAVING on two preceding occasions given illustrations of the General Credit and Discount Company's offices, Lothbury, we this week give drawings of the principal doorway and of the board-room window. The shafts of the doorway are of serpentine marble, and the doors are in wainscot. The voussoirs of arch are alternately in red Mansfield and Portland stone. The carving was executed by Mr. L. T. Carter. The architect, as before stated, was Mr. Somers Clarke.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.

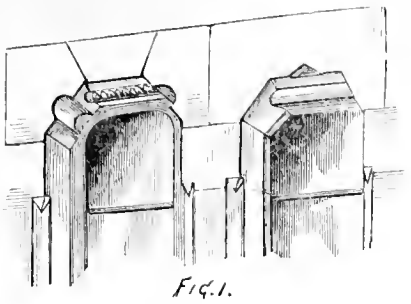


FIG. 1.

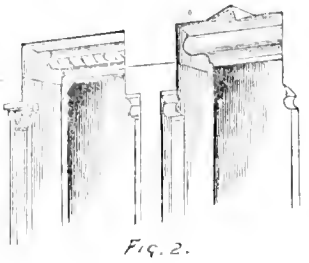


FIG. 2.

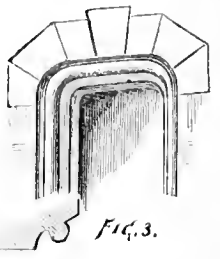


FIG. 3.

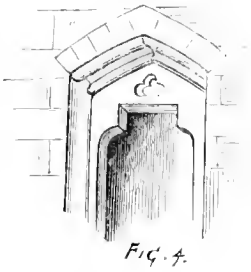


FIG. 4.

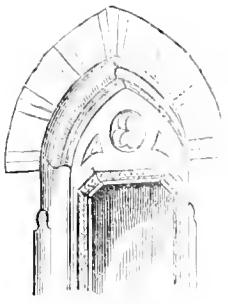


FIG. 5.

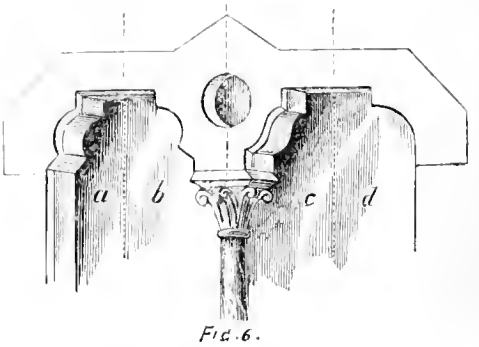


FIG. 6.

PUBLIC STATUES IN LONDON.

MR. FRANCIS TURNER PALGRAVE, a cleverly-pleasant writer, though an art critic of strong prejudices and somewhat oracular utterances, contributes to the current number of the "Broadway," the first instalment of a notice of the public statues in London. The critic sets out by remarking, that monumental statues, common enough in Ancient Egypt, Greece, and Italy, were hardly known during the Gothic or Mediæval period of Western Europe. They first appear in England in connection with the Lord Arundel who collected antique marbles. It was he who caused the bronze equestrian group of Charles I. at Charing-cross to be modelled, in 1633, by Hubert Le Sueur, who is called a pupil of the Italian sculptor, John of Bologna. Placed well for effect, Mr. Palgrave considers this statue "too high for convenient study as a work of art—it appears to be in a tame, at least a timid, style, which hardly rises above the common monumental sculpture of that day; and, in the age of Vandyck, one would have expected a more picturesque and effective likeness, especially since, when seen in front, one traces a distinct reference to that great painter's equestrian portraits. The horse is fairly natural, though not free from indications that the artist was thinking of the ill-modelled breed of the ancient Roman sculptors; and the best thing we can say of the group, is that it avoids the bad extravagant style which had by 1633 corrupted Italian sculpture, and of which John of Bologna was one of the most brilliant representatives.

Strange as it may seem, London contains at least one public statue the subject of which is hardly less uncertain than if it had been dug up in Greece or Italy. Probably during the reign of Charles II., when Soho-square was begun, a stone figure was placed there, which has been assigned to the unhappy Duke of Monmouth, to James II., and to Charles himself. The last appears the most probable. It is a standing figure, clothed in English armour, but with a robe twisted behind; a wig surrounds the mutilated features. Cromwell still waits for his statue; and he, in truth, should be a very powerful and accomplished sculptor whose hands could safely attempt the difficult task of doing justice to the great man who stands up like some huge rock among the petty figures of the Stuarts. But unless we commemorate a prince or a general (and Cromwell was something more than most princes and generals), English funds are rarely forthcoming. Men even greater than the Protector are equally unrepresented. Yet there are few methods by which a wealthy man might more certainly or more honourably hand his name down to future generations than by a first-rate public monument to departed genius.

James II., by Gibbons, the woodcarver, apparently completed in 1687, stands behind Whitehall, and, considering its age and exposed position, is well preserved. He is in full Roman armour, laurel-crowned, and a robe falling behind him; the attitude, that of a man giving some command, is rather too showy, yet is rendered with ease and a certain dignity, and there is a considerable air of likeness in the harsh but narrow-looking features. The modelling is fair in its conventional way, which reminds one rather of the Roman-antique style than of nature; and it deserves special praise that Gibbons has known how to take advantage of his material, and has given his figure the comparatively disengaged or "open" attitude of which bronze, from its superior tenacity, admits. The drapery, from the same reason, has been kept light and flat in the folds. These may seem obvious merits; but it will be found that sculptors of much greater pretension and experience than Gibbons have not felt the difference between working in stone and working in metal, and have made their bronze figures dark and heavy, by a massive treatment which only looks well in its own appropriate and light-coloured material. The artist received £500 for this work—a very large sum, the time and the size of the figure considered, and a proof that he must have obtained fashionable recognition as a sculptor.

William has but one statue—that in the centre of St. James's-square. So far as its distance from the eye admits of a judgment, this group (it is equestrian), though rather clever and lively, appears to be in a poor style, imitating the French statues of Louis XIV., and has all the look of a contemporary production. Yet it seems certain that the younger Bacon not only placed this figure here in 1808, but modelled it. Though wanting in dignity and grace, this group has some truth to character in its expression of will and energy. The curious way in which the hair of the tail is detached in little masses in the direction of the horse's progress was probably intended to increase this effect. But there is always a want of due stability and repose when a figure appears to be rapidly moving off its pedestal. The pause of arrested motion, the moment of suspended action, by the laws of material, is almost always the right instant for sculpture to express.

Anne figures thrice: before St. Paul's, and in the two Queen-squares named after her. Of these statues it will be enough to describe one. That in Queen-square West (apparently Portland stone painted) represents her exactly as she might have looked in one of the pictures of the time, in full court robes, wearing a crown, and rising up or walking forward; whilst the right hand is extended over a cushion resting on a twisted column. The features are pleasing, and though

the work is without any trace of proper style, the figure has a ladylike and dignified air. The broken sceptre now lies upon the cushion—an emblem of her ill-fated family! The quiet square, with its solemn but not ungraceful houses around, some still preserving fragments of contemporary carving, the trees and the untrodden grass plots, is a fit place for the monument of the last reigning Stuart.

A figure of George I., showy but effective, and infinitely better designed for its position than the York and the Nelson columns, by two once fashionable [illegible], with into the picturesque campanile of St. George's, Bloomsbury.* George II. (or George I.,—the point is disputed), in Leicester-square has been lately mutilated and ordered for removal, equal acts of folly, for, though the statue was, perhaps, not of greater merit in art than several of our most recent figures presently to be noticed, yet it had real interest for all who feel that to love their land is to love its history, and are aware how much a past period is vivified and realized by the sight of any actual monument which the men of that day saw and handled. A second statue of George II., perhaps by the same hand as the one of his father, stands, like a Roman warrior, in Golden-square. This, again, is a stone figure painted over with the exquisitely absurd English taste in these matters, to look, no doubt, more like stone! The statue is of the ordinary monumental sort, though very elaborately wrought in the drapery and armour, which, from unskilful arrangement, gives it a clumsy air.

The Duke of Cumberland, an equestrian bronze set up in 1777 within Cavendish-square, is the last and perhaps the worst public statue in the primitive style which need be mentioned, for a standing figure of Sir H. Sloane, by Rysbrack, in the Apothecaries' Gardens at Chelsea, though noteworthy as the first extant memorial to a private citizen of distinction, hardly falls within our subject. Awkwardly huddled together in his robes, and seemingly desirous to ride off and hide himself, the statue of the Duke almost justifies a criticism which it drew from Sir J. Reynolds—that modern dress was radically unsuitable for sculpture. But no powerful sculptors had proved then, as David d'Angers in France, Rietschel in Germany, and Watson and Wolner with us, have since proved, that the reverse of Sir Joshua's verdict is the truth. Indeed, it is obvious to common sense that, if we cannot clothe our contemporaries as they were really clothed, we had better leave monumental sculpture alone.

These figures, remarks Mr. Palgrave, all date before sculpture was studied as an art in England—nay, before it was thought possible that genuine English hands could produce anything worthy to be called sculpture. After observing that, during the first half of the last century, nearly the same scepticism existed also in regard to our capacity for painting until Hogarth's time, and the appearance of Reynolds, Gainsborough, and Wilson, Mr. Palgrave says it is about a century since the efforts of Nollekens, Banks, and others, began to lift sculpture above the church figure fashion, or the mere imitation of French and Roman models, and there is henceforward some attempt at sculptural style, although often imperfectly carried out, in the public statues of London.

THEORY OF COLOUR.

ON Saturday evening last, Mr. W. Cave Thomas gave a lecture on "Some Thoughts and Experiments in Reference to a Theory of Colour," to the members of the Associated Arts, Richard Westmeath, Esq., R.A., in the chair. The lecturer said it was to be regretted that the three phases of the theory of light—the physical, the physiological, and the æsthetic—were too frequently separated and studied as distinct specialities; it is therefore seldom grasped in its totality and pushed to its legitimate and ultimate conclusions. He then gave a short history, derived from the best authorities, of the two great theories—the corpuscular and undulatory—which so long divided the scientific world, and traced the progress of the growing conviction of the ultimate coincidence of light and sound in one common phenomenon—the vibrating movement of an elastic medium. He then drew attention to the more recent and sweeping generalization—the correlation of the physical forces, which considers light, heat, sound, electricity, &c., to be merely modifications of an active substance—that everything objectively varies only in configuration and mode and degree of motion; but produces, phenomenally or subjectively, all that infinite variety over and above those differences which is commonly but erroneously supposed to exist externally and independently of sense, whereas, independently of sensuate being, there is nothing but a colourless, silent, fluctuating universe. It is somewhat difficult to conceive this condition of the external world without some previous habit of abstract thinking. Nevertheless, it is a conception which both the Newtonian and Huygenian theories favour; for the former ascribes the differences in colour to the differences in the velocities of the atoms emanating from the sun, and not to differences inherent in the particles themselves; for, if this were the case, colour would be independent of differences of velocity and refraction: and the latter, or undulatory theory, attributes light and colour to undulations of an elastic medium of different rapidity and magnitudes just as the different notes of music are produced in the ear by relative differences in the pulsations of the air. That which through the medium of our senses is actually perceived by the sensorium, is indeed merely a property, as change of condition of our nerves; but the imagination and reason are ready to interpret those changes produced by external influences, as properties of the external bodies themselves, and it is only by close reflection that we perceive this notion to be erroneous, and that there is neither light nor colour in the world to other than living eyes, and no safe progress can be made in scientific studies till this position be thoroughly comprehended.

The first great deduction to be drawn from the theories just noticed is, that light and colour are in all of them attributed effects of moving matter acting on the retina. If, therefore, this physical hypothesis be correct, it might be *a priori* surmised that, as one simple physical cause produces all those diverse effects on the retina from without, the same simple cause would produce similar effects acting from within, and such is the fact—the accumulation of blood in the capillary vessels of the nerves, as in congestion and inflammation, is the one uniform cause, exciting in the retina, while the eyes are closed, the sensations of light and luminous flashes, and in the auditory nerve, humming and ringing sounds. The mechanical influence of a blow, concussion, or pressure, also excites in the eye the sensation of light and colours, and in the auditory nerve the sense of ringing. Voltaic and frictional electricity, and chemical agents, such as narcotics, also produce the different sensations proper to the two senses. Here, then, is another class of facts pointing to force as the common cause of light and sound. Mr. Thomas then passed to the consideration of the phenomena of ocular spectra, and showed that these were yet another proof that colours have their immediate cause in the condition of the retina itself; one very notable experiment illustrating this were the slips of card of one uniform grey tint, which were made to assume all the hues of the spectrum by being placed in the midst of various fields of bright colour, and it was readily proved that these hues had no external existence. In these phenomena, too, the lecturer drew attention to the presiding principle of compensation or balance, and to this being the key to all harmony, and went on to say that it would be noticed in the facts brought together that light and sound may be produced by mechanical means—by a blow, by pressure, by the arterial pulse, by electricity, and by narcotics; that the remarkable phenomenon of interference by which two rays (of either light or sound) extinguish each other, is common to both; and that the theory of light which has the widest acceptance is that which makes its propagation analogous to that of sound. Every colour, therefore, as every musical note, will, in this case, depend upon the relativity of the vibrations of an elastic medium acting upon the retina. But the very fact of the complementary colours, or of compensation in the ocular spectra, connected them with the larger physical phenomena of the solar system, in which the great law of compensation is immutable. It may be thus stated: every departure from a mean state on one side must be compensated by an equal but opposite aberration on the other,—this law, he believes, will eventually lead to the clearing up of much which is still obscure in the theory of colours. But whether we consider the theory of light in its physical aspect as the relativity of vibrations and of states of the retina, as produced by mechanical pressure, or in the phenomena of compensation, its wonderful parallelism with that of sound becomes more and more apparent, and that, like music, it ultimately merges in a science of relative proportion. Mr Thomas concluded an exceedingly able and interesting lecture by observing that science often speaks too confidently about force, as if she had the power to recognize cause *per se*, when she has but the means to infer; that all the time she fancies herself occupied in studying the external, she is only contemplating the world in sense, in its appearances to human nature; and that the fundamental form of sense is quantity. The science of proportion, therefore, is the master one which underlies all others. Of this science Mr. Thomas has given an outline in his work, "The Science of Moderation." When all our knowledge shall have assumed the form of correct quantitative statement, it will have attained its highest degree of certitude.

VENTILATION FOR THEATRES.

M. HAMELINCOURT, of Paris, in his design for the ventilation of the new Grand Opera there, provides for separate systems of ventilation in the summer and winter; in the one case admitting the external air direct, in the other heated. In both cases the fresh air is procured from an opening at the roof to ensure greater purity, and enters the house between each tier of boxes. The foul air is drawn downwards through openings in the floor, thence through flues which pass outwards to the walls, where they ascend, again converging to a common central shaft over the dome of the house, which has an outlet for the vitiated air under the cupola. The draught in this great central shaft is promoted by the ascent of the heated air nearest the ceiling of the house, which has access to it through perforations. Thus it will be seen that the air is renewed by entering in a horizontal direction in the sides of the house, and going out at the top and bottom, the movement of the air in the pipes, which draw it down through the floor, being created by artificial heating. The success of such a system will depend on the complete but imperceptible changing of the air to meet fully the requirements of the largest audience. It is imperative that the air drawn out by the floor should not contain the products of the combustion of the gas used in lighting the house. A gold medal has been awarded to M. Hamelincourt for his apparatus.

AN EARLY ECCLESIASTICAL FRAGMENT.

AT a recent meeting of the Society of Antiquaries of Scotland, Lord Neaves, one of the Vice-Presidents, in the chair, an interesting paper on "the Priory of Restennet, in Angus," was communicated by the Bishop of Brechin. The portions of the priory which still remain consist of the chancel and the tower, with the walls of the cloister. The chancel is a fine specimen of Early English, but the most interesting feature is the tower, which the Bishop considers to be of the period of St. Rule's Tower at St. Andrews, with some features of rudeness identical with those found in the admittedly Saxon tower of St. Michael's at Oxford. In this tower at Restennet, the Bishop noticed for the first time a rude arch of a different material from the rest of the fabric, and so massive and rude in its construction that it must have belonged to an earlier church. The photographs of both the exterior and interior aspects of this arch were sent, from which it appeared that on the outside a rude moulding might be distinctly traced; while the interior view gave very distinctly the composition of the rude work, where a massive lintel, hollowed out as a round arch, and hewn out of one stone, is superimposed upon the posts on either side, thus forming a doorway. It appeared that this doorway had been imbedded in the masonry of the tower from the beginning, and built up, so that it never had been used as an actual entrance since the erection of the tower. Another account of the priory was read by Mr John Stuart, the secretary of the Society. This gentleman was of opinion that the doorway and arch described by the Bishop had also formed part of an early tower, and that it had been built into the enlarged tower of the eleventh century, probably under the influence of David I. or his father Malcolm, by both of whom charters were granted to the priory, and who were both church builders and restorers. Mr. Stuart entered into a consideration of the Scotican mode

* [illegible] ... "A Masterpiece of Absurdity."

of building, which was the only one known to Nectan (King of the Picts, 710), he then directed attention to the recent introduction into Northumbria of the Roman mode of building, which implied the chiselling of stones and the use of mortar. Of Benedict Biscops Church at the mouth of the Wear, the only part now remaining is a tower, penetrated by two arches of small dimensions. Taking all the circumstances into account Mr. Stuart was led to believe that in the rude arch imbedded in the eleventh century tower there was preserved a fragment of the eighth century church built for King Nectan by the workmen sent from Jarrow, if indeed we are not to recognize these workmen in Bonifacius and his companions. In this case, it must be considered the earliest ecclesiastical fragment now left to us; for while, in various features, it greatly resembles the doorways of many of the round towers and early churches of Ireland described by Dr. Petrie, which might be of an almost contemporary period, and while in the round towers of Brechin and Abernethy the arches of the doorways were cut out of the solid stone, as at Restennet, yet it was with a skill and finish which marked them as of a later date.

BIRMINGHAM ARCHITECTURAL SOCIETY.

AT a meeting of the Architectural Society, on Thursday evening last week, Mr. George B. Nichols, of West Bromwich, read a paper as an introduction to a more detailed discourse to be delivered on a future day before the same society, on "The Adaptability of our own Home-grown Timber for internal purposes." Mr. Nichols said the subject had been forgotten by the profession for the last half century at least. The timbers of foreign countries having been brought rapidly into use on account of their adaptability and cheapness, the country had been led to depend entirely upon them, and home-grown timber had been allowed to degenerate, and become of no use except for inferior purposes. The beauty and adaptability for internal purposes of many of our home-grown timbers had been overlooked. He laid before the society samples of home-grown timber, "with a view to the introduction of a variety in design for internal work, when occasion may offer for an improvement upon the ever monotonous painting and graining." The samples he wished to bring under notice, included "the vine prop alone;" "the poplar, never dry," "the builder oak, sole king of forests all;" "the willow, worn of forlorn paramours;" "the yew, obedient to the bender's will;" "the birch, for shafts;" "the warlike beech;" "the ash, for nothing ill;" the maple, the larch, the Scotch fir, the lime tree, the wych elm, the sycamore, the cherry tree, the alder, the howler, the hornbeam, the apple tree, the plum tree, the walnut, and the chestnut. He hoped the subject of internal decoration would be considered, with a view of bringing out in their natural state the materials to be dealt with, relying on the beauty of nature for effect, wherever it could be obtained by judicious treatment of form and colour. He presented the samples to the society for the museum.

LONDON WATER COMPANIES.

IN his recently published returns, the Registrar-General discusses Professor Frankland's report on the drinking water supplied to the metropolis in the past year. In connection with the opinions now generally entertained with regard to the propagation of certain forms of disease, such as cholera and typhoid fever, by means of spires or germs contained in excrementitious matter, he states that the search for sewage pollution in the metropolitan waters has now assumed a high degree of importance. In 1867 the total solid impurity exhibited an increase over 1866 in the water supplied by the different companies, except in the case of the East London Company, in which a marked decrease had occurred. This water, it is stated, was now only inferior to that distributed by the New River Company, which stood alone in the perfection of its filtering apparatus. On one occasion only had the New River water exhibited the slightest turbidity, thus proving that perfect filtration was compatible with a large supply. The other companies occasionally or habitually sent out water that was turbid, and subjected the inhabitants of more than 300,000 houses to the unnecessary expense of private filtration. The Registrar-General calls attention to the fact that, in a sanitary point of view, the tendency of rapidly increasing populations within fixed boundaries was to deterioration. The rate of mortality, uncontrolled, was sure to rise; and if there was reasonable ground to believe that the great engineering works which had been undertaken in connection with the public health had checked this tendency, and to some extent subdued the virulence of epidemic diseases, such results must be regarded with satisfaction and hope. On the whole, the metropolis, as compared with the principal towns in the kingdom, continued to maintain its favourable position in the hygienic scale.

JET.

JET, like amber, is a substance concerning the origin of which more than one conjecture has been hazarded. Some writers confidently describe it as a species of coal; others, as fossil wood, and one ascribes its origin to the action of petroleum. It is found in Saxony and in the Prussian amber mines, and in this country in the upper lias shale in the vicinity of Whitby, and has been worked there for many hundred years. The best is obtained from a lower bed of the upper lias formation, which is of an average thickness of about 20ft., and is known as jet rock. "Soft jet," obtained from the upper bed of the lias, and from the sandstone above it, is an inferior kind. Both are found spread out between the laminations of the rock, in layers seldom more than 1in. or 2in. in thickness. Jet ornaments were made in England during the occupation of the Romans; and in mediæval times, when Whitby Abbey was a centre of religious life, jet rosaries and crosses were worn by the nuns. On the advent of Protestantism, however, at the commencement of the reign of Elizabeth, the manufacture ceased, and appears to have fallen into desuetude until the year 1800, when two working men commenced to make bead crosses and neckchains with files and knives. A stranger who visited Whitby noticed their rude attempts, and advised them to try and turn the material. They followed his advice with complete success, were joined speedily by several others, and since then the trade has steadily increased. The best ornaments are sent to London, the inferior ones being designed for the American market.

VARNISHES.

VERY superior varnishes are made with a solvent composed of highly rectified alcohol and benzole, instead of using, in the common way, alcohol alone. The alcohol should be nearly pure, and equal portions of it and the benzole mixed together and distilled with 7oz. of caustic lime to each gallon. The gum resins should be reduced to as small pieces as possible before being fed into the solvent. The following are different varnishes made with gum resins and alcohol—benzole solvent:—1. For carriage varnish—copal, 23oz.; amber, 8oz.; anime, 4oz.; camphor, ½oz.; solvent, 1 gallon. 2. Varnish for external use—copal, 28oz.; amber, 4oz.; anime, 4oz.; camphor, ½oz.; solvent, 1 gallon. 3. Furniture varnish—copal, 24oz.; shellac (bleached), 8oz.; olibanum, 4oz.; camphor, ½oz.; solvent, 1 gallon. 4. Picture varnish—copal, 20oz.; damer, 12oz.; mastic, 8oz.; solvent, 1 gallon. 5. White hard varnish—copal, 8oz.; mastic, 16oz.; sandarac; 4oz; camphor, ½oz.; solvent, 1 gallon. 6. French polish—shellac, 32oz.; solvent, 1 gallon. 7. Another French polish—shellac, 32oz.; olibanum, 4oz.; solvent, 1 gallon. 8. Varnish for prints and maps—mastic, 16oz.; sandarac, 16oz.; Canada balsam, 4oz.; solvent, 1 gallon. 9. Varnish for iron (to be applied hot)—resin, 12oz.; sandarac, 16oz.; seed lac, 6oz.; solvent, 1 gallon. Preparations of lacquer—1. Sandarac, 26oz.; shellac, 6oz.; turmeric, 6oz.; gamboge, 1oz.; solvent, 1 gallon. 2. Seed lac, 18oz.; amber (fused), 6oz.; gamboge, ½oz.; dragon's blood, 1oz.; saffron, ½oz.; solvent, 1 gallon. 3. Seed lac, 8oz.; copal, 4oz.; sandarac, 12oz.; turmeric, 2oz.; aloes, 1oz.; gamboge, 1oz.; dragon's blood, ½oz.; solvent, 1 gallon.

LEEDS DRAINAGE SCHEME.

MR. ALFRED M. FOWLER, the surveyor to the Borough of Leeds, has submitted a report on the formation of a drainage district for the south-west portion of the borough, which has been published. The proposed new district includes the townships of Armley, Upper and Lower Watley, Farnley, Hough End, Upper Moor Side, Beeston, Mill Shaw, Waterslacks, with such portions of Stanningley and Pudsey as are in the borough. The whole of the district, with the exception of 604 acres at Armley, which drains naturally into the river Aire, and 524 acres near Beeston, which drain naturally into Middleton Beck, is in the valley of the Holbeck. Five main sewers and a number of minor ones draining into them will be required, embracing a total area of 5,764 acres, containing a population of 26,800. Of this about 561 acres are covered with buildings. The sewers are not intended to carry the floods of the district, and a number of storm outlets are provided for the purpose of relieving the sewers in times of heavy rain. The total estimated cost of the project is £40,500. This amount, however, does not include any provision for ventilation, that subject being at present under the consideration of a sub-committee. The cost of maintaining the works in an efficient condition is calculated to amount to about £200 per annum.

NOTICES OF PUBLICATIONS.

"A Century of Birmingham Life; or, a Chronicle of Local Events, from 1741 to 1841." Compiled and edited by JOHN ALFRED LANGFORD: Birmingham, E.C. Osborne. 1868.

To the numerous histories and memorials of Birmingham already existing, Mr. Langford has added another. He has ransacked the files of *Aris's Journal*, from its commencement in 1741 to 1841, and has collected together a vast amount of information, in the shape of newspaper extracts and advertisements respecting the appearance, habits, customs, amusements of Birmingham in days gone by. A good deal of said information is not, we suspect, of a kind likely to interest much anybody but a native. But to him the work will be an entertaining *Olla Podrida*, and it will afford abundance of raw material which a local historian may work with advantage. The present bulky book—which must have entailed a considerable amount of labour and research on the part of the compiler—is only the first volume of the chronicle. Among other interesting facts we learn that Birmingham, which in the time of William the Conqueror was an insignificant hamlet, has now property of the annual ratal of more than a million pounds; the town is more than 5 miles in length and 3 miles in breadth, and covers an area of upwards of 7,800 acres. It has more than 200 miles of streets, which contain something like 60,000 houses. It is also worth noting that there are, at least, 140 ways of spelling the name of the town, as appears from a list given by Mr. Langford.

"The Year Book of Science and Art, exhibiting the most Important Discoveries and Improvements of the Past Year." By JOHN TIMBS, F.S.A.: Lockwood and Co. 1868.

WE only notice Mr. Timbs's now well-known publication to say that the new volume is in every respect identical with its predecessors, except as to the introduction, which this year is devoted to a notice of the life of Sir Samuel Baker, the African traveller, of whom a steel portrait is given. The rest of the contents is of the same varied and useful character as hitherto.

BUILDING AND LAND SOCIETIES.

THE London and Suburban Land and Building Society held its ninth ordinary meeting of shareholders at the London Tavern, last week, Mr. Coleman presided. The report of the directors stated that the total amount of land sold during the half year ending the 31st December last upon the several estates had been £10,202. The number of shares issued during the same period had been 2,879, leaving 1,174 to be disposed of to complete the share list. From the amount of profit standing to the credit of the company the directors had resolved to take the sum of £2,500 and add to the reserve account, leaving a balance of £3,627 5s., out of which they recommended the declaration of a dividend at the rate of ten per cent. per annum. The report was adopted.

The fifteenth annual meeting of the shareholders of the Leicester Permanent Building Society was held the other day. The report shows the society to be in a prosperous and progressive condition. During the year 795 new shares have been issued, making a nett increase of 316¼ shares, and leaving 4,235½ shares on the books at the close of the

fifteenth year. The amount advanced upon mortgage to borrowing members has been £21,800; the amount paid for invested shares completed £3,332 17s. 6d., and for shares withdrawn £4,155 11s. The total receipts for subscriptions have been from borrowers £14,735 18s., and from investors £17,952 3s. 6d., making together £32,688 1s. 6d., being an average monthly receipt of £2,724, and an increase on the previous year of £2,577 14s. 9d. The amount of securities at present held by the trustees is £121,750.

In their sixth annual report, just published, the directors of the Aberdeen Association for the Improvement of the Dwellings of the Labouring Classes state that their house property at Gilcomston terrace has yielded a gross return on the expended capital of 8½ per cent., and a free return of about 5 per cent. The Lock-street property shows a gross return of £9 2s. per cent., and a free return of 6½ per cent., while other dwellings of the association have yielded as high a gross return as 17½ per cent. The total rent of the whole properties was £322 14s. 5d. for the year, being a return of 9 per cent. on £3,588 5s. 9d., the capital expended. It may be stated that the society's new dwellings are built of coursed granite rubble work, with close picked granite dressings. The walls are 2ft. and 2ft. 6in. thick, old Scotch style, with crow-stepped gables. There are ash shafts and water closets for females on each stair landing, and an outside iron range of water-closets for males; iron sinks with hinged covers, water, and gas in each room; common washing-house and bleaching green to each house, and a large coal cellar in basement to each tenement. The tenements consist generally of room and bed closet, or room and two bed closets; and the average total cost of each, including architect's fees and every other charge, amounts to £48, but, counting the rooms and bed closet, the average cost amounts to only £30 for each apartment. Iron bedsteads and cupboards are furnished to each room. The architect is Mr. D. Macandrew. The directors declare a dividend at the rate of 4½ per cent.

The annual meeting of the shareholders of the British Land Company, Limited, will be held in the Guildhall Tavern to-day. The report states that the sales for the year, including timber and materials, have amounted to £205,757. After paying the interim dividend of 5 per cent. amounting to £7,500 the balance sheet shows a profit of £35,398, and out of this sum the directors recommend a further dividend of 5 per cent. and a bonus of 10 per cent. free of income tax, making 20 per cent. for the year, and leaving a balance of £12,898 to be carried forward.

A determination "to keep on the safe side of the hedge," is certainly an admirable resolve, and one that must bring its own reward. This, according to Mr. Tweedie, its chairman, is the determination of the Temperance Permanent Land and Building Society, and the result of its wise policy may be seen in the state of its affairs. The fourteenth annual general meeting of the shareholders was held on Wednesday. The report showed great progress in the transactions of the society. The total receipts of the year had been £67,000 in excess of those of the preceding year; £230,000 had been advanced on houses, being £108,000 more than in the previous year, there having been at the end of the year a total of £197,000 out on mortgage. A tabular statement of the shares and assets showed a regular increase from 1854 to 1867—from 450 shares in the former year and £1,650 assets, to 67,633 shares at the end of 1867, with assets amounting to £592,981, or above half a million. More than £900,000 had up to this time been lent out on mortgage, and the reserve fund had increased to £62,000. But, though the business had increased, and the benefits of the society had been spread over a large area, the profits had not increased beyond the 7½ per cent. Regret was expressed at the retirement of Mr. Benjamin Scott, whose engagements no longer permitted him to continue to act as trustee; also at the death of Mr. William Jansen, who had been arbitrator. The directors also regretted that Mr. Thomas Beggs had been compelled, from want of leisure, to resign the office of arbitrator.

WATER SUPPLY AND SANITARY MATTERS.

At a meeting of the Dewsbury, Batley, and Heckmondwike Waterworks Committee, last week, a number of tenders for the repair of Dunford Bridge Reservoir, and the construction of one in Windleden Clough, were considered. The tender of Mr. J. B. Macguire, of Ulverston, contractor, to execute the works required for the sum of £25,900 3s. was accepted. This was the lowest tender. The works are to be completed in three years.

Dr. Liddel, the Medical Officer of Health in the Whitechapel district, has just published his report for 1867. The document gives returns showing the amount of work performed by the Sanitary Inspectors in that East-end quarter during the year. The number of rooms found to be overcrowded, the space being less than 300 cubic feet for each person, reckoning two children for each adult, was 121, and as many as 150 cases of indecent occupation were discovered. Measures were taken to have these remedied. In addition 13 cellars used as dwellings were cleared of their inmates, and 65 other houses were closed as being unfit for human habitation. In 238 instances dust-bins were provided; water butts in 343; drains improved in 510; cesspools were abolished in 44; and the houses in which the rooms and passages have been whitewashed amounted to 1,143. These figures prove that nowhere is there so much need for the Sanitary Inspector to be abroad as in Whitechapel.

Building Intelligence.

CHURCHES AND CHAPELS.

The new church of St. Mary, Compton Abbas, Dorset, was consecrated on Tuesday last, by the Bishop of Salisbury. The old church and parsonage, which were in a very dilapidated state, have been pulled down, and both rebuilt on a more convenient site. In taking down the old church some rude frescoes were discovered on the walls. The whole of the walls had evidently been covered at two separate periods with frescoes. A curious old hammer beam roof was also found in pulling down the parsonage, with oak timber, wrought and chamfered, which had evidently been an open roof at one time. The timbers were framed to form a trefoil. It may have been brought from the neighbouring town of Shaftesbury, when the monastery there was destroyed. The new church is in the Early English style, and consists of nave, south aisle, porch (under tower on the south side of the church), chancel, and vestry, and the tower is crowned with a handsome broach spire. The chancel has a groined ceiling, the ribs of which are supported by Devonshire marble columns; the capitals and intersections of the ribs are richly carved. The church will accommodate 250 people, and the south aisle is fitted up for the children. Both the church and parsonage adjoining are built of Melbury ragstone, with Doulting stone dressings. The architect was Mr. G. Evans, of Wimborne Minster, and the builder, Mr. A. Green, of Blandford, Dorset.

The parish church of Batheaston, near Bristol, was reopened last week after undergoing considerable alteration and restoration. A new aisle has been built, the south gallery over the west of the nave has been removed, the tower arch has been thrown open, and the church has been reseated throughout. The architect was Mr. F. Preedy, of London, and the contractors were Mr. Newman, of Bathford, and Mr. Silver, of Maidenhead. The cost of the restoration has been between £1,800 and £1,900.

The chancel stone of a new church to be dedicated to St. John, at Meads, Eastbourne, has been laid. The edifice is to consist of chancel, nave, tower, spire, and aisles. It will be in the Decorated style, and will accommodate 450 persons. The architect is Mr. H. E. Rumble, and the builder, Mr. James Peerless, both of Eastbourne.

The newly erected church of St. Stephen's, Newcastle, was consecrated on Thursday week by the Bishop of Durham. The style of the building is Early Geometrical Pointed. It consists of nave, chancel, and south aisle, with provision for the future addition of a north aisle. The chancel is 34ft. 6in. long by 26ft. wide; the nave 82ft. 3in. by 29ft.; and the south aisle 82ft. 9in. by 18ft 7in. The cost of the building is £5,700. Mr. Johnson, of Newcastle, is the architect; Mr. Walter Scott, the contractor for the masonry; and Mr. Joseph White for the carpenters' and joiners' work.

Some workmen lately employed at Holy Trinity Church, Milton, near Sittingbourne, scraping the walls of the east end of the north aisle previous to whitewashing, uncovered some ancient paintings, which appear to have been of a diaper pattern, parallelograms of a foot long and nine inches deep. The colours employed were red, blue, and yellow, and in some places they are still very bright.

The church of St. Barnabas at Burnmoor, Durham, was consecrated on Tuesday by the Bishop of the diocese. It is built in the Early Geometrical style, from designs provided by Mr. R. J. Johnson, of the firm of Austin and Johnson, Newcastle. The material used for the walls is variegated bricks, the roof of the nave being supported by two stone pillars with ornamented capitals. The stone and masonry work was performed by Mr. Hudspeth, of Alnwick, the joiners' and painters' work by Messrs. Charlton and Co., of Newcastle.

The corner-stone has been laid of a new chapel in Chapel-lane, Bradford. The building was designed by Messrs. Andrews, Son, and Pepper, architects, of Bradford, and is in the French Gothic style, and will cost the sum of £5000.

Mr. Wm. Morris sends the following:—"Will you oblige by correcting an error in the Building News respecting the re-opening of St. Andrew's Church, Blunsdon, Highworth; Mr. Butterfield is the architect, I am clerk of works under that gentleman."

The foundation stone of a new Roman Catholic church at Longton will be shortly laid. The design, which is by Mr. E. W. Pugin, is in the Late English style of architecture, and consists of a nave, with side aisles and chancel; a clerestory will divide the roof of the nave from the lower roof of the aisles, the outside walls of which will be supported by buttresses. The walls will be of brick, with stone dressings. The edifice will seat 1000 persons.

On Tuesday, the Bishop of Tennessee laid the foundation stone of the third church which is at present being built in the populous district of St. Mary, Haggerstone. The church of St. Chad will be from the design of Mr. Brooks, the architect of St. Michael's Shoreditch, and is to consist of a nave of red brick, groined with brick, an apsidal chancel with two vestries on the north side, and a narthex, or covered porch, at the west end. It will seat 750 persons, and will cost £6500, exclusive of the site, the price of which was about £3000. To these three churches, which are all being "worked" on High Church principles, one gentleman gave the munificent sum of £10,000.

Mr. Gilbert Scott estimates that the sum of £53,000 will be required for the restoration of Chester Cathedral, "as it deserves to be restored." The Ecclesiastical Commissioners have offered to give £10,000 towards the work, and certain noblemen and gentry in the diocese have promised to contribute liberally. The following is the estimate of the cost of restoration:—Necessarry repairs, £22,531; desirable repairs, £7,000; improvements, £20,000; total, £49,531; and architect's commission (5 per cent.), £2,500—£52,031. Desirable repairs include flying buttresses, restoration of cloisters, king's school, and bottom stage of west Norman tower, with lead instead of slate on the roof. Improvements include stone groining of the nave and aisles, restoration of the tower and spire, internal cleansing and repairing, and complete restoration of the choir.

BUILDINGS.

The Committee of the Travellers' Club have determined, during the ensuing autumn, to restore the balconies of the south front of their Club House to their original condition, as designed by Sir Charles Barry.

A college for young women—in the Oxford sense—is spoken of. The buildings, with accommodation for 100 students, are estimated to cost £30,000. It is proposed that the college should be situated somewhere between London and Cambridge.

The first stone of a new school in connection with the church of St. John the Evangelist, Leeds, was laid on Monday. The building, which is in the Gothic style, will accommodate 400 children, and is to cost £2,300. The walls will be built of pressed brick, with stone window dressings. Mr. John Simpson is the architect; the contractors are Messrs. Garland and Sons, bricklayers, and Mr. M. Spence, mason.

The rebuilding of the burnt part of Constantinople is making progress, but very slowly. Mr. Street's memorial church in Pera is approaching completion. The palace of Aali Pasha, the Grand Vizier, has sustained the usual fate of being consumed by fire. The rebuilding of the burnt palace of H.H. Fuad Pasha has been checked. The Sultan had undertaken the completion at the public cost, and directed it to be adorned with marble and gilding, notwithstanding the preference of Fuad for humbler material. After a Palace intrigue the Sultan took umbrage with Fuad, and the minister surrendered the title deeds to the sovereign. The old Sublime Porte of the Seraglio, the Bab Humayoon, having become inconvenient, has been pulled down, and is being replaced by another gateway. Expectation has been excited that the fresh granted Adrianople railway will be begun in the neighbourhood of the metropolis.

Messrs. Kirk, building contractors to the War Department in the Royal Arsenal, Woolwich, last week commenced laying the foundations of the seven magazines ordered to be erected on the river bank in the arsenal marsh.

A letter from the Metropolitan Board of Works was read at a meeting of the City Commissioners of Sewers on Tuesday, which announced that the Board had voted in aid of the Mansion House improvement the sum of £7,354, and in aid of widening the west-end of Ludgate-hill the sum of £11,756.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—H. R. E.—H L.—I. T. and T. W.—T. E—I. W. W.—R. H. V.—S. and B.—M. and Co.—S. D.—R. P.—W. S.—I. D. P.—R. B.—P. and K—M. and Co.—W. L—E. P.—B. W.—S. J H.—T. E. B.—I B. O.—H. G.—I. T. D.—M. O. T.—I. D. W.—G. Sons and Co—H H.—C. F.—W. and I. D.—I. I.—C. J. A.—W. W.—W. M.—N. S.—T. I. P.—S. W. and Son.—J. H.—P. B. A.—W. and C.—R. W. E.—E. W. P.—B. Brothers.—S. and H.

*** Several "Intercommunication" questions, &c., are postponed.

B. C.—You can have the back numbers from the middle of last year.

W. S. C.—Poetry, unless it be like refined gold, is inadmissible in our pages. Your lines being simply execrable are in the waste basket. If W. S. C. ever sent such lines to a lover as those sent to us, he deserves to be jilted.

Correspondence.

MR. TARVER ON SYMMETRY.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Tarver is a young man—a very young man: when he is some twelve years older he will feel how very strange it was that at his present age he should have taken up about the most abstruse subject in the whole range of art. Questions like Pure Beauty, Symmetry, Composition, &c., are abstract ideas of which it is a part of metaphysics to treat. To speak of these subjects in anything like an objective manner for the practical guidance of the artist is impossible, as all artists know. The great artist feels rightly on these points, but he can give no rules that have not endless exceptions. That which is an abstract idea in philosophy, and is beyond human reason to define definitely, will, in an objective form, be equally indefinable. To Mr. Tarver one may say, read your Plato, Aristotle, Schelling, Gioberti—learn something of the abstract idea if you can. As an artist, follow the admirable advice of Mr. Burges, given many years ago:—Draw and measure. Does it not strike Mr. Tarver that the man who has measured and drawn to scale more mediæval buildings than anybody in Europe, always, in his lectures, confines himself to objective facts? When a young man talks about symmetry of the Middle Ages and Renaissance, we ask, what does he know about these great works of the past? How many of the magnificent French cathedrals has Mr. Tarver drawn to scale, or any parts of them? because these drawings are valuable, and should be exhibited. There are comparatively few in the country. Has Mr. Tarver ever made drawings of any of Wren's works. St. Paul's is not usually considered to be wanting in symmetry. Michael Angelo and Bramante are not habitually spoken of as ignorant of this quality in art. Has Mr. Tarver ever drawn a Classic building? Can he draw the orders? Has he ever seen an ancient Greek or Roman building? To make invidious remarks about Classic and Gothic at this moment shows unfortunately inability to understand the current of present thought on the subject. The great artists in all ages have the same feelings regarding symmetry. The Greek, the Mediæval, the Renaissance artist felt alike. All great works of art, it matters not what age, possess symmetry. The decorative forms change, but the first principles of beauty, indefinable as they are, remain for ever. Just as humanity is incapable of producing a perfect work in any age, so also no age is without work of merit, and of very high merit. There is change, development in the human mind; but, just as there never exists absolute perfection, so also there is never absolute incapacity. Whether we hold a philosophy of progression or not, this fact remains, and a philosophy of history is not possible without it.—I am, &c, A. O. X.

COCOA NUT FIBRE.

SIR,—Having read Mr. Morton's letter of the 14th, and your reply of the 15th inst., respecting the inflammable nature of cocoa nut fibre, I will gladly bear my testimony to the truth of your assertion, "that it is not inflammable." That it cannot be consumed by fire, without great difficulty, I have many times experienced during many years residence in Bombay, Kurrachee, and other parts of India, where, in cases of cholera and other infectious diseases, I have superintended the destroying of beds, &c., made of that material. I have no interest in the trade, but have strongly recommended it for hospital purposes. I have myself slept on a cocoa nut fibre bed for many years. It is much cooler than any other material, and can easily be cleansed and remade.—I am, Sir, &c.,

J. GARDNER.

46, Albert-street, Newington Butts, Feb. 18.

THE BARRY-PUGIN CONTROVERSY.

SIR,—I have received the enclosed two very important letters from Mr. Herbert, the R.A., which I shall feel obliged by your inserting in your columns at your earliest convenience.—Yours faithfully,

21, Savile-row, Feb. 25. E. WELBY PUGIN.

7, Grove-end-place, St. John's-wood-road,
Feb. 24, 1868.

DEAR EDWARD PUGIN,—I was at the Grange when your father made the drawing for the throne. I have a distinct recollection of being there at that time. I was at work on the same board with your father when the post brought a packet from the then Mr. Barry. It was a drawing of the throne made by your father, treated as a pointed shrine, as if to enshrine Royalty, and covered with magnificent tabernacle work, and going high up towards the roof of the House of Lords. This was a very fine thing indeed, and your father had fixed his heart upon it. In the packet was also a small sketch, treated as a baldequin, square headed, and in a very few lines, barely enough to indicate what it was. Now, why I so well remember this was that your father turned to me, and with his unusual quiet sadness, said, "He spoils everything I do." These are the exact words, and I shall never forget them. But he went out to the study place, and remarked, "Barry wants a 'testa.'" Some days after this he was engaged upon the throne by my side, and I saw him make the design entirely for the present throne.

I had written thus far before seeing the frontispiece of Dr. Barry's pamphlet, and to my utter astonishment I find the photograph is taken from the actual drawing made under my eye; but, independent of my evidence, it must be clear to any one, though not an artist, that the man who could have made this drawing must have had your father's power of doing all that he accomplished before or after. Knowing this I am shocked at seeing Messrs. Barry should have made so grave an error.—Believe me, dear Edward Pugin, always faithfully yours, J. R. HERBERT.

E. Pugin, Esq.

7, Grove-end-place, Friday, February 21, 1868.

MY DEAR EDWARD PUGIN,—I think you may now wholly withdraw from further anxiety or trouble in the question of "who was the art-architect of the palace at Westminster."

The admitted destruction of the thousands of drawings made by your father for Sir Charles Barry, together with the 76 letters entrusted to him under the promise that they should be returned and held by his executors, declare even painfully, but most emphatically, to any man of honour, the justice and truth of the claim made in your pamphlet.

You may quite rely upon it that the article in the "Standard" of the 20th inst., so thoroughly logical and fair, has placed your father's claim beyond dispute; and the public, always desirous to give honour where honour is due, will, though late, insist that your father's name shall go down to posterity as not less than the joint architect of the Palace of Westminster.—Believe me, dear Edward Pugin, always faithfully yours,

Edward Pugin, Esq. J. R. HERBERT.

SANDGATE TOWNHALL COMPETITION.

SIR,—Seeing an advertisement in your impression of February 14, of a competition for "Townhall, Sandgate," I made application for particulars issued to intending competitors, and I find, upon looking over the few almost useless (written) instructions, that no requirements are stated, except that the directors say—"The greatest amount of accommodation at the least cost is the desired object;" and I should really be disposed to believe them, as they state that "Three guineas will be allowed for selected drawings." The secretary writes as follows:—

SIR,—The enclosed has been sent to all applicants. It is intended to guard against accepting designs furnished by some irresponsible designers. The gentleman is expected to sell his design for three guineas. As far as can be, the designer will be retained to carry out the work upon terms to be arranged. The directors are in earnest to select a design without impartiality.—In haste, yours obediently,
(Signed) J. H. HEDGE.

No comment upon this letter is needed, but what can we say to "responsible designers," who would so forget the dignity of their profession as to think for one moment of sending in drawings for this "townhall?" You would confer a great boon on the profession if you would bring your powerful aid to teach boards and "limited companies" that "responsible designers" are not educated through long years to make and "sell" drawings at "three guineas" per set.—I am, &c.,

GEORGE JAMES LOUGH.

67, Tachbrook-street, February 19.

THE COLOSSEUM.

SIR,—I have read with considerable interest your article on "The Colosseum," in the BUILDING NEWS of this week, and beg leave to inform you that it was the intention of some gentlemen some time ago to set on foot a club for young men, and circulars were distributed to that effect; but, as I have heard of nothing further with regard to the subject, I presume it has been abandoned with despair. Nevertheless, I hoped that it would come to something, as it would be a very good thing for young men and youths in the vicinity, as the following circular will show, a copy of one sent to me when the subject was first started. If you would wish to make this known to your correspondents, perhaps a word or two in your valuable journal might again stimulate the gentlemen to persevere in endeavouring to raise a club which would prove so advantageous to young clerks, &c., of London.—I am, &c.,

C. FULLER.

8, Gloucester-crescent, Regent's Park, London, N.W., February 21.

[COPY OF CIRCULAR.]

COLOSSEUM CLUB.

SIR,—At the request of the provisional committee of the above-named club, I beg to lay before you the object contemplated—viz., to convert the Colosseum, Regent's Park, into a club-house for young men engaged in professional and commercial pursuits. It is estimated that accommodation will thus be afforded for 500 resident and 1,000 non-resident subscribers, for whom a lecture hall, reading, dining, class, and billiard rooms (swimming-bath, if possible), and every other convenience would be provided to ensure a comfortable home, combining facilities for intellectual improvement with all kinds of rational exercise and amusement, including frequent musical entertainments, &c. Members can be supplied with breakfasts, dinners, &c, at cost prices, but no wines, beer, or spirits, will be obtainable on the premises. The rent for a single

a [illegible], with all the ordinary advantages of the club, will [illegible] per week, according to the position of the room; but any member wishing a private sitting-room [illegible] may be accommodated therewith at a proportionate rate. The estimated capital for purchasing, altering, and thoroughly furnishing the aforesaid building [illegible] to be raised by [illegible] shares of £5 fully paid up. After very carefully going into estimated receipts and expenditure, the committee have every reason to believe that the nett profits will not only provide for repayment of the original outlay at the expiration of the lease, but also pay a dividend of at least [illegible] per cent. per annum. A large amount of the capital is expected to be subscribed by City merchants, of whom two have already promised £[illegible] each; but [illegible] desirable to raise as much as possible [illegible] themselves, as it is [illegible] that [illegible] in the undertaking should [illegible] of the club, and thus create a [illegible] the present [illegible] interest young men [illegible] of premises of [illegible] depend whether the committee will [illegible] several gentlemen of [illegible] influence and support to [illegible]. If an earnest desire to establish the club be manifested by young men. Any further information you may desire will be immediately furnished on your applying to Mr. H. Tregarthen, the hon. secretary, *pro tem.*, at the [illegible] address. On behalf of the provisional committee.—I am, &c., John Rogers,

Incumbent of St. Thomas, Charterhouse, Chairman.

[illegible] Brunswick-square, W.C., October 15, 1867.

Intercommunication.

QUESTIONS.

[751.]—ROOFAGE WATER.—The superficial area of my roofs are about [illegible] ft. I am desirous of collecting the rain water in an underground tank. I shall feel obliged if some of your correspondents would inform me the required dimensions I should build it (my farmstead is situated in the midland counties of England), the average gauge per annum, and the rule employed for finding the number of gallons I could calculate for in one superficial foot of roof?—M. Payne.

[illegible]—CREOSOTING.—How long should a balk of Memel timber remain in a creosoting tank so as to absorb 10 lbs. of creosote to the foot cube?—J. R. P.

[illegible]—STOCK BRICKS.—Why is it the universal practice of making stock bricks [illegible] in. by 4½ in. by 3in.; and why should they not be made [illegible] in. by [illegible] in. by 6in.?—M.

[illegible]—FLEXIBLE IVORY.—Can you, through the Intercommunication, tell how I can make ivory flexible, and also how to restore it to its original rigid condition?—[illegible].

[illegible]—INDIA RUBBER.—I want a book describing the process of manufacturing india rubber, and especially the [illegible]. Can any of your readers direct me to a book, or give me any information on the subject?—Chisale.

[756.]—CONTOURS OF MOULDINGS.—Will some readers of the Building News inform me how to obtain the correct contours of the mouldings in an existing building? Is there not an instrument for the purpose?—J. K. J.

[illegible]—WATER.—Can you or any of your readers inform me where I can obtain the requisite information to enable me to determine the amount and nature of foreign ingredients held in suspension by water?—G. F. L.

[illegible]—EGG SHAPED SEWERS.—Can you or any of your readers inform me how to work out the formula ([illegible]) for determining the size of egg shaped sewers given in Mr. Weale's "Engineers and Architects' Pocket-Book," as Mr. Hawksley's?—G. F. L.

[illegible]—FREESTONE CHIMNEY PIECES.—Would any of your numerous readers oblige by informing me of any [illegible] with which a light freestone chimney piece might be [illegible], so as to preserve it from injury by finger marks or greasy [illegible]—S. B.

[illegible]—QUANTITIES.—Which is the best work on taking quantities? [illegible] timber [illegible] is easily obtainable; the correct [illegible] the same at other distances [illegible] and respectfully solicited. Can an architect demand a copy of a bill of quantities taken by a surveyor for contractors at their own cost; or, is it a matter of courtesy to furnish him with it free of cost?—F.

[761.] CLEARING AWAY SNOW.—In November, 1867, in the Building News, suggestions were invited to clear away snow from the streets of the City, to be sent to the principal clerk at Guildhall—£50 for the first, £20 for the second that the Committee thought most suitable. I have looked through your paper most weeks, but have not seen any conclusions come to; if you have heard anything of it, an intimation in your next week's paper would oblige.—Interested.

[This matter is adjourned, waiting the results of experiments to be made. The result will be advertised in due course.]

REPLIES.

[742.]—ILLEGIBLE INSCRIPTIONS ON SILVER COINS.—Look at them very obliquely through a convex lens of long focus, such as a spectacle glass, or, to get more power, in the same way with a double eyeglass folded up. So also for marks on old plates.—J. G. C.

STATUES, MEMORIALS, ETC.

An allegorical group in sculpture has been erected in the Parish Church, Leeds, as a memorial to the late Mr. W. Beckett, banker, and formerly M.P. for Leeds. The monument, which is in marble, is 1[illegible]ft. high with the pedestal, the centre of which is occupied with a medallion likeness of the deceased. Baron Marochetti was the sculptor, and the monument has been erected under the superintendence of Messrs. Dobson and Chorley, architects, Leeds.

LEGAL INTELLIGENCE.

Building Bye-Laws.—The Corporation of Leeds the other day summoned Mr. A. Hallbrook, of Carr-moor Side, Hunslet, a builder, in order to enforce the provisions of the 11th Building Bye Law, which says that "party walls of all buildings shall not be less than 12in. in thickness if built of stone, and 9in. in thickness if built of brick. It appeared that the defendant was erecting eight houses, the party walls of which, instead of being 9in., were only 5in., and the buildings were not in accordance with the plans he had sent in to the Building Committee. The magistrates, after hearing the evidence, inflicted a fine of 20s. and costs, and further adjudged that there would be a penalty of 40s. per day for non-fulfilment of the building in conformity with the plans, but that such 40s. would not commence until March 31, so as to give the defendant an opportunity of making his building according to the plans he had deposited.

Our Office Table.

The Home Secretary, on Monday, in answer to a question by Mr. Candlish, intimated that he was not prepared to legislate on the subject of the pollution of rivers this session. The old commission, he stated, had been dissolved, and a new one was about to be appointed to inquire into the whole matter; and Mr. Hardy did not think it desirable to do anything on the subject until their inquiry was completed. On the same day Mr. Ewart obtained leave to introduce a bill, which he does annually, for the adoption of the metric system of weights and measures.

The death is announced, at the age of 78, of Mr. John Herapath, well known as the proprietor of "Herapath's Railway Journal," and as author of "Mathematical Papers." He was first cousin to Mr. William Herapath, of Bristol, the celebrated analytical chemist, whose decease we announced only last week.

A conference of persons interested in the establishment of museums and libraries will be held on Thursday, March 5 next, in the hall of Sion College, London.

We recently stated that Mr. G. Dobie, painter and decorator, of George-street, Edinburgh, had offered a series of prizes for the best designs of drawing-room and dining-room decoration, the competition being open to the whole of Scotland. Thirty-six competitors entered, and the result has been a very creditable display of artistic skill. Some of the designs—which are now on view at Mr. Dobie's place—are said to be of a very high class. The gentlemen who acted as judges in the competition were Messrs. J. Dick Peddie, (architect); James Ballantine, (artist in stained glass); John Nisbet, Edinburgh; R. Dow, Perth; and J. B. Bennett, Glasgow. Their decisions were as follows:—Drawing-room—1st prize (20 guineas), William Luetjens, Glasgow; 2nd (10 guineas), Alexander Girdwood, Edinburgh; 3rd (5 guineas), Matthew Hislop, Langholm. Dining-room—1st prize (10 guineas), Alexander Girdwood, Edinburgh; 2nd (5 guineas), William Luetjens, Glasgow, 3rd (2½ guineas), Anthony Wells, Glasgow.

The municipality of the City of Paris has just determined, for reasons of economy, to have every other gas lamp in the streets of the capital extinguished after midnight. This measure is to come into operation next month. The saving is incontestible, but the police, when informed of the intention, made some just observations as to the difficulties which the arrangements will introduce into their surveillance.

The trustees of the Clyde navigation at a meeting lately held in Glasgow resolved to ask for borrowing powers to the extent of £600,000 in the bill for the formation of a new graving-dock, which the trustees intend to bring before the present session of Parliament.

Since the establishment of the Masons' Society in 1840, they have expended for benevolent purposes alone £102,181; for trade purposes £62,182.

A second collection of Artizans' Essays on the comparative merits of British and continental industry and manufactures will shortly be published. These essays will emanate from the Paris Excursion Committee.

Certain native artists, it is said, when they would drill a hole in pearls, first fit them loosely in apertures bored in a piece of wood. Then a little water is sprinkled around them, which gradually penetrates the fibres and causes the wood to "swell," until each little pearl is held as firmly as in a vice. Indeed, no vice could hold such delicate little treasures without marring them and diminishing their value. But by this simple process, which might be applied to other purposes, the choicest ones are kept securely in their places, without injury, until the artist's work is done, and then, as the water dries out, the fibres gently relax, and the pearl is free.

A correspondent states:—My object in writing is to warn you and your readers that Temple Bar is no longer safe, and to recommend that it be either shored up or pulled down without delay, for when I passed it on Saturday afternoon I not only discovered several fresh cracks in the masonry, but saw that the old ones had increased in length and breadth. This new "settlement" may have been caused by the disturbance of some part of the northern abutment during the removal of the houses for the Law Courts.

Although forty years have elapsed since Ali Pasha gave "Cleopatra's Needle" to George IV. it still lies outside Alexandria. We understand certain savants have been in communication with the Government, with a view to bring the time-worn monolith to England. It is said that £20,000 would be required to accomplish the project.

Now that the necessary legislative powers have been obtained, there is every reason to think that the erection of the East London Museum will be commenced immediately. The site is at the junction of the Bethnal-green-road with the Cambridge-heath-road, leading from Whitechapel to Hackney, and about half a mile distant from Victoria Park.

We announce, with pleasure, that the next annual dinner, or we suppose we may now say banquet, of the Hardware and Metal Trades Society, will be graced by the presence of ladies. The appearance of ladies at the annual dinners of charitable and other institutions will do much to make such festivals worthy of the objects they profess to promote. As now conducted they smack of vulgarity and selfishness.

The Summer Session of the Female School of Art (43, Queen's-square, W.C.) will commence on the 2nd of March. Professor Donaldson will give a series of lectures on the principles of shadow, and Mr. O'Neil, A.R.A., a series on painting, in the course of the session.

A sale of much interest to art collectors is announced to take place at Munich on the 16th of next month. The collection of M. Entres, a sculptor, will be brought to the hammer. It is exactly fifty years ago—in 1818—since that gentleman began to amass all that he could find bearing on the history and development of German art, and the result of his labours is a collection which is said to be rare both in the number of the objects brought together and their, in some cases, almost inestimable value. The sculptures in wood and ivory, we are told, are quite unique. There are also the finest impressions of the rarest engravings, woodcuts, and etchings, besides original drawings by Raphael, Corregio, Rubens, Rembrandt, Domichino, and other great artists. The pictures of the old German school give a perfect history of the art. The Flemish, Dutch, French, and Italian masters are also well represented. There are caskets in the precious metals so admirably wrought, that the material becomes insignificant beside the workmanship. The fact that there are in all nearly 4,000 lots will give some idea of M. Entres's collection, and, on looking at all the efforts of skill and genius, one is at a loss, as a correspondent remarks, to understand how a private individual could become the possessor of such a museum.

Mr. Boucicault has, it is said, purchased the Sablonière Hotel, Leicester-square, intending to convert it into a theatre.

The Hardware and Metal Trades Pension Society has been in existence for many years, during which time it has done an untold amount of good. The society was instituted for granting annuities to aged and deserving members of the above-mentioned trades and their widows. As an evidence of the growth of the society, we may mention that in 1856 its annual income was £1,155, and in 1868 its income amounted to £2,612. In the former year 60 pensions were granted, and in 1867, 132 pensions were granted. Of this number 57 were men and 67 were women. The annual ball of the society came off at Willis's Rooms, a few nights since, and, as usual, it was characterized by overflowing numbers, bewitching beauty, and brimming satisfaction. Our notice of the society would be incomplete without associating with it the name of Lieut.-Col. Stedall, who for many years has lovingly and energetically promoted its prosperity.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—Discussion on "Papers read on the Surveys of the Proposed Lines for a Ship Canal between the Atlantic an Pacific on the Panama Railroad;" and, on the "Darien Ship Canal," by Dr. Cullen, 7 30.

TUES.—Institution of Civil Engineers.—"On the Manufacture and wear of Rails;" by Mr. C. P. Sandberg, Assoc. Inst. C.E., 8.

WED.—Society of Arts.—"A Workman's Views of Technical Education;" by Mr. J. Randall, one of the artizan Reporters on the Paris Exhibition.

SAT.—Associated Arts Institute.—"On the Pictorial Art of the Egyptians, Assyrians, and Greeks;" paper by H. E. Wooldridge.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1660 B. TEMPLAR. IMPROVEMENTS IN FASTENINGS FOR WINDOW SASHES. Dated June 6, 1867.

This invention consists in making the fastenings of window sashes self-acting, so that when the window is closed, the sashes are securely connected together, and cannot be opened from the outside. Another part of the invention, which is applicable to fastenings of the ordinary construction, as well as to these improved fastenings, consists in making the casement plate of the bracket of the bottom sash to overlap that of the other, to prevent the introduction of a knife blade or other instrument in order to throw back the catch.—Patent completed.

1855 W. COOKE. IMPROVED APPARATUS FOR HOISTING BUILDING MATERIALS. Dated June 25, 1867.

This invention consists, principally, of a single fall or endless rope passing over a grooved pulley above, and having fixed, or connected to it, appliances for attaching two hods thereto, so that when the full one is being hoisted the empty one is descending.—Patent abandoned.

1919 P. IRONSIDE. IMPROVEMENTS IN THE CONSTRUCTION OF VENETIAN BLINDS OR SHUTTERS. Dated July 1, 1867.

Here a vertical rod is laid in a groove, and each lath carries an arm which, besides passing through the vertical rod, rests in bearings formed in the sides of the groove. The vertical rod has a slot at its central part for each lath, and each lath receives a disc, eccentric, or plate, and through which each arm of each lath passes; pins also pass through the projecting points of each disc or eccentric; therefore, the arm of each lath is tied, as it were, in two places to the vertical rod; thus when motion is communicated to the vertical rod, whether causing it to rise or fall, so the discs turn the arms of the laths and alter the position thereof, as desired.—Patent completed.

1845 J. WEBSTER. A NEW METALLIC ZINC PAINT. Dated June 25, 1867.

The patentee takes spelter and melts it in a furnace, and raises it to 800 deg. Fah. He then covers the metal with a flux of borax mixed with caustic of soda or chloride of ammonia. He then adds about 7 or 8 per cent. of finely divided iron wire or scrap, agitating the whole with an iron rod until the whole of the iron or scrap particles are taken up by the zinc. He then adds sufficient antimony to cause the metal to run freely from the furnace. When the metal thus prepared has cooled down it is next pulverized and ground, when it may be mixed with any oleaginous matter or varnish, and the metallic zinc paint results.—Patent completed.

1902 A. HODGE. IMPROVEMENTS IN ADJUSTABLE APPLIANCES FOR FIXING DOOR HANDLES. Dated June 29, 1867.

This invention consists in adapting an internally screwed collar to screw upon the screwed edges of the square or equivalently shaped spindle, such collar holding the handle by a flange or rim turned over a bead or flange on the neck of the handle, and being prevented from unscrewing from friction against the door or shield by an interposed disc loose on the spindle, but fitted so as not to turn thereon.—Patent completed.

1953 T. WELTON. A NEW REVOLVING SHUTTER OR BLIND, TO BE APPLIED EITHER INSIDE OR OUTSIDE OF HOUSES OR OTHER BUILDINGS. Dated July 4, 1867.

This invention consists in making a shutter or blind of sheet iron or steel, so that each part (described as plates) interlocks with the other and others, and so forms a continuous hinge or hinges, to the front of which may be affixed laths of wood, or metallic bars of the required thickness of any sectional form or width, either as regards the plates, otherwise hinges, or the outside covering (if any) of iron or wood.—Patent abandoned.

1927 J. STURGEON. IMPROVEMENTS IN MACHINERY EMPLOYED IN GETTING COAL, STONE, AND OTHER MINERALS, AND IN APPARATUS CONNECTED THEREWITH. Dated July 2, 1867.

The chief object of this invention is to produce a machine capable of performing the principal operations required in tunnelling or making a drift, long wall, cutting or pillar and stall cutting, or to work at an irregular face of coal of any length. The patentee employs a cutter or cutters actuated by an engine worked by compressed air, which is so arranged that the cutter may have an independent forward motion imparted to it for a certain length without shifting the whole machine bodily from its original situation during the process of cutting.—Patent completed.

1922 W. STEVEN and A. ROBERTSON. IMPROVEMENTS IN BRICKMAKING MACHINES. Dated July 2, 1867.

This invention relates to machines of the kind described in a former patent, dated March 22, 1811 (No. 8857), and one of these improvements consists in dispensing with certain pistons or plungers employed in the machines constructed according to that invention. A cover of metal or wood is placed over each pug mill outlet, and is shaped so as to lead or guide the issuing clay down into the moulds or mould openings in the sliding frame. A second improvement consists in actuating the remaining pistons or plungers by means of weights in combination with levers, which levers have their movements regulated by cams shaped with depressions to allow of the descent of the weights at the proper times, and the inclined sides of which depressions re-elevate them by a positive action. A third improvement consists in introducing a yielding appliance in the driving arrangement, so that when from obstructions in the machine the resistance becomes injuriously increased, the parts will slip, and thereby save the gearing.—Patent abandoned.

1978 T. C. THOMAS. IMPROVEMENTS IN WATERCLOSET FITTINGS. Dated July 6, 1867.

This invention consists in so arranging the fittings that a regulated quantity of water may be discharged for flushing the basin every time the closet is used. This is effected by establishing at some convenient point above the level of the pan a small cistern or chamber with a tumbling trough which is always kept charged with the regulated quantity of water, and is filled from a reservoir above. The tumbling trough is filled from the supply pipe through a ball-cock which only admits a certain quantity; it is mounted on centre pins, so that when required it may be tipped over, in order to discharge the water. It is worked by gearing consisting of bands and pulleys connected to a lever, which may be actuated by a handle in the ordinary manner; or it may be connected to the door of the closet, so that it may be actuated whenever the door is open. The pan is provided with a syphon, and when the lever is pulled up or the door opened the tumbling trough will be pulled over on its axis, and the water will be discharged therefrom and allowed to rush down the exit pipe with considerable force into the pan.—Patent abandoned.

1980 J. CAPPER. IMPROVEMENTS IN THE CONSTRUCTION OF CHIMNEY TOPS. Dated July 8, 1867.

According to one modification of this invention the inventor makes that part of a chimney top which is attached to the upper termination of the chimney of a cylindrical form, and surrounding the higher part of it by another cylinder of larger diameter, so that an annular space is left between the two. Both of these cylinders are open at the top; the larger and outer one rises above the termination of the smaller one. A short distance below the larger cylinder, and attached to the smaller one, there is a projecting ring from which pieces rise and are attached to the outer cylinder, so as to leave alternately closed and open spaces. Wind enters at the latter, rises upwards in the annular space, and assists egress of the smoke.—Patent abandoned.

2018 J. E. WHITING. IMPROVEMENTS IN SUSPENSION BRIDGES AND OTHER STRUCTURES IN WHICH GIRDERS ARE EMPLOYED. Dated July 10, 1867.

This invention consists in connecting by a hinge, or other flexible joints, the ends of the upper chords of two diagonally braced girders, so that each girders may have its top chord always in tension; and these girders are constructed so that this may be the case, and they are inclined to one another at an angle properly chosen according to the proportions of the structure, and the requirements of the case, as to moving and fixed loads, and so as, the girders being free, to adapt themselves to changes of length consequent on changes of temperature and strain.—Patent completed.

2028 G. R. B. AMOTT. IMPROVED MACHINERY FOR MAKING BRICKS FOR BUILDING AND OTHER PURPOSES, AND OF COAL PEAT OR OTHER SUBSTANCES TO BE USED AS FUEL. Dated July 10, 1867.

This machine includes both a pugmill and a moulding apparatus. Mounted upon the bed of the machine is the pugmill, which is fitted with knives for working the clay, &c., and forcing it down towards the bottom of the mill. At the bottom of the pugmill cylinder openings are made to permit of two or more endless chains of moulds passing through the cylinder. These moulds are carried by tumblers or drums mounted in bearings at opposite ends of the machine, and they receive their transverse motion from the axle of one of the tumblers, which is driven by suitable gearing. As the moulds pass through the pugmill they are filled with the material to be compressed, the surplus of which is removed by the lip of the exit opening of the pugmill cylinder through which they pass. The filled moulds in passing along the bed severally come under the action of a compressing plunger and a discharging plunger, the former of which completes the moulding of the brick, &c., while the latter serves to discharge it from the mould on to a transverse travelling apron for delivering the bricks, &c., out of the machine.—Patent completed.

2029 A. H. BRANDON. IMPROVEMENTS IN WOOD-PLANING MACHINES. (A communication.) Dated July 10, 1867.

Here the inventor, according to one arrangement, places the timber to be planed on the table of a machine, and he advances it towards a rotating cutter by an upper feed roller turning in fixed bearings above the timber, and a lower feed roller let in the table immediately below the first, and beyond these rollers and above the timber he places transversely a cutter running at a high velocity, on either side of which, and parallel with the same, he also places guiding rollers to maintain the timber steady under the action of the cutter. In order that the feeding rollers may adapt themselves to any thickness of stuff to be passed through the machine; he terminates the under edges of the table in which the lower one runs in the shape of inclined planes, and by advancing and withdrawing horizontally two inclined planes on which the table rests he causes it to rise and fall vertically to the required extent.—Patent abandoned.

2030 A. H. BRANDON. AN IMPROVED CIRCULAR SAW MACHINE. (A communication.) Dated July 10, 1867.

This invention refers to a machine provided with two rotating circular saws, either of which can be brought to bear on the wood or other material to be operated upon. The patentee mounts each saw on the extremity of a shaft, and one of these shafts is mounted on bearings adapted to the extremities of two parallel levers, kept at a proper distance apart by a hollow sleeve shaft connecting them at their centre. The other shaft is mounted on bearings adapted to the other extremities of these levers. The sleeve shaft, with its levers, shafts, and saws, is mounted on a stationary shaft or bolt at such a distance below the table of the machine that the upper saw projects to the required extent. A small pulley is mounted on each of these saw shafts, so that the driving strap will always drive the upper one, whilst the lower one will remain stationary; thus, by rocking or turning this apparatus on the stationary shaft as its centre of motion, either one of the saws can be brought into work.—Patent completed.

2041 R. A. KENNEDY. IMPROVEMENTS IN DOORS AND WINDOWS, AND FASTENINGS FOR THE SAME. Dated July 12, 1867.

This invention is chiefly applicable to the windows generally known as "French windows," and it consists in making the sashes so that they can be raised on their hinges above the bottom bead forming part of the frame.—Patent abandoned.

2062 W. DRURY and C. WESTRUP. IMPROVEMENTS IN THE MEANS OF INDICATING NUMBERS AND NAMES ON DOORS OF PRIVATE HOUSES. Dated July 13, 1867.

Here the patentees cast the head of a street door knocker, which is usually of solid metal, with a round, oval, or other shaped opening, and in the back of this opening they insert a ground or other glass tablet, having thereon the number of the house inscribed. An aperture of similar form is also made through the door immediately behind the tablet in the knocker head. In this manner the number may be readily discerned on the transparent tablet from the street at all times, and especially at night, by the light of the hall or passage lamp, or from other source.—Patent completed.

Trade News.

TENDERS.

ALDERSHOT.—For sewering, paving, curbing, channelling, and other works, in Victoria road. Quantities supplied by Mr. W. Rowley, surveyor:—

Wainwright	£1860 16 6
Jeffries	1400 9 8
Benthall	1391 12 8
Martin	1372 4 2
Beevons	1333 6 4
Booth	1315 7 5
Knight (accepted)	1275 9 7

BRIGHTON.—For alterations to shop-front and house for Mr. Booth, 70, East street, Brighton. Messrs. Goulty and Gibbins, architects:—

Chappell	£650
Cheesman and Co. (accepted)	428

DERBY.—For the erection of six slaughter-houses in the Holmes, for the Derby Corporation. Mr. George Thompson, Borough Surveyor:—

Bingham	£1490 (!)
Riley	1095
Bridgart	1084
Thompson, J. W.	1070
Fryer (accepted)	1048

EXETER.—For converting Coombe-street House into a chapel. Mr. Charles Pinn, architect. Quantities supplied:—

Easton	£620 0 0
Bragg	500 0 0
Brealey	481 15 0
Miller	459 3 0
Scadding	450 0 0
Westlake	445 0 0

HARROW.—For the erection of Board room, Offices, &c., for the Local Board of Health. Mr. A. H. Jacob, surveyor to the Board, architect:—

Avery	£1080 0 0
Crabb and Vaughan	989 0 0
G. Webb	986 0 0
Lauder	982 15 0
Taylor	977 0 0
W. R. Webb	950 0 0
Gibson, Brothers	948 0 0
Nightingale	947 0 0
King and Son	947 0 0
Wood	946 0 0
Upchurch and Hanks	886 0 0
Shurmur	883 0 0
Smith and Simmons	849 0 0
Salter	848 0 0
Woodbridge	804 0 0

LONDON.—For two houses, Mile End-road, for Dr. Todd. Mr. Iron, architect:—

Smith (accepted)	£1060

[illegible] Hill.—For the erection of new Wesleyan Chapel and [illegible]:—

Bar[illegible]	£2100
Mar[illegible]	1[illegible]
S[illegible]	1[illegible]
Halfpen[illegible]	1[illegible]
Keen	1[illegible]
Grosvenor [illegible]	1595

Stamford Hill.—For erecting a detached villa residence and stables at Stamford hill. Mr. Thomas J. Hill, architect:—

[illegible]	£[illegible]
M[illegible] and Burren	[illegible]
[illegible] and [illegible]	[illegible]
Hen[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	2[illegible]
W[illegible] and Sons	[illegible]

BATH STONE OF BEST QUALITY.

PROPERTY SALES.

Feb. 17

At the Mart.—By Mr. Dyer.—Leasehold residence, No. 1, Gloucester terrace, The Grove, Blackheath, annual value £1[illegible], term [illegible] years unexpired at £30 per annum—sold for £6[illegible].

Feb. 18.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer.—Freehold tannery and premises, situate between Willow walk and Grimscott street, Bermondsey, occupying an area of about 47,[illegible] square feet—£6,000.

Freehold house, No. [illegible], Grimscott street, Bermondsey, also a large yard and workshops, occupying an area of about 6,000 square feet—£1,400.

Freehold residence, known as Highbury House, Selhurst-road, South Norwood—£1,700.

Leasehold house, No. 2, Lloyd square, Clerkenwell, let at £48 per annum, 49 years unexpired at £7 10s. per annum—£[illegible].

By Messrs. Glasier and Son.—Leasehold two residences, Nos. [illegible] and [illegible], Union row, Queen's road, Peckham, producing £[illegible] per annum, term [illegible] years unexpired at £19 10s. per annum—£675.

Freehold ground rent amounting to £150 per annum, arising from six houses and shops in Arundel place, Arundel square, Islington, and fifteen houses in Bride street, Liverpool road, Islington—£[illegible],400.

Feb. 19.

At the Mart.—By Messrs. Ventom, Clarke, and Bull.—Policy of assurance for £[illegible] in the Scottish Union Fire and Life Insurance Office, on the life of a gentleman in his 61st year—£1[illegible].

By Messrs. Norton, Trist, Watney, and Co.—Freehold corner plot of building land fronting New road, Carshalton—£[illegible]15.

Freehold plot of building land, situate as above—£235.

Freehold corner plot of building land fronting North street and New road aforesaid—£440.

Freehold building site known as White Bench field, situate overlooking Beddington Park, Surrey, and containing 2a. 1r. 20p.—£1[illegible].

Freehold building site, containing 5a. 2r. 20p., and known as the School House, Beddington, Surrey—£1,150.

Freehold, 1a. 1r. 24p. of building land, situate at Walton-on-the-hill, Surrey—£150.

Freehold [illegible]a. [illegible]r. 17p. of land, fronting the Epsom road, Surrey—£1,[illegible].

Freehold and copyhold farm, known as Mount Pleasant, situate four miles from East Grinstead, Sussex, comprising a residence, with farm buildings, and [illegible]a. 1r. 1[illegible]p. of arable pasture, and wood land—£2,[illegible].

Freehold three farms, known as Denman's, Swedes, and [illegible], in the parish of West Hoathly, Sussex, and farmhouses, buildings, and [illegible]a. 0r. [illegible]p. of arable, pasture, and wood land—£1,[illegible].

Freehold farm, known as Adgates, Cinder Hill, Horsted Keynes, Sussex, with house, buildings, and [illegible]a. [illegible]r. of pasture land—£1,[illegible].

Freehold [illegible] of arable pasture, and wood land, situate in the parish of Horsted Keynes—£[illegible].

Freehold [illegible]a. [illegible]r. 25p. of arable, pasture, and wood land, on the road leading from Lindfield to West Hoathly, Sussex—£1,[illegible].

Freehold farms, known as Hoathly Hill, and Newlands, with part of [illegible], situate close to the village of West Hoathly, with farmhouse, homestead, cottage and brick [illegible] buildings, &c., and [illegible]a. [illegible]r. [illegible]p. of arable, pasture, and wood land—£[illegible],[illegible].

Freehold farm known as Longridge, West Hoathly, with homestead, cottage, buildings, and [illegible]a. 1r. 12p. of arable, pasture, and wood land—£[illegible].

Freehold building known as the Police Station, West Hoathly—£[illegible].

Freehold [illegible] of building land, situate at West Hoathly—£[illegible].

Freehold 8a. [illegible]r. of arable land, situate at West Hoathly—£400.

Freehold estate known as Sharpthorn, West Hoathly, comprising a homestead with house, buildings, and 27a. 2r. 21p. of arable, pasture, and wood land—£1,[illegible].

Freehold farm known as Blacklands in the parish of East Grinstead, Sussex, with homestead, house, farm buildings, &c., also part of Nayland's farm, the whole containing 1[illegible]a. 2r. [illegible]p.—£[illegible],250.

Freehold farm known as Nayland's, East Grinstead, with farm house, buildings, and 56a. 1r. 31p. of arable, pasture, and wood land—£1,[illegible]20.

Freehold 7a. 3r. 12p. of meadow land, known as Bunch Grove Fields, situate at Bunch Grove, on the road from Horsted Keynes to Maresfield, Sussex—£2[illegible].

At the London Tavern.—By Messrs. Vigers.—Freehold plot of land, forming the corner of Denmark road, Camberwell—£2[illegible].

Freehold plot of land, fronting the Camberwell Station road—£600.

Freehold plot of land, fronting the Camberwell Station road—£310.

Freehold plot of land, fronting Wyndham road, Camberwell, and a lease for 1,000 years of two railway arches—£[illegible].

Freehold plot of land, fronting Crown street, Camberwell, and a lease for 1,000 years of a railway arch—£380.

Freehold plot of land, situate as above, and a lease for 1,000 years of a railway arch—£2[illegible]0.

Freehold house, No. 12, Olney street, Walworth road, let at £5 12s. per annum—£390.

Freehold plot of land fronting Sutherland square, South, Walworth road, and lease for 1,000 years of four railway arches—£1,320.

Freehold plot of land fronting Sutherland street, Walworth road, and a lease for 1,000 years of a railway arch—£[illegible]20.

Freehold plot of land, situate as above, and a lease for 1,000 years of a railway arch—£310.

Freehold house, No. 2, Carter street, Walworth road—£[illegible].

Freehold four houses and land, fronting Gravel lane and Paradise row, Southwark—£[illegible]10.

Freehold house, No. 12, Brixton place, Manor rise, Brixton—£620.

Freehold house in Shepherd's lane, Brixton—£330.

Freehold house, land, and buildings, fronting Nursery road, Park grove, Brixton—£960.

Freehold plot of land and buildings, in Stewart's-lane, Battersea Fields—£1,560.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Pottow Dyke, Greenham, timber dealer, March 4, at 2—William Augustus Hammon, London-street, Tottenham-court road, builder, March 5, at 2.—Thomas Keen, Stratford, builder, March 11, at 11—Robert Lipscomb Blomfield, Birchington, near Margate, church decorator, March 18, at 12.—John Cottell, South Norwood, painter, March 18, at 12.—Samuel Goslacre, Bromley, Kent, builder, March 9, at 12.—George Lapthorn, High street, Poplar, master joiner, March 18, at 11.—William Lintott, New Barnett, timber dealer, March 10, at 12.—William Parry, Hampstead, builder, March 9, at 12.—Richard Charles Rudman, Walmer road, Notting-hill, builder, March 18, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Scurr, Darlington, joiner, March 4, at 11.—William Smith, Hull, joiner, March 11, at 12—George Fawsett, Kyo, near Antield Plain, Durham, joiner, March 9, at 1. George Gale, Sherborne, builder, March 4, at 12. —Uriah Halsall Jones, Liverpool, builder, March 5, at 11. Anthony Rogers, Trevethin, Monmouthshire, contractor, March 9, at 11.—Henry Sharp, Burton, stonemason, March 9, at 1—Thomas Whetter, Truro, Cornwall, joiner, March 4, at 11.—Edwin John Wyles, Brighton, builder, March 9, at 11.—James Young, Goole, builder, March 9, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

March 16, F. Davy, St. Paul's-street, New-north-road, builder—March 16, W. Luxford, Myrtle-street, Dalston, builder—March 16, W. H. Soar, Vauxhall bridge road, plumber—March 18, W. Dudley, Naylor-road, Commercial-road, Peckham, painter—March 19, R. Deeks, Bromley, Middlesex, carpenter—March 24, I. Thompson, Monkwearmouth Shore, builder—March 24, T. Groves, Appleby, builder—March 20, J. Buck, Nutfield road, East Dulwich, carpenter—March 10, H. J. Daver, Gipsy-hill, Upper Norwood, builder—March 20, S. Reeve, Greenwich, plumber—March 26, C. Burry, Christchurch, plumber—March 16, C. Rolfe, Llanberis, civil engineer—March 6, H. Evans, Everton, plumber—March 30, H. Sargeant, Portsmouth, plumber—March 13, J. Russell, Oldham, journeyman joiner—March 2, A. R. Hollington, Sussex, builder.

SCOTCH SEQUESTRATION.

Charles Lindsay, Edinburgh, plumber, February 29, at 1.

DIVIDEND.

March 4, R. M. Robson, Liverpool, gasfitter.

DECLARATIONS OF DIVIDEND.

Sir C. Fox, and J. Henderson, Smethwick, and New street, Spring-gardens, and Fore street, Limehouse engineers, d[illegible], upon new proofs of 3s. 6d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak ...load	£11	0	12	0	Archangel, yellow ..	£11	0	£12	0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	10
„ yellow pine..	2	15	4	0	Finland	7	10	8	10
St. John N.B. yellow	0	0	0	0	Memel................	0	0	0	0
Quebec Oak, white..	5	5	5	15	Gothenburg, yellow	8	0	10	0
„ birch........	3	10	4	10	„ white	8	0	9	0
„ elm	3	10	5	0	Gefle, yellow........	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	0
„ fir	2	5	3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	12	0	15	0
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	0
Riga................	3	0	3	5	Pumice Stone per ton	6	0	8	0
Swedish	2	2	2	7	Oils, &c.				
Masts, Quebec red pine	6	0	7	0	Seal, pale....per tun	39	0	40	0
„ yellow pine..	5	0	6	0	Sperm body	105	0	110	0
Lathwood, Dantzic, fm	4	10	5	0	Cod	35	10	36	0
„ St. Petersburg	8	0	9	0	Whale, Sth. Sea, pale	37	0	39	0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli......	73	0	0	0
Quebec, white spruce	13	0	19	0	Cocoanut, Cochin, ton	55	0	15	0
St. John, white spruce	13	10	15	10	Palm, fine	39	10	40	0
Yellow pine, per reduced C.					Linseed	34	10	35	10
Canada, 1st quality.	17	0	18	16	Rapeseed, Eng. pale..	38	10	0	0
2nd do......	11	0	12	0	Cottonseed..........	34	0	42	0

Metals.

Iron:—

Welsh Bars in London	per ton	6	10	0	6	15	0	3
Nail Rod	do	7	5	0	7	10	0	2½
Hoops	do	8	5	0	8	10	0	
Hoops, Single	do	9	15	0	10	0	0	
Staffordshire Bars	do	7	5	6	7	10	0	
Bars, in Wales	do	5	10	0	6	0	0	3
Nails	do	5	10	0	6	0	0	net
Foundry Pigs, at Glasg. No 1 ..	do	2	15	0	3	5	0	2½
Swedish Bars	d	10	5	0	10	10	0	net

Steel:—

Swedish Keg, hammered	per ton	15		0	15	10	0	2
Swedish Faggot	do	10	10	0	12	10	0	2

Copper:—

Sheet & Sheathing, & Bolts	per ton	0	0	0	2	0	0	
Hammered Bottoms	do	92		0	0	0	0	
Flat Bottoms, not Hammered ..	do	0		0		0	0	
Cake and Tough Ingot	do	71	0	0	2	0	0	
Best Selected	do	75	0	0	80	0	0	
Australian	do	80	0	0	83	0	0	
Y. l. Metal Sheathing & Rods	per lb	0	0		0	0	7	

Zinc:—

English Sheet	per ton	26	10	0	27	0	0	2
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

Tin:—

English Block	per ton	93	0	0	9	0	0	2½
do Bar	do	94		0	97	0	0	
do Refined	do	94	0	0	99	0	0	
Banca	do	91	0	0	2	0	0	nett
Straits	do		0	0	90	10	0	

Lead:—

Pig, English	per ton	20	0	0	21	0	0	2½
„ Spanish Soft	do	18	0	0	0	0	0	
Shot, Patent	do	22	10	0	0	0	0	
Sheet	do	20	5	0	0	0	0	5
White	do	27	0	0	27	0	0	

Spelter:—

On the Spot	per ton	20	0	0	20	5	0	nett
Quicksilver	per btl	6	17	0	0	0	0	

Regulus of Antimony

French	per ton	28	0	0	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 6, 1868.

LEGISLATION UPON IMPROVED DWELLINGS.

AMONG the many important subjects pressing for Parliamentary consideration, the improvement of the humbler class of dwellings is certainly not the least. No amelioration of the condition of the masses can be real or permanent without an improvement of their squalid and unwholesome habitations. Health and strength are inestimable blessings to us all, but they form the entire capital of the poor; and, while no other dwelling-places are provided for them than the present overcrammed dens, where strength becomes palsied and health is hourly undermined, all other efforts for their benefit, whether political, social, or educational, are of very diminished value. We are, therefore, glad to perceive that Mr. Torrens is availing himself of the earliest opportunity to press forward his third bill on the subject. This perseverance does him infinite credit, and, though we consider his plan deficient, and in some respects even unwise, we are sure that its continued discussion will lead to the framing and adoption of some really practical and efficient measure at no distant date. In its main features the bill is the same as that of last year, and provides with respect to dwellings proved to be unfit for human habitation, that, if the present owners refuse to effect improvements themselves, they shall be compelled to sell them, at a valuation, to the local authorities, for the purpose of alteration or demolition, and the erection of improved dwellings on the site, the expenses of which are to be provided for by an addition of threepence in the pound to local taxation. Last year we pointed out, as a great objection to this proposal, that, so far from a compulsory sale (which always means a sale at a very high price) being regarded by sordid owners in the light of a penalty, it would practically operate as an inducement for them first to screw up the rents of their wretched tenements as high as possible, so as to enhance their nominal value, and then to permit them to fall into that state of neglect which should soonest compel the authorities to purchase them. The bill would thus defeat its own object, and offer a premium for the creation of the very evil it is intended to suppress. We perceive that criticisms of this nature have not been altogether unnoticed, and in the new bill a feeble attempt is made to meet the difficulty, by a proviso that, in assessing the amount of compensation, "allowance shall not be made in respect of the compulsory taking of the property." Now we very much doubt whether such a proviso will be permitted to pass the Committee. Holders of property will consider it a rather dangerous precedent; but, if it does, it will produce a very small effect indeed. The present race of weekly landlords, who wring heavy rents from poverty-stricken tenants, will not want for means of wringing a heavy price when compelled to sell their property. We are in principle opposed to compulsory sales at all, as will be seen, but, if the thing is to be done, we will offer a hint that it might be wise to take. Let the valuation be based upon the returns which have been made to the Income Tax Commissioners, for an average number of years past. In the case of weekly property, these returns are made, as a rule, by the landlords themselves. We should be sorry to suspect them unjustly, but it is within the bounds of possibility, that, when valuing their property for taxation, they have put rather a smaller figure upon it than if valuing it for purposes of sale. Be that as it may, they would have no right to complain, and the country ought not to be expected to admit a higher value when it has to pay money out of the exchequer than when it has to receive it. This we offer as a suggestion, though we should greatly prefer to see other means adopted. The man who draws from them an income of from 15 to 20 per cent., as the owners of the tumbledown tenements are said to do, is a trader upon immorality and disease, and the legislature should fix a stigma upon such a man, it should make him suffer in pocket, the most sensitive part of his nature, and, by a system of inspection, and fines if need be, should drive him to find it to his interest to make his places decent habitations, or to sell them at such a price as would permit others (themselves of course being subject to like control) to do so. A measure of this kind has had a wonderful effect upon the common lodging-houses of London, which now being bound to be regularly cleansed and subject to stringent regulations to prevent overcrowding, present an appearance contrary in every respect to the filth and squalor of some years back. We admit that from structural defects many places would be found incapable of improvement without utter demolition. In such cases, although we must hold that public authorities will always make bad builders and very objectionable landlords, we cannot object to compulsory acquisition by the authorities for the purpose of reconstruction.

It can hardly be said in most cases to be the present possessor's fault that the house was badly constructed at first, and he is entitled to reasonable remuneration. Nor can we object to the compulsory acquisition of property for the purpose of creating vacant spaces for air and ventilation. This is pre-eminently a work devolving upon the public, and cannot possibly be expected of private enterprise. The expenses being in the nature of capital laid out for the benefit of all future generations should be raised by loans and spread over a period of considerable length, otherwise we think the practical efficiency of the measure will be very much jeopardised. In small corporations the average municipal mind is not educated up to the point of acknowledging the paramount importance of sanitary measures, and if called upon to tax themselves too heavily for the purpose, such a consideration is likely to overbalance other motives, and the good work will be left undone. In fact, the proposal of an extra tax is likely to prove a rock upon which the entire measure will be wrecked, as regards the metropolis at least. Other proposals for improvements have had to be postponed on account of the fact that local taxation has reached its outside limit. We wish we could agree with the advocates of the bill, who aver that the rating power is taken merely as a reserve, and is not likely to be used. It is true, that properly conducted dwelling improvements will pay a fair percentage. But we have the awkward fact that the attempts of public bodies hitherto have not been well conducted, and we see no reason to suppose that they will be in the future. The well meant exertions of the City of London Corporation, and the recent failure of the Liverpool Corporation, are instances in point. The former acquired a site at Clerkenwell, at the price of £15,000, on which they have erected a pile of buildings at a further cost of £39,000, containing 168 separate tenements and 12 shops. Now, making every deduction for the value of these shops, it will appear that they have spent for every poor man's tenement, consisting only of two or three rooms, with a scullery attached, a sum which may be variously estimated from £250 to £280. These again are not occupied by the class of persons removed from wretched hovels, but by skilled artizans and others in the receipt of good wages, at rents varying from 4s. 6d. to 7s. 6d. per week; and at these rents the dividend is only 4 per cent. At Islington Cattle Market, also, they have spent £10,000 on the mere alteration of two large taverns into improved dwellings. These examples of corporate proceedings contrast very unfavourably with the action of private individuals and companies, or even of charitable associations, where the same work is usually done for at most about one-half of the cost, and the really poor are much more effectually housed. The Liverpool Corporation has, at present, according to all appearance, broken down in its attempt. Hampered by some inexplicable regulations, after having bought land, they rejected, first, the plan of their own officers, and afterwards all those sent in upon competition, and the last report is that the scheme is likely to be abandoned. Before casting the responsibility of fresh work upon such bodies, is it not true wisdom to inquire how they have hitherto accomplished work of the same nature, which they have voluntarily undertaken? If it be alleged that they are likely to perform the work well in future, some reason should be given for the expectation.

Our own view is, that the action of corporate bodies should not extend to the erection of buildings at all. The great practical obstacles at present to dwellings' improvement are—the difficulty of procuring sites in crowded neighbourhoods, owing to their high price, and the incorrect notion prevalent in the minds of capitalists that the investment is precarious and unremunerative. The former difficulty is increased by the present bill, which will enhance the value of land by taking it compulsorily, but might be obviated to a great extent by legislation framed with the view of rendering "bad" property burdensome to the present holders, while it remains in its present condition, a course which should compel them voluntarily to improve it themselves, or dispose of it at a fair price to others who will do so, which, failing, we conceive the law would have a right to step in and compel them to dispose of it—say, by public auction—under supervision of the authorities, subject to conditions of improvement and reconstruction on the part of the purchasers. Thus would a great number of eligible sites, for which dwelling reformers now search in vain, be thrown into the open market, and being sold subject to conditions for the erection only of improved dwellings, would be purchased at values to admit of that object. Again, the prejudice of capitalists against dwellings' improvement as an investment is likely to be increased by the working of the bill. Public bodies, as we have seen, always build extravagantly and pay the lowest possible dividend. What is most required is some examples on a sufficiently extensive scale showing that it will pay. This Alderman Sir S. Waterlow's company is doing; but the proposed corporate action would be set over against all their efforts, and the good effect they might have be most lamentably neutralised.

We think we need say little more to maintain that the action of the authorities should be limited to its proper sphere, which is not that of becoming house builders on a large scale, but of examining where improvement is necessary, and of using their powers to compel those who now derive profit from squalid wretchedness to effect such improvement themselves. No addition should be made to our fiscal burdens for the purpose of putting money into the pockets of landlords, or for expenditure on building jobs, but only for the unavoidable purpose of effecting clearances where no building of any kind should be allowed to stand. If the corporations are restricted to these departments only, we believe that a vast amount of capital which is now locked up would flow forth to effect a sorely needed social improvement.

IGNORANCE OF STYLE.—THE NEW WORKS, PALACE-YARD.

MR. E. M. BARRY, A.R.A., has done nothing to maintain the reputation of the architect of the Palace at Westminster by his last work—the piers and railings enclosing

Palace-yard. To anyone who knows something of the style in which the Palace is built, it must be a matter of surprise and regret that the present architect of the Palace should have learnt so very little even of the grammar of that style. According to all the evidence which the Messrs. Barry have advanced in the paper trial of Pugin v. Barry, the father of Mr. E. M. Barry must have been most intimately acquainted with all the details of the architecture commonly known as Perpendicular, or third Pointed, when the architect of the railings was in his long-clothes. It does indeed seem strange that, after years and years of apprenticeship to a master of one particular phase of Gothic art, the master should have been so cruel as not to have enlightened the pupil, or the pupil so obstinate as to refuse to be enlightened. A few months, a year at the furthest, would be time enough for any young man having eyes in his head to make himself master of the rudiments of our insular style, the Perpendicular. He would require no foreign travel, he would need but little home travel, for in almost every town he would find examples of this particular style. So that whether we accept Barry or Pugin as the art-architect of the Houses of Parliament, it is, we repeat, surprising that in our day, any man, principal or clerk, who had to work in harmony with such a building as the Palace of Westminster should make such a muddle of his subject and exhibit so much ignorance of the style to which he was necessarily committed. We can quite understand that Mr. E. M. Barry, like a number of his brethren, was never fond of the Gothic school of architecture, and, knowing what architects' offices are like, we can quite understand this even in the face of the evidence presented by the Endell-street Schools. It is possible too, that, even supposing Mr. Barry to be catholic enough to admire Gothic art as well as Classic work, he may yet have strong preferences, and hold, with Mr. Ruskin, that the later school of Gothic was "ignoble, uninventive and declining," and the earlier, "noble, inventive, and progressive." He may possibly have learnt almost to despise that kind of Gothic art in which his father seemed to him so proficient, and have narrowed his faith in Gothic to some very early phase of it. Still under no condition or conditions that we can think of is it possible to find an excuse. If Mr. Ruskin be right, the nation has accepted a building which some people think magnificent, "though there may not be from foundation to coping one ray of invention, or any other intellectual merit, in the whole mass of it." Still merit or no merit, declining or progressive, Mr. E. M. Barry was appointed its finishing architect, and might at least have taken the trouble to understand the nature of the work he was called upon to complete. That he does not understand it is plain to anyone who will take a walk round the railings of Palace-yard and note the details of the stone piers and the coarseness of the mouldings, their relation to one another, and all those things which indicate *style*. Of the general design, the intervals or spacing of the piers, the management of levels, the proportion of the mass of the pier, the outline of it, the curb, the gilding, and the lamps, we confess we are not at all enamoured; but for defects on these points excuse may be found. For the ignorance in detail there is no excuse. That a man should be unable to compose may be a shortcoming, but is not a blameable fault—that he should be unable to spell a single word or construct a single sentence grammatically are faults most blameworthy. It is very disheartening to us to write thus against the works of those who from their position may be assumed to be the art pioneers of the rising generation of architects. It is still more disheartening to us to find apathy and indifference so widespread, and mere personal considerations so strong, that so few care to take up the cause of art for its own sake. The individual shortcomings, or ignorance of Mr. Barry, are not much in themselves; the great danger at the present time is the very unwholesome influence such ignorance may possibly exercise on the future of many an unfledged architect. The letter of our correspondent "A. O. X." in our last impression should be taken well to heart by our younger readers. There is, without a doubt, a spirit of flippancy hovering over the young architects of the present day. They are too anxious to be heard, and not anxious enough to listen. A week or fortnight's trip on the Continent, a few hurried scratchy sketches, and a copy of Viollet-le-Duc, are considered by too many fit substitutes for the years of toil and study their elders have endured. This indifference to education, and this carelessness about the details of art, have been in a measure induced by the worldly success which appears to have fallen on men certainly not distinguished for their art knowledge. Young men see that the game of life is played sometimes successfully by fluking. They know that the right track involves hard uphill work, and to avoid this they take their chance with the flukes.

We are not crying "Wolf" without good cause, and Mr. E. M. Barry may be confident of this much, that it is not to hurt, or vex, or expose him that we have thus written, but rather to warn others, and especially our younger readers, that works showing ignorance of the grammar of art shall find no quarter in our columns.

A VISIT TO THE NEWARK PLASTER MINES.

NEWARK-UPON-TRENT, with its grim old feudal castle on the margin of the river, its quaint old timber houses, and its beautiful church, is a cherished spot to those versed in historic and legendary lore. Although in the midst of a district rich in objects dear to the antiquarian, we must pass on to the distant hills, where are situate the far-famed plaster mines. Upon ascending Beacon Hill, we turned aside into the works of the Newark Plaster Company, and, after hastily inspecting the various groups of men employed in selecting, dressing, baking, and grinding the plaster, we approached the face of a perpendicular cliff whose base is covered with vast heaps of débris. This "open working" has long been abandoned for the more economic mode of "mining." In a loosely stratified class of red marl this is not an easy matter, as the treacherous material above is rife with danger. The approach to the mine is by a descending tramway which leads to the lowest point of the old workings. Our guide, after penetrating the mine for a few yards, begged to return to the office, his ideas of safety being strongly in advance of remaining in such a dangerous place. Upon looking round at the numerous props, planks, and beams which were doing office in holding up the falling roofs, we could see ample cause for fears of personal safety. Being handed over to the foreman of the mine—a hardy fellow who has taken care of these underground works for five years—we commenced our dismal march. By the faint light of a candle suspended by a long wire swinging from the hand of our guide, we were able to form an opinion of the character of the workings. We were passing down a broad drift 10 or 15ft. wide, and from 6 to 8ft. high, with beautiful erratic veins of various coloured gypsum ornamenting its sides. Presently we had to step aside to allow a horse and wagon to pass; the boy in charge of the same, although provided with no better light than ourselves, pursued his dismal occupation with a joyous heart. We confess we were scarcely able to associate the popular air he was humming with the surrounding scene—conveying a load of crude gypsum along such a dreary road seemed the last thing in the world to inspire one to indulge in sounds of mirth and music. Admiring the wisdom of Providence which fits the back to the burthen, and makes light the heaviest load, we pursued our onward course. In the distance we could distinguish other lights. The atmosphere thus illuminated reminded us of a London fog. Our guide informed us that it was caused by the smoke from the powder used in blasting. The very idea of blasting in such a place evoked numerous fears. Upon nearing these lights, which were common candles stuck into pieces of clay, we were introduced to a class of workmen whose daily occupation is to dress the blocks of gypsum as they are brought away from the miners. Pursuing our journey we soon came to the end of the drift, where the miners were busily at work. There we were shown the system to which the mining of gypsum is reduced. The rock, which partly consists of layers of gypsum varying in shade from green and red to the purest white, is interstratified with consolidated red marl. Into this marl the miners bore horizontal holes for the insertion of blasts of powder, which, upon exploding, displaces the surrounding materials. A horizontal chase being thus formed, shots are placed in like manner in the material above and below, until the whole is cleared out except the lower stratum, which forms a step or raisement from the floor. This is a bed of solid gypsum, and is one of the best the miners pursue. Blocks of great size for architectural and other purposes may here be obtained. From being somewhat blue or variegated in colour the miners have given this vein the name of the "blue rock." The principle of these workings is to drive drifts of 15ft. in width to the extent of the boundary, leaving a wall of rock of the same thickness to separate them. This being done, cross drifts are cut, connecting them at regular distances. The mine is thus like an underground temple, set out in true parallelograms, its roofs being supported by innumerable pillars of massive strength. After the earth is thus honeycombed, the miners commence at the farthest extremities to work the area over again. This is done by sinking the floor 15 or 20ft., and, as the veins and beds of gypsum are extremely rich in the lower portion, this secondary operation is pursued at a trifling cost. These lower levels, save by the diminished ray of some distant lights, are lost in darkness, the penetration of which we found no easy matter. After climbing over tons of gypsum which had been raised from these lower workings, we passed along a series of narrow inclined planks, upon which men, who can accommodate themselves to lead a life in such an atmosphere, wheel heavy loads of stone. We are often surprised at the ease with which our labouring men wheel heavy loads along these narrow planks, but to pursue this feat in darkness is a work of no ordinary peril; yet such is the ease with which difficulties are overcome by practice, that these miners can pursue their calling with no other protection from falling into the abyss of darkness below than a candle fixed in front of their barrows.

Being landed at the lowest levels of the mine we are introduced to its grandest features. The pillars have so risen in importance that the roof which they support is lost in the darkness overhead. The lower beds of gypsum which now present themselves are of pearly whiteness, the lowest being of the greatest value and thickness. This is mined for artistic work, and to be manufactured into the finest plaster of Paris, and of late years a great trade has been carried on with this class of stone, in being ground up in an uncalcined state for "terra alba." This powder is used in enamelling paper, and in the preparation of calico and other textile fabrics. It is also largely used in confectionery and in the adulteration of food, the principal market for this purpose being on the Continent. Whether it returns again to this country, and is consumed as a condiment in our food and spices, we will not stop to inquire; certain it is that a large trade is done in this calcareous powder. Returning to the material itself, we find the men busily engaged

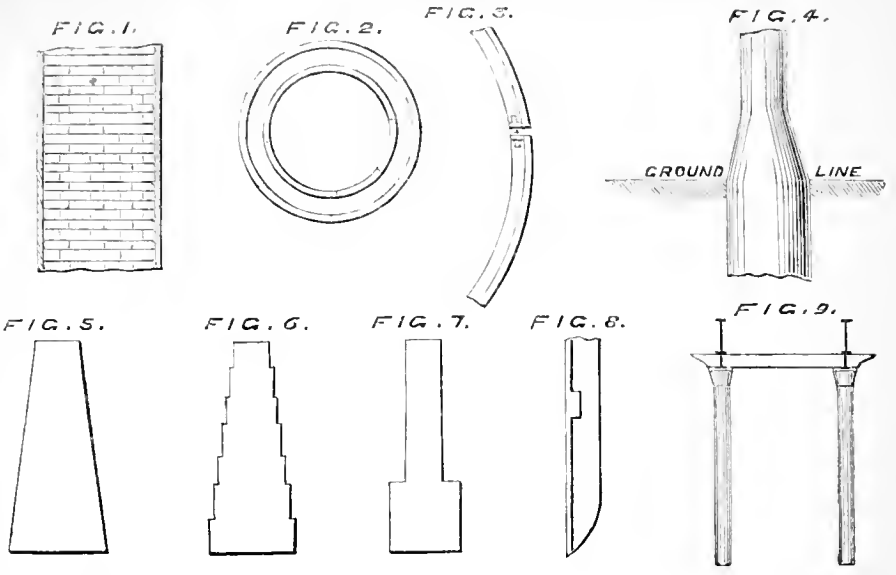
in drilling blast holes in this valuable bed of gypsum, extracting the white powder from the drill holes, or charging them with shot for blasting. From this point we were led through a perfect network of passages to examine the various sections, some of which were truly beautiful. Those which were newly cut, and had not been discoloured by the damp and smoke, reflected with their myriads of amorphous and nedular crystals our lights a thousandfold. Forgetting for a moment the position we were placed in, and being away from the noise of the miners, we were induced to question our guide, in the hope that such a great worker of geological sections in the upper series of the new red sandstone system might be in possession of that long sought philosopher's stone, "a fossil from the gypseous marls." Whilst waiting his reply we suddenly reeled, our breath became suspended, and, half unconscious with a sense of internal displacement, we hoarsely exclaimed, "Has the mine fallen in upon us? What was that terrible shock which shook the very earth?" "That, sir," said our guide, "is a blast;" he quietly continued, swinging the candle in his hand, "it is not so bad as some—we have every candle in the mine blown out at times by the concussion of the air." Before we had retraced our steps many yards, another and still another blast overtook us, and with mingled fears for our safety and our senses—which had never been so severely tested—we pursued our way to the mouth of this dismal mine. With dilated eyes we regained the light, and, after breathing the fresh air which is so sweet on the hills of Nottinghamshire, we left the Newark plaster mines, having the inward satisfaction that those amongst the curious who wished to explore them could do so without our envy.

ELEMENTS OF ENGINEERING.

CYLINDERS.

IN all examples of construction, the inherent strength of the whole design is due, either to the individual strength of a number of comparatively small component parts, intimately and rigidly connected to one another, or in that of a few massive constituents, serving to compose the fabric. The greater the number of parts, or the smaller their dimensions, the greater the necessity for solidity and firmly completing their connection. As a case in point, let us select a solid pier of masonry, and compare it with one similar in form and size, constructed of screw piles, in the manner described in our last article on "Elements of Engineering." When once the pier of masonry has been erected, it resists all attempts to disturb its equilibrium, as much, if not more, by its own insistent weight, as by any additional strength it may derive from the value of the cementing material between its component parts. It is otherwise with an assemblage of screw piles, which we have previously shown must be strutted, braced, and tied in almost every conceivable direction, to maintain them in that position which alone can guarantee their uprightness and safety. If once a pile gets out of the plumb, the cause originating its deviation from the perpendicular being still at work, its ultimate fall is only a question of time, and of the durability of the bracing. In truth, the thin film of cement put between the joints of two large stones, weighing, as many of them do in the present Thames Embankment and Blackfriars Bridge works, four or five tons, is completely a superfluous operation. Any force that would move the stones themselves, would speedily detach the cement. The case is very different where brickwork is concerned. In the first place, brick is a more porous substance; and, secondly, the quantity of the cementing material employed for each stone—regarding each brick as a small stone—bears a large proportion to that of the parts to be cemented together. Taking the ordinary mortar joint at an eighth of an inch, the proportion between the solid contents of a brick and the surrounding mortar will be about six to one. When bricks are not the material constituting the structure, but large stones are used instead, the proportion becomes almost infinitely great, as the mortar increases simply as the square, the thickness of the joints being constant, while the stones increase as the cube. Apologising for this digression, we now return to the more immediate purport of our article.

ELEMENTS OF ENGINEERING.—CYLINDERS.



As screw piles present peculiar advantages in certain localities, which counterbalance the complexity of their arrangement, and the element of weakness always attached to designs composed of a multitude of small subordinate parts, so do cylinders afford a freedom from many of the disadvantages possessed by the other means of laying foundations under water. These latter do not attain to the solidity and imposing massiveness of the solid pier, yet they have more inherent strength, owing to their increased dimensions, than the screw piles. The real difference is mainly one of degree and not of kind, if we except the absence of the screw flange upon the lowest length of the pile. There is, however, a very important difference to be observed in the duties demanded of piles and of cylinders. Piles act as the *bonâ fide* support of the superstructure; while cylinders, after serving the purpose of laying a solid foundation under water, may be regarded more in the light of a casing or protection to the concrete, masonry, or brickwork contained within them, than as sustaining the weight of the bridge resting upon them. A vertical section taken through one of the cylinders of the Charing-cross or Cannon-street bridges would represent the appearance shown in fig. 1. The real utility in the employment of the cylinder system is the facility it affords, as a perfectly watertight cofferdam, of building up a pier of solid material under water, with nearly as much rapidity and safety as the operation could be carried out upon dry land. The diameter is seldom less than six feet, as a smaller dimension would interfere with the working of the men inside, and the prosecution of the undertaking. Moreover, as the contents are ultimately intended to support the superstructure, it would scarcely be judicious to employ a pier with a less minimum breadth. There is also but very little extra difficulty and expense incurred in sinking a cylinder exceeding another by merely a foot or two in diameter. All the tackle and temporary plant required in the one instance would be equally necessary in the other, and the mere cost of the material would be too trifling a consideration to be allowed to interfere with the result. The shape usually chosen for cast iron cylinders in plan is round, although at first sight it would appear as if they should be of the same form as an ordinary pier, that is, rectangular in the centre portion, and either pointed or curved to an angle at the extremities. When, however, it is kept in view how small their dimensions are in comparison with a solid pier running the whole breadth of the bridge, it is manifest that the circular form offers scarcely any appreciable difference in resistance to the flow of the water. There is, besides, a very forcible objection to employing cast iron plates with a sharp angle in the position of a cutwater of a pier, as, from the brittleness of the material, a blow from any heavy body floating in the stream would certainly fracture it. The cylinders encasing the piers of the Charing-cross and Cannon-street railway bridges are circular in plan, and those of the former have different diameters, according to their height above foundations. From the bottom up to the level of the ground they are fourteen feet in diameter, and from that level to the cross girders over head they are ten feet. Their plan, viewed from above, is shown in fig. 2; and they are composed of segments cast with horizontal vertical flanges upon them, both for the purposes of strength and also to allow of each segment to be bolted to its neighbours. A peculiarity in the joint is that the separate segments do not touch one another, but a small space is left, as shown in fig. 3, which is filled with iron cement, through which the connecting bolts pass To ensure an accurate close fit the joints of the segments are all planed and faced. It will be seen, on referring to fig. 3, that the flanges are cast upon the inside of the segments, which not only, similarly to screw piles, is indispensable to those lengths penetrating the substratum, but also enables the bolting up of the separate segments to be accomplished with greater facility and convenience. Where the dimensions of the cylinder, as in the case of a small screw pile, are contracted, it is less laborious to bolt up the different lengths from the outside, as the workman has abundance of room, and is not hampered in the use of his tools.

At the ground line, as represented in fig. 4, the part of the cylinder in the structure already alluded to having a diameter of fourteen feet, slopes up at an angle to that of ten feet in diameter above ground.* Generally, when there is a difference in the diameter or

* As we are dealing with the subject generally, we have selected the cylinders of the Charing-cross Bridge merely as an example, and not as a pattern or model. The reader will find a full description of the whole of this bridge in a paper read before the Institution of Civil Engineers by Mr. Hayter.

dimensions at the top or bottom of any pier, whether solid or hollow, the two inequalities may be united or reconciled in one of several methods. The most usual is that of an uniform batter, especially when applied to brickwork or masonry (see fig. 5); and there would be not the slightest difficulty in employing this principle in the construction of cylindrical iron casing piers. The wrought iron pillars carrying the roof and galleries of the Exposition Universelle were made of this form, although their horizontal section was rectangular instead of circular. An increase towards the base may also be obtained, as shown in fig. 6, which presents a very elegant appearance to the eye, or the difference may be surmounted by a single offset at right angles, where it is judged advisable to enlarge the dimensions of the structure. In the case of cylinders exposed to the action of tidal waters, the increase by either one or successive offsets would be a less preferable plan of augmenting the size compared to that in fig. 5 or fig. 4. Owing to the quantity of detritus and solid matter contained in the stream, those portions of the cylinders below high water mark, if formed in this manner, would constitute small receptacles for the deposit of foreign substances, and at low water present a very unsightly appearance. Strictly speaking, the junction of the two dissimilar segments, represented in fig. 4, is identical with that shown in fig. 7, except that the offset is bevelled off at a very flat angle. The vertical ribs cast upon the interior of the bottom segments are tapered off (see fig. 8) to allow of the free penetration of the cylinder into the bed of the river or sea, and also to prevent any chipping of the edges taking place. It is difficult to lay down any rule or the proportion of thickness to be observed in the castings, but the limits may be taken as lying between one inch and one inch and a half. In bolting the various segments together, the joints, where possible, should always alternate—that is, the different lengths should break joints with one another. This was not done in the Charing-cross Bridge cylinders, and it was alleged that by not complying with this usual detail the horizontal joints fitted better. It is probable the case was so, but it is not sufficient to form a precedent, nor do we acknowledge the validity or force of the argument in any degree. The absence of all bracing and strutting is a feature favourable to the employment of the cylinder system, and draws a broad line of distinction between that system and the adoption of screw piles. The only bracing that cylinders require is a strong connection at top, which is easily and most advantageously effected by the cross beam necessary to support the roadway, supposing the main guides to rest immediately over the longitudinal axes of the cylinders. This arrangement is represented in fig. 9, and is that evidently presenting itself as the one most suitable for adoption whenever it can be applied with propriety. Care, however, should be taken in bedding the girders that they should not actually rest upon the edges of the cast iron casing. All danger of this occurring can be readily obviated by carrying up the internal pier an inch or so above the outer casing, which is best accomplished by capping the pier with a massive granite or limestone block capable of bearing any weight short of what would crush the material. Having completed a description of the cylinder principle, the next step is to consider the means of sinking them. There are several different systems in use, but, as these are all equally applicable to the sinking of caissons—another description of subaqueous foundations—we shall reserve an account of them until we have touched upon the latter method of laying the foundations of piers, harbour-walls, and other examples of engineering construction. This we propose to do in our next article relating to "The Elements of Engineering."

GOSSIP FROM GLASGOW.

(From our Correspondent.)

Whether men are to be made moral, good, and wise by Act of Parliament—by Household Suffrage, Technical Education, or Permissive Beer Bills—or not, meanwhile crime creeps apace with our so-called civilization, and accordingly Glasgow is crying out for more of court-room in which to administer justice, and gaol-room in which to punish. The additional court accommodation is to be attained by a conversion of the present "County Buildings" in Wilson-street, and the erection of new towards Ingram-street; also by altering, in the Old Gaol at foot of Saltmarket, the Small Debt Sheriff Court into rooms for witnesses. It will be necessary to apply to Parliament for power to raise the requisite ways and means for this extension of courthouse accommodation, and the standing orders require the preparation of an explanatory block-plan; but the Commissioners have instead had plans made out in detail and estimated, the cost being £36,000 for the alteration and addition in Wilson and Ingram-streets, and £4,000 for the alteration at foot of Saltmarket. No street in Glasgow is already richer in public buildings than is Ingram-street, and the new façade of the courthouses will be a most important addition, although, unfortunately, it will have to face the north. It is well that the alteration of the Old Gaol will not affect the exterior—a remarkably fine elevation in Greek by Stark, albeit without the platform on which his excellent judgment originally designed it. The prison extension will assume the form of an addition or additions to the present Bridewell in Duke-street at a cost of about £50,000. If the style of architecture of the present building be carried out, I fear that an undue punishment will be imposed upon such poor prisoners as have any feeling for the Fine Arts.

The insurance companies are following the banks in the erection of palatial offices. The Scottish Widows' Fund and Life Insurance Society have, with this view, just purchased a very large property in a commanding situation, the corner of Renfield and West George-streets. Although at present covered with substantial buildings, about their demolition there will be little hesitation, as lately a public edifice in their immediate neighbourhood was pulled down before that it had either shown any decay or known a second decade.

Although such mere materialism as a slated and fenestrated big box of stone, timber, and cast iron might be occasionally removed, one's idea of the peculiar status of a statue is the *statu quo*. In Glasgow we exercise an extraordinary amount of deliberation in choosing sites for our statues; but, after all, we surely either choose not well, or else are foolish enough not to let well alone. The Queen's Statue, erected only a few years ago in St. Vincent-place, has been lately erected over again in George-square, and the other day the Town Council resolved that the statue of Sir John Moore be removed to make way for that of Lord Clyde. Of course the public have been addressed on the subject in "letters to the editor," from "A Constant Reader" and "A Peninsular Veteran." Hierocles speaks of a brick as a specimen of a house; and Glasgow has just received a specimen of the Clyde Statue in the form of a bust, which has been kindly sent by Mr. Foley to our "Portrait Exhibition." There have been exhibited in Glasgow, also, busts of Lord Clyde by Adams and Ewing.

Competitions are a *questio vexata* here as well as in London. In my last I mentioned that the United Presbyterians, in asking designs for a church, bound the competitors over to merely Greek or Gothic, but the Reformed Presbyterians have shown themselves even more knowing. Ever since the so-called "National" Wallace Monument Competition, when, notwithstanding that competitors were strictly limited to "India-ink," one boldly ventured upon colour, and was accepted, competitions have had anything but a sweet-smelling savour about them. The Reformed Presbyterians have guarded themselves in a most effectual way against such malpractices by—well, what do you think?—issuing the paper on which the elevations are to be drawn, a paper that, even if made expressly for the purpose, could not have better served it. It is whispered in "circles likely to be well informed" that the committee will be aided in its decision by a professional assessor, so, if "justice" be not given for once, it at least seems as if intended. But the committee must needs know that long ago a patent was taken out for using up even the best intentions into Tartarian pavement.

We have had another visit from Mr. Bazalgette and Mr. Bateman anent the sewage question. As now nothing of a public nature can be done without that noun of multitude conveying plurality of idea, Mr. Demos getting his hand in, a "sewage association" has been formed, in which essays are periodically read on the most economical means of removing and utilizing the city *excreta*. As, according to Dogberry, "comparisons are odorous," I am happily spared the unpleasantness of pronouncing upon one or other of the schemes set forth by members of the association; and, notwithstanding that in a multitude of counsellors there is wisdom, I ask to be excused if I put my trust in an individual engineer, who, like Bazalgette, has reported upon plans for the improved drainage of such towns as Belfast, Folkestone, Dublin, Brussels, Oxford, Norwich, Cambridge, Cheltenham, and Saint Leonard's. To Bateman we are greatly indebted for furnishing us with an exhaustless supply of pure water, and, if he be as successful in ridding us of the foul, our gratitude will be none the less.

The same day that the Town Council resolved upon the removal of the statue of Sir John Moore, a plan for providing accommodation in the Corporation Property, Sauchiehall-street, the building in which are the several art galleries, for the School of Art, the Philosophical Society, and the Institute of Engineers, was exhibited and considered. The plan embraces also retiring rooms in connection with the upper galleries for the use of the corporation, and a hall about forty feet by thirty for a museum for inventions, models of machinery, &c. The School of Art is, I believe, prepared to enter into a lease for twenty years at £300 per annum, and the Philosophical Society and the Institute of Engineers conjointly into a long lease at £200 per annum. The Galleries sub-committee expressed its opinion that having such establishments under one roof would tend to promote the interests of art and technical education in the city, and that the return to be secured is sufficient to justify the proposed expenditure.

All building business is unusually dull. There is little doing in even speculative enterprise, notwithstanding that of late the rent of almost all classes of houses have been considerably raised.

PLUMBERS' WORK.

A paper on this subject was recently read before the Architectural Association by Mr. J. A. Bunker. Dividing his subject into three sections—Historical, Chemical, and Practical—he referred, first, to the great antiquity, importance, and wide diffusion of the metal lead. He then gave the results of various experiments that have been made with a view to determine the exact action of water on lead pipes. Passing to the practical part of his subject Mr. Bunker said a plumber who really understood his business should be able to cast lead into sheets even as thin as 4lb. to the foot superficial. In casting sheet lead, a copper is provided, well fixed in masonry at the upper end of the workshop, near the mould or casting table, which consists of strong deal boards well jointed together, and bound with bar iron at the ends. The sides of this table, of which the shape is a parallelogram, varying in size from 4 to 6ft. in width, and from 16 to 18ft. and upwards in length, are guarded by a frame or edging of wood 3in. thick, and 4 or 5in. higher than the interior surface, called the shafts. The table is fixed upon firm legs, strongly framed together, about 6 or 7in. lower than the top of the copper. At the upper end of the mould nearest the copper a box called the pan is adapted in its length to the breadth of the table, having at its bottom a long horizontal slit from which the heated metal is to issue after it has been poured in from the copper. This box moves upon rollers along the surface of the rim of the table, and is put in motion by means of ropes and pulleys fixed to beams above. While the metal is melting, the surface of the mould or table is prepared by covering it with a stratum of dry and clean sand regularly smoothed over with a kind of rake, called a strike, which consists of a board about 5in. broad, and rather longer than the inside of the mould, so that its ends, which are notched about 2in. deep, may ride upon the shafts; this being pressed down the whole of the table reduces the sand to a uniform surface. When this is done, the pan is brought to the head

of the table close to the copper, its sides being guarded by a coat of moistened sand to prevent its firing from the heat of the metal, which is emptied in with ladles from the copper. These pans or boxes are made as to their contents equal to the quantity of lead required to cast a whole sheet at one time, and the slit is so adjusted as to let out during its progress along the table just as much as will completely cover it of the thickness and weight per foot required. Everything being thus prepared, the slit is opened, and the box is moved along the table, dispersing its contents from the top to the bottom, and leaving in its progress a sheet of lead of the desired thickness. From this description it will be understood how the old lead cisterns, fast disappearing, were cast. The pattern required for the front and ends would be impressed in the sand, and when cast the sheet of lead would thus be ornamented, and being bent at certain points at right angles the cistern would be formed. The great objection to cast lead is that it frequently happens in casting that small air holes are left through which water will of course find its way. This difficulty is overcome by milling the lead. Milled lead being now nearly always used, all students should acquire by experience the power of testing, with the aid of the thumb and finger only, the several weights of milled lead, and, as a rule, not believe too readily in heavy 4lb. lead when it ought to be 5lb.

In using milled lead for gutters, flats, and flashing, let the leading principle be that of giving the metal as much liberty as possible to expand and contract as it may be necessary according to the variations of the temperature: this is done by dividing flats into narrow strips by using rolls which should not be more than 2-6 apart. Gutters should not be more than 10ft. long without having drips or rolls as may be necessary. In ordinary gutters the lead should always be at least 9in. under slates, and 6in. against vertical walls, and be properly flashed. The flashes should be well wedged and pointed to brickwork and burnt into stonework. This latter plan is not done so often as it should be; a groove or chase is cut into the stone, the edge of the flashing is then inserted, a length of clay, properly prepared, is attached, and molten metal poured in in such a way as to make the edge of the flashing and the metal poured in one solid mass.

Lead pipes used for conveying water to and from cisterns, sinks, &c., are jointed together with solder, either by wiped or blown joints. The former is the older method, and consists of opening one end of the pipe in order to receive the end of the length of the pipe to be joined with it, which end has been previously shaved; the two ends being brought together and secured in a steady position, the molten metal, as contained in a small ladle, is taken in the one hand, and the wiper in the other—metal is poured on the joint and wiped round until the bulb join, so well known, is obtained; these joints are generally finished off with a hot iron, but an experienced plumber would be able to wipe a joint and finish it off without its use. It is of great importance in these joints that the molten metal should be used at a certain degree of heat, such as can only be ascertained by experience. Where this experience is wanting it is generally sought to conceal that fact by the use of the iron and tallow, the object being to leave the solder such a colour that to an experienced eye it may appear to denote a joint made with metal at the right heat and wiped and finished without an iron. Blown joints are formed, as may be inferred from their name, with the aid of the blow pipe; these joints are not so neat in appearance as the wiped joints, but many believe they are much stronger, because, by the aid of the blow pipe, the molten solder is brought into contact with the ends of the pipes, and the whole formed into a more solid and compact joint than can be done by merely pouring over the liquid metal on ends of pipes that must chill it, and thus, unless great care is used, form but an imperfect joint.

From experience of the serious consequences of taking waste pipes of cisterns into D-traps, soil pipes, &c., he advised that in all cases these pipes should be carried into rain-water pipes, external gutters, or into internal sinks, indeed anywhere but where they will become as ventilating shafts to the soil or drain pipes. He suggested the more extensive use of air pipes from D-traps and soil pipes; they might be carried into chimney shafts, or otherwise disposed of, and at a very small expense would greatly assist in keeping houses free from noxious smells. He trusted that the subject would receive increased attention from architects, and earnestly advised them never to be careless over the specification for plumbers' work.

REMARKABLE MECHANICAL INVENTION.

A NEW JERSEY (United States) paper tells the following story:—Mr. Zaddock Deddrick, a Newark machinist, has invented a man; one that, moved by steam, will perform some of the most important functions of humanity; that will, standing upright, walk or run, as he is bid, in any direction, and at almost any rate of speed, drawing after him a load whose weight would tax the strength of three stout draught horses. Six years ago the inventor conceived the novel idea of constructing a man that should receive its vitality from a perpetual motion machine. The idea was based on the well-known mechanical principle, that if a heavy weight be placed at the top of an upright slightly inclined from the vertical, gravitation will tend to produce a horizontal as well as vertical motion. The project was not successful. However, by observing carefully the cause of failure, persevering and perfecting the man-form, and by substituting steam in place of the perpetual motion machine, the present success was attained. The man stands 7ft. 9in. high, the other dimensions of the body being correctly proportioned, making him a second Daniel Lambert, by which name he is facetiously spoken of among the workmen. He weighs five hundred pounds. Steam is generated in the body or trunk, which is nothing but a three horse power engine, like those used in our steam fire engines. The legs which support it are complicated and wonderful. The steps are taken very naturally and quite easily. As the body is thrown forward upon the advanced foot the other is lifted from the ground by a spring and thrown forward by the steam. Each step or pace advances the body two feet, and every revolution of the engine produces four paces. As the engine is capable of making more than a thousand revolutions a minute, it would get over the ground, on this calculation, at the rate of a little more than a mile a minute. As this would be working the legs faster than would be safe on uneven ground or on Broad-street cobble stones, it is proposed to run the engine at the rate of five hundred revolutions per minute, which would walk the man at the modest speed of half a mile a minute.

The fellow is attached to a common Rockaway carriage, the shafts of which serve to support him in a vertical position. These shafts are two bars of iron, fastened in the usual manner to the front of the carriage, and are curved so as to be joined to a circular sustaining bar, which passes around the waist, like a girth, and in which the man moves so as to face in any direction. Besides these motions, machinery has been arranged by which the figure can be thrown backward or forward from a vertical position nearly forty-five degrees. This is done in order to enable it to ascend or descend all grades. To the soles of the feet spikes or corks are fixed which effectually prevent slipping. The whole affair is so firmly sustained by the shafts, and has so excellent a foothold, that two men are unable to push it over or in any way throw it down. In order to enable it to stop quickly, it is provided with two appliances, one of which will, as before stated, throw it backward from the vertical, while the other bends the knees in a direction opposite to the natural position. An upright post, which is arranged in front of the dashboard, and within easy reach of the front seats, sustains two miniature pilot wheels, by the turning of which these various motions and evolutions are directed. A sufficiently large amount of coal can be stowed away under the back seat of the carriage to work the engine for a day, and enough water in a tank under the front seat to last half a day. In order to prevent the "giant" from frightening horses by its wonderful appearance Mr. Deddrick intends to clothe it and give it as nearly as possible a likeness to the rest of humanity. The boiler and such parts as are necessarily heated will be encased in felt or woollen under-garments. Pantaloons, coat, and vest, of the latest styles, are provided. Whenever the fires need coaling, which is every two or three hours, the driver stops the machine, descends from his seat, unbuttons "Daniel's" vest, opens a door, shovels in the fuel, buttons up the vest, and drives on. On the back between the shoulders the steam cocks and gauges are placed. As these would cause the coat to set awkwardly a knapsack has been provided that completely covers them. A blanket neatly rolled up and placed on top of the knapsack perfects the delusion. The face is moulded into a cheerful countenance of white enamel, which contrasts well with the dark hair and moustache. A sheet-iron hat with a gauge top acts as a smoke stack. The cost of this "first man" is 2,000 dol., though the makers, Messrs. Deddrick and Grass, expect to manufacture succeeding ones, warranted to run a year without repairs, for 500 dol. The same parties expect to construct, on the same principle, horses which will do the duty of ten or twelve ordinary animals of the same species. These, it is confidently believed, can be used alike before carriages, street cars, and ploughs. The man now constructed can make his way without difficulty over any irregular surface whose ruts and stones are not more than nine inches below or above the level of the road.

RUNNING-UP HOUSES.

DR. LANKESTER, the coroner, last week held an inquest at the Torrington Arms, Finchley, on the body of George Moore, who was killed by the falling of a portion of a building, on which he was working. The case only furnishes another lamentable instance of the extraordinary way in which houses are "run-up" in London, and we need scarcely say that it reflects the greatest discredit on those who can be found to execute such work. The evidence showed that the house in question was intended for a public-house, and an effort was being made to get it finished in time for the forthcoming licensing day. In order to obtain large cellarage room the stacks of chimneys were not carried down to the ground, but built upon the party wall, which was 28ft. long and 9in. thick. As soon as the centring was removed the wall and chimneys fell, burying the deceased and suffocating him. Mr. Richard Wale, an architect, who was examined, said that no architect could have designed and no competent builder have erected a building on the plan of the one which fell. It could not possibly have stood. If it had been propped up for twelve months and the support then removed it must have fallen. The dead weight upon the structure was altogether too great for its capacity. If the chimneys had been carried down to the ground the wall would have stood. He had been in his profession for thirty years, and had never seen a building on such a plan before. Henry Moule Thomas, a carpenter and joiner, living in Finchley, admitted that he prepared the plans and specifications for the construction of the building for a Mr. Denton but with respect to the chimneys he merely suggested the way they should be put up, and left it open for Mr. Denton to decide. He thought the wall was strong enough to bear the weight, and considered that the accident had been caused by the contraction and expansion consequent upon alternate cold and warmth. He had certified that the work was carried out properly so that the builder might get his money. The jury, after returning a verdict of "accidental death," passed a resolution attaching blame to the owner of the house for not obtaining competent assistance, and extending the censure to all the principals, but they subsequently differed about the exact terms to be employed, some thinking the resolution as worded by the foreman not strong enough, and others thinking it too strong. Ultimately the coroner and six jurors signed the following resolution:—"The jury empanelled at the Torrington Arms, Finchley, on the 27th day of February, 1868, on view of the body of George Moore, having returned a verdict of 'accidental death,' are of opinion that sufficient care was not taken by the owner of the building in which the deceased met his death, to secure efficient assistance in the planning and construction of the said building, and the said jury are also of opinion that the said owner and his advisers and assistants are culpable for the deficient arrangements by which the said deceased met his death."

Four companies share the work of cleaning the streets of Paris, the contracts for it being obtained on sealed tender. The persons employed are divided into street sweepers of the first and second classes, with auxiliaries, men and women. The total number in the service is about 6,000. This little army of labourers is paid, not by the day, but by the hour. The sweepers of the first class receive 38 centimes, and those of the second 29; the male auxiliaries, 25; and the female, 20. As the work is ten hours daily, summer as well as winter, the wages of the men amount to 2f. 50c., and the women to 2f. Nearly all these labourers, of both sexes, come from Alsace, Rhenish Prussia, the Grand Duchy of Baden, and Luxemberg, but chiefly from the latter.

FRET CUTTING AND PERFORATED CARVING.*

In noticing this book on Fret Cutting and Perforated Carving, we can recommend it as containing many valuable practical hints for the amateur, and a number of good and useful designs for fret cutting. The book is elegantly got up with illustrations and descriptions of tools necessary for the use of the learner. It possesses, however, many defects, some of which we will point out. The designs, fifty-three in number, are appropriate, and, considering their effectiveness, are not difficult to work out, and, being applicable to articles of utility, the professional fret cutter will find them serviceable. Should, however, the amateur attempt to execute them according to the instructions given, we are afraid he will be disappointed. The mode of working, although apparently simple, is exceedingly difficult, and, should the amateur by perseverance overcome all the difficulties, he may have the mortification of learning that much better work can be produced by an easier and simpler method in much less time. Why should the amateur adopt the most primitive and difficult method, when, by the outlay of a few pounds, he can purchase a machine which will enable him to do his work with ease and satisfaction? Fret work is now extensively used in commerce, simply because it can be produced, by the aid of the fret cutting machine, cheaper and better than by the old methods. These machines are worked in the following manner. The work is held and guided by both hands on the table of the machine; the saw works up and down by means of a treadle similar to a sewing machine. In the absence of a machine there is another method commonly used, which is preferable in many respects to the one recommended by the author. It is a kind of wooden vice (called a donkey), which holds the work steady. The fret cutter guides his work with one hand, and saws with the other. His position is easy, his work is straight before him, and he has more command over it. This vice may be either screwed to the bench, or stand independently. The drilling tools and saws recommended in the work are the proper ones, but, when several pieces are to be worked together, the manner of fastening them by means of glue and paper is not so good as tacking them together with French brads in the margin of the work, as it saves the trouble of removing the paper. A piece of fine glass paper should be held firmly on a flat cork, and lightly rubbed over the rough side of the work; it removes the burr produced by the saw, and gives the work a sharp appearance. Fret cutting is purely a mechanical process—we may say it is the preparation of the wood for the carver, or, at the most, it is only a thing half expressed, and requires the aid of the carver to give it full form and expression. The author of the book seems to acknowledge this, and gives a few practical instructions to guide the amateur in this method of proceeding. The carving tools recommended should be taken rather as a sample of what is required than a complete set. The pupil is told to cut away a portion of the leaves so as to lay them in a natural and graceful position, and then to carve in the stems and veins. Again we must say the amateur is in a fair way of being disappointed unless he first obtains the assistance of a practical carver to instruct him in the way of holding the tools, and show him the peculiarity of the grain of different woods, and, above all, in the manner of producing certain effects in the wood, as a substitute for the forms of natural details. Should the amateur attempt to copy Nature exactly, he will find he labours in vain. The nature of the material is such that it will not allow of so fine a manipulation. The experienced carver has learnt to produce effects in carving which are, after all, only a substitute for natural forms. The pupil having been rightly instructed in the use of the tools, with the exercise of a little patience and practice he will soon master the mechanical part of carving, and then his artistic powers will be brought into play. Then, in fact, it is that carving becomes truly an agreeable and delightful amusement. The fact that so many of our best carvers began carving as an amusement is encouraging to amateurs. It is not necessary that a great deal of time should be devoted to the mere manipulation of the material; that is a fault of modern carvers. The principal part of the carvings of the present time are nothing more than a display of mechanical cleverness and skill in working the material. The old carvers were content to carve wood as wood, caring little for the fineness of the work, so long as it expressed some noble thought or some beautiful idea. We are afraid such books as we are now considering have a tendency to lead the amateurs to devote too much time to the mechanical part of carving.

* Fret Cutting and Perforated Carving. Bemrose and Sons, London.

CAB-RIDES FOR NOTHING.—LONDON BARRICADES.

Our friend, the London cabman, is usually considered a proficient in the art of extortion, and the last person in the world likely to give his professional services gratis. This, however, is only partially true. In one part of London, it is quite a common thing for cabby to stand and offer the use of his vehicle freely to the first passer by, who will accept it—he will even thank those who avail themselves of his offer. However, like most of our poor humanity, a selfish motive lurks in the recesses of cabby's breast. The offer is only made in the neighbourhood of those London barricades, the private street bars and gates, to which we called attention a short time ago. Cabby is not allowed to pass these sacred barriers with an empty cab, and, as it is often an object with him to save time and distance, he loiters about till he finds some workman or poor person who will accept a lift, "for the honour of the thing," whereupon he drives up boldly to the gate, which is duly opened by the obsequious beadle, and cabman and "fare" pass triumphantly through. We call attention to this, as a very practical illustration of the inconvenience and obstruction caused by these barriers. If the London cabman finds it worth his while to resort to such an expedient, no further demonstration can be wanted that the free opening of them all would greatly facilitate other traffic. When cabby cannot get through with his empty cab, he is obliged to take it round other and more crowded thoroughfares, to his own and the public inconvenience. The same thing takes place in the case of loaded vehicles of all kinds, which are not allowed to pass at all, unless going to the inhabitants of the district; they thus crowd our other streets and contribute an enormous quota to that great roar and traffic which, let it not be forgotten, causes every week the destruction of four valuable lives, not to mention the maiming and injury of between thirty and forty others. Are we not a foolish generation to spend hundreds of thousands upon the formation of new streets to relieve this traffic, while so many of the old thoroughfares are closed for private pleasure or convenience?

WALNUT-TREE LITANY DESK, ST. ANDREW'S, WELLS-STREET, AND ALABASTER LECTERN AND CANDELABRA AT WORCESTER COLLEGE OXFORD.

We this week present our readers with a double plate, one representing a carved walnut litany desk, executed by Mr. Robinson, of 173, High Holborn, for St. Andrew's Church, Wells-street; and the other a lectern and candelabra lately fixed in the Chapel of Worcester College, Oxford. These were carved by Mr. Jacquet, of Stanford-street, Vauxhall-bridge-road. The figures of the latter and rough models of those in the litany desk were executed by Mr. Nicholls, sculptor, Hercules-buildings, the whole being designed and made under the superintendence of Mr. W. Burges, architect.

MANCHESTER NEW TOWNHALL.

We understand that at a meeting of the Manchester City Council held on Wednesday, the Mayor stated that the report of the architects consulted in respect to the designs and plans of the New Townhall, namely Professor Donaldson and Mr. Street, had been received. Those gentlemen name five of the eight sets of plans with approval, and recommend one for selection by the Council. It is pretty generally believed that the architect of the design recommended by the referees is Mr. Alfred Waterhouse, the architect of the Manchester Assize Courts. It may be mentioned here that the eight competitors are Mr. Brodrick, Mr. W. Lee, Mr. J. O. Scott, Mr. T. H. Wyatt, and Mr. Waterhouse, of London, Messrs. Speakman and Charlesworth, Mr. Worthington, and Mr. Salomans, of Manchester.

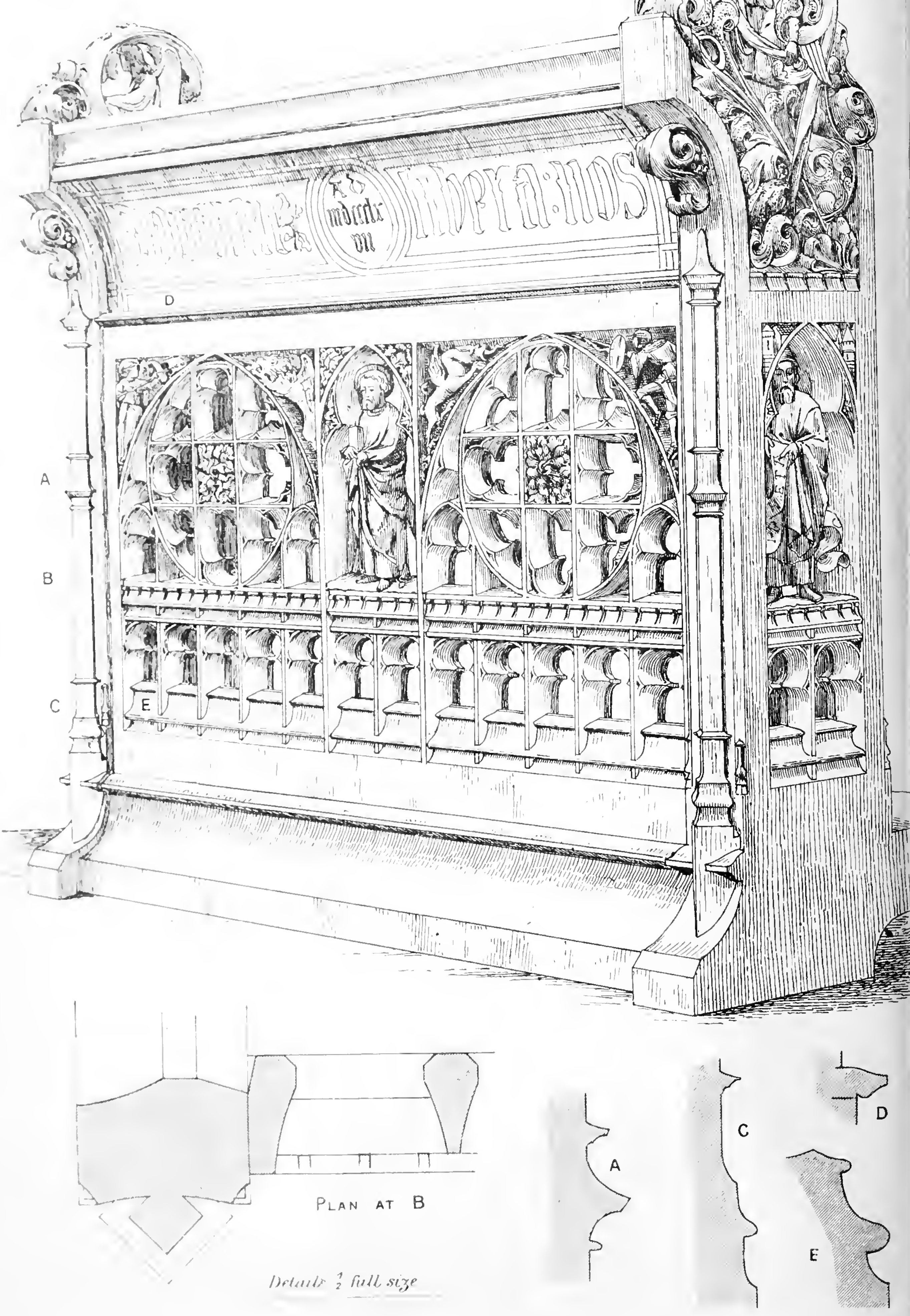
MR. RUSKIN ON ART TEACHING.

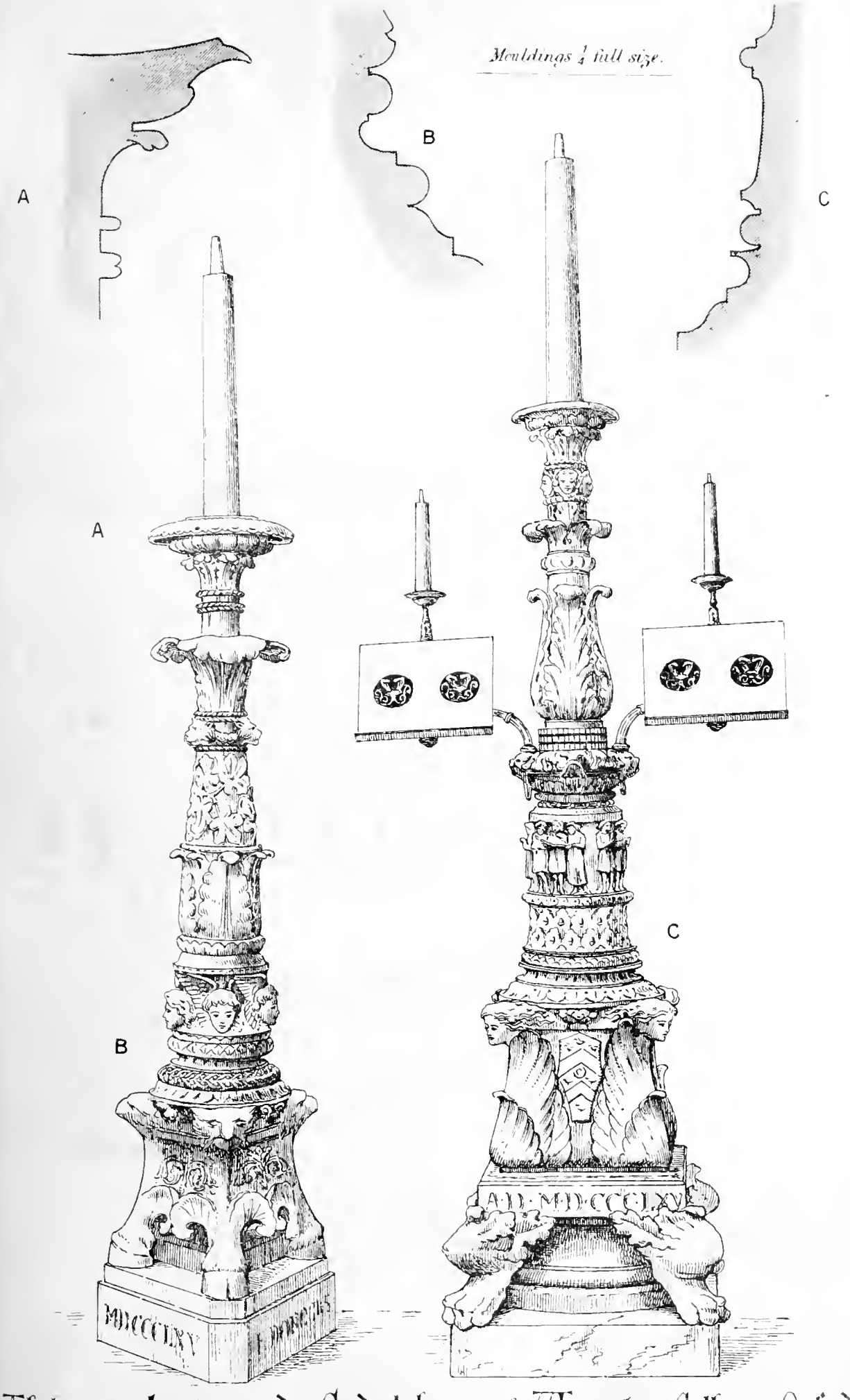
It appears that Mr. Ruskin has been invited to the forthcoming Exhibition of the Wakefield Industrial and Fine Art Institution. We regret to hear, however, that, owing to ill-health, Mr. Ruskin has been obliged to decline the invitation. In the course of an interview granted to the Mayor of Wakefield and other gentlemen on the subject of the institution, Mr. Ruskin remarked that he had been in indifferent health during the last two years, and for some time past had avoided public meetings, wishing to reserve his remaining years for quiet work. In the next place, his opinions upon the best manner of teaching art had lately undergone much change. He remarked that we had long been working from the wrong end; we had been trying to work downwards instead of upwards. All true art must be the efflorescence of a people's joy—the spontaneous outpouring of their inner happiness. The right way to lay the foundation of art, he believed, was to improve the condition of the dwellings of the people, by rendering them more comfortable and decent; to make the streets of our towns cleaner and less unsightly; to study more the purity of Nature, to consume our smoke, to cleanse our streams, and to use every means in our power to raise the people from the squalid misery and vice into which they have sunk—such misery and vice that a true-hearted man entering the slums of one of our great towns, if he did not perish by violence, must die of grief to witness the bitter wretchedness of the inhabitants. In these days, he said, we had too much mere talk of improvement; we thought too much of mere words; we paid too much attention to what a man said than to what he did. If there was any recollection of the little he had done, he should prefer to use what influence he possessed in quietly helping forward societies and institutions of a benevolent and charitable kind, and all such means as would promote the objects he had pointed out. On his being informed of the whole scope of the Wakefield Institution, Mr. Ruskin expressed his hearty approval of it, and said, although he could not come to the opening meeting, he should endeavour to send to the museum of the institution a leaf from some old missal, with a few words which he would himself write upon it, or a few objects of art which would not be without some helpfulness towards the main object of interesting the working classes. He now spent much time in examining and arranging minerals, in order to extract from them the many principles they contained; and he should, if he were able, also prepare a small series of minerals in a way which would be interesting, and send them to the museum, where they would, he hoped, be considered of value, not for their intrinsic worth, but for the lessons they would teach. There were great lessons of morality to be studied in a piece of quartz—still more in the forms of animal life. Ever since the great struggle between good and evil had commenced, since the serpent and the dove had first existed, these great lessons had been set before mankind in ever increasing circles.

On Wednesday next Mr. Thomas Beggs will read a paper before the Society of Arts, on "Courts of Arbitration and the Principles of Co-operation, as means of bringing into harmonious action the Interest of Capital and Labour." The importance of the subject, and the able manner in which, in all probability, it will be handled, will, no doubt, attract a large meeting.

Walnut · Litany-Desk, · St Andrew's, · Wells · Street.

W. BURGES, ARCHT.





Alabaster Lectern and Candelabrum at Worcester College, Oxford.

W. BURGES, ARCHT.

VERIFICATION.

WHEN we stated last week that the more a true statement was examined the more it became manifest, we did not expect that it would, in connection with the Pugin and Barry controversy, so soon receive such a complete verification. It will be remembered that Dr. Barry put as a frontispiece to his pamphlet a photograph of the drawing for the throne of the House of Lords. Mr. Pugin said that he saw his father make the design for the throne. Mr. Burton spoke from his knowledge that he knew the design was executed by Mr. Pugin's hand. Mr. Herbert also stepped on the stage and said he also saw Mr. A. W. Pugin make the drawing with his own hand. In answer to these statements Mr. Charles Barry, in a letter to the *Standard*, twits Mr. Herbert for his "powers of imagination," and says there was "not a line of Pugin's in the drawing in question, and further I say that any architect who was acquainted with the style of the two could not hesitate for a moment in recognising my father's hand throughout the drawing." He proceeds to rebuke Mr. Herbert for making "statements quite untrue," and for not "taking the slightest pains to test such statements." Whereupon Mr. Herbert returns to the charge, and solemnly declares that he saw Mr. Pugin make the "design" for the throne. His letter is as follows:—

SIR,—I would gladly have made a bridge of gold for Mr. Barry, as I do not doubt that he believes that his father made the design from which the photograph in Dr. Barry's pamphlet is taken. I would, however, ask him whether his father was in the habit of inserting in his own designs the initials of Augustus Welby Pugin? I ask this because I find in the upper part of the profile of the canopy of the throne between the pinnacles, on the left of the photograph, the separate initials, A. W. P., which my old friend had the habit—I might say the providential habit—of dropping into all kinds of places in furniture, hangings, metal work, &c. This is not a question of "imagination." Every person who will use his eyes may see (even in the small photograph) the initials, and all the world may judge whether I have given testimony in matters entirely unknown to me.—I am, Sir, your faithful servant, J. R. HERBERT, R.A.

7, Grove-end-place, St. John's Wood-road, Feb. 3.

This, then, puts the controversy for ever at rest. No destruction of documents, no suppression of evidence, no tortured interpretation of particular words, no special pleadings, will ever make the fact different. A drawing, and no less a one than that of the throne in the House of Lords, has been presented to the world as from the hand of Sir C. Barry, though it was nothing like anything that Sir Charles did, and resembled in foundation, feature, and spirit every drawing Augustus Welby Pugin executed. We can say, with the editor of the *Standard*, that we have carefully examined with a magnifying glass the photographs published by Dr. Barry in his pamphlet, and there is no possibility of doubt that the letters A. W. P. are to be found there. Mr. Barry in his last letter says, that he fails to see the letter A., and that the letters W. P. are intended for the Prince of Wales. The letter A. is written almost as plainly as W. P., and there it stands as an ineffaceable testimony that Augustus Welby Pugin designed the throne.

A great deal has been said about Mr. Pugin not accepting the offer of submitting the matter to the arbitration of the council of the Institute of Architects. As it is not matter involving any principle of architecture but purely a question of evidence, we do not see that a committee of architects would be the best tribunal to investigate it. If a court of arbitration be appointed, the legal mind should be largely represented in it. Let architects by all means form a portion of the court. If any such step be taken the best way would be to appoint a commission of enquiry, in which the persons most interested, and the general public should have confidence. If it were a question of altering the Houses of Parliament, or of passing an opinion on its architectural merits, the Council of the Institute would be a proper body to appeal to.

THE ARCHITECTURESQUE.

IT has been remarked that the man who can make two blades of grass grow where only one grew before should be regarded as a benefactor of mankind. We suppose that a proportionate amount of credit is due to him who contributes an additional word to our vocabulary, if the word be truly and really an addition. That, of course, is the important point. It must be something more than a word—it must be the word, one that is happily conceived, and exactly adapted to convey to the mind the idea intended to be conveyed. Moreover, it seems almost indispensable to its general acceptance that such term should be euphonious, smooth, and soft; it should come pat and glib to the tongue. It ought not to be a word hard to pronounce, a "jaw-breaker," or one of sesquipedalian proportions. Whether the new term which Professor Kerr is anxious to see added to our stock of architectural phrases altogether fulfils these conditions may safely be left to the decision of our readers. It will doubtless occur to some that the adjective "architecturesque" sounds not very musically on the ear, and that still less does the adverb "architecturesquely." They are a sort of five-barred gate words, rather difficult to get over comfortably. Nor is their meaning plain at first sight. Professor Kerr explained, in his address at the Architectural Association last week, that he found argument and justification for the use of architecturesque in the word "picturesque"; and this, by the way, is precisely what we cannot call the other word. It is not picturesque. But let us give in brief Professor Kerr's idea. Picturesque he defined as signifying worthy of being painted. It was purposely to fix and define this idea that the word was introduced into our language. It formulated a most valuable and essential idea. Having described the landscape painter's notion of what a picturesque subject was, he went on to say that he thought it desirable that we should have some word that would be equally useful in connection with the fine arts in architecture, one that would carry with it the same idea in regard to their own art. He suggested "architecturesque." It signified the picturesque in architecture, or architecture worthy of being painted. The word "picturesque" was not a mere name, but an entity of the painter's art upon whose existence he depended. And why should we not suppose a similar entity in other arts? Architecture was an essence of form and disposition. It used to be called the beautiful in building. For building was not architecture, nor was architecture building. There were various modes and various fashions of the picturesque. At one time the Italian villa was considered picturesque, then the Elizabethan style was so considered. Gothic churches, whatever else they might be, were always picturesque. Mediæval architecture was essentially so, and the French chateau and the Scottish castle, though not always comfortable places to live in, were always picturesque. Now, the architecturesque was architecture and nothing else. The Parthenon was cited as a building which had not one element at all picturesque, and it showed that the Greeks were a thoroughly architecturesque people. The site of the building, however, was picturesque. The Egyptian temples, again, were architecturesque and not picturesque. The Pantheon at Rome was the same; there was no attempt to make it pictorial. It was the same again with the Pompeian house, which was eminently architecturesque. We were thus led to perceive, according to Professor Kerr, that Classic work and Oriental work generally were essentially and primarily architecturesque only, and that mediæval architecture, on the other hand, was picturesque. Pursuing his idea into other arts connected with architecture, he observed that architecturesque painting implied subordination to architectural principles and forms. Then he took occasion to remark that the decorative paintings of Mr. W. B. Scott, which were recently illustrated in the BUILDING NEWS, were not, in his opinion, treated architecturesquely. They were admirably executed as paintings, but they had not been subordinated to architectural principles. Sculpture also ought to be adapted to the forms and purposes of the architect—that was, it should be treated architecturesquely. The statues at Temple Bar, though excellent sculptural works, were not adapted to their situation, and he thought that the statue of Sir Robert Peel at the New Palace at Westminster would present a very meagre and inartistic effect when unveiled. Its position was decidedly bad. As seen through the railing it looked like something inside a cage. Professor Kerr also instanced furniture, observing that cabinet makers always objected to the architect's designs for furniture. The reason was that the architect kept himself anxiously to architectural principles and failed to perceive the cabinet making principles. If furniture was to be well adapted it must be done by the architect. But it must be treated architecturesquely. In designing an interior, one is apt to treat it architecturally. Now, the first object of a plan being convenience, it must be treated architecturesquely. Adverting next to landscape gardening the Professor dwelt upon the architecturesque style of Italian, and the picturesque style of English gardening. In speaking of site, he said the Houses of Parliament had been treated by Sir Charles Barry as an essentially architecturesque building with reference to its site. The Thames Embankment had an interest to architects for the same reason. It was certainly an effort of the architecturesque. And the principle was to be seen in perfection in Paris in regard to the treatment of its streets. That city offered a striking contrast to the mediæval town, with its winding zigzag streets, and many turnings and corners, which were so picturesque. He thought this object was one of great importance, and if so, why, he asked, was it so completely neglected, as it was in London? There was not the slightest attempt made to dispose of our most costly buildings with a view to their architecturesque site, which would simply double their value. In concluding his address, Professor Kerr said that the subject of the architecturesque being entirely new, he had had no authorities to consult. He merely, therefore, suggested and offered reflections of his own. It was possible that he might be more or less wrong in his conclusions, but he hoped he had made his meaning intelligible. The subject, as it appeared to him, was one well worthy of careful study and further development.

The Professor's address, we may say, evoked, or provoked, less discussion than almost any address we ever remember to have listened to at the Association. Probably this was owing to the peculiar novelty of the subject. It certainly did not lack interest at the hands of Professor Kerr. However, there appeared to be a more than usual shyness, or at all events reticence, among the members, and very few opinions were ventilated. A vote of thanks to Professor Kerr was moved by Mr. Tarver, who thanked the lecturer for having given them a new word, which he thought they might often have occasion to make use of. He, however, differed with the Professor respecting his definition of mediæval architecture, which he conceived had as much of the architecturesque in it as the Greek, or as the Pantheon, for instance. A similar opinion was expressed by Mr. Lacy Ridge, in seconding the vote of thanks. This gentleman held that Gothic architecture contained all the same elements of beauty as the Classic *plus* the picturesque. He also objected to the description given of mediæval towns, where there was no absence of straight lines any more than in modern towns. As to the French capital he sincerely hoped that they would avoid the style adopted there. It was utterly dry and uninteresting. Mr. Phené Spiers, the

chairman, did not agree with Professor Kerr's opinion that the northern nations had gone in so exclusively for the picturesque, while the eastern nations had followed the principle of the architecturesque. The Egyptian statues supporting buildings, however, he thought, afforded an apt illustration of his argument, for those figures were invariably treated architecturesquely. He also agreed with the objection taken by the lecturer to Mr. Scott's decoration. The figures had the appearance of being cut off by the arches. He mentioned similar decorations designed by Rosetti at Oxford. They were some paintings round windows, and portions of the heads and figures were actually missing. Besides, the light coming in through the window prevented the picture being seen, and the effect was entirely lost. He hoped the buildings to be erected along the Thames Embankment would be treated architecturesquely, like the Houses of Parliament, and, though he himself did not object to a little irregularity in style, he was in favour of following the example of our French neighbours in this respect.

THE INTERIOR OF ST. PAUL'S CATHEDRAL.

THE notorious John Wilkes, it will be remembered, was confined in the Tower for calling the House of Commons a "den of robbers." He was compelled to make an abject apology on his bended knees before the House. On rising he addressed the Speaker in his usual sneering manner, and said, rubbing his knees, "After all, Mr. Speaker, this is the dirtiest house I was ever in." And for this he was sent back to the Tower. Had Mr. Wilkes seen the interior of St. Paul's he might have used similar language. We are afraid that St Paul's Cathedral is the dirtiest cathedral in England or anywhere else. Several complaints have reached us regarding its very neglected state. It is complained that dust and dirt lie thick in all parts of the edifice, and that one or two of the marble monuments in particular are disgracefully dirty. Surely some little attention ought to be bestowed on these interesting and beautiful memorials of the dead. No one who has seen the cathedrals on the Continent could fail to have been struck with their great cleanliness as compared with those at home. Compare, for instance, the Notre Dame in Paris with St. Paul's. The "dim religious light," of which Milton sings, is scarcely applicable to St. Paul's, if we except the dimness which is owing to dirt. It is this which gives the noble interior an oppressive rather than impressive air. It is dull rather than solemn. As compared even with other English cathedrals, the greatest cathedral in the country is wretchedly looked after.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT a special meeting of the members of this Institute held on Monday last, the recommendation of the council that the Royal Gold Medal for the current year should, with her Majesty's gracious sanction, be awarded to Austin Henry Layard, D.C.L., M.P., was unanimously adopted.

The following medals and prizes were awarded:—The Soane Medallion, to which, under certain conditions, the sum of £50 is added by the Institute (subject of competition, "Design for a Townhall") to W. George Walls. A second prize of £20 was given by W. Tite, M.P., president, to Mr. Henry L. Florence, whose drawings were considered next in order of excellence; and a medal of merit to Mr. Herbert M. Marshall.

The late Sir Francis E. Scott's prize of £10 10s. (subject of competition, "An Establishment for Baths and Wash-houses, designed in accordance with modern requirements, and in the style of the thirteenth and fourteenth centuries") to Mr. Ernest Lee.

The Institute Silver Medal, with £5 5s. (subject of competition, "The Restoration of the Choir of Old St. Paul's Cathedral, founded on the Plates illustrating Dugdale's Work"), first prize to Mr. Edmund B. Ferrey; medal of merit to Mr. H. Renault Mangin. In this competition, Mr. E. B. Ferrey, complying with the conditions prescribed in the last year's list of prizes, sent in drawings illustrating the restoration of the entire cathedral.

The Institute Silver Medal, with £5 5s. (subject of competition, "Measured Drawings of any Building erected before the year 1700, and hitherto unpublished,") to Mr. William Henman; medal of merit to Mr. Charles H. Heathcote. In this competition the drawings of Mr. Morton M. Glover were "honourably mentioned."

The Institute Medal, for the best essay "On the Origin and Progress of Window Tracery" or other suitable subject, was awarded to Mr. W. Scott Champion.

The designs, drawings, &c., are now on view from ten to five daily at the Institute, where they may be inspected by anyone bringing a card of introduction from a member.

BUILDING AND LAND SOCIETIES.

IF we are to rely on report, unanimity of feeling and purpose does not seem to prevail at the Board of the London Land and Building Company (Limited). At the annual meeting of the company which was held at the London Tavern last week (Mr. W. T. Makins presiding), there was an unusually large attendance of shareholders. The report of the directors stated that no new obligations had been entered into since the last annual meeting. The amount received from the estates sold has been somewhat less than the directors anticipated; but this has arisen, partly from forcing the sale of property the mortgages on which were called in, and partly from the premature realization of leasehold estates, the holding of which would have necessitated further outlay in new buildings to the extent of nearly £100,000. The whole of the shareholders not assenting to the alteration of the shares from £10 to £5, as proposed by the directors in circular of January 1st, 1867, the contemplated reduction could not be effected, and another plan for the same purpose, suggested by the directors, in circular of August 26th, 1867, was likewise frustrated, by the non-co-operation of shareholders. The directors retiring by rotation were Messrs. W. T. Makins and T. H. Harris, who were eligible for re-election. Messrs. Simpson, Fraser, Johnson, and Churcher having resigned, the directors had elected Messrs. H. F. Makins and J. Smith, whose election requires confirmation by the shareholders, in accordance with the articles of association. After a long and angry discussion, says the reporter, in the course of which two amendments were made and withdrawn, the report was adopted, the retiring directors and auditors re-elected, and the election of Messrs. H. F. Makins and J. Smith, as directors, confirmed.

The "Birmingham Post" announces with much regret the failure of the Victoria Freehold Land and Building Society. The affairs of the society have been placed in the hands of a solicitor, with a view to the presentation of a petition to the Court of Chancery, under the Winding-up Act. The liabilities are not yet precisely ascertained, but we believe that £30,000 is due to depositors, and that the deficiency amounts to about £7,000.

COMPETITIONS.

REFERRING to the Darlington Workhouse Competition, a report of which we gave last week, a correspondent in sending us an account of the proceedings at a meeting of the Local Board of Guardians, writes:—"You will observe that the professional gentleman selected for the first premium the drawings bearing the motto 'Nota Bene'; second, 'Economist'; third, 'A in a circle'; but the guardians have, it appears, been unwilling to go the 'whole hog' by allowing all the premiums to be sent out of the town, and, to save disrepute from falling on the local talent, have partly negatived Mr. Lee's well-considered decision by assigning the first place to 'Suum Cuique,' a townsman. Such is life—let us hope that 'A in a circle' is delighted and 'Suum Cuique' surprised. I can fancy the former being devoid of friends in court to assist him with a timely vote. When will those unhappy competition affairs be properly managed?" We quote an extract from the report of the meeting to show the amusing way in which certain matters are managed or mis-managed by local magnates. "At a meeting of the Plan Committee, it was moved by Mr. Rowlandson, seconded by Mr. W. Thompson, and carried unanimously, that the following resolution be recommended to the Board for its confirmation and adoption:—'That this committee accepts the opinion of Mr. Lee as regards the plan marked "Nota Bene," upon condition that the architect can give a guarantee from some respectable builder or builders that the work can be executed for the estimate he has given, namely, £9,000, including the alterations suggested by Mr. Lee.' Mr. Bowman moved and Mr Ward seconded that the second premium be given to 'Suum Cuique.' Mr. Thompson moved and Mr. Stephenson seconded as an amendment, that 'Economist' receive the second. The amendment was carried by a majority of two. It was moved by Mr. Spark and seconded by Mr. Bowman that the plans marked 'Poverty is no sin' are entitled to the third premium, whereupon it was moved by Mr. Thompson and seconded by Mr. Thomas Robinson that 'A with a circle' should take the third place. There were an equal number of votes for each of these propositions, and it was therefore agreed that the two plans should be referred to the Board for selection. At the meeting on Monday, on the proposition of Mr. Hodgson, seconded by Mr. Middleton, it was resolved that the recommendation of the committee with regard to 'Nota Bene' should be adopted. With regard to the second premium, Mr. Hodgson proposed and Mr. Middleton seconded that 'Economist' be accepted. Mr. Spark moved and Mr. Bowman seconded the acceptance of 'Poverty is no sin.' The original motion was carried. Mr. Ward proposed and Mr. Nesham seconded, that the third place be assigned to 'Suum Cuique.' Against this, Mr. Benson proposed and Mr. Robinson seconded 'A with a circle.' The motion in favour of 'Suum Cuique' was carried. The seals were then broken, and the names of the competitors were disclosed as follows:—'Nota Bene,' C. J. Adams, Stockton; 'Economist,' G. Styan, York; 'Suum Cuique,' R. B. Dixon, Darlington; 'A with a circle,' W. Snowdon, jun., Bishop Auckland; 'Poverty is no sin,' G. G. Hoskins, Darlington; 'Oxenham,' G. W. Hamilton, Liverpool; 'Freemason,' W. Bryson, Darlington; 'Efficiency and Economy,' J. J. Bradshaw, Bolton; 'Knowledge is Power,' M. Thompson, Newcastle; 'Palmam qui meruit ferat,' W. Peachey, Darlington; 'Palmam non sine pulvere,' Messrs. Paton and Thompson, Bradford; 'Pro Bono Publico,' C. Eaglesfield and Sons, Maryport; 'Red Seal,' J. Ross, Darlington; 'Spen,' J. P. Pritchard, Darlington; 'The poor shall not always be forgotten,' W. H. Blessley, Middlesborough; 'Red Star,' W. Longson, Liverpool; 'Alpha,' W. Hodgson and R. J. Lithgo, Darlington; 'Earnest,' J. E. Oates, Halifax. The chairman produced a number of testimonials to the ability of Mr. Adams, including one from his son."

WATER SUPPLY AND SANITARY MATTERS.

Mr. Codrington, Associate of the Institution of Civil Engineers, has addressed a letter to the Mayor of Reading, proposing to submit a plan to the Drainage Committee for the disposal of the sewage of that town. Irrigation of a sufficient area of land at Lower Caversham, above flood level, and an outfall from the irrigated land, aided by pumping, are prominent points in the plan. A saving of £7,000 in cost of works, and of a large sum in annual working expenses, is anticipated.

After much debating, the Health Committee of the Liverpool Town Council, by a majority, has at last put forward a distinct programme on the water-closet question. Till the next Session of Parliament it is proposed to continue the present system, but the Council is to recommend them to apply for Parliamentary powers to enforce the general adoption of water-closets, the cost to be defrayed by the Corporation and the owners, in such proportions as may hereafter be decided upon. It is also proposed to make an allowance, under certain conditions, to those owners who may have already been compelled to convert middens into water-closets. The cost of a wholesale conversion is estimated at £250,000, one half of which, it is assumed, will be borne by the owners, and the other half by the Corporation.

The results of Dr. Frankland's analyses of the water derived from the Thames, as we find them in the Registrar-General's weekly return, are not satisfactory. The waters contained impurities probably of an animal origin to a considerable extent. The waters of the New River, East London, and Kent companies were clear and transparent. The hardness was least in the West

Middlesex water (18), highest in the Kent (30). The Kent Company's water, delivered at Deptford, differs essentially from the other waters. It contained 59 parts of solid impurity in 100,000 parts, and of this impurity 15 parts were common salt, which it is difficult to account for, except on the supposition that the wells have some connection with the brackish reaches of the Thames.

Liverpool.—The idea of obtaining a water supply for Liverpool from Bala Lake appears to be favourably entertained by a number of the members of the Local Council. At a meeting of the water committee, on Monday, several members expressed the opinion that, instead of spending £160.000 on additional works at Rivington and on works at Dudlow-lane, it would be much more advisable to obtain powers to spend from £2.000,000 to £3,000,000 upon a scheme to obtain water direct from Bala Lake, in order that the supply to Liverpool might be continuous both for present and future want. After some discussion, the chairman stated that they were bound to proceed with the works sanctioned by the Council, and that, if economy were exercised, and the present system of water-closets recommended by the Council were not pushed too far, there might be a sufficient supply from existing sources for the next twenty years.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Wesleyan chapel has been opened at Winlaton, near Newcastle. The style is an adaptation of Gothic, and the internal dimens 40ft. long by 28ft. wide. The building 250 persons at a cost of about £600. Mr will seat March, of Blaydon, was the contractor. Thomas

The Prebendal stalls of the choir of Wells Cathedral have been enriched with sculptured diapering from the designs of Mr. Ferry, the diocesan architect. These stalls, designed by Salvin, during the diaconate of Dr. Jenkins, are of stone, and placed between the piers of the choir arches, thus showing the bases of those piers, in groups of five; they consist of gabled and crocketted canopies, with sub-ogee arches, also crocketted, divided by pinnacles supported by slender polished Purbeck shafts. The names of the several Prebends attached to the Cathedral, numbering in all 57, are carved on the panels of these stalls. Some of the diapers are copied from ancient examples, and the very beautiful hexagonal Canterbury pattern has been employed on the Dean's and other stalls on the Decanery side. The Precentor's stall is marked by the introduction of harps and other musical instruments. Before the sculptured diapering was decided upon, the desirability of employing polychrome as a background was considered.

A new Wesleyan chapel, dedicated to St. Nicholas, has been erected at Tapshaw, near Hereford; the style adopted is Early French Gothic. The building consists of nave, with north and south transepts and chancel. In the apse wall are five lancet memorial windows, by Messrs. Heaton, Butler, and Bayne, representing Christ and the Evangelists. Mr. F. R. N. Haswell, of North Shields, was the architect.

On Sunday last the opening at Chester of a new Catholic and Apostolic church was celebrated by services at which the angel of the Catholic and Apostolic diocese and a portion of the priests and choir of the Liverpool church officiated. The church, which is a plain building in the Early Gothic style, is built of brick, and calculated to seat about 300. It consists, at present, of a nave and vestries for priests and choristers, but it is intended to add a chancel and spired tower. The architect is Mr. O. Ayliffe, of Manchester, and the building, as at present, was erected for about £1,500.

A new parish church has been built at Faccombe, Hants. It is in the Decorated style, having a tower and spire at the west end. The materials used are flint and Bath stone dressings. The church comprises a nave 52ft. by 21ft., chancel 18ft. by 15ft., with a vestry and south porch. Mr. G. B. Mussellwhite was the architect, and Messrs. Hillary, of Andover, the builders.

The manufacturing and colliery districts of Durham are gradually becoming well provided with places of worship. Churches have lately been built at Leadgate, Quarrington, and Burn Moor, and within the next six months there will, it is stated, be half a dozen new churches in the colliery villages round Durham city. The church erecting at Coxhoe is approaching completion, and the Wesleyan Methodists of Lanchester have in course of erection a handsome church in that village.

Halifax.—Plans for the new church in Rhodes-street have been prepared by Messrs. Mallinson and Barber, architects, Halifax. The church is designed in the Geometrically Decorated style of Gothic. The interior will be divided into nave, side aisles, and chancel. The length of the nave measures 82ft. 9in.; the width of nave and aisles, 51ft.; and the height from the floor of the nave to the roof, 48ft. The chancel will be 34ft. by 20ft. The church is calculated to seat 500 persons.

BUILDINGS.

A new warehouse for Messrs. Cox and Painter, drapers, at Malvern, has just been erected by Messrs. McCann and Everall, from designs by Messrs. Haddon, Bros., architects, of Malvern. The style of architecture adopted is Early Domestic Gothic. The materials employed are bricks with Bath stone dressings, the columns and mullions having Mansfield red stone shafts, with carved caps and abaci.

The old national school at Wakefield has been reconstructed and adapted for the Wakefield Fine Art and Industrial Institution, and will be opened in April. The architect employed was Mr. W. Watson.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—G. W. N.—E. A.—W. S.—H. I. G.—I. T.—W. C. B.—B. and P.—W. B.—P. and K.—P. and M.—S. and J.—B. J. T.—I. W. H.—E. F.—T. P.—W. H.—I. H. A.—G. N.—W. I. J. F.—W. I. C.—E. W.—E. P.—G. H. G.—H. N.—A. W.—M. and Co.—I. H.—I. R.—H. and Co.—E. G. P.—S. J. H.—W S.—S. and B.—C. P.—W. P.—G. R.—I. I. S.—N. and Son.—B. and Co.—I. H.

R. F. G., Glasgow—The "Old Book" is the best.

A. Hayes., Manchester.—We have made our arrangements.

C. R. P.—The price of binding the Building News will depend on the manner in which the work is done.

Cautia.—The number is out of print. We do not know whether the paper on Iron Girders was reprinted by the author.

Correspondence.

ORGANS.

To the Editor of the Building News.

Sir,—As architects are continually employed more or less directly with this instrument, perhaps a few words on the condition of the trade may be of use. Organ builders in England, with one or two exceptions, are essentially tradesmen—not artists, nor craftsmen. You will find in English organs all the names of the celebrated stops of Schulze and Cavaillé, but these have not the slightest resemblance to them in tone. As a rule, English organs are very cheap, although very pretentious in appearance. The pipes are made of very inferior metal that costs very little indeed, but the right mixture to get beauty of tone is very costly. You may make wooden pipes of cheap, bad, new wood; you may make the bellows one third the full size; you may have inferior mechanism throughout. All these things are pretty generally done in England. The churchwarden idea of getting something cheap and showy prevails. An organ builder should be a man of innate taste for sound—to this he must add artistic and mechanical knowledge of a high order. He must be a man of taste and education; a great knowledge of mechanism will not produce a fine instrument, there must be also great taste. There are at the present time three builders of organs who are really artists in their craft, and who produce instruments of the highest merits. Schulze, of Paulinzelle, in Saxony, is remarkable for fulness and richness of tone, power of bellows, and excellent mechanism. Cavaillé, of Paris, is remarkable for delicacy and refinement of tone in his reeds. There is a beautiful instrument by him in the Carmelite Church at Kensington. Schulze has instruments at Doncaster and Leeds. T. C. Lewis is remarkable for excellent mechanism, power of bellows, and for the fulness of tone so well known in Schulze; he has also a good deal of Cavaillé's merit; he may be described as a pupil of Schulze. There is a good small instrument by him in Christ Church, Clapham, and a fine instrument at Shields. One great disadvantage in England is the general absence of any high scholarship in music. We are deluged with clerical amateurs with half knowledge—with crotchets—all of which are very detrimental to the real interests of music—I am, &c.,

A. B. C.

CHAPEL ARCHITECTURE.

Sir,—I have read, with considerable interest, your somewhat severe critique on "Architecture and Independent Dissenters" in last week's Building News. In some things there said I do cordially unite, but I must protest against the sweeping condemnation with which you visit the whole denomination, simply because the designs published in the last Congregational Year Book are not up to the standard of earlier years. You must not, however, suppose that the Year Book contains plans of all the buildings the denomination has erected during the past year, and I have little hesitation in saying that many of the best buildings find no place in that Year Book, beyond the bare announcement that such-and-such places have been opened. In the Building News for January 3, mention is made of a Congregational church, erected at Driffield, at a cost of £15,000, from designs by Mr. H. J. Paull, of Manchester. I believe this building will not suffer by comparison with anything that has been done during the year, either in church or chapel architecture; and I am the more induced to notice this because you have ventured, in a left-handed manner, to compliment the architect as having, in some way or other, learnt "a little of the art of architecture." I will not attempt to describe the work, architecturally or otherwise; the building is here, and will of itself testify whether anything decent has been done during 1867.

I believe architects are too often hampered with conditions, which in many cases it is impossible to carry out. Tower and spire are stipulated for, and when cost has to be considered, a sum ridiculously small is named, and the consequence is an erection more or less contemptible. In the case I have named, the committee in their instructions, with a judgment too seldom displayed, simply stated the amount of accommodation required in a given space, and left all matters of detail to the architect, who was to be the judge of the style of architecture best suited to the locality. The committee have every reason to be satisfied with the result—a thoroughly substantial building, massive without clumsiness, clean, comfortable, well ventilated, and at what everyone would consider a moderate outlay. It would be unwise to look upon this as an isolated case. I believe "Independent Dissenters," as such, have as keen an appreciation of the beautiful and the correct in art as any other body of public men.—I am, &c.,

Driffield, March 2, 1868. A. B.

MR. TARVER ON SYMMETRY.

Sir,—Will you favour me with a little space to explain that the paper that I read on "Symmetry from a Gothic Point of View" was, in fact, no more than the following proposition, submitted with all deference to my fellow students in the Architectural Association:—"Should not the study of Gothic architecture be undertaken with as much reverence for symmetry as that of Classic architecture?" From the censure passed on me by "A. O. X." your readers might infer that I had taken a very different ground, and had denied the existence of symmetry in Classic work; even the short report of my paper that you were good enough to publish in your number of the 21st ult., will dispossess their minds of such an idiotic assumption on my part. If "A. O. X." had been present at the meeting, and had favoured me with his remarks on the spot, by taking part in the discussion, I would have attempted to answer him. Two of the newspaper reporters kindly asked me for the paper in full, and I at once declined to publish my youthful—very youthful—efforts to appreciate Gothic principles; and I must, therefore, be

excused from defending in print that which I did not venture to offer to public criticism.—I am, &c.,

Edward J. Tarver.

10, Craig's-court, Charing-cross, March 3, 1868.

Sir,—Your correspondent "A. O. X." appears to argue from speculations rather than from facts. It is very evident he was not present at the delivery of Mr Tarver's paper, had he been, he would have heard Mr Tarver preface by saying that he simply took the matter up as a student for the consideration of his fellow students, and with no intention to dogmatize. The title of the paper was not "Symmetry," but "Symmetry from a Gothic Point of View," and therefore, it is not surprising that he confined himself to his subject. Had "A. O. X." taken the trouble to have made a few inquiries about Mr Tarver, he would not have made the strong personal attack he has done, for those who know him know also that he has not neglected to measure and draw to scale ancient examples in England and France, and so far as following the advice of Mr Harris, I will say, that if that gentleman has any disciples Mr Tarver may certainly be reckoned as amongst his first and foremost. For the benefit of your correspondent and others, permit me to state that the whole sum and substance of the paper was this—endeavour, by careful study, to discover the principles that actuated the designers of the mediæval building, and by this means obtain for your building the symmetry possessed by many Classic buildings. At the same time gain greater truthfulness between plan and elevation; and rather study the necessities of the nineteenth century than reproduce or adapt designs made for other climates and requirements.—I am, &c.,

A. A.

Sir,—Having had the honour of occupying the chair when Mr. Tarver's paper was read before the Architectural Association I feel it my duty to inform the readers of the Building News that he most distinctly disclaims all attempt at dogmatic teaching, and simply set forth his opinions for discussion among his fellows. This renders the criticism of "A. O. X." altogether unfair; and I can only hope that "twelve days" will suffice to make him feel it "very strange" that he could have written anything so grossly personal. To those who know Mr Tarver intimately, the advice of your anonymous correspondent as to drawing and measuring seems to savour of impertinence. Feeling sure that your columns will not be less open to defence than attack—I am, &c.,

Lacy W. Ridge.

28, Bedford-row, March 2, 1868.

CAUTION.

Sir,—I will, with your permission, claim a few lines in the Building News to caution its readers against a man who is going about to various architects' offices under the following pretence. He came to the office where I am employed and asked to see the "Governor," who was not in at the time. He then told me a very pitiable story about his having been articled to an architect and civil engineer, who had gone abroad; and he added that he had been out of employment for six months, and had not had anything to eat that day. I gave him a trifle and started him. The next morning he came and said that Mr ——, a leading architect of the day, had given him employment, and that his instruments were in pawn, and, if I would lend him the balance he wanted, he would return it on Saturday. I thought it a hard case, and (though very suspicious of him) I lent it, and immediately wrote to the person he named, and found he had been neither seen nor employed there. He said he was a Welshman (he might also have added a "Welsher"), which I found correct on asking him a few questions. He is tall, with fair moustachios, and poorly clad.—I am, &c.,

Fleeced.

Intercommunication.

QUESTIONS.

[762.]—FIXTURES.—If a covenant in a lease states that fixtures are to be delivered up at the end of the term, can the lessee claim, in addition to landlord's fixtures, what are usually considered tenant's fixtures? In a legal point of view, it appears to me that this would be so, but I should be glad to know what is the usual custom in such cases.—J. J.

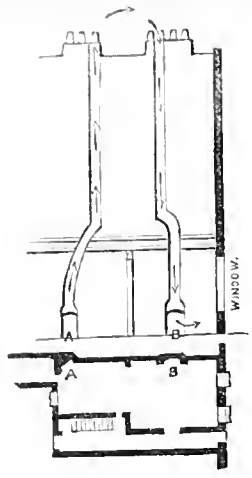
[763.]—FILTERING.—I want to filter 1,200 gallons of rain water, caught in a tank used for laundry purposes; can any of your readers inform me of a cheap and effectual way of doing this?—E. H. H.

[764.]—PAVING TILES.—I have been told there has been recently published a set of designs for laying paving tiles of only three colours so as to get a pleasing variety. I should be obliged by being informed where I could obtain the above designs.—H. W. B.

[765.]—BLACK STAIN. Will you, or any of your readers, kindly inform me how to make the black stain used by gasfitting manufacturers to stain the metal before black leading, in green bronzing. Also how to make green, ormolu, French gold, and pale lacquers?—F.

[767.]—THE BUILDING ACT.—In the back yard of the house next mine stands a building contrary to the Building Act, but it has been in existence about two years. Can any of your readers inform me whether there is any limit to the time after the erection of a building during which the District Surveyor has power to interfere, and if so, what that limit is?—Building Owner.

[766.]—SMOKY CHIMNEY.—Would you, or some of your correspondents, kindly inform me of some way to cure a chimney? In the accompanying sketch you will find two



fireplaces and chimneys, marked A and B: when there is a fire in A and not in B the smoke comes down B and fills the rooms with smoke, so that we are obliged to open the doors and windows for a time, more especially in the evening.—Smoky.

REPLIES.

[736.]—RESERVOIR BOTTOMS.—In answer to J. W. H. of February 7, I would advise him to cover the bottom of his reservoir with concrete, about 9in. deep, to prevent the growth of vegetation and facilitate the process of cleaning when empty. Good concrete will cost about 12s. per cubic yard, if stone and sand are easily procured, mixed in the following proportions:—one measure of blue lias lime to three of clean sand, and four of broken stone, well pounded together before setting commences.—Wm. Watts.

[749.]—ILLEGIBLE INSCRIPTIONS ON SILVER COINS.—To read illegible inscriptions on old silver coins, lay the coin on a red hot iron. The parts which have been most compressed in the die oxidize at a higher temperature than the other parts, and remain a lighter colour. See "Sir David Brewster's Letters on Natural Magic."—Ardwick.

[751.]—ROOFAGE WATER.—The average rainfall in the midland counties will be about 30in. per annum. But "M. Paynter" must construct his underground tank to hold the greatest rainfall in twenty-four hours, which we will take at 2in. deep upon every square foot of his roofage; *i.e.*, 90,000 × 144 × 2 = 25,920,000 ÷ 1728 (the number of cubic inches in a foot) = 15,000ft × 6·25 (the number of gallons in a foot) = 93,750 gallons. A tank, therefore, 42ft. by 36ft. by 10ft. will hold 750 gallons more than what is needed, but it is better to have room sufficient. The only thing to look at is a capacity of 15,000ft. or twenty-four hours' rain, whatever that may be, and construct the tank accordingly. I shall be glad to render your correspondent any further assistance.—Wm. Watts.

[751.]—FLEXIBLE IVORY.—"Ilminster" can make ivory flexible by immersing it in a solution of pure phosphoric acid of sp. gr. 1·30, and leaving it there until it loses its opacity. It must then be taken out, washed in water, and exposed to dry air till it hardens. It will resume its pliancy on immersion in hot water.—Sans Peur.

WAGES MOVEMENT.

The North Shields operative painters turned out on strike on Monday for Saturday half holiday. They were paid 30s. a week.

The operative masons of Hamilton, near Glasgow, are on strike for an advance of wages.

STAINED GLASS.

A stained glass memorial window has recently been fixed in the parish church of Winslow, Bucks, erected by Mrs. Miles, in memory of the Rev. J. Miles, B.D., late incumbent of Holy Trinity Church, Paddington. The lights are four, the subjects being—the Agony in the Garden, the Crucifixion, the Resurrection, and the Ascension. The work was designed and carried out by Mr. A. J. Mingaye, of London.

The east window of Horspath Church, near Oxford, which is in the Perpendicular style, has just been filled with stained glass at the cost of the Rev. H. R. Bramley, Fellow of Magdalen College. The subject, which extends across three openings, is the Crucifixion; our Lord and Mary Magdalene in the centre, and in the side compartments the figures of the Marys, St. John, and Salome. The whole is surmounted with a canopy. The tracery is filled with figures of St. Frideswide, St. Giles, St. Mary Magdelene, and St. John Baptist, patron saints of the diocese and church combined. The window was designed and executed by Mr. G. J. Baguley, of Newcastle-upon-Tyne.

STATUES, MEMORIALS, ETC.

The high cross at Taunton has just been completed. It is 30ft. in height, and is built of Ham-hill stone, with pillars of dark polished marble. At the base are three steps of blue Portland stone. The northern and southern faces contain drinking fountains, and half way up are niches for six statues. The top is spire-shaped, and is surmounted by a carved cross. The new cross has been built by Messrs. Shewbrooks, of Taunton, from designs by Messrs. Giles and Robinson, architects, of London.

LEGAL INTELLIGENCE.

A District Surveyor's Fees.—Mr. Albert Nicholls Bryett, builder, of 116, St. James's-road, Holloway, was summoned, before Mr. Cooke, by Mr. John Turner, of 8, Duerden-villas, Tollington Park, one of the district surveyors of Islington, to show cause why he refused to pay the sum of 15s., for surveying the erection of a cellar attached to a bakehouse, erected after the roof of the bakehouse had been covered in. Mr. Cooke—the case having been heard at great length on a previous occasion, and adjourned for the purpose to this day—now delivered a lengthened judgment, in which he laid down the principle that where an addition to a building was not contemplated and commenced before the main building was covered in, it could not come under the "additions" referred to in the act, covered by the first notice and first survey; but was an addition for which an additional notice must be given, an additional survey had, and an additional fee paid. He thought the builder had a right to say that the cellar now in dispute formed part and parcel of the bakehouse, and was intended to be included in the notice of June 12th, 1867. The wall of the cellar formed part of the bakehouse, and, though there was an external and not an internal communication, he thought that that did not make it a separate building within the meaning of the act. The cellar being therefore a part of the bakehouse, the surveyor was not entitled to another fee.

Professional Claims.—William Fogerty *v.* Hugh Moore.—This action was brought by Mr. Fogerty, the well-known architect, of Harcourt-street, before the Court of Exchequer, Dublin, against Mr. Moore, druggist, of Capel-street, to recover fees for plans, specifications, estimates, details, and part superintendence of the works of a warehouse proposed to be erected by the defendant in that city, and estimated to cost about £12,900. Tenders had been received from the leading builders and a contract nearly entered into, which was afterwards broken off. The defendant lodged £223 18s. 6d. in court. The case came on for hearing on Tuesday, the 18th ult., when Serjeant Barry opened for the plaintiff. After examination of Sir Charles Lanyon, M.P., President of the Royal Institute of Architects of Ireland, and the taking of a portion of the plaintiff's evidence, the further hearing of the case was postponed.

Our Office Table.

We hear that paraffin has been used with good results for the preservation of fresco wall paintings. Frescoes, in a very advanced state of decay, become quite solid after saturation in mineral turpentine. Further experiments are being made in its application.

Some interesting antiquarian discoveries, says a correspondent at Rome, have been recently made on the site of the Palace of the Cæsars. Signor Rosa, who directs the excavations for the Emperor of the French, has found the base of what appears to have been an altar, bearing an interesting inscription, stating that it was erected by "Curius Domitius Calvinus," who twice filled the Consular dignity in the years B.C. 53 and 40. This relic was found close to the basement of the temple of Jupiter Victor, raised at the close of the Social war, by Fabius Maximus, B.C. 80. In another part of Rome, on the site of the Emporium between the foot of the Aventine and the Tiber, Signor Visconti has brought to light numerous masses of rich ancient coloured marbles, some bearing dates of the time of Domitian.

Portable rustic bridges, composed of ropes so arranged as to be hastily thrown over a river to facilitate the transit of the native huckeries, have long been known in India; these, though differing so essentially in the simplicity of their formation and the fragility of their materials, deserve, nevertheless, from their similarity of principle, to be considered as the prototypes of our more elaborate and massive suspension bridges of iron. It has, indeed, lately been asserted, that the largest iron bridge in the world is in China, near Kingtung, where it forms a perfect road from the top of one immense mountain to another; moreover, it is formed by twenty chains bound together by cross chains, and is more than 150 years old.

The annual meeting of the Architects' Benevolent Society will be held at the Royal Institute of British Architects, on Wednesday next. We trust it will be well attended, and to the advantage of the friends of the Institution.

A public meeting, convened by the Amalgamated Society of Carpenters and Joiners, was held on Wednesday, for the purpose of presenting the accident benefit of £100 to George Bewford and Francis Johnns, two of its members, who have been permanently disabled from work. Mr. T. Hughes, M.P., presided.

The Liverpool Architectural Society has decided to present to the next meeting of the town council, a memorial setting forth that the present regulations affecting the building trades are anomalous, impracticable, and highly injurious to the interests of many individuals, as well as to those of the public generally, and requesting that such measures may be speedily adopted for the amendment of such regulations as to the council may seem expedient, after consultation with their official advisers, the representatives of the profession of architects, and the building trades.

Notwithstanding his very imprudent, and it must be said rather ridiculous infatuation for Lola Montes, there were a great many good points in the character of old king Louis of Bavaria, whose death, at the age of 82, is recorded. It is not generally known that he was very much devoted to art, and was himself an artist, though his talents were chiefly appreciative, not creative. He did not attempt to excel, or even to rival the works of Italian art; he merely reproduced them. The Pitti Palace, the Loggia de Lansi, obelisks, churches, basilicas, all Florence, Rome, and Ravenna, rose to new life in Munich. It has been said of him that he went to Italy as to his real home and country; he brought Italy home to his own German country. Every ward in the city of Munich was like one of the courts at the Crystal Palace. The buildings outside were mere copies, but the treasures within were genuine. The King was a good connoisseur and collector. Munich had its pictnres and sculpture galleries; it had its schools of painting and statuary; its Klenze, Oelmuller, and Gœrtner, its Cornelius and Schwanthaler. Since his dethronement, old Louis had devoted his time and means to the encouragemeot of the art to which he was so warmly attached.

There is a "London Central Painters' Hall" announced under a limited liability company, with a capital of £4,000, in 2,000 shares at £2 a share. It is intended to close the share list on the 1st of May.

The report of the Directors of the National Gallery states that 17 pictures were purchased during the year, at a cost of £4,382 10s., and that 17 others were received as bequests or donations. The gallery was visited by 1,469,942 persoos on the public days during 1867; 823,426 at Trafalgar-square, and 646,516 at South Kensington. The portion of grant for 1867-8 for the purchase of pictures according to estimate was £10,000.

The new edition for this year of the Royal Insurance Company's Almanack gives a detailed statement of the operations of the company for the past twelve months. The directors' report shows a favourable result in each branch of the Company's business, which is steadily increasing. It is now announced that henceforth the life assurers are to receive an increased share in the profits of the company, although the life bonuses hitherto distributed have been among the largest ever given by any Assurance Institution.

The Royal Commission on Trades' Unions recommenced their sittings on Tuesday last, and proceeded with the examination of witnesses.

The time for sending pictures to the Royal Academy for the forthcoming Exhibition is on Monday the 6th, or Tuesday the 7th of April next.

In confirmation of the opinion expressed by Mr. Mechi, of Tiptree Hall (see BUILDING NEWS of Feb. 28), relative to chimney-pots, a correspondent writes:—"Chimney-pots are a blunder. In the cities of New England, with fires and fuel of every character, such things are unknown, and scarcely have they a smoky chimney. The cause is that which you advocate—narrowing the draught just over the fire. In Boston it is done by a small zigzag into the flue."

The French Government has ordered a very powerful organ of Messrs. Cavaillé-Coll for the Cathedral of Notre Dame, the restorations of which are just completed, and a special commission has been appointed to watch over, and receive the work. The commission includes the composers Auber, Thomas, and Rossini, M. Benoist, professor of the organ at the Conservatoire, Baron Seguier, of the Academy of Sciences, several dignitaries of the Church, the Director of the School of Religious Music, M. Viollet-le-Duc, the architect, and several officials.

Husband-street and New-street, Golden-square, having fallen into disrepute, the Metropolitan Board of Works, on the application of the vestry of St. James's, Westminster, has ordered the names of those two streets to be abolished, and the whole line of thoroughfare to be called Ingestre-place. The subsidiary names in the following thoroughfares are also ordered to be abolished—Talbot-road, Paddington; Avenue-road, Bow; Alderminster-road, Bermondsey; Guildford road, South Lambeth: and the houses re-numbered. The board lately ordered that Red Lion-street, Holborn, should be incorporated with and named Lamb's Conduit-street; but, on the remonstrance of the inhabitants that theirs being the oldest of the Red Lion-streets in the metropolis should not be the first to be altered, the board has rescinded the resolution, and Red Lion-street remains as of old.

A new system of paving footpaths has been tried in Paris on the Boulevard de la Chapelle, where iron frames, measuring three feet square, have been laid, into which, by means of holes bored in the frame, are encased blocks of poplar, forming a capital pavement, the wood of the poplar having been selected instead of oak. The latter, from its non-absorbing qualities, was found objectionable. The system presents a pleasing effect to the eye, and appears to succeed. On each side of the footpaths are small conduits, by which rain-water is at once drained off into the side sewer.

The "Niagara Falls Gazette" says that workmen are engaged in putting cables over the river for the new suspension bridge at that place.

There are ten marble quarries now in successful operation in West Rutland, and three others in process of development. The entire thickness of the stone in these quarries is nearly 50ft., and is so stratified that it can be easily worked in separate layers, ranging from 1ft. to 6ft. in thickness. Successive strata frequently present a great variety, both in colour and quality, from purest white—the marble so valued by sculptors—to the coarsest of coloured rocks, the best often lying in close proximity to the poorest.

Baron Haussmann is girding his loins for renewed efforts in the way of demolitions and improvements in the French capital. His programme of improvements for the present year includes the opening of the Rue de l'Imperatrice and the Rue Réaumur, the completion of the two new boulevards of the Faubourgs St. Jacques and St. Marcel, the laying out of the park of Montsouris, the construction of the Hotel Dieu, completion of the central markets and their approaches, erection of the College Rollin on the site of the Montmartre abattoir, completion of the College Chaptal at the angle of the Rue de Rome and Boulevard des Batignolles, construction of a magnificent fountain on the Place du Château, and the termination of the Boulevard St. Germain and of the Rue de Rennes.

MEETINGS FOR ENSUING WEEK.

TUES.—Institution of Civil Engineers.—Discussion on Mr. Sanberg's paper on "The Manufacture and Wear of Rails," 8

WED.—Society of Arts.—"On Courts of Arbitration and the Principle of Co-operation as a means of bringing into Harmonious Action the Interests of Capital and Labour," by T. Beggs, Esq.
Geological Society, 8

FRI.—Architectural Association,—Members' Soiree.
Society of Arts.—Cantor Lectures, first of four Lectures "On Chloride of Sodium, the Products Obtained from it, and their Application to Arts and Manufactures," by Dr. F. C. Calvert, F.R.S.

SAT.—Associated Arts Institute.—Committee Meeting.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2128 R. SHAW and J. STIRK. IMPROVEMENTS IN BRICK-MAKING MACHINERY. Dated July 20, 1867.

The object of this invention is to construct bricks by a simple and direct acting apparatus, thereby ensuring a durable machine, as well as one that may be worked economically. The inventors effect this by the use of an ordinary vertical pug mill (for disintegrating the lumps of clay), having at the bottom an aperture of about the size of an ordinary brick, and placed over a suitable rectangular table which sustains a shaft having a double ratchet wheel upon it, and driven by suitable gearing. Between the top of the table and the bottom of the pug mill, a space of the depth, say, of a brick, intervenes to permit the passage of a series of moulds placed across the table. The moulds, although close to each other, are in no way connected, but are successively traversed along the table by the action of the ratchet wheels upon projections on their extremities, and each in turn comes under the aperture in the bottom of the pug mill, receives a charge of clay, and is thrust forward by the one behind it, a drag roller rotating on the top of the moulds keeping each in its place. The brick may then be discharged from the mould by being thrust out through a perforated portion of the table upon an endless band below.—Patent abandoned.

2139 E. TOMLINSON. IMPROVEMENTS IN ORNAMENTING, PRINTING, COLOURING, ENAMELLING, STAINING, CUTTING, CREASING, BLENDING, AND MANUFACTURING ARTICLES FROM WOOD AND OTHER MATERIALS. Dated July 23, 1867.

This invention has for its object improvements in printing or placing designs of labels on wood, card, paper, metals, and particularly on wood and scale board, for match or other boxes, which are printed or stamped and cut through at one operation, and for boxes creased and bent, the whole being the result of the same combined action. This is accomplished by placing knives, cutters, or rules made of any suitable material in combination with the printing press, or any suitable machine (either cylindrical or flat pressure), that is, the knives or cutters are fixed in the required position in the forme, or that part that receives the pressure resulting from the action of printing, so that the wood, card, paper, or other material is first cut through and then stamped or printed, and with boxes creased or bent, the whole being the result of the same combined action; or in some cases to perform one or more of the said operations at one and the same time.—Patent abandoned.

2108 J., J., and T. PALMER. IMPROVEMENTS IN MOVABLE SPANNERS OR SCREW WRENCHES. Dated July 18, 1867.

This invention consists in certain improvements in actuating and adjusting the movable jaws of movable spanners or screw wrenches of the kind called Clyburn's spanners or screw wrenches, that is, spanners or screw wrenches in which the movable jaw usually works across the body in a line at right angles, or nearly at right angles, to the handle of the spanner or screw wrench. In actuating the movable jaws of the said spanners or screw wrenches according to this invention the patentees construct and arrange the parts in the following manner:—The bar of the movable jaw works in a recess made across the body of the spanner in the usual way. In the end of the bar of the movable jaw they make a screw box, in which screw box one end of a screw works, the other end of the said screw turning in the body of the spanner immediately under the fixed jaw. A milled collar is fixed by a cross pin or otherwise to the screw. By means of this milled collar the screw may be rotated in one or other direction. A hole is made through the body of the spanner from side to side, in which hole the milled collar is placed and works, the said milled collar being flush, or nearly flush, with the faces of the said body. Instead of placing the milled collar for turning the screw in a hole or recess in the body, one end of the screw may project from the edge of the body, and have a milled head thereon for rotating the screw. By turning the milled collar or head in one or other direction, the screw box of the movable jaw is moved upon the screw in one or other direction, and the movable jaw advanced towards or withdrawn from the fixed jaw on the body of the spanner, and the distance between the two jars is thus adjusted.—Patent completed.

Trade News.

TENDERS.

ABINGDON.—For villa residence to be erected upon the Albert-park, Abingdon, for Mr. Edward Harriss. Edwin Dolby, architect. Quantities not supplied:—

Dover	£1300
Thomas	1088
Selby	1026

HANLEY.—For the erection of a house in Trinity-street, for Mr. Sutton:—

Wooldridge	£669 10 0
Bennett and Cook	514 0 0
Hammersley	489 0 0
Emery (accepted)	435 10 0

LONDON.—For alterations to 55, Old Broad-street, City, for Messrs. Somes, Mullens and Co. R. J. Woodcock, architect. Quantities supplied by Mr. G. Evans:—

Johnstone and Jeanes	£1935 10 6
Gammon and Son	1597 0 0
Carter and Sons	1570 0 0
Piper and Wheeler (accepted)	1524 0 0

LONDON.—For erecting a detached residence and stables at Stamford-hill. Mr. Thomas J. Hill, architect:—

Colls and Sons	£3470
Mordand and Burton	3300
Ashby and Sons	3125
Henshaw	2995
Pritchard	2991
Conder	2948
Webb and Sons	2929

HAMMERSMITH.—For St. Peter's Free School, Albion-road, West-end, Hammersmith. Mr. G. A. Burn, architect:—

Stimpson	£4665
Braithwaite	4617
Dove, Brothers	4140
Adamson	3995
Myers	3938
Mansell	3795
J. and E. Bird	3755
Chamberlain	3687
Scrivener and White	3677

KENTISH-TOWN.—For alterations and additions to Bower Cottage, Kentish-town, to adapt the same as a relief office for district No. 1 and a labour yard, for the Parish of St Pancras. Mr. E. C. Robins, architect:—

Waters	£2400
Keeble	2300
Palmer	2190
Brass	2097
Abbott	2090
Till	2054
Heming	2026
Crockett	2000
Newman and Mann	1996
Crabb and Vaughan	1990
Ball	1988
Nightingale	1873
Lathey, Brothers	1870
Kelly, Brothers	1853
Robert Mann	1850
Nutt and Co	1790
Scrivener and White	1789
Manley and Rogers	1764
Sharpington and Cole	1777
Thomas and Son	1755

LONDON.—For erecting a dwelling house and shop in Old street, St. Luke's, for Mrs Brain. Mr. Thomas J. Hill, architect:—

Chessum	£1167
Rivett	1093
Moreland and Burton	1085
Perry	1031
Henshaw	1020
Enner	971
Sabey	931

LONDON.—For alterations to White Horse Tavern, Fann-street, City. Mr. Thomas J. Hill, architect:—

Deer	£340
Foale	335
Perry	330
Corbelblick	301
Fagg	257

OULTON.—For alterations in, and additions to, Kibbleston-hall, Oulton, near Stone. Mr. C. Lynam, architect, Stoke on Trent:—

Critchlow and Ward	£950
Turner	880
Critchley	860
Jeffries (accepted)	850

PORT-HILL.—For residences at Port-hill, near Bursleim, for J. J. Hancock, Esq., exclusive of outbuildings and boundary walling. Mr. G. B. Ford, architect, Burslem:—

Barlow	£1360
Bowden	1100
Brindley and Critchlow (accepted)	1050

STOKE-ON-TRENT. For the addition of ten rooms to Mr. Lawton's Commercial Hotel. Mr. E. Boon, architect, Burslem:—

Yoxall	£540
Oakley and Minks	525

PROPERTY SALES.

FEB. 24

AT THE MART.—By Mr. Robins.—Leasehold house and shop, No. 132, Clarendon road, Notting Hill, let at £37 10s. per annum, term 80 years unexpired, at £15 per annum—sold for £325.

FEB. 25.

AT THE MART.—By Messrs. Farebrother, Clark, and Co.—Freehold business premises, No. 281, Strand, let on lease at £100 per annum—£1,800.

By Messrs. Debenham, Tewson, and Farmer.—Freehold two houses, with stabling, coach house, and lands, situate in Hill street, Clapton, let on lease at £84 per annum—£1,870.

Freehold premises, No. 23, Broad street, Holborn, let on lease at £75 per annum—£1,050.

Freehold residence, known as The Elms, Bickley Park, with stabling, grounds, &c., 3¼ acres—£6,400.

By Messrs. Wilkinson and Horne.—Leasehold business premises, No 68, Castle street East, Berners street, Oxford street, annual value £40, term 21 years from 1862, at £1 per annum—£320.

Freehold rentcharge of £30 per annum, arising from an estate comprising the Manor of Shipton Sollers, Gloucester, together with the messuages, tenements, farm buildings, &c., thereon—£700.

Redeemed land tax of £10 9s. per annum, charged upon a messuage, and 445 acres of land, situate in the parishes of Shipton Sollers and Shipton Olliffe, Gloucester—£220.

Freehold groundrent of £30 per annum, with reversion in 1897, arising from property in Wapping High street, and Queen's Head alley—£1,180.

Leasehold residence with stabling and pleasure garden, containing about 1¼ acres, situate at Denmark Hill, term 22¼ years unexpired at £30 per annum—£1,500.

FEB. 26.

AT THE MART.—By Messrs. E. Fox and Bousfield.—Freehold house and shop, No. 160, Hackney road, together with workshops and sheds, let at £47 per annum—£915.

FEB. 27.

AT THE MART.—By Messrs. Fuller, Horsey, and Co.—Freehold groundrents arising from houses, &c., in Cordova and Hamilton roads, Mile End, terms 80 years unexpired.—Lot 2, groundrent of £42 per annum—£650.
Lot 4, groundrent of £25 per annum—£400.
Lot 5, groundrent of £20 per annum—£310.
Lot 6, groundrent of £16 16s. per annum—£250.
Lot 7, groundrent of £3 10s. per annum—£50.
Lot 8, groundrent of £28 7s. 6d. per annum—£450.
Lot 9, groundrent of £3 10s. per annum—£50.
Lot 10, groundrent of £10 10s. per annum—£160.
Lot 11, groundrent of £11 14s. 6d. per annum—£180.
Lot 12, groundrent of £25 7s. 6d. per annum—£400.
Lot 13, groundrent of £10 10s. per annum—£150.
Lot 14, groundrent of £10 10 per annum—£160.
Lot 15, groundrent of £3 10s. per annum—£50.
Lot 16, groundrent of £2 10s. per annum—£40.
Leasehold six houses, Nos. 2 to 7, Meetinghouse lane, Woolwich, producing £78 per annum, term 73 years unexpired at £14 12s. per annum—£200.

By Messrs. Ellis and Son.—Leasehold two residences, Nos. 94 and 96, Leighton road, Kentish Town, producing £76 per annum, term 68½ years unexpired at £10 10s. per annum—£810.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Fortune, Augusta street, Regent's Park, timber merchant, March 16, at 12.—Thomas Ginger, New Barnet, carpenter and joiner, March 12, at 12.—Robert Grant, Croydon, stonemason, March 12, at 2.—William Henry James, Warren street, Fitzroy square, builder, March 10, at 1.—John Wentworth Liddell, Bromley, Kent, builder, March 12, at 12.—Edward Maynard, Chester street, Kennington lane, timber dealer, March 18, at 1.—James William Woolhough, Hoxton square, Hoxton, bricklayer, March 16, at 2.—Thomas Morris Capes, Commercial road, Peckham, builder, March 16, at 2.—Charles Hunt, Harrow road, house decorator, March 18, at 11.

TO SURRENDER IN THE COUNTRY.

John Cole, Chester, March 10, at 12.—James Cooper, York, journeyman plumber, March 11, at 11.—Edward Cowin, Hulme, joiner, March 10, at 11.—George Freeman, Hereford, builder, March 10, at 10.—Adam Lever, Bolton, stonemason, March 11, at 11.—John Scourfield, Liverpool, surveyor, March 13, at 11.—Edwin Walker, Litchurch, journeyman joiner, March 12, at 12.—John Bretherton, Little Bolton, joiner, March 18, at 10.—John Pyne, Exeter, carpenter, March 13, at 12.—David Roberts, Festiniog, joiner, March 13, at 12.—Thomas Shepherd, Worksop, joiner, March 25, at 3.—Joseph Shipley, South Shields, painter, March 16, at 11.—Robert Whitehead, Bradford, plumber, March 17, at 9.15.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

March 27, W. Flood, Southampton street, Pentonville, builder.—March 27, W. Rowden, Portobello road, Notting Hill, painter and glazier.—March 27, J. Starkey, Acton, carpenter and builder.—March 26, B. Wilhams, Rhyl, builder.—March 18, C. Coney, Bournemouth, builder.—March 25, J. Springbett, Cottage grove, Peckham, builder.—March 25, F. Hersee, Old Kent road, carpenter.—April 1, P. Farrell, Salford, builder.—March 19, R. Lillycrap and W. Pearcy, Bursted, Hants, brickmakers.—March 18, J. Coleman, Ewell, surveyor.

SCOTCH SEQUESTRATION.

Donald Forbes, Inverness, house painter, March 9, at 1.

DIVIDENDS.

March 12, J. Best, Seaforth, joiner.—March 12, J. D. Wilhams, Chester, builder.—March 13, J. Heatley, Whitehaven, plumber.—March 17, S. Cole, Cencoed, civil engineer.—March 13, J. Dufton, Birkenhead, contractor.

DECLARATIONS OF DIVIDENDS.

T. Forrest, Wandsworth, surveyor, div. 1s. 3d.—F. H. Green, Lower Norwood and Battersea, builder, div. 2s. 3½d.—J. F. Mathews, Reigate, builder, div. 1s. 6½d.—T. Rose, Buxton, plumber, div. 6½d.

PARTNERSHIPS DISSOLVED.

Stidder and Co., Hanover street, Long Acre, sanitary engineers.—Richards Brothers, Chester builders.—Moorshead and Lett, King's road, Bedford row, architects.—Sudbury and Son, Halstead, builders.—Rennie and Co., Lewisham, railway contractors.—Legan and Co., Macclesfield, railway contractors.—S. and C. L. Norman, Sheffield, builders

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£12	0	13	0	Archangel, yellow	£11 0 £12
Quebec, red pine		3	0	4	10	St. Petersburg, yel.	10 10 11 10
,, yellow pine		3	15	4	0	Finland	7 10 8 10
St. John, N.B. yellow		0	0	0	0	Memel	0 0 0 0
Quebec Oak, white		5	5	5	15	Gothenburg, yellow	8 0 10 0
,, birch		3	10	4	10	,, white	5 0 9 0
,, elm		3	10	5	0	Gefle, yellow	9 0 10 10
Dantzic oak		3	10	5	10	Soderham	9 0 10 0
,, fir		2	0	3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	12 0 15 0
Memel fir		3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0 10 1 3
Riga		2	0	3	5	Pumice Stone per ton	6 0 8 0
Swedish		2	2	2	7	Oils, &c.	
Masts, Quebec red pine		0	0	7	0	Seal, pale, per tun	39 0 40 0
,, yellow pine		5	0	6	0	Sperm body	0 0 0 0
Lath wood, Dantzic, fm		4	10	5	0	Cod	34 0 0 0
,, St. Petersburg		3	0	9	0	Whale, 8th. Sea, pale	38 0 0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Olive, Gallipoli	73 0 74 0
Quebec, white spruce		13	0	19	0	Cocoanut, Cochin, ton	55 0 0 0
St. John, white spruce		13	10	16	10	Palm, fine	39 10 0 0
Yellow pine, per reduced C.						Linseed	34 10 35 10
Canada, 1st quality.		17	0	18	10	Rapeseed, Eng. pale	38 10 0 0
2nd do		11	0	12	0	Cottonseed	34 10 42 0

METALS.

IRON:—

Welsh Bars in London	per ton	£6	0	0	£6 10 0	3
Nail Rod	do	7	5	0	7 10 0	
Hoops	do	8	7	6	0 0 0	2½
Hoops, Single	do	9	15	0	10 0 0	
Staffordshire Bars	do	7	5	0	7 15 0	
Bars, in Wales	do	6	10	0	6 0 0	3
Nailrods	do	7	5	0	7 10 0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	6	2 14 0	net
Swedish Bars	do	10	5	0	10 10 0	2½

STEEL:—

Swedish Keg, hammered	per ton	£14	16	0	£15 0 0	2½
Swedish Faggot	do	0	0	0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolts	per ton	79	0	0	81 0 0	3
Hammered Bottoms	do	80	0	0	0 0 0	
Flat Bottoms, not Hammered	do	84	0	0	0 0 0	
Cake and Tough Ingot	do	71	0	0	73 0 0	
Best Selected	do	76	0	0	79 0 0	
Australian	do	79	0	0	87 0 0	
Y. l. Metal Sheathing & Rods	per lb	0	0	6½	0 0 7	

ZINC:—

English Sheet	per ton	26	0	0	26 13 0	2½
Devaux's V. M. Roofing Zinc	do	26	10	0	0 0 0	

* And 5 per cent. discount if laid upon the new system

TIN:—

English Block	per ton	93	0	0	95 0 0	2½
do Bar	do	94	0	0	96 0 0	
do Refined	do	96	0	0	97 0 0	
Banca	do	91	10	0	0 0 0	nett
Straits	do	89	0	0	89 10 0	

LEAD:—

Pig, English	per ton	21	5	0	0 0 0	3½
,, Spanish Soft	do	19	0	0	0 0 0	
Shot, Patent	do	22	10	0	0 0 0	
Sheet	do	20	5	0	20 15 0	5
White	do	27	0	0	30 0 0	

SPELTER:—

On the Spot	per ton	20	5	0	0 0 0	nett
QUICKSILVER	per btl	6	17	0	0 0 0	

REGULUS OF ANTIMONY

French	per ton	44	0	0	45 0 0	

THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 13, 1868.

SCENERY AND MACHINERY OF THE STAGE.

NO one can examine the scenery and machinery of the various theatres in London very closely without coming to the conclusion that they present a sorry spectacle. Curiously enough, the houses which have the greatest capacity for scenic display seem to possess the worst apparatus. At Drury Lane, except on very extraordinary occasions, when the management appears to concentrate all its forces, and bring up every reserve for a gigantic effort, the stage appliances are poverty-stricken. Badly painted and dirty drapery, scanty and scraggy sky borders, flats far below the proper height, wretched tree-pieces, with boughs wriggling in strange contortions, no-fashioned impossible furniture, dingy distances, and foregrounds where everything is faulty and faded, cover a huge wilderness of stage, which looks all the more huge and wilderness-like because it is seldom thought worth while to mask the wings, or even to bring the various parts of the scenery and machinery close together. Not long ago the Adelphi was notorious for the badness and incongruity of its apparatus. Playgoers were displeased at having the same scene set before them twice in one evening in different pieces, and many of the properties were strangely dilapidated. Of late matters have been somewhat mended. The same remarks are applicable to the Olympic. The Haymarket has not attempted anything very grand in the matter of scenery for a considerable period, but what little it has accomplished has been poor. The St. James's is in a chronic state of incompetency as respects the matter of scenery. The Princess's is an exceptional house, where great things are occasionally attempted, and sometimes with a large measure of success. No expense is spared, and remarkable skill and ingenuity are evinced in the production of imposing and complicated spectacles. Nevertheless, the scenery here, as almost everywhere else, though effective, is faulty, and fails to produce the full picture. At the New Royalty things are no better. At the Holborn, despite the flattering "opinions of the press" on the Derby-day in the praise-bespattered "Flying Scud," things are done very inefficiently. The Strand struggles valiantly against the difficulties of its very small stage, and, with the aid of some well-painted back cloths, contrives to pass muster very creditably, considering the condition of matters elsewhere. The Prince of Wales's stands out prominently among the many theatres in the metropolis as a house at which a strong effort is made to produce scenes realistic in their character, and of true artistic merit, and it well deserves all the credit which accrues to honest art-labour.

This is not a state of things to be proud of. It reflects no credit on the enterprize of managers, still less does it bear testimony to the extent of their intelligence, while, for the development of taste on the part of the public, it speaks ill. The evil arises commonly from one or more of three potent causes: first, economizing; second, want of knowledge; third, prejudice. Sometimes one and sometimes another of these causes operates most powerfully. Where all three act in concert the result is terrible. The poverty of the confessedly poor excites sympathy, but the poverty of the pretentiously rich gains no pity, and provokes censure. The plea of "limited resources," and the host of equally vain pretences upon which managers occasionally ground their excuses for insufficient expenditure, are wholly inadmissible. To commence the building of a city or the working of a theatre without first sitting down to count the cost is folly. No less inexcusable is the stingy policy which starves a theatrical enterprize, defrauding the stage of its fit and proper appliances, and insulting playgoers with scenes sorrily painted and still more sorrily set. We cannot explain the policy of many of the London managers on any principle except that which points to an overweening love of cutting and scrimping. Managers err grievously when they permit everything to go to rack and ruin in their respective scene-docks and property-rooms, and replace or improve nothing until the clamour of public opinion becomes irresistible. At the Adelphi and Olympic, however, and in a less degree at the Haymarket, certain improvements have been recently effected.

How comes it to pass that of the "new pieces" brought out on the London stage but a very insignificant proportion survive? Managers must certainly have amassed a large amount of experience as to what will, and what will not, please the public; yet they make these repeated mistakes. As respects scenery and machinery, the ignorance which prevails is truly surprising. Else, how is it that scene-painters are allowed to perpetrate such absurd trees as those in the first scene of that marvellous concoction entitled "The Prisoner of Toulon?" Or why, if things theatrical are governed by intelligence, do managers persist in working their scenes from the wings with flats, instead of from above, to the detriment of the general effect and the increase of expenditure? Even at the New Queen's Theatre, where one might reasonably expect to find the most recent improvements, this pernicious practice is in vogue. Why, if experience teaches managers, do they allow flaps on the stage instead of slides, to the annoyance of the audience and the actors? Why do so many managers continue to use sky-borders, and the score of equally absurd appliances which disfigure the scenery and mar the machinery of the stage? It is impossible that any one can examine the effect of these objectionable apparatus from the front without detecting their manifest incongruity—skies cutting off the tops of trees, skies hitched up and carried way by refractory flats, and other little vagaries incidental to the manœuvring of an army of useless contrivances.

The whole subject of stage management needs revision. In the selection of pieces and the casting of characters a radical change is indispensable. The long approved and yet manifestly inconvenient construction of theatrical companies requires to be reformed, and many other departments of theatrical work deserve and call loudly for consideration. Indeed, sooner or later, the whole subject must be submitted to a vigorous inquiry and process of reconstruction. But no department is so urgent in its demands for help as that which includes scenery and machinery.

Within the scope of this topic comes all that is seen on the stage—the place, accessories, and costume of the *dramatis personæ*. It is a large subject, requiring close and accurate inquiry. Before we can stir one step in the right direction, it is necessary to clear the way by a definite and complete comprehension of the causes which have helped to reduce this department of theatrical art to the condition in which we find it. The causes we have now pointed out are the most powerful, and originate the greatest amount of evil. If managers were more liberal or better provided with funds so as to secure the assistance of competent designers for their stage scenes, and better painters and machinists; if, again, they were possessed of more accurate knowledge or had the wisdom to consult men versed in art and archæology; if, moreover, they could pluck out of their minds the pertinacious parasite of prejudice which now saps the life-blood of all originality and genius, there might be hope of improvement. Until these causes have ceased to work, or some vigorous effort is made to destroy or alter them, we see no hope. The scenery and machinery of the stage will remain as heretofore a sorry spectacle, and one which reflects discredit on the art, taste, and intelligence of the country.

THE ST. ANDREW'S COMPETITION, HERTFORD.

IN our issue of January 31 attention was drawn to the competition for this church. The remarks we at that time made concerning the rejection of the previously selected design by the Messrs. Smith, we see no reason to modify; we may, however, say that we have reason to believe that the present competition will be managed fairly. One of the instructions that the site "should be visited by every competitor," and that no block plan would be supplied, although it seems at first sight to point to the ultimate selection of a local man, does not necessarily bear that interpretation. Hertford is but a short distance from London, and no one seriously intending to compete would grudge either the time or money necessary for the visit. Another provision, which requires satisfactory references to be given by the successful architect, is not altogether unreasonable. The committee simply desire an assurance that the successful competitor is able to carry out his design; and that some such assurance is necessary, especially as there is no architect on the committee, is proved by many of the designs which are now being exhibited in the Shire Hall, Hertford. Ninety-four applications for particulars were made, but, though fifteen designs only have been sent, several of this number are by persons with very limited architectural education, who could not possibly carry out the work in a creditable manner. Taking the designs in order, and commencing with that marked "Justice," we must say that a fourteenth century roof is not suitable for an Early English church, though, unless it had been specially described as such, we should not have suspected it. The material is yellow brick banded with red, the spire being covered with slate. The proportion of the piers to the whole height of the church is remarkable. The height to the top of the caps is about 81ft. 6in., while the height of roof above the hammer beam is something like twenty-five feet. The next design, signed "Quis," is certainly not done by an architect, and requires no notice. Another, bearing a device of intersecting circles which form a quatrefoil, is a fair design in the Geometrical style. The interior is lined with brick, a practice prevalent enough at present, though it has, in our opinion, little to recommend it. The spire is of stone. Here it may be observed that the committee left to the judgment of the competitors the choice of materials, and the restoration or removal of the tower. Some of the competitors accordingly endeavour to preserve the tower by new facing it, and adding buttresses. From a careful inspection of the tower, we can safely say that any attempt to restore it would be unwise. It may be left as it is until funds are collected sufficient to build a new one, but, in its present state, it would not bear a stone spire, and the works necessary to strengthen it would cost as much as a new tower. The title "Justicia" is given to a remarkable set of drawings. The author is manifestly no architect, but he has the stuff in him to make a good one. "Hope" is the motto attached to a very fair design, with a new tower and spire. The tower is too low and the spire too high. The columns standing in the aisles are very objectionable: the architect seems aware of this, and has represented them of considerably less size than they would actually be. "Well considered" is worthy of its title; the exterior and interior are both very good. It is, however, to be regretted that the existing tower is utilized. Apart from that there is little to find fault with. "Hope and Faith" is a good design, with much coloured decoration: the removal of the tower is proposed. "Chrysalis and Butterfly" is the appropriate title of a design

which, while retaining a large portion of the existing church, proposes such additions as would cause a complete metamorphosis. The designer does not appear to be an architect. The drawings marked *Deo adjuvante, nil desperandum*, show a very plain church in the Earliest Pointed style. This is a really good design, and, if the tower were higher, little fault could be found. *Tace aut face* is the unfortunate motto of a design which could not have been made by an architect. "All things considered"—in this design the tower is retained, and, as in other cases, very costly alterations have to be made, the spire being of stone. It is surprising that anyone who has seen the tower should dream of new facing it and supplementing buttresses. *Veritas* is the title of one of the worst in the exhibition—galleries are introduced. The committee cannot entertain this design, and the same may be said of another marked *Pro ecclesia Dei*, which has an iron framed roof and apparently iron tracery in the east window. A design marked "M.P.O." is also practically out of the competition. The last set of drawings which require notice are marked with the device "£3,000." There is considerable merit in this design, but the church is too low, in fact squatty. The designer complains of want of time, press of business, &c., and sends an interior of another church as a "specimen of the description of roofs there would be in nave and chancel." He requests this drawing to be withheld, but his request has not been complied with. In conclusion, we may say that the choice lies between "Quatrefoil," "Hope," "Well considered," "Hope and Faith," and *Deo adjuvante, nil desperandum*. The decision will be given about the end of the month, and we sincerely hope that it will be impartial and satisfactory.

GLASS PAINTING.*

ANCIENT painted glass attracted very little attention in this country previous to the time of Horace Walpole, who is entitled to the credit of bringing it into favourable notice. The actual revival of the ancient system is principally due to Mr. Miller and Mr. Willement, two eminent glass painters of their day, the latter of whom was the first to distinguish and mark out the different styles with which we are now familiar. The late Mr. Charles Winston, though only an amateur in the art, was a very distinguished one. Indeed, few amateurs in any technical subject—if we except Mr. Ruskin for instance—have accomplished so much towards its elucidation and advancement as did Mr. Winston, in the art of which he was so enthusiastic a student. A barrister by profession, and holding a highly respectable position in that profession, he devoted the leisure of more than thirty years; and with his time his means, to the study of glass painting, for which, we may add, his highly cultivated artistic taste and remarkable industry eminently fitted him. He gave the result of his labours to the world in his well-known "Inquiry into the Difference of Style observable in Ancient Glass Paintings," originally published in 1847. We gladly welcome, after a lapse of twenty years, the appearance of a second edition of this work. The death of its author, which happened suddenly from an affection of the heart, in October, 1864, was a great loss to art, and especially to that art which he had laboured so assiduously and so successfully to foster and encourage. In the Building News of that date will be found an estimate of his labours, and a tribute to his memory. In again noticing the two handsome volumes before us, it may be observed that, with the exception of several additional notes and references, and a few verbal corrections, which appear in the new edition, the work remains substantially the same as its author left it. The object Mr. Winston had in view was to investigate the varieties of ancient glass painting, and to reduce them to a few classes or styles in the same manner as has been done with regard to Gothic architecture. In the first volume, accordingly, a classification of this kind has been made, the second volume being devoted to a series of illustrations of the best known examples of glass painting from the author's own drawings. A number of these represent both the design and colouring of the original—all the drawings are copied from genuine examples—and the value of these plates may be judged from the fact that they form a tolerably connected series of paintings from the thirteenth century to the seventeenth century. The reader need hardly be reminded that the difficulty of producing in a plate the *effect* of painted glass has never yet been overcome, even in engravings of large size. The spirit and fidelity which characterize Mr. Winston's drawings generally are remarkable, and they have been admirably executed by Mr. Philip H. Delamotte. The beautiful window painting from Little Malvern Church, Worcestershire, is particularly rich and effective, and is an important addition to the new edition. On the general subject of painted glass, a few brief notes, based on the researches of Mr. Winston and others, may be useful to the student. We are inclined to agree with Mr. Winston in thinking the term "painted glass" the more correct expression than "stained glass." For a glass painting, as he observes, may be entirely formed of painted glass—that is, glass painted with an enamel colour—but it would be impossible to execute a glass painting merely by staining the glass. Most glass paintings are formed by combining the two processes of enamelling and staining; and, moreover, as regards colour, the same general principles apply to glass painting as to any other. Our great teachers, the Egyptians, were acquainted with the art of glass blowing upwards of three thousand years ago. They made glass both white and coloured, opaque and transparent. The exact date of the application of glass painting as an art is uncertain, but we know that it was in vogue at least as early as the tenth century. The different varieties or styles of the art which have successively prevailed in this country have been arranged under five classes. There is, first, the Early English, which extends from the date of the earliest specimens extant to the year 1280. Then followed the Decorated style, which flourished for the next hundred years. One of the most distinctive features of this style is the natural form of its foliaged ornaments. It was superseded by the Perpendicular style, but the exact date cannot be fixed with certainty, the change being a very gradual one. The Perpendicular windows, however, are easily distinguishable from the Decorated by the form of their details, the greater breadth and delicacy of their colouring, and their more refined and finished execution. Mr. Winston assigns about a century and a half as the period of its duration, being of opinion that it terminated with the use of Gothic ornamental details about the year 1530. This, in its turn, was succeeded by the Cinque Cento style, so called from the ornaments of this style of glass painting resembling those of the Italian architecture of the sixteenth century. It prevailed for about fifty years, or until the introduction of the "Mosaic Enamel mode" of glass painting, about the middle of the sixteenth century. This style is considered more ornamental and less severe in its character than the Perpendicular, though the early Cinque Cento examples bear so striking a resemblance to the contemporaneous Perpendicular windows that it is not always easy to distinguish them. The change in this case also was very gradual. The decade between 1525 and 1535 Mr. Winston calls the golden age of glass painting, the gorgeous Cinque Cento style having then reached its perfection. The Intermediate style he dates from the middle of the sixteenth century to the present time. This style, from its long duration, includes many varieties. These the author of this work classes under two heads; the first comprising the glass paintings executed between 1550 and the revival of the Mosaic system, which took place some forty or fifty years ago; the second those which have been executed since that period. Mr. Winston goes minutely into each of these five styles, describing their leading characteristics, and examining their various details and modes of treatment, in a series of chapters and sections. The vast amount of information given, and the clear and systematic manner in which the author treats his subject, apart from the critical opinions which he expresses—with which some doubtless may not always agree—make the work a most valuable text-book alike to the artist in glass painting, the student of architecture, and to the archæologist. We shall on another occasion enter more critically into glass painting as an art.

* "An Inquiry into the Difference of Style observable in Ancient Glass Paintings, with Hints on Glass Painting," by the late Charles Winston. Second Edition. Parker and Co., 1867.

ROYAL SCOTTISH ACADEMY'S EXHIBITION.—ARCHITECTURAL DESIGNS.

(Communicated.)

WE regard the present exhibition of drawings with mingled feelings of disappointment and hope. Disappointment, that the exhibition should receive so few contributions from good authors, and hope, because in the designs of some we can distinguish the germs of good things in store for architecture. There is at present great disorder in the architectural profession. Our architects announce that they will design in any style, from Egyptian, or Grecian, to the latest phase of Gothic, whether it be a shop-front or a cathedral. In fact, they profess to be able to do what in any other profession or trade would be divided among twenty men. Take painters, for example, whom we have divided into landscape, figure, portrait, and animal painters, and we have men celebrated in each division who could not paint well in any other. Why, then, should architects not also be divided into church, mansion, and house architects? For, if we do not expect that landscape painters should be equally good at figure and portrait painting, how can we expect a church architect to be equally good at designing mansions, public edifices, or tenements, in any style? In order that this anomaly in the profession may be more clearly pointed out, we will draw attention to it as we proceed. We will go over the churches first, then the mansions, and, lastly, the tenements.

(118) and (162) are two designs, by David Bryce, R.S.A., for the St. George's Church, Edinburgh. The former is Classic, and resembles a bank or insurance office; the tower is merely two of his cupolas on the Bank of Scotland put on the top of one another. The latter is Gothic, but of a very debased kind: the tower is a copy of the old church tower, Dundee, and the spire is a very bad copy from St. Giles's. Now, although Mr. Bryce stands pre-eminent among Scotch architects for large mansions in the Scotch Baronial style, and large Classic edifices, like the Bank of Scotland, yet it is well known that he cannot design churches, for he has erected very few, and they are not considered good. For his own credit he should refuse churches, and trust his reputation to mansions, for architects have, or should have, reputations to maintain as well as artists. J. T. Rochead, of Glasgow, also sends two churches. (123) is a design in the Early Pointed style, which has a lofty and beautiful appearance; but the spire is too bare, and presents a miserable contrast to the rest of the building. (103) is a design in mixed Moorish and Lombardic styles. From this and other designs by the same ar-

chitect in last year's exhibition, it is evident that, like some more of our Scotch architects, he is satisfied that Gothic, as it now exists, is not to be the future style for Britain, and he is groping his way to another. It is curious that all the present endeavours after something new, land in the semicircular arch, or some variation of it, as the leading feature. If one may judge from passing appearances, the pointed arch will form no characteristic feature in the architecture of the future. From Mr. Rochead's design it is evident that something might be made out of it. The horse-shoe arch might be used with advantage. It is not to be expected that Mr. Rochead would be successful in his first attempt at something novel; he has borrowed too completely. We can no more expect Turkish Mosques to become general, than we could expect Turkish flowers to grow and propagate amongst them without protection. (211) Free Church, near Edinburgh, by J. W. Smith, has originality and neatness to commend it. (231) by the same architect, Church at Dalkeith, is also creditable. (120) United Presbyterian Church, Newtown, St. Boswell, by John Paterson, has not much to recommend it, except the red stone rubble work. The apse is ungainly, and the small tower is far from pretty. A small church, in our opinion, should rather have dignity and simplicity than prettiness. (57) Design for Free High Church, Partick, by John Honeyman, jun., Glasgow, has a very good chancel, and the best advantage seems to be taken of the sloping ground; but the square spire spoils the general effect. It is curious that people will not take warning from the experience given them by others. Square spires always look ill, and, from their very construction, must look ill. Architects, moreover, never seem to think that a spire can be built in any other way than by a continuous taper from the top of the tower to the vane. Those Classic churches built a hundred years ago, or more, might at least teach us a very useful lesson in breaking up our spires. We never saw or heard of a round spire, and yet we think it would look very well. (194) Church of St. Michael and All Angels, Helensburg, by Robert Anderson. This has a large hideous tower and spire, without shape or design. It could have been most beneficially spared in order to adorn the rest of the edifice, which has windows in it that resemble stable openings. No church seems to be considered complete by a congregation unless it has a spire, but if those in the exhibition are to be taken as specimens of those erecting throughout the country, the less we have of them the better. Unless an architect has sufficient money to make a good spire, he should be content, and try to make his clients content, with a neat spirelet rising from the gable. (210) by the same architect, Interior of the Church of St. John the Evangelist, Alloa, shows that he is better at interiors than exteriors. (42) United Presbyterian Church, North Berwick, Island of Craig, Leith, and Firth of Forth in the distance, by R. R. Raeburn. This is the worst architectural design in the rooms. The background is decidedly the best of it. The angle buttresses in front have a most uncouth and clumsy termination. (160) Improvement of the choir of St. Giles's Cathedral, by Robert Matheson. The principal improvement is the erection of stalls all round the choir, an absurdity in a Presbyterian church, and a mere sham. If the cathedral were in the hands of an architect who knew more about Gothic, the edifice could be ornamented in a more effective manner with less money. Although Mr. Matheson made a good job of the Classic Post-Office, it does not necessarily follow that he is able to improve a Gothic cathedral. (270) Greenfield Church, Dundee, by Frederick J. Pilkington, is the most beautiful building exhibited. The grouping of the different parts, the beauty of the skyline, and the taper of the spire are all that could be desired. The design is in his own peculiar style, Continental Gothic, used freely with a mixture of Moorish and semicircular arched windows. For boldness and originality, his churches cannot be surpassed by any in Scotland. Although Mr. Pilkington was very much cried down at first, yet the public are now beginning to appreciate and encourage him.

We now come to the mansions. (192) Langton House, Berwickshire, by David Bryce, R.S.A., has a noble and handsome appearance, and is decidedly the best exhibited. There is a lightness and cheerfulness about it caused by a plentiful supply of windows that makes us prefer it to many of his Scotch Baronial mansions, where windows are at a discount. It is Elizabethan, however, and we think that that style should be left to the Elizabethan age; for architecture, like everything else, was meant to progress, and we should no more design as they did 300 years ago, than we should write, compose, or paint as they did at the same time.

(249) Kingsknowes House, Galashiels, by Wm. Hay, is a very good building in the Scotch Baronial style, with a sufficiency of windows to make it a convenient and comfortable dwelling for the present time. Some maintain that it is debasing Scotch Baronial to erect a building in that style with many windows in it, because our old castles had few windows. But the cause for that it is not difficult to find in those warlike times; it suited their comfort and convenience to have it so. For our comfort and convenience many windows in our rooms are necessary, and yet unthinking architects will not supply us with them. If it is necessary for Scotch Baronial buildings to have few windows because old castles have few windows, then we think it also necessary for them also to have stone roofs, stone floors, 10ft. thick walls, and many other things that old castles have. (61) House at Westoe, Durham, Douglas and Stevenson, is a very neat dwelling, with pointed windows, but the bare walls and want of windows give a dead appearance to the whole, which is only slightly relieved by the red rubble with yellow stone dressings. (228) Mansion at Walkerburn, Pilkington and Bell, has a better skyline than their mansions usually have, and shows a boldness and originality characteristic of all this firm's productions; but the conservatory at entrance is too conventional, quite unlike their style and the rest of the building. (84) House, Queensferry-road, although too much like a swelled-out villa, shows that R. R. Raeburn is better at houses than churches, and that it would be better for his credit if he kept to them. (159) by the same architect, is so miserably plain that one wonders why an exhibition drawing should be made of it. (148) Villa at Dean, by George Beattie and Son, is a plain substantial edifice, with little attempt at design. This is the only villa exhibited, and, as there are hundreds springing up all round Edinburgh, it says little for their general appearance when architects are afraid to exhibit them. Villa architecture is too much neglected. It is a kind of building that has only lately come into fashion, and it says little for our architectural taste that we have made so little of it. We hope to see a number in the exhibition next year. (100) Treame House, Ayrshire, Peddie and Kinnear, is a very picturesque and well grouped mansion. The only objection is that the massive square tower seems out of keeping with the broken-up roofs and the sharp-pointed gablets and gables of the other parts. As shown here, a very effective appearance might be made by barge-boarding and overhanging roofs. We are astonished that they are so little used in villas. (81) Hotel at Roslin, E. A. Sutter, C.E., resembles stables and lofts more than a hotel. (20) Competition Design for a Workmen's Institute, W. D. Dobson, looks more like a double villa, and would answer that purpose better. (144) Eastbourne House, Portobello, by J. C. Walker, is in very bad taste, and has a furniture look.

We now come to the tenements. (16) Tenements, Heriot Mount, by R. T. Shiells, are situated on an eminence overlooking the Queen's Park, and for this reason the architect thinks that his buildings should be Scotch Baronial, and, being Scotch Baronial, that they should resemble a castle. Evidently one of the first principles of architecture is to make a building look like what it is intended for—that a church should look like a church, and not a bank or barn. Yet how often do we meet with gross violations of this rule! (153) Street Buildings, Castle-terrace, is designed upon geometrical principles, the proportion being multiples of 2 with 45 deg. angles on face plan, and 67½ deg. on elevation, James Gowans. There is a boldness and originality about these that commends them, and some parts will look better in execution than on the drawing, which is very feebly done. Mr. Gowans would design better if he did not tie himself so closely down to geometrical principles. (154) New-terrace, Murrayfield, by Pilkington and Bell, shows the usual originality of the firm's designs, whether they be cheap or costly. Whatever they do, they seem to make the most of; some architects grumble because they do not get a sufficiency of money to make a good job. The test of a good architect is not in making a good building with an unlimited amount of money, but in making a good design with little money. We are sorry we cannot say so much for (273), Selected Design for Easter Club House, Dundee, by the same architects. There is so much of a conventional treatment that is so repugnant to their natural style, that we hope they will not continue it. The conclusions we come to, from a survey of the designs, are these—that architecture in Scotland is in a backward state; that there is a feeling for some fixed national style which we hope may continue; that more attention ought to be paid to villa architecture; and that to improve, our architects must be divided into sections, as proposed in the commencement of this article.

PUGIN *v.* BARRY.

THIS subject has been the topic of conversation in architectural circles during the past week. Old-fogeydom, that sneered at the pretensions raised in A. W. Pugin's favour a few days since, is now dumb-founded. We cannot find room for all the letters sent us. One will be found in another column. Another correspondent, who enjoys a well-won reputation, says, "I must congratulate you on the extraordinary turn of the controversy by Herbert's discovery of A. W. P. Everybody to whom I have shown the photograph is astonished at the audacity of Mr. C. Barry pretending to deny the existence of the A., and, still more, pretending that W. P. meant Prince of Wales. I confess I was staggered by some things in Dr. Barry's pamphlet; but equally struck with the rottenness of his defence about the 76 letters, which I had all along fixed upon as the fatal blot in this case. * * * I wonder whether the 'Pall Mall Gazette' will have the honesty to retract. Of course the 'Builder' won't." Another correspondent, a well-known architect who knows nothing of E. W. Pugin, says, "I have been 25 years incessantly engaged in architectural drawings, and might be justified, I think, in styling myself what the newspapers terms an expert. In the first place, the drawing in its careless exactness shows Pugin's authorship. If Pugin had been gifted with prophetical powers he could not have shown more wisdom than he did in this his sign manual. The section having three spaces would naturally suggest his own initials, and, being at the side of the drawing, where they were not likely to be noticed, he claps them in. But he does not repeat them elsewhere, nor does he put the initials in the front. If, as the Barrys say, the letters refer to a member of the Royal family, it might certainly be expected the panels *in front* would have them. Augustus Welby Pugin we know, but who is Albert Wales Prince? It is preposterous for the Barrys to say that any ordinary draughtsman would be competent to

make correct details from this drawing. It is suggestive enough, but requires an equally clever man to translate it into, so to speak, the vulgar idea of working drawings. If such a drawing were given to twelve different assistants to work independently of each other, you would get twelve sets of details with little or no resemblance to one another. Another correspondent says, "If the Barrys had not resorted to a subterfuge in trying to show that A. W. P. stood for the Prince of Wales, the world would have sympathised with them. But it is now apparent that they are more interested in vindicating their father's name than of defending truth. Before this discovery of Mr. Herbert's I saw an old drawing of A. W. Pugin's in a bookseller's window, and I was struck with the exact resemblance of that drawing and the photograph which served as a frontispiece to Barry's pamphlet. If, as Mr. Herbert says, the late Mr. Pugin was in the habit of dropping his initials into all kinds of plans in drawings of furniture, metal work, &c., most likely it will be found that these initials will be similar to those fixed on the design for the throne. There is an unmistakeable individuality about a man's initials as there is about his signature; and, if it can be shown that the letters A. W. P. in the throne resemble Pugin's initials in his other designs, that will settle the controversy beyond the possibility of dispute." Another correspondent says, "I have reason to believe that the Barrys have called in their pamphlet. I also hear that Mr. Powell, of Birmingham, intends to bring out a pamphlet on the subject."

PUBLIC HEALTH IN EAST LONDON.

WHEN the cholera visits us again, will it find us unprepared and panic-stricken? We fear so. The immediate danger passed away with the year 1866, and has been well nigh forgotten in the efforts that have been made to overcome the still more dangerous because apparently chronic disease that succeeded it in its own peculiar field. Starvation has struck down its thousands in East London, where cholera only destroyed hundreds, and, under the weight of the new calamity, the memory of the old one is almost obliterated. Yet distress has this advantage over disease, we can sometimes trace and so remove the cause. With cholera it is different. It comes upon us almost unforeseen, we are ignorant alike of its origin and cure, and it leaves us sadder but little wiser than when it came. Thus, we look with satisfaction on all efforts made to discover the deadly secret. Mr. Orton, the medical officer to the Limehouse Board of Works, has just issued his Report for the year ending Lady Day, 1867, with supplementary remarks on the cholera epidemic in the East of London. He is certainly rather late in the day, but he pleads in excuse the many authorities he has had to consult, and the advanced season of their appearance. He has been at some pains to examine into the different theories started on the subject, and the arguments by which their supporters seek to maintain them. His own opinion is that the primary cause of cholera was atmospheric, that it originated in the East, and, after a lapse of months, having traversed the Continent true to the westerly direction, it found its way to England, when East London terribly felt its shock, resulting in an extraordinary mortality, mainly attributable to masses of filth in various forms, traceable to docks, canals, sewers, &c., and to such a degree as not to be equalled by all the rest of the metropolis. That, after the evolution of deadly vapours and gases from this accumulated filth in the hot season, during an almost perfect calm for several days, a continuous wind, with slight variations, chiefly N.E., conveyed the poisonous air direct through the heart of the cholera field, which happened to be tolerably co-extensive with that of the East London Water Company's sphere of supply from their works at Old Ford. He believes that, owing to the intensely high temperature in the latter part of June and beginning of July, there would, in the ordinary course of things, have been a great accession of fever, for which, in fact, he was preparing, but a special atmospheric poison coming gave the sickness another turn, so that large numbers of persons under certain conditions were carried off by cholera. The number of deaths from general causes, apart from cholera and diarrhœa, during the period embraced by the report was 11 per cent. less than during the previous year. The amount of fever was 20 per cent. less. These facts further induce him to regard cholera as specially a destroyer among the fever haunts, and in some way or other as a substitutionary or vicarious disease. He is satisfied that foul water had nothing to do with originating or even exaggerating the epidemic, and supports his conviction by adducing instances of many large institutions and manufactories where nothing but the supposed impure water was drank, and few, if any, deaths occurred. He submits several practical propositions to the public, calculated to prevent or at any rate to check a future attack. He believes that the daily evolution of millions of cubic feet of noxious gases from the main outfall did not fail to enhance the pestilence, and suggests that the air-shafts should be more efficiently ventilated or means be adopted to destroy the exhalations as they rise, that the sewage from the West Ham pumping works should be pumped into the Bow Creek only at ebb tide, and that it should be diverted as soon as possible into the main outfall; and that the refuse of factories and sewage, as far as possible, should be rigidly prohibited from passing into the Lea Cut and Regent's Canal, as injurious to the public health.

FIRE-PROOF CONSTRUCTION.

IS it possible to construct a building really fire-proof? asks "The Engineer." The shell or staircase, and the roof covering, of all at present erected are so, in conformity with legislative regulations, but the internal arrangements are left entirely to the builder. To ensure the complete incombustibility of a structure, it should be composed altogether of fire-proof material. Any portion of it, no matter how trifling or apparently insignificant, consisting of substance not so constituted, is an element of weakness, of danger, and perhaps of ultimate destruction. It will be urged that a structure of this character is an impossibility, that we cannot have iron doors, iron window-frames, and iron flooring in our ordinary dwellings. While we do not admit the validity necessarily of this "*non possumus*" argument, yet we will concede the point; but, at the same time, maintain that a great deal more might be done to prevent the contingency of conflagration, especially in the construction of those particular classes of buildings which are peculiarly liable to suffer from such a cause. Probably none are so exposed to the chances of being ultimately consumed as theatres, and places of evening amusement and recreation. It almost appears as if the exertions of the builder and architect were directed solely towards the best means of extinguishing a fire, instead of aiming at the possibility of preventing its occurrence. The recent total destruction of the Opera House demonstrated how theatres can burn, and the scenery and stage no doubt assisted very materially to feed the flames. We see no reason why this part of the interior of a theatre might not be cut off at will from the rest, and the introduction of iron in other portions, to the total exclusion of timber, would be attended in the long run with other than merely precautionary and economical advantages.

The danger of adopting a compound system of construction, part fire-proof and part inflammable, was shown the other day by the fire that occurred in the Charing Cross station, and which consumed the customs and luggage office, and destroyed the sheeting in a couple of bays of the roof, besides doing a large amount of damage in the item of broken glass and general disfigurement. One cannot help observing how extremely injudicious it is to jeopardise not merely the station roof, but the hotel itself, by the erection of so large a mass of inflammable material in close proximity to them. Had the fire occurred under less advantageous circumstances with respect to time and weather, in all probability it might have reached the hotel. The point to which we desire to call the attention of our readers is the construction of the roof. So far as the girders or ribs are concerned they are of wrought iron, but the louvre, running the whole length of the station, is of wood, and so also are the sides of the roof at the springing for about a fourth of the distance between it and the ridge. The fire originated at the entrance to the station, upon the bridge in fact, and manifested that, if unchecked, it would have reached the hotel, by at once seizing upon the timber portions of that bay of the roof nearest it. In reality it would be difficult to imagine a more convenient route for it to follow, and, metaphorically, if the hotel were to represent a fort to be blown up, the timber sheeting along the roof might be compared to the train of powder, and the fire that originated at the end, to the igniting spark. To make a sound and durable roof whenever zinc or slates are employed for the external covering, there is no question but that an under-sheeting of at least inch boards is necessary, and the same arrangement should be adopted when very thin plain sheet iron is used, although the last-mentioned covering can be fixed upon wrought-iron laths. The employment of cast-iron, which, however, makes a very heavy roof, or that of strong corrugated iron, would obviate all necessity for wooden sheeting, especially in a large station roof, where the preservation of an equable temperature is not essential. With the exception, perhaps, of some of the magazines and stores attached to the various ordnance depôts, there is scarcely a roof that can be regarded as absolutely fire-proof; they all contain in themselves not only the seeds of self-destruction, but the capability of extending that destruction to neighbouring objects. The establishment of large reservoirs and tanks, the connection with the water mains, and the organization of a complete system, with all its attendant paraphernalia of buckets, hose engines, and plugs for the purpose of extinguishing fortuitous conflagrations, are an indispensible portion of the management of all cities and towns. But we wish, while recognizing the value and efficacy of our fire brigade, that those engaged in the practice of architecture and construction would endeavour to design their works in a manner that would render its services as nearly as possible unnecessary. The usual means adopted for the extinction of fire have repeatedly failed to save the immediate object attacked, and are at the best chiefly effective in checking the spread of devastation. Prevention is better than cure, and, although so long as we acknowledge the evil we must always be prepared with a remedy, yet the wiser course is to endeavour to need it as seldom as possible.

MANCHESTER TOWNHALL DESIGNS.

ANNEXED is the report of Professor Donaldson and Mr. G. E. Street, the consulting architects to the Corporation. The principal recommendation contained in the report, in favour of the designs of Mr. Waterhouse ("St. Valentine"), having been already made public, there appears to be no longer any reason to withhold the document itself:—

(Copy.)

London, March 3, 1868.

Dear Sir,—We have been honoured by the instructions of the Townhall sub-committee for the erection of a new Townhall in the city of Manchester, dated the 20th February last, and conveyed through you, requesting us to furnish our opinion generally on the plans sent in by the eight competing architects, and especially with reference to the matters therein specified. (Mottoes of Designs:—1. "Arnolfo di Lapo;" 2. "Faire sans dire;" 3. "Fides;" 4. "Sperandum;" 5. "St. Valentine;" 6. "Masons' symbol of crossed triangles;" 7. "True to the line;" 8. "Valentine.") We have accordingly examined, with very great care, the several drawings, and read the explanations of their designs drawn up by the architects, and we beg to report as follows:—

1. As to the comparative merits of the designs in an architectural point of view, having regard to the form of the site, the lines of the adjacent streets, the climate of the district, and the purposes for which the building is required, we are of opinion that the designs No. 6, No. 4, No. 7, and No. 5 are, as works of art, the finest designs of the whole series; and, with regard to relative merit, may be considered to stand in the order in which we have here placed them.

2. As to general arrangements and convenience, having regard (amongst other matters) to the simplicity of plans, the facilities of access to the different parts of the building, the entrances for the different streams of visitors, the position and convenience of staircases with a view to the avoiding of unnecessary walking inside the building, the provision made for setting down and taking up visitors arriving or departing in carriages, and also for the entrance of carts, and for the loading and unloading thereof; also the convenience and character of the mayor's reception rooms, and the arrangements made for keeping the same distinct from the business portion of the building; and also whether the whole of the accommodation asked for by the corporation has been provided, and the extent of unappropriated space; we are of opinion that the first place ought decidedly to

be given to No. 5, the two next best designs being those of No. 6 and No. 8.

3. As to the sufficiency of window light supplied throughout the building, we consider the designs of No. 5 best.

4. As to the provision made for ventilation and warming, we consider that all the designs would admit of the adoption of proper artificial systems of warming and ventilation; and that, owing to the open arrangements of the internal courtyards in this plan, the design of No. 5 would be best as regards natural ventilation.

5. As to the acoustic properties of the large hall or room and the council chamber, we are not prepared to give any decided opinion on this head.

6. As to the cost of the design, and the probability of the same being carried out for the amount stated by the architect, we are of opinion No. 5, No. 8, and No. 7, are the least costly of the designs submitted, and that the expense of carrying either of them into execution would probably not exceed the sum named in the instructions to the competing architects.

The conclusion at which we have arrived, after a careful adjustment and comparison of the various designs, on the ground of architectural merit, construction, excellence of plan and arrangement, light, cost, and provision of spare room, is, that the four best designs in order of merit are—1st, No. 5; 2nd, No. 6; 3rd, No. 4; 4th, No. 7. And we both concur in recommending that the design marked "St. Valentine" (No. 5) should be recommended by the sub-committee to the Mayor and Corporation for adoption. The architectural character of this design is, as we have said, not so good as some of the others, but the plan has such great merits, is so admirably and simply disposed, and so well lighted, that we cannot but feel that it is thoroughly entitled to the first place. The general disposition of the masses of the elevation is very picturesque, and there is much dignity about the treatment of the principal storey towards Albert-square. We are bound to say that in some respects the design appears to us to require additional study and modifications, of which it admits without difficulty. The great entrance requires better apertures, more light, and greater dignity, and the design for the clock-tower and the angles of the front towards Albert square will, doubtless, be modified and improved by the architect, before they are carried into execution. We regret very much that the interior courts of this building (as indeed those of almost all the designs) have not been more carefully designed in regard to their appearance. They will be seen by most visitors to the building, as the whole of the corridors open upon them, and, as they are all as spacious and open as could be contrived on the site, it seems a fatal mistake to leave them entirely unadorned. Good, solid, simple, but really architectural character is what they require, and there is no reason why they should not have it. The character of the whole building as a work of art depends very much upon its being uniformly good throughout.

We cannot conclude without saying that all the competitors appear to have bestowed immense pains on their designs for this very important work, and that the requirements contained in the instructions appear to have been generally very carefully attended to.—We remain, dear sir, your very faithful servants,

(Signed) Thos. C. Donaldson,
George Edmund Street.

To Jos. Heron, Esq., Town Clerk of Manchester.

We give the names of the competing architects whose designs are referred to by the mottoes or symbols only in the above report of Professor Donaldson and Mr. Street. 1. "Arnolfo di Lapo," Mr. Cuthbert Brodrick (architect of the Leeds Townhall); 2. "Faire sans dire," Mr. T. H. Wyatt (architect of the Liverpool Exchange); 3. "Fides," Mr. Lee (London); 4. "Speraudum," Mr. J. Scott (London); 5. "St. Valentine," Mr. Waterhouse; 6. The Masons' symbol of crossed triangles, Messrs. Speakman and Charlesworth (Manchester); 7. "True to the line," Mr. Thomas Worthington (Manchester); 8. "Valentine," Mr. Salomons (Manchester).

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of this society was held on Wednesday, at the rooms of the Royal Institute of British Architects, 9, Conduit-street, Sidney Smirke, Esq., R.A., in the chair. After a few introductory observations by the chairman, the balance-sheet was read. It showed that in round numbers the receipts for the year, including £104 13s. 6d. carried forward from the previous account, amounted to £366, and the disbursements to £319, leaving a balance of between £40 and £50 in hand. The amount of stock (New Three per Cents.) was, on December 31, £1,367 15s. 8d. The report, which was also read, expressed the regret of the committee of management that the receipts for the past year had not increased to enable them to do all the good they desired. Fourteen applicants had been relieved, but several pressing claims were rejected from the want of funds. Since the last report eighteen new members had joined. The report concluded with a graceful allusion to the loss the society had sustained by the death of Sir R. Smirke, and an appeal for increased subscriptions. The report and balance-sheet were adopted. The formal business of electing officers having been gone through, several votes of thanks to officers for their services in the past year were recorded, and the proceedings closed.

A CHURCH ON FIRE.

THE parish church of Wembdon, near Bridgwater, was burnt to the ground on Sunday morning last. With the exception of the tower and the chancel, the building was completely destroyed, together with an organ almost new, and a beautiful carved oak pulpit. An overheated flue was the cause of the fire. Singularly enough the fire broke out during divine service. It is with churches as with theatres and all other public buildings, it is very seldom that they take fire while an audience is assembled, but almost invariably after the audience has dispersed. In the present case, however, the vicar had just given out his text, when a loud knocking was heard at one of the doors, and, on its being opened, a person, who at a distance had observed smoke issuing from the roof, presented himself and exclaimed, "Make haste out, the church is on fire." As might be expected, great consternation prevailed in the congregation, who were, of course, utterly unconscious of their imminent danger. No fire or even smoke was, at this time, observed inside the building. The worshippers hastily left their seats and got outside into the churchyard, when it was seen that the roof was in a blaze. The whole affair appears to have been of a dramatic and highly exciting character. It is satisfactory to add that no loss of life occurred.

NEW RAILWAY WORKS.

THE contract in connection with the new line of railway from Lewisham to Tunbridge was originally taken by Mr. John Jay, whose tender of £600,000 was within the parliamentary estimate, and the other tenders received extended to £850,000. Mr. Jay, however, was unable to complete his contract, and the works have been carried out under the superintendence of Mr. Peter Asheroft, the engineer-in-chief of the South-Eastern Railway Company, Mr. F. Brady, the resident engineer, and their assistants. The works, generally, are the heaviest executed in England of late years. The embankment at Orpington is 80ft. high, and contains about 800,000 cubic yards of earth work. The cuttings at Chelsfield are very heavy, and are of a somewhat similar character to the Merstham cuttings on the Brighton Railway, except that they are much longer and deeper, and they contain about 820,000 cubic yards. There are also three tunnels between Chislehurst and Tunbridge, that at Chelsfield, through the chalk range, being about 600 yards in length; the Polhill tunnel, about a mile from Chelsfield, and also through the chalk, is upwards of 2,500 yards in length; and the Sevenoaks tunnel, which is through the green sand range, is 3,550 yards, or over two miles in length. This last tunnel was found to be a work of extreme difficulty, in consequence of the great quantity of water met with in sinking the shafts.

THE MANSION HOUSE.

THE four months that have elapsed since the election of the present Lord Mayor have been spent in repairing and restoring his official residence. The work has been carried out under the supervision of Mr. Horace Jones, the city architect, at a cost of above £3,000. The principal part of the expenditure has been devoted to the interior adornment of the Egyptian Hall. It may not be generally known that this room was designed by the then Earl of Burlington, and derives its name from its accordance with the Egyptian Hall designed by Vitruvius. The hall has been decorated in strong colours, the columns and prominent ornaments being relieved with gold, and the niches kept in dark marble, thus throwing out the sculpture in bold relief. The walls, cornice, and frieze have ornaments in the character of the architecture of the hall. The saloon has been embellished in light delicate colours and gold, but in a different manner from the hall, with a view to contrast. The erection of the Mansion House, which stands on what was anciently called the Stocks Market, was begun in 1739, in the time of Lord Mayor Perry, and finished in 1753, in the mayoralty of Sir Crisp Gascoyne, the first chief magistrate who resided in it. The architect was the elder Mr. Dance, who was then the city architect, and the fabric was built at a cost of nearly £71,000. The previous Mansion House was situate in Cheapside, immediately opposite Mercers' Hall, and the front of it, in a fair state of preservation, may still be seen.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

A VERY interesting meeting of the members of the above society took place at their rooms on Monday evening. Mr. French read a paper on the maces belonging to the corporation of Stratford-on-Avon; and in the discussion which followed, some valuable suggestions were offered respecting the origin of maces as the insignia of civil authority. Mr. Brogden exhibited the 7,000 coins which one of his gardeners recently discovered in his grounds at Highbury. With the exception of two, which are of gold, they are all of silver, and from the fact of there being none later than the reign of Richard II., it is surmised they were buried for safety by the Knights of St. John, to whom the estate then belonged, at the time when Wat Tyler's mob attacked and pillaged their house in Clerkenwell. Mr. Clark offered some further remarks on the Roman sarcophagus recently discovered near the Clapton Orphan Asylum. Through the niggardliness of the Government officials, this unique specimen of Roman workmanship, instead of being deposited in the British Museum, has been allowed to pass into private hands.

A paper was also read by Mr. Cussans on a curious mural painting and a window discovered in Buckland Church, Herts. The painting represents the rod of Jesse rising between, or rather separating, a bush and flames of fire. At the top of the rod is a rose enclosing the sacred monogram, I.H.C. (Old English), the whole encompassed by a chain, the top link of which is broken. Some interesting remarks were made respecting the origin of these letters in connection with Christian worship. I.H.C. was undoubtedly the earliest form, and stood for the first three, or possibly for the first, second, and last letters of *Ιησους* in Greek capitals. The *Iota* was I in Roman character, the *Eta*, H, and the *Sigma* was expressed in its ancient Greek form by the Roman C. When these capitals were represented in what printers would call "lower case," they stood I. h. s., to suit which the interpretation *Jesus hominum salvator* was subsequently devised. Mr. Cussans also exhibited some curious terriers, and copies of Court Roll, belonging to the lordship of Amwell, commencing from the year 1308.

At the ensuing meeting Mr. Overall will read a paper on the metal Laton. Although this word occurs so frequently in ancient documents, it is a moot point amongst antiquarians what it really was: whether brass, pewter, or tinned metal of any kind.

An ingenious arrangement for the artificial raising of water, to supply power for a flour-mill in a United States town, may be briefly described as follows:—The process is nothing more or less than to introduce steam—the exhaust of a non-condensing engine is sufficient—into a reservoir connected by a pipe with a supply of water below, and then by a jet of water to condense the steam, creating a vacuum, which is instantly filled with water to be discharged into a flume or reservoir, from which it is carried to the water-wheel.

THEATRES.

NO one who has kept his eyes open can have failed to have seen a manifest improvement of late in many things pertaining to the theatre. It will suffice for the present to enumerate some, as, for example, the sunk float, the equal distribution of light in what is called the auditorium, the construction of scenery, and the introduction of figure painting by artists of known ability. So far things look more promising than they did twenty years ago—emphatically things, not men and women. Of actors and actresses I have nothing whatever to say at present. Parallel with these marked improvements certain features have been developed which go far to counterbalance the advantages already mentioned. These are the subsidence of architectural form, the over development of the balcony system, the extension of the pit, the publicity of so-called private boxes, and, above all, haste in building.

Probably every architect who has had practical experience of the difficulties involved in building a theatre—difficulties which I would not for a moment presume to underrate—will meet us at starting with the assertion that those things I have enumerated as defects are not defects, and that, if time proves to the contrary, he at any rate is not to blame. The subsidence of architecture as a fine art, in connection with theatres, is remarkable. A theatre must either be rectangular or circular in its constructional boundary. The rectangle takes us back to the inn yard of our own country and the cortile of Italy, in which actors performed without scenery, and under the severe test of daylight. The circular form takes us back, by way of Palladio and the Vitruvian plan, to the mighty semicircles of Asia Minor. Projecting within the constructional boundary are certain tiers of galleries, which may be rectangular within the rectangle, as at the Haymarket, or concentric within the circle, as at Drury Lane, or circular within the rectangle, as at Covent Garden. Now, to anyone who has a weakness for looking towards the stage during the progress of the play, and has the pleasure of a side seat in the rectangular house in the Haymarket, it is quite unnecessary to say a word in condemnation of this plan, as there carried out. But the rectangular or square nucleus is by no means to be despised; on the contrary, I believe that, in the hands of an architect unfettered by managerial trammels, it is a form that would prove itself capable of a development which, whilst satisfying the dramatic student, would not outrage the architectural judgment. That we have no such theatre is, I am persuaded, the fault of managers, and the system to which managers seem slavishly chained, and not the fault of architects, except in so far as architects sacrifice their judgment to worn-out conventionalities and narrow prejudices. That much may be made of the square or rectangular idea, I thoroughly believe; but we shall learn nothing from the Theatre Royal, Haymarket, or the Opera House, Covent Garden. If we turn to the circular form of theatre, the poverty of the architecture—if architecture it can be called—is quite as manifest as in those I have already mentioned. There are two or three foreign theatres, which are exempt from this condemnation—*e. g.*, the Victoria Theatre, Berlin, and those at Dresden and Mayence, especially the last mentioned. Of course, the theatrical manager and everybody whose policy it is to agree with him will join Mr. Fergusson in his condemnation of the Mayence Theatre—a condemnation altogether directed against the only architectural feature of the interior, *i.e.*, the order of columns in front of the two upper galleries which connect the roof with the wall behind the two lower galleries or box-tiers, and which are consequently in front of some of the occupants of the upper galleries. But there are certain people whose delight in what they choose to call architecture is in proportion to the absence of architectural forms. Because, in the hands of some men, pillar and capital, and arch and cusp, have been abused, and all the great and lovely elements of architecture burlesqued, then away with pillar and capital and cusp for ever. Because a few sixpenny seats in the gallery of a theatre would fall behind pillars, then away with these old world features, and this visible constructive support, and go in for concealed girders and all the other cheap expedients which we grandly denominate "inventions." These are the sentiments of those who have hitherto written on theatres, and they seem to have been thoroughly endorsed by the theatre-building architects of the present time. We have, however, three buildings which are more or less free from this new architectural vice; these are the Alhambra, the Holborn Amphitheatre, and the new Shoreditch Theatre. In the Alhambra, we possess the greatest amount of architectural character. Its architect may have adhered a trifle too closely to the peculiarities of the place from whence he derived his inspiration, but, admitting this as an error, fully recognizing the crude way in which the stage impinges on the circle of the auditorium, and cognisant of the space covered by pillars, I cannot but think Professor Lewis has produced the best galleried interior of modern times, regarded solely as an architectural effect. To copy this building for a theatre, I need hardly say, would be most unwise, although many things may be learnt from it. Its arrangement by no means solves the problem of how to build a modern theatre.*

E. W. Godwin.

THE CRANES OF SOUTHWARK STREET.

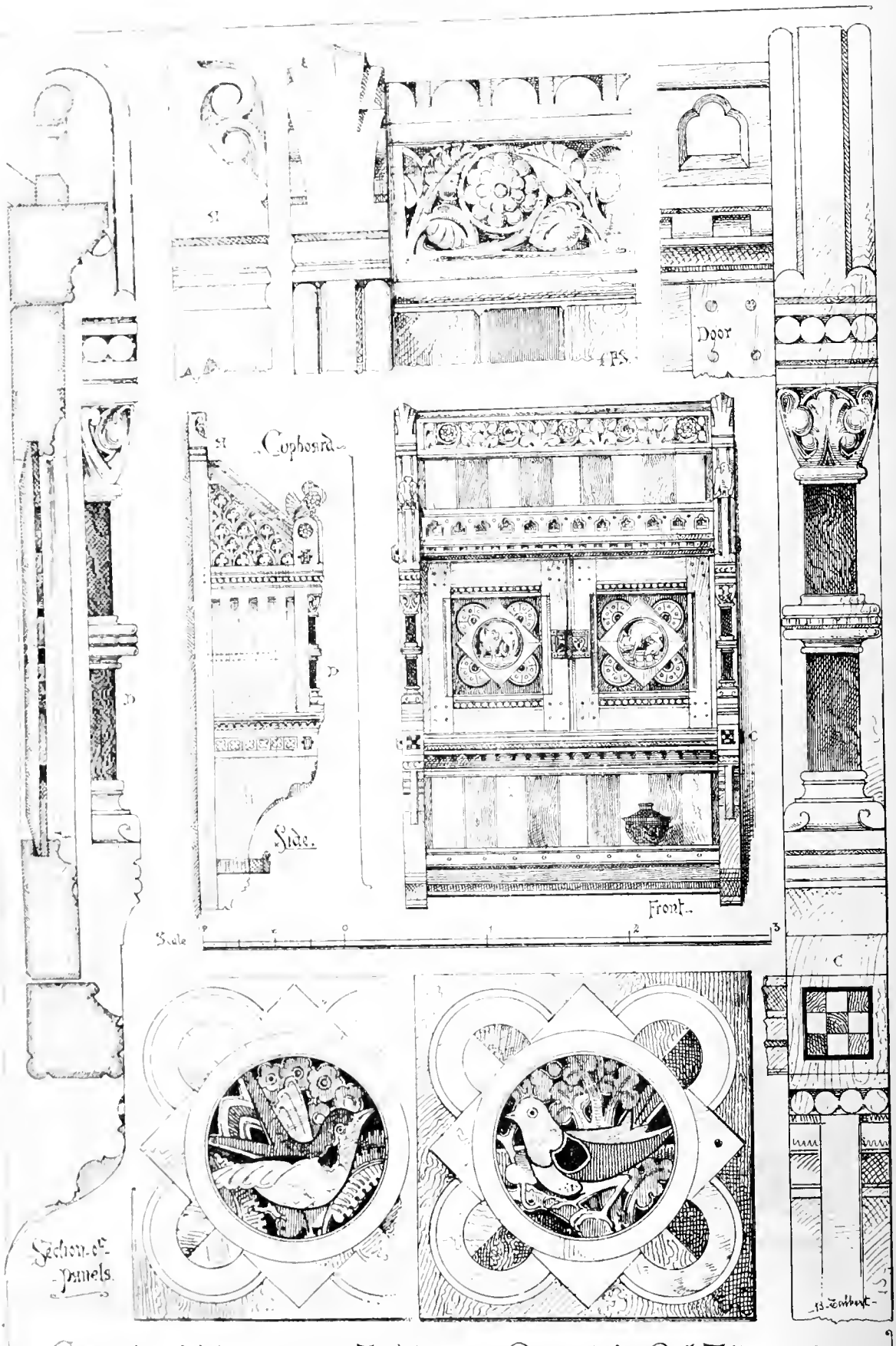
THOSE accustomed to London's "silent highway," the Thames, are familiar with the many-storeyed warehouses upon its sides, the barge-beds at their bases, and the gibbet-like contrivances for raising freights to the numerous floors. As the new embankment proceeds these features will be changed, and the change is practicable only because railway conveyance has thus far superseded navigation. In Thames-street and in many of the adjoining lanes similar arrangements are found, except that wagons are substituted for barges, and the pedestrian has to thread his way in nervous haste beneath impending loads—grates and crates, bales, boxes, sacks, and packages of all denominations are everywhere swinging in mid-air, the carriageways are chronically "blocked," and the footways occupied by porters and carmen engaged in raising and lowering goods. The privilege or easement is known among wharfingers and warehousemen as cranage, and, though very essential to their business, it is obviously attended with great public obstruction in narrow rivers, and is wholly at variance with modern notions of street economy. Nothing could therefore seem more anomalous than the creation of such easements in a new thoroughfare devised for public use, and formed at great public expense, yet this very creation is, we fear, the distinct blot of Southwark-street. This street is one of the earliest and most successful achievements of the Metropolitan Board of Works. As the much-needed continuation of a line from Westminster Bridge-road that ended at Blackfriars, but now debouches on the Borough High-street, a total of about a mile and a half, it has an importance more than commensurate with its own extent of about five furlongs. The new road is of fair width, is well and evenly paved, has a subway, and is lined, so far as the erections have proceeded, with buildings of a novel and grandiose air. The examples differ widely in expression and merit, but the variety is picturesque, and the masses are in some instances well balanced. The effect is indeed original; no other place is reproduced, there are no shops for retail trade, no private residences, but factory and warehouse, warehouse and factory, are interchanged throughout. This condition of things gives rise, no doubt, to special wants, but the condition has been voluntarily brought into existence, and the wants ought to have been foreseen and provided for without prejudice to public convenience. Before further mischief is done, we would ask the authorities to consider how specious such a benefit will appear whenever the public have to buy up the cranes and cranage of Southwark-street.

* To be continued.

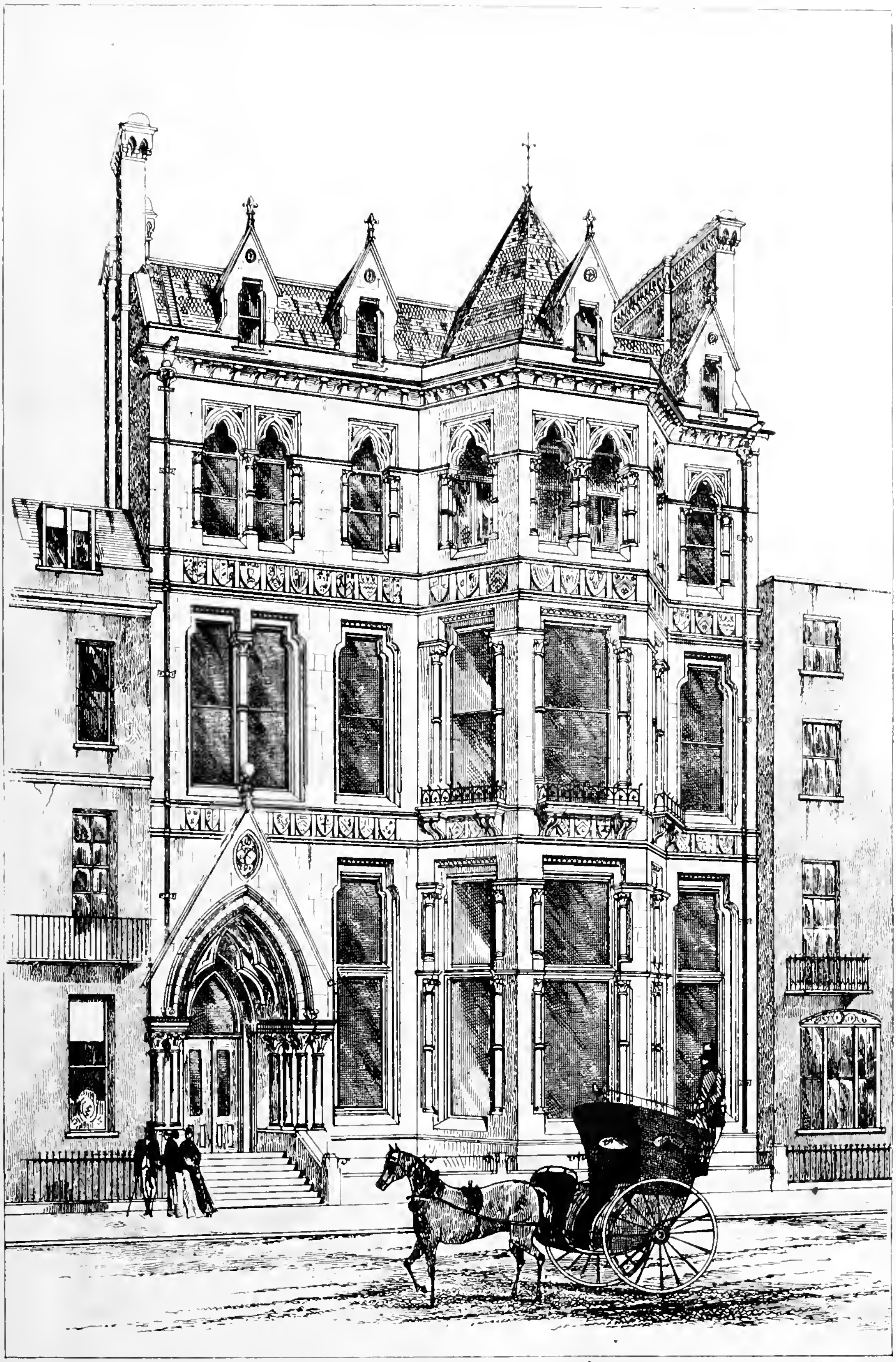
WASHING PUBLIC BUILDINGS.

ONE of the objections frequently urged against London as a place for architectural display is, that its atmosphere is so smoky, and frequently so foggy, that it is difficult, in fact almost impossible, to keep a public building bright, as in France or Italy. This is, no doubt, true. England, like every other country, has its advantages and disadvantages. Disadvantages that are inevitable should be met with resignation; and, as we cannot change the climate or diminish or alter the structure of the clouds, the next best thing is to adapt ourselves to circumstances, and turn the advantages we possess to the best account. The public buildings of London are generally in harmony with the atmosphere of London. They look gloomy; and there has recently arisen a disposition in many minds to treat these buildings as some dirty children are treated—wash them. When the Sultan came to England we treated him, the Greeks said, as if he were Messiah, and, amongst other things done in his honour, we washed Temple Bar. But that renowned obstruction to metropolitan traffic has not looked itself since. Begrimed with the dirt of ages, it appeared venerable. Now it carries with it a kind of would-be look of respectability. Temple Bar, with the gloom of antiquity about it, was bad enough; Temple Bar, with its gloom washed off, is a nuisance, and the sooner it is "buried amid the things that were" the better. No doubt its days are now numbered. We called attention to it a fortnight since, and cautioned the authorities as to its insecure condition. We said that the ominous crack which ran through its centre was visibly increasing. Now that a house has fell down only a few feet from it, let us hope that immediate steps will be taken to prevent the fall of Temple Bar itself.

The Mansion House has just suffered a similar indignity as Temple Bar. It has been washed with soda and water; but, instead of wearing an improved appearance, it exhibits a sickly monotonous look. It looks, in fact, neither ancient nor modern, but pale, insiped, and characteristic. St. Paul's Church, Covent Garden, which is cracked up in "Gwilt's Dictionary of Architecture" as the acme of architectural beauty, but which is, in reality, a heavy, dull, lifeless structure, has also, during the last few days, had its west-end front washed, by a new process invented by a M. Hurwitz, of Paris. The process consists of forcing a jet of water warmed by steam against the smoke-hued stone, and so, with the help of a scrubbing-brush, removing the dirt. Possibly this process has its advantages; but, like all other processes when so applied, it does not improve the face of public buildings. From St. Paul's, Covent Garden, it would not be a very great step to St. Paul's Cathedral. We trust, however, that no attempt will be made to rob St. Paul's of the garment, befitting the metropolis, which a century and half have imparted to it, and substitute in its place an appearance of washed-out respectability. One of the characteristics of St. Paul's Cathedral is the varied light and dark tints which wind and rain have written upon it, and to remove them by artificial aid, and thereby give the building a weak, sickly, uniform hue, would be an economical and æsthetical blunder.



Cupboard exhibited at Paris Exhibition 1867 Designed by B. J. Talbert, Arch.t



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A. WATERHOUSE, ARCHT.

STREET TRAMWAYS.

THE advantages of a smooth tramway over a rough road in reducing the power required to draw a given load, or to move such load at the highest velocity, are known to the veriest tyro in mechanical science. Accordingly tramroads of some kind or other, either of wood, stone, or iron, have been in use from very early times wherever the traffic was uniform and constant, and the loads have been great in proportion to the power at hand to move them, as, for example, in our collieries and mines. In Russia, we are told that the practice of laying down wooden tramways in difficult roads is as ancient as civilization itself in that country. Now, in all our great towns, within the present century, there has sprung up an enormous omnibus traffic subject to conditions precisely similar to those which led to the use of iron tramways in collieries and mines. It is quite as constant in one direction, and is fast growing heavier than can be managed by present available horse powers. The vehicles are small and uncomfortable, and a journey by omnibus is so trying to the nervous system that numbers of persons prefer walking to the purgatory of riding in them. In London, at least, we have not practically solved the problem of giving to these vehicles the smooth surface for their wheels to run upon which will enable them to carry the greatest number of passengers with the smallest horse power, and thus permit the owners to give us better vehicles, cheaper fares, and put us to less discomfort when we are unfortunately obliged to enter them. Other cities are ahead of us in this respect. In the city of Milan the wheels of the carriages have been long made to pass over broad stone trams, with a rougher pavement between for foothold of the horses. In New York iron rails for omnibus traffic were laid down in 1852 along the Sixth Avenue and Eighth Avenue, and, although at first strenuously opposed by thousands of the people, so popular has the system now become in that city that no less than 63 miles of tramway are in daily and hourly use, over which, in 1866, 70 millions of passengers were conveyed by 5,500 horses. In all the other great cities of the United States, and of Canada, similar progress is being made. In Paris omnibuses run upon rails all round the outskirts of the city. In Birkenhead, in Liverpool, in Manchester, in Darlington, and other provincial towns, iron tramways have been introduced, and although, from defective construction, they do not give entire satisfaction, yet, on the whole, they are acknowledged to be of so much use and convenience that their removal would on no account be consented to by the persons who at first vehemently opposed them.

In the metropolis great prejudice has been excited, owing to the failure of Mr. Train's street tramways in 1861. Had he laid down a rail which would not have interfered with the ordinary traffic, while it would have equally well accommodated his own omnibus, we should by this time have had a length of rails far exceeding that of New York. Delays, however, though vexatious, are not unmixed evils, and it may prove that, in the present case, we shall get a rail with the latest improvements, and which shall facilitate not only the traffic of wheels specially made for it, but shall give a surface lessening to the load of every other kind of wheel.

Tramways may be divided into three classes: 1st, for common wheels only; 2nd, for wheels with flanges; 3rd, for both common and flanged wheels. In the first class we may place every construction of wood, stone, or iron which gives smoothness and guidance, without requiring a special wheel to run upon it. We have referred to the stone slabs at Milan, and we may say that such contrivances are not unknown in London in our narrow city lanes, on some of the bridges, and near the docks. These were not laid down for the

STREET TRAMWAYS.

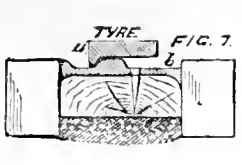


FIG. 7.

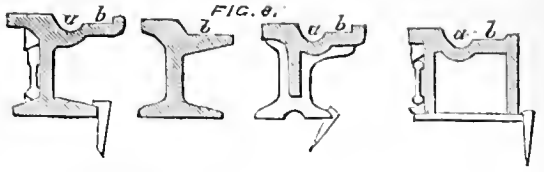


FIG. 8.

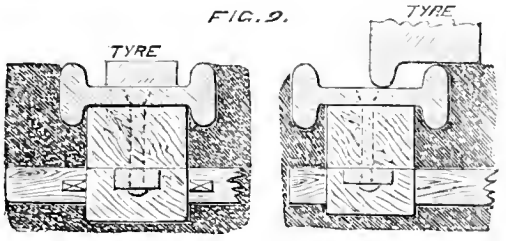


FIG. 9.

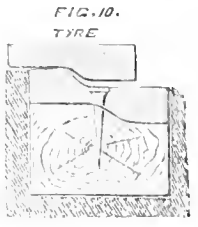


FIG. 10.

purpose of facilitating traffic, but for reducing the wear and tear, which was confined to one precise rut. Yet every driver knows how much the labour of his horse is lightened if he can only manage to get even one wheel upon these smooth surfaces. They give, however, only smoothness, and to lighten the labour as much as possible some amount of guidance is required. This led to the first step towards the introduction of tramplates, as now understood. The first cast-iron plates with an upright ledge (see fig. 1) were introduced by Mr. Curr, at

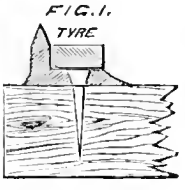


FIG. 1.

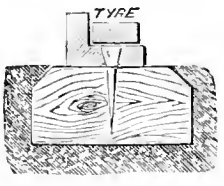


FIG. 2.

the Sheffield colliery, belonging to the Duke of Norfolk, about the year 1776. The ignorant colliers of his day destroyed his railway at first, but he persevered, and his plates afterwards became known by the name of tramplates. Whether this name was derived from Mr. Benj. Outram, the father of General Sir James Outram, of Indian fame, who in the year 1800 effected certain improvements in them (see figs 2 and 3); from the word "tram-

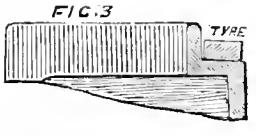


FIG. 3

mel," the wheels being confined to a precise course; or from the "trams" or wagons which run upon them, we must leave the learned and curious in etymology to decide. The improvement usually attributed to Mr. Outram is the substitution of stone supports for timber. It is, however, stated by Wood that this improvement is due to Mr. Barns, who used them at Newcastle colliery, in 1797. A tramway on Outram's principle was laid down from Croydon to Wandsworth in 1801. These, of course, from their upright ledge could accommodate only vehicles of a particular gauge, and would have been quite inapplicable to street traffic, and the first proposal of iron tramways for ordinary street traffic we have met with was a plan of concave rails, patented by Mr. Woodhouse so long ago as the year 1803 (see fig. 4).


FIG. 4.

Another kind of rail presenting a convex surface, and on which, while wheel tires having a corresponding concavity might have an advantage, ordinary wheels could run with advantage and could cross without obstruction, was patented by Mr. Brooman, in 1866 (see fig. 5). We cannot conceive of much objection to the principle of Mr. Woodhouse's rails, over which vehicles of all kinds could have passed without any obstruction, and with great ad-

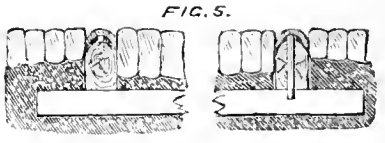


FIG. 5.

vantage, and the only reasons we could suggest for its non-adoption would be on the ground of expense, and that no master mind had arisen to educate the great party of obstructives to improvement in 1803.

The great extension of steam locomotion since 1825 led to great improvements, both in rails and wheels specially adapted for them. However, few, if any, since Woodhouse's patent, suggested anything of the kind for street traffic, till a proposal was made by Mr. W. B. Adams for a grooved rail, with a wheel having a projection in the centre of the periphery to work in it. This proposal was made by him in the "Westminster Review" of September, 1844, and was the first proposal of the kind (see fig. 8).

In 1846, a tramway of timber, with an iron plate at the side for a flanged wheel to run upon, was fixed on Southend pier (see fig. 6), and attracted much notice, as the first public use of a flanged wheel and rail apart from steam locomotion.

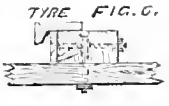


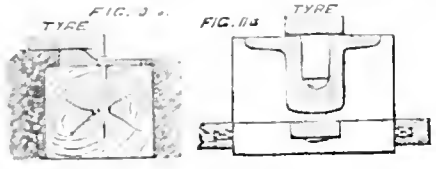
FIG. 6.

In 1852, the Americans of New York laid down their first line of street rails, of which fig. 7 is a section. In this an endeavour was made to suit all kinds of wheels, a flange working in the groove *a*, and a common wheel being able to run in the wide groove *b*. We can well conceive that this form would be prejudicial to vehicles which might have to cross it, and give rise to the complaints which have been heard both here and there on the danger caused to common vehicles. It seems, however, that so satisfied are the people of New York on the whole, that they would rather incur such small inconvenience, on account of the other great advantages of street railways, and endeavour to improve rather than destroy or forbid them entirely.

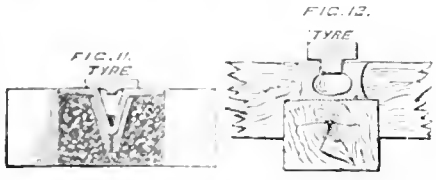
Several forms of improvements patented in New York and England are shown in fig. 8. A simple plan of laying the common double-headed T-rail, so as to suit either flanged or common wheels, was suggested by Mr. W. B. Adams, in a valuable paper on the subject, read at the Society of Arts, in 1857 (see fig. 9).

Mr. Train's street tramway of 1861 is shown in fig. 10, being an improvement upon

that laid down at Birkenhead (see fig. 10a) by him in 1860. Of this Londoners have a lively recollection. Great complaints were made of it, and it was voted a nuisance by a Surrey grand jury, and the proprietors of carriages at the West End. Yet every one who rode in Train's carriages admits fully their great comfort, convenience, and speed. We have said that his failure was owing to his form of rail, and it is with the view of directing attention to the subject that we give these illustrations. A rail presenting in itself no obstructions whatever to ordinary traffic is the grooved or V tramway (see fig. 11). Over this vehicles of all kinds may pass



and repass with the utmost freedom, and no obstruction whatever. They may even pass along it, as shown in fig. 11a, and gain great advantage from it. Thus, by its adoption, an improved route would be secured, not only for vehicles specially made, but everything upon wheels might receive benefits. As our last diagram, we reproduce the original proposal of a grooved rail, made by Mr. W. Bridges Adams, in the "Westminster Review," in 1844 (see fig. 12,); and we hope to



see the day when it or some modification of it shall be general, wherever practicable, through the whole length of our overcrowded streets. A proposal to adopt some such plan has just been rejected by Parliament, but we hear that it is likely to be re-discussed.

In London, without tramroads, we conveyed, in 1866, 44,000,000 passengers by omnibus alone, and required 6,600 horses. In New York, as we stated above, 70,000,000 passengers were conveyed by 5,500 horses. In other words, each horse in London can do only one half of the work that can be done in New York. How long we are to remain behindhand in the path of improvement we do not know. But we trust it will not be long, and that in the country where street railways were first suggested though the suggestion may be carried into practice a little later than by our go-ahead brethren in America, it will be found that the delay has only resulted in the adoption of much more satisfactory plans.

SCULPTURE IN WESTMINSTER HALL.

A CARTOON by Mr. Armstead is now on exhibition in Westminster Hall, showing the way in which it is proposed to decorate that building. The cartoon, which is of large size, forms one of a series of panels into which it is contemplated to divide the walls. The subject is the field of Bosworth. Richmond is in the act of placing on his own helmet the crown which has just been taken from the dead Richard. The design is by no means good, as the lines are very rigid and ill chosen in their rigidity. A bas-relief, to be worth anything, should have easy flowing lines, and we wonder that Mr. Armstead's classical studies should not have taught him as much. Apart from the question of whether this is or is not a good design, it is by no means certain that sculptured decoration would improve the appearance of Westminster Hall. It will assuredly take off from its apparent size, and on that ground alone is undesirable. Already the hall has been hacked about by the insertion of a granite plinth, and encroached upon by the introduction of five or six statues which do not harmonize with it. We believe that these statues were originally intended to be placed elsewhere, but no one seems quite certain where. Very good authorities hold that in Gothic buildings statues should always occupy niches, the opposite treatment of isolating them on pedestals being the Classical method. We may farther remark that white marble statues cannot be satisfactorily introduced in a Gothic building—the contrast is too strong. When our ancestors used alabaster, which is warmer in tone than marble, they generally painted and gilded it. Every portion of a true Gothic building will bear painting and gilding, and as the marble statues in question will certainly not bear that test, they are manifestly unsuitable to the building. Mr. Pitt, in a blue coat, brass buttons, and gilt shoe-buckles, would not provoke admiration, nor would the more gorgeous costume of Fox command respect. We must not, however, be thought to mean that all that is necessary for the proper treatment of Gothic statues is to place them in niches. A visit to Palace-yard will convince anyone of the contrary. It has seldom been our lot to see a worse pair of statues than those of Alfred and William the Conqueror, flanking the clock tower entrance to the arcade. Doomsday Book is growing out of the Conqueror's stomach, and the anatomy of both figures is contemptible. The expression of William is a cross between Motley and Mephistophiles. We are sorry to say that Mr. Armstead is the sculptor, and he bears a high character for correctness. We suppose that press of work has prevented his giving sufficient attention to these two statues, which is the more to be deplored, as they are so close to the eye and in so conspicuous a situation. It would seem as if some fatal blighting influence pervaded Palace-yard.

CUPBOARD EXHIBITED AT PARIS EXHIBITION.

ONE of our lithographic sheets this week illustrates a cupboard, with details, designed by Mr. B. J. Talbert and executed by Mr. Wright. The cupboard was exhibited at the Paris Exhibition last year, and two medals were awarded to the work. It was purchased by the Austrian government for the Vienna Museum. Our illustrations have been reduced by Messrs. McClure and Company's process, from Mr. Talbert's work on Furniture, which we shall notice more fully in an early number of the Building News.

UNIVERSITY CLUB.

THIS building, which forms the subject of one of our illustrations this week, is very nearly finished. The club-house consists of three floors with basement and attics. The principal room is on the ground floor, and is a handsome octagon apartment 22ft. in height, and has a large bay window and sunlight. On the same floor, situated at the back, is the members' dining-room, which is 46ft. by 27 by 17. It is lighted by three windows which occupy the whole side of the room. Adjoining are a smaller coffee-room 27ft. by 18ft.; and a strangers' dining-room 27ft. by 20ft. Both have top lights of ground glass. The smoking-room is on the second floor, with bay window to the front. Its dimensions are 46ft. 6in. by 31ft. by 14ft. 6in. A corridor 72ft. in length leads to the billiard-rooms, of which there are two, each measuring 27½ft. by 22ft. by 14ft. 6in. Like the dining-room underneath, the windows occupy the whole length of the rooms, which are admirably lighted. The drawing-room is on the first floor, and is the same size as the smoking-room, but is 17ft. high. This has a fine bay window, and sunlight. On this floor is the library, corresponding in size with the members' dining-room, and is similarly lighted, but has two additional sun lights. These are the principal apartments. It may be mentioned that all the stairs are supported by iron carriages. The club is well supplied with note rooms and lavatories, while the ventilation arrangements seem in every way complete. The club is built of Portland stone, and, as will be seen, shows a considerable amount of ornamentation in details. The two courses of coats of arms are intended to represent the arms of the various colleges both of Oxford and Cambridge. The architect is Mr. Alfred Waterhouse; Mr. W. Brass, of Old-street, City, is the builder. The coloured glass, and lead lights, as well as the decoration of the walls and ceilings, have been executed by Messrs. Heaton, Butler, and Bayne. Mr. H. G. Mappleson is the clerk of the works. The building, which has been nearly two years in hand, is expected to be ready for occupation in April or May.

PLASTER.

"IT seems very hard upon such a really beautiful building material as Portland cement," says Mr. F. Rogers in "Atchley's Price Book" (the second edition of which is announced), "that its use should be almost entirely abandoned to those who hide bad bricks and slovenly brickwork, and rear sham stone 'fronts' with 'Corinthian porticoes.' Why cannot it be used in some common-sense way? As, for instance, in a brick building, if there is wall panelling, the face of the panel might be plastered, and the wall surface would then show the true principle of construction, the panelling being treated with some impressed ornament, and, if colour be required, tiles or terra cotta embedded in the cement. There would be no practical difficulty in doing this, and the thinnest walls would then be as weatherproof as the thickest, by being covered with this imperishable material,—for so it is, if properly mixed and laid. Some of the older timber-framed houses of Chester and Shrewsbury are covered with lime and hair, and a large embossed scale pattern worked upon the face of the plaster. Some nice effects of colour are produced in old houses in Kent and Sussex by two coats of different coloured plaster, parts of the outer coat being scraped off whilst still wet, and then filled in, thus revealing the pattern by the variation of tint. The prevailing idea as to room ceilings seems to be an elaborate coroice bounding its junction with the wall, and a still more elaborate 'flower' in the centre; and, although this may be a very tasteful arrangement, it does not contain the essence of all that can be done in this feature, and I cannot help wishing sometimes that the ceiling was divided into simple panels; even a simple ribbed moulding would do; a pattern in the centre of the panels, if you can afford it; if not, leave the bed plain. This would give a much greater scale to a room, and would do away with the necessity for so many plaster flowers growing upside down. The eighteenth-century fashion of arranging a room with a low skirting, a dado at the height of the chair-backs, and the space below left for panelling or other decorations, whilst the space above may be papered or otherwise decorated, is one which certainly gives great dignity to a room, adding to the apparent height of wall, and, in fact, giving us something else than the eternal paperhanging. Whilst upon the internal arrangement of rooms, I should like to say that I cannot see the use of the immense height given to them. They are certainly not easier to ventilate, because in a very lofty room the foul air rises to the ceiling, cools, and then descends again, colder, but not purer than before. An apartment of moderate height, the head of the window coming up nearly to the ceiling, and keeping the top sash generally open a little way, is much more easily ventilated. If to this be added a double sash, perfect ventilation and government of temperature may be obtained."

COMPETITIONS.

Kensal New Town.—An anonymous gift of £4,000 was recently made to the Bishop of London's Fund for the purpose of erecting a church in Kensal New Town. The carrying out of the donors intention was undertaken at the request of the Bishop's Fund Committee, by the London Diocesan Church Building Society, who invited a few architects to submit designs. Out of four sets of drawings sent in the committee have selected the designs submitted by Mr. Bassett Keeling, of Gray's Inn, under whose superintendence it will be at once erected. The church will seat 800 adults, and the inclusive cost, site only excepted, will be covered by the amount above stated.

The St. Pancras Infirmary.—A number of architects having been invited to compete for the above, eight designs were submitted. The guardians have selected the designs of Messrs. John Giles and Biven, of 28, Craven-street, and awarded the second premium to Mr. Burdon, and the third to Mr. Robins. The estimated expenditure is about £33,000, and the number of patients to be provided for, 500.

Worcester Orphan Asylum.—The competition for this building, the advertisement of which appeared on August 17, 1867, has resulted in the selection of a design, the joint production of Mr. William Watkins, of Lincoln, and Mr. S. Dutton Walker, of Nottingham. There were twenty-three competitors. As regards external treatment, economy being a great consideration, little stonework has been introduced, but the effect has been obtained by a bold treatment of the roofs, the general grouping of the design, by a broken and picturesque skyline, and by the introduction of Staffordshire blue brick bands or strings. The building is designed to accommodate 25 girls and 25 boys, with arrangements for the extension so as to receive double that number when required. The material chosen is red brick and Bath stone. The estimated cost is £4,000.

BUILDING AND LAND SOCIETIES.

The Bradford Third Equitable Benefit Building Society, which we believe has one of the most extensive businesses in the country, and has proved eminently useful to artizans and others, held its fourteenth annual meeting last week. We learn from the official report that, while in 1866 the receipts of the society amounted to £202,851, they had reached in 1867 to £231,647. The amount advanced on mortgage in 1866 was £94,317; in 1867, £108,206. The number of members had increased from 3,711 to 4,090, and the shares from 10,126 to 11,772. A bonus of 6 per cent. upon invested subscriptions was declared.

The directors of the Leeds Permanent Benefit Building Society, in their nineteenth annual report, state that in all its sources of income great progress has been made during the last year. The total receipts of the year were £203,147 10s. 5d., or £3,906 5s. 10d. per week; and the payments £211,032 5s. 9d. The number of new members was 2,043. The board recommend that 2s. 1d. per share be paid out of the surplus fund to those members entitled to the same, until the next annual meeting.

PARLIAMENTARY NOTES.

On Monday next Mr. Candlish will ask the First Commissioner of Public Works whether there is any objection to the erection of a statue of Oliver Cromwell between the statues of the two Charleses in Westminster Hall.—The Metropolis Subways Bill was read a second time on Monday.

The Artizans and Labourers' Dwellings Bill was also read a second time on Wednesday.

ARCHÆOLOGY.

The Government have purchased the antiquarian and archæological collection of the late Dr. Petrie, and the well-known specimen of Early Irish art called the Tara brooch. These are to be the property of the nation, and are, for the present at least, to be deposited in the Royal Irish Academy.

One of the most important of recent discoveries of the archæological sort has been made in Rome, "This is nothing less valuable," says the "Athenæum," "than eight of the missing fragments of the plan of ancient Rome, which was incised in marble by order of Antoninus Caracalla, and is famous under the name of the Pianta Capitolina, and occupies part of the sides of the staircase in the Capitoline Museum. Two of the eight pieces are of considerable dimensions; one of the other fragments illustrates the Porticus Liviæ in the most satisfactory manner.

WATER SUPPLY AND SANITARY MATTERS.

The Liverpool Corporation are about constructing another reservoir for the storing of water at Rivington, at a cost of £130,000; but the scheme was on Wednesday strongly opposed at the meeting of the town council. Mr. Alderman Picton said that there would be no water for the reservoir, and Mr. Miller advised that they should husband their resources for getting water from Bala Lake. In reply, Mr. Beloe contended that an average rainfall would soon fill the proposed reservoir; and that, as for the Bala Lake scheme, they never would be able to overcome the opposition they would meet with from the city of Chester and other parties locally interested.

Building Intelligence.

CHURCHES AND CHAPELS.

The Franciscan Church of the Holy Trinity, at Killarney, has been consecrated. The style adopted is similar to that of Muckross Abbey, which was a monastery possessed by the Order as early as 1340. The length of the building is 165ft., and the width 35ft. The total cost is estimated at about £8,000. Mr. J. G. M'Carthy, of Dublin, was the architect, and Messrs. Barry and Doyle, the contractors.

A new church is shortly to be commenced at Hunslet, under the auspices of the Leeds Church Extension Society. The design, which is by Mr. George Corson, of Leeds, is in the Fourteenth Century style, and the building will be constructed of pitched faced Weetwood wall stones. The plan comprises a nave, with north and south aisles, chancel, organ chamber, and vestry. The church will seat 700 persons.

A new Wesleyan Chapel is to be erected in Norfolk-road, Brighton, to cost about £2,500.

The Catholic Apostolic Church, Chester, which is situate in Church-street, Upper Northgate, was opened for worship on Sunday last. The nave only has been completed at present, and a temporary chancel formed by screens on either side, enclosing vestries for ministers and choristers. The principal entrance is by a western porch or narthex, and the nave consists of five bays lighted on either side by coupled lancet windows, and a four-light traceried window in the west gable. The bays are marked externally by bold projecting buttresses, and internally by the large trusses to roof, which is of high pitch and single span, the whole of the timber framing being visible, which, together with the rest of the woodwork throughout, is stained and varnished. The chancel stalls and a portion of the nave benches are temporary. The font is of stone, and placed at the south-west angle. The nave is 75ft. long by 33ft. wide and 45ft. high internally. The present accommodation is for 360 persons, exclusive of space for lower and upper choir and sanctuary. The complete building comprises future chancel, &c., with tower and spire at the south-east angles, which will form a prominent feature in the view from the Northgate. The whole will be built of brick, with bands of stone, in the Early Gothic style. The architect is Mr. O. Ayliffe, of Manchester, and the general contractor, Mr. Thos. Hughes, of the Northgate. The whole of the works have been satisfactorily executed in a thoroughly substantial manner.

BUILDINGS.

The second contract for the Bolton New Townhall has been let, and gained by the firm who have built the basement—Messrs. Ellis and Hinchcliffe, of Manchester. The sum is between £44,000 and £45,000. Their contract for the basement was £11,800. The contract will have to come before the council meeting on Wednesday for confirmation, but there is little doubt on such a matter as to the opinion of the Townhall Committee being adopted.

The North-Eastern Railway Company is engaged in replacing the whole of their numerous wooden viaducts with stone and iron. Upwards of £67,000 have been spent in this way during the past five years, and it is estimated that £110,000 more will be required to complete the work. The Hutton, Malton, and Whitby Viaducts have been completed, the Ripon is in progress, and the Norton is being filled up. The Ouseburn Viaduct will be next taken, after which the remaining works of magnitude will be the Esk Valley Viaducts (two), and the Scotswood, Willington, Cassop, and Bradbury Viaducts. The whole of the wooden bridges, however, cannot be finished till six years hence, and it is proposed to expend yearly a sum of about £20,000 until completion. These renewals are done at the cost of revenue.

The foundation stone of the Brighton Turkish Baths was laid on Monday, the 2nd inst. Let us hope that this speculation will turn out more satisfactory to the shareholders than several undertakings recently set on foot in Brighton, more particularly the three large hotel companies.

The new College Green Hotel, Bristol, is to be opened shortly. It is in the Italian style, both inside and out. The central hall is 62ft. long, 32ft. wide, and 40ft. high, and extends the whole depth of the building. All the bed-rooms are fire-proof. The architect is Mr. W. H. Hawtin, of Bristol, and the contractors Messrs. Beavan and Son, of Bedminster, for masonry, and Mr. H. Brooks, of Bristol, for carpentry.

The newly-erected schools in connection with the United Methodist Free Church at Horfield were opened last week. They have been built at the back of the chapel, of rough stone, pointed, and having Bath stone dressings. The cost has been about £350. A large number of timber merchants, builders, and others contributed to the schools by giving materials. Messrs. Taylor, Brothers, have given the joists; Messrs. Barnes and Sons, the rafters; Mr. Williams, of Westbury, thirty loads of stone; Mr. Eddington, of Horfield, door-frames; Mr. York, Horfield, the front doors, with frames; Messrs. Hall and Sons, the glass, which was put in gratuitously by Messrs. Charley and Moon; Mr. Norris, of Kedwick, two fire-grates; Mr. Lambert laid the flooring; Mr. Davey, of Horfield, did a certain amount of hauling; and Mr. Coates, of Cheltenham road, superintended the work without fee.

Mr. Horace Jones, the architect for the City, in a recent report prepared by him, furnishes a detailed account of the state of the works in connection with the New Dead Meat Market in Smithfield. The report gives a very satisfactory statement of the condition of the building. There are, it appears, 220 men at present employed upon the works, and the erection of the different portions of the market are proceeding rapidly. It is believed that the building will be completed and opened before next Christmas.

The present vegetable market at Edinburgh having been acquired by the North British Railway Company, they are bound to provide another market for the city in the same locality. They propose to form it in the space between Kennedy's Hotel and Waverley Bridge. The level of the proposed market is to be 28ft. below the level of Princes-street, and the work required will be pretty extensive. The successful contractor is not yet announced, neither is the amount of the tenders known, but they are believed to range from £12,000 to £20,000.

The new buildings at Trinity College, Cambridge, erected by the munificence of the late master, will be completed and ready for use in October next. The rebuilding of the front part of Caius College will commence next month, and the work is to cost about £31,000.

Leeds.—The new Church Institute, the foundation stone of which was laid in 1866, is nearly finished. The style adopted is the Decorated Gothic of the fourteenth century, and the cost of the building, exclusive of the site, is about £7,000. The building consists of two portions—a main building, with the front to Albion-street, and a second building at the back, with a distinct roof. The materials employed are pressed brick with stone dressings. The front is divided by buttresses into five bays, which are gabled and finished with stone coping and carved finials. Crockets, representing figures in different designs, are placed on the coping on either side of the finials, and boldly projecting grotesque gargoyles, supported by shafts, rest upon the caps of the buttresses. The roof is high pitched, with an ornamental iron ridge, and in the centre rises a *flèche*, surmounted by an iron cross and finial. The top of the finial is 115ft. from the ground. The architects are Messrs. Adams and Kelly, of Leeds; the contractors being Mr. E. Boothman, for the brickwork, Mr. J. Pounder, masonry, and Messrs. Hall and Son, joiners' work.

We understand that at last something is likely to be done towards restoring Herne Bay pier, and throwing it open both for traffic and as a promenade. Mr. Archibald Dawnay, civil engineer, has the matter in hand, and we have no doubt that, if he is properly assisted by the proprietors and the public, the works will be commenced at no distant date.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before five o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty Four Words.

Replies.—R. L. B.—E. A.—E. W. P.—W. S.—T. S.—C. Brothers.—E. W. P.—E. P.—A. D.—I. B.—P. and S. L. and E. G.—I. H. B.—L. C. I.—H. C.—O. W. D.—P. and R.—L. N. T.—G. H. H.—C. L.—R. P. S.—F. and B.—E. W. P.—S. F. and Sons.—A. W.—I. S. G.—O. W. D.—E. H.—E. J. P.

Errata.—A correspondent last week stated that the new Congregational Chapel at Driffield cost £1,000. It should have been £1,500.

Correspondence.

PUGIN v. BARRY.

To the Editor of the Building News.

Sir,—I am a stranger to Mr. E. W. Pugin, but, as an ardent admirer of his father's genius, and with full faith in the claims made by Mr. E. W. Pugin on his father's behalf, I beg heartily to congratulate him on the extraordinary *faux pas* the Messrs. Barry have made in making public and so positively certifying that a certain design was by their father, when there exists undoubtable proof in the same design of its proceeding from the brain and hand of Pugin! Mr. Pugin's adversaries have herein proved themselves his greatest friends, poetical justice, inasmuch as those who should have been his friends have shown themselves his chief enemies. People often talk about a Providence in events—such may find much worse illustrations of what they mean than in this matter of the design for throne, House of Lords. For my part, I had come to the conclusion from the style that it was Pugin's work, no one but he possessing the same freedom of hand with exact correctness of character and feeling. Dr. Barry insists strongly on Mr. E. W. Pugin submitting the whole affair to the decision of the "Institute." It would be utter folly for him to do anything of the kind: dispassionate unbiassed judgment is impossible there. All the chief members are personal friends of the Messrs. Barry, whilst Mr. Pugin is a stranger to them. They are all Protestants, and a certain amount of odium certainly exists towards Mr. Pugin as being a Roman Catholic. The Messrs. Barry are also in the stronger position, having, as one may say, the "possession," proverbially "nine points." But, more than all this, whilst Mr. Pugin is making public the individual case of his father, he is unintentionally exposing a system. For the members of the Institute to admit Pugin's claims, they must stultify themselves. Is it not a notorious fact that many members of this honourable Institute are mere brain-suckers, whose reputations have been made by the talent of their assistants? If Mr. Pugin is well advised, he will never submit his father's fame to the dictum of such a jury as this. It is the public now must judge in the matter, and, though it may be a work of time, yet, in the end, I am confident truth and Pugin's fame will be triumphant.—I am, &c.,

Justitia.

NEW TOWNHALL, MANCHESTER.

Sir,—The published report of Messrs. Donaldson and Street on the designs for the new Townhall shows the public that the sub-committee of our City Council had good cause for not adopting it when presented. It is to be feared that, unless the whole of the competitive designs are publicly exhibited and the opinions thereby produced influence the selection, a mistake will be made, and thus an injustice done to the eminent men who have competed, as well as to the public at large. Briefly analyzing the report, we find that "St. Valentine" occupies the lowest position as a work of art, and the highest as regards the plan. Another design, however, occupies the position of second in merit of plan to that of "St. Valentine," whilst, as a work of art, this same design is placed at the head of the list. Further, the report states that "St. Valentine" in his exterior and interior architecture is inferior to the others, and recommends additional study and modifications. Surely in an important public monument, of which our citizens should have reason to be proud, we ought to expect a design which is not only a good plan, but more particularly a work of art, and a perfect piece of architecture.—I am, &c.,

Mancunium.

ARCHITECTURE AND INDEPENDENT DISSENTERS.

Sir,—I suppose I ought to thank you for the pleasure of a "new sensation," that of suddenly finding myself asserted to be the greatest architectural humbug in Europe. The novelty of that position, as assigned me in your article of the 28th ult., having somewhat worn off, I now beg some space, not for the purpose of disputing the accuracy of such strongly pronounced opinions, but to record my indignant protest against the imputations made by you, as to "pushing" and taking unprofessional rates of remuneration, &c., &c., which are evidently intended to account for the success with which I am credited. So far from their having any foundation, I beg to say that I never apply to any committee or individual for professional work, never enter into competition, and never charge less than the usual 5 per cent. commission. As to subscribing, I believe that architects rarely build churches or chapels without contributing towards their erection or embellishment, and I am not aware that I contribute more than is usual. I should, however, be perfectly justified in doing this, for, as an Independent Dissenter, of twenty-five years' standing, I naturally have an interest in chapel extension, apart from any professional considerations. Before accounting for my alleged success by unprofessional means, it certainly was worthy of consideration whether my buildings may not have been deemed, by Congregationalists themselves, as specially suitable for their requirements. My long association with, and knowledge of that body, renders such a solution not unreasonable. If, however, you did not intend these obnoxious remarks for me individually, I am justified in asking your repudiation of them in all connection with myself, for they are so interwoven with that portion of your article which is distinctly personal, that the reader can only consider them to have been intended for me. In your various articles on chapel architecture a desire is apparently manifested for its improvement. I conclude by remarking that any rules or suggestions for raising the character of chapel architecture, to be beneficial, must be based on a knowledge of the services and various requirements of Independent Dissenters, and this I fail to discover in any of your articles.—I am, &c.,

W. F. Poulton.

Reading, March 9, 1868.

[We wish it distinctly to be understood that our remarks in regard to pushing architects did not apply to Mr. Poulton.—Ed. B.N.]

ORGANS.

Sir,—I wonder what "A. B. C.," or any of your professional readers, would have said if he had read in a leading musical journal, that architectural power has very much declined in the world—that, in fact, there were only three architects, viz., Viollet le Duc, Kuypers, and Mr. Tarver, or some other possibly rising man; and yet the assertion would not have been a whit more absurd than your correspondent's condemnation of all living organ builders. Your readers are not necessarily judges of organs, or I would not trouble you with my remarks upon the utter nonsense of comparing Mr. Lewis, who certainly is not much more than a fair specimen of English organ builders, with the really leading men in the profession, with such an artist and genius, for example, as Mr. Willis, one of the first organ builders, whether we look to tone or mechanism, that Europe has ever produced, if not the very first. Of this, at any rate, I am quite certain that he far surpasses either Schulze or Cavaillé-Coll. I say this without fear of contradiction, as I am borne out by many of the very highest men in the musical profession, as Dr. Wesley, Mr. Costa, and others. "A. B. C." shows that personally he is not much acquainted with his subject, by his observation upon the effect of the metal upon the quality of sound. Spotted metal does not improve the sound of a pipe at all. You could have a row of pipes alternately of spotted and ordinary white metal without the most accurate ear being able to detect any difference. Here, again, I do not speak on my own unsupported authority. The great diapasons, and, in fact, all the metal, I think, of Father Smith's fine organ at St. Paul's Cathedral was not made of spotted metal. So long as the metal is sufficiently thick and tough there is no particular advantage, except sightliness in its containing so much tin, which needlessly increases the expense.—I am, &c.,

J. C. J.

LOW ESTIMATES, AND HOW CARRIED OUT.

Sir,—Many of your readers, I doubt not, feel somewhat surprised at the great discrepancy in tenders for works which appear weekly in your journal, and any information which would tend to explain or throw some light on the way in which they are carried out, ought to and would, I feel assured, be acceptable. Some months since, I, amongst others, tendered for the erection of a fire brigade station at St. John's Wood, for the Metropolitan Board of Works, the highest estimate being £2,000, and the lowest a trifle under £1,650, the latter being accepted. I paid ten shillings for plans and specifications, and went through them most carefully, and priced it out to do (as the specification certainly implied) a first-rate job. After providing that the ground should be excavated to a sufficient depth to ensure a good foundation, the specification went on to say that the concrete should be composed of fresh burnt blue lias ground lime and clean-washed Thames ballast in the proportion of one of the former to six of the latter, to be thrown in while hot, well rammed, &c. The job having only been recently commenced, and my business taking me past it very frequently, I was rather curious to see how these instructions would be complied with, when—I confess not very greatly to my surprise—instead of clean-washed Thames ballast being used, a little dirty pit ballast, with a great deal of unscreened burnt clay (or ballast if you will), was being used in the foundations. The brickwork is now being carried up on this precious substitute for good concrete, and with a clerk of works looking on. Why, Sir, only a few weeks since, the surveyor to an adjoining estate detected some speculating builders doing the same thing, when he ordered and insisted that it be taken out and proper ballast concrete substituted; and yet, in a public building, one that the whole of the metropolitan public have to pay for, it is allowed to remain. I would, in conclusion, ask what inducement can there be for respectable builders to enter into competition jobs with so little chance of success against the "cheap jacks" of the present day? I enclose my card in confidence.—I am, &c.,

Fair Play.

THE RIGHT THING IN THE RIGHT PLACE.

Sir,—Weather-tiled cottages in Sussex and Surrey, half-timbered buildings of Kent, the stone cottages with mullioned windows in Somerset, the village churches generally, and the Elizabethan mansions, were admirable for Elizabethan times. The red brick houses of the last century in country towns, the French cathedrals in France, the Renaissance palaces in Rome. Wren's buildings are admirable as city buildings and palaces, and eminently suited to their place. Inigo Jones's buildings in like manner. The Belgian townhalls to their municipal wants; English townhalls and market-houses until very recent times have been constructed on principles arising out of local wants; the ordinary seventeenth century houses of a Flemish town were excellent for Flemish wants. So we have found that, until very recent times, people have constructed the right thing in the right place.—I am, &c.,

A. B. C.

Intercommunication.

QUESTIONS.

[707.]—BEAD AND FLUSH FRAMING.—Can any of your readers inform me whether, in bead and flush framing the correct practice is to work the bead on the panel or on the frame? Opinions differ most remarkably on this question, and it is one which ought to be satisfactorily cleared up. Gwilt declares in favour of the panel; Nicholson and Brees state the bead should be on the frame. From all I can learn on the subject, the latter method (which is certainly the best) is the one sanctioned by the older authorities, while modern practice and steam machinery has introduced the former mode of construction. I am told that, where steam machinery is employed, the bead is invariably worked on the panel, with the grain; and at the top and

bottom, where it would occur across the grain, a rebate is sawn out and a wrought bead bradded on. It seems to me that this method, if allowed at all, should only be used for inferior work, and the older plan (which, by-the-bye, obviates the danger of unsightliness from shrinkage) should be specified for all good work.—Gilbert R. Redgrave.

[768.]—PERSPECTIVE.—I should be obliged by any of your readers explaining the method of drawing interiors in perspective. I have looked up a work on the subject, but the method employed there seems to me confused and difficult.—Constant Reader.

[This question was asked in the last volume of the Building News, at p. 658, and was answered and books recommended by various correspondents at pp. 729, 747, 765, and 784.]

[769.]—EARLY ENGLISH STYLE.—Perhaps some of your correspondents would oblige me by enumeratiog a few of the principal examples of the Early English style, as seen in the English cathedrals only?—Architect's Pupil.

[The principal examples of the Early English style in the cathedral churches of this country are to be seen at York, in the north and south transept; Ely, the presbytery; Wells, the tower and the whole western front; Carlisle, the choir; Oxford, in the chapter-house; Lincoln, in the nave and arches beyond the transept; at Durham, in the additional transept; at Rochester, the choir and transept; and the whole of Salisbury Cathedral, which is the only unmixed example of Early English which we possess.]

[770.]—SMOKY CHIMNEYS.—Will some kind reader suggest a cure for a smoky chimney? We have tried nearly every remedy known in Glasgow, but none of them has been of any good. The house is one storey high, and there is a large building close by. The south-west wind blows all the smoke down the chimney; when the wind is in any other direction it is all right.—R. F. G., Glasgow.

[771.]—APPRAISER'S LICENCE.—Will you, or any of your readers, say if an architect requires an appraiser's licence, or any other licence, to enable him to measure off a building and determine the value of the extras, &c?—J. H. S., Leeds.

REPLIES.

[734.]—BUILDING MATERIALS IN NEW ZEALAND.—Messrs. Virtue, Ivy-lane, Paternoster-row, publish a Guide to New Zealand, by James Baird, B.A., and the other colonies in Australasia.—W. G.

[757.]—WATER.—If your correspondent "G. F L." will communicate with us, our chemist will be happy to furnish him with the requisite information for determining the nature and amount of foreign matters in water.—Yours truly, the Silicated Carbon Filter Company, Battersea.

WAGES MOVEMENT.

The strike of slaters in Glasgow has terminated, the masters having conceded the demand of the men for payment at the rate of 6d. per hour.

Workmen's Wages in Paris.—From Mr. J. Ward's recently published work on "Workmen and Wages at Home and Abroad," we find that the general earnings of the Paris workmen in the different branches of industry are much below those paid to similar classes in this country, as may be seen from the following figures:—Carpenters, 4f.; joiners, 4f.; masons, 4f. 50c.; paviors, 4f. 50c.; plumbers, 5f. 20c.; wood-turners, 4f. 20c.; wood gilders, 3f.; cabinet makers, 3f. 50c.; lithographers, 3f. 50c.; stone cutters, 5f. 20c.; painters, 4f. 50c. The dead season in these trades varies from three to four months, and in the case of the painters five months, in each year.

STATUES, MEMORIALS, ETC.

The principal inhabitants of Edinburgh have resolved to erect in some public and conspicuous part of the Scottish capital a statue to the late Sir David Brewster, in commemoration of his services in the cause of science.

Two busts, one of Mr. R. Ingham, M.P., and the other of Mr. Thomas Salmon, the town clerk, have been placed in the Townhall at South Shields. The former is by Mr. Ewing, of Glasgow, and the latter by Mr. Rowe, of South Shields.

A marble statue of Charles II. is now placed in Westminster Hall, which completes the number of statues intended to be placed there for the present, viz.:—Charles I., Charles II., James I., William III., George IV., and William IV. The first of a series of cartoons is now placed between the statues, representing the death of Richard III. and the crowning of the Duke of Richmond.

STAINED GLASS.

Another stained glass window has been placed in the western portion of St. Mary's Catholic Church, Warwick, representing Jesus in the house at Nazareth, between his parents, helping St. Joseph at his handicraft. St. Mary, standing behind, appears to be lost in contemplation of her Divine Son. The subject forms one of a series in chronological order, illustrating the mysteries of the infancy of our Saviour. The work was entrusted to Mr. T. Dury, of Warwick.

LEGAL INTELLIGENCE.

Alleged Penal Liability by the Chairman of a Local Board.—Knight *v.* Dashwood.—This was an action (special jury) brought to recover penalties amounting to, in the aggregate, £1,150 from Mr. Dashwood, the chairman of the Local Board of Commissioners at Ryde, inasmuch as it was alleged by plaintiff, a well known participator in local politics, that defendant, being a commissioner or member of the board, held a place of profit at the same time, thereby rendering himself liable to a penalty of £50 for every occasion on which he sat in his official capacity. Mr. Cole, Q.C., who appeared for the plaintiff, said that the defendant had become a partner in the firm of Messrs. T. and J. Dashwood, timber and cement merchants, who supplied goods to the board, and after such disqualification continued to act as chairman of the said board. Several witnesses were called in support of the case, and some merriment was caused by their one and all declining to give evidence until their expenses were paid. Mr. H. Dashwood, of Gosport, timber merchant, said he was sole proprietor in the firm of Dashwood and Co. His brother Thomas was never a partner, and he had never had a partner at all. There was to have been a partnership in 1865, but it never came to anything. James Dashwood was never a partner either. Thomas had money in the firm, but received no profits whatever. It was part of the father's estate, pending a partnership which was never carried out. The money was used in the business of the firm. Never paid any interest on it, nor would he tell Mr. Cole what money remained in the firm of this or of another brother. The judge said, if the witness was believed, he disproved the case; if he was disbelieved, there was no opposing evidence. The defendant's case was not opened, and plaintiff was non-suited.

Important to Timber Merchants.—A case of interest to local timber merchants was decided by the Judge of the Bristol County Court last week. The plaintiffs were Messrs. Barnes and Sons, the well-known timber merchants, of this city; and the defendants, Messrs. Pearson and Leng, owners of a barque called the "Hope." Both parties were represented by counsel. The action was for the recovery of £30, which the plaintiffs had paid as demurrage under protest, and also £15 4s. 7d. for timber alleged to have been deficient in a cargo belonging to the plaintiffs. His Honour, in delivering judgment, read and explained the charter-party, by the terms of which there were 20 "lay days"—which were the days on which the ship should be unloaded; the charter-party contained also an agreement that the sum payable for demurrage should be at the rate of £10 per day. The cargo was not discharged till three days after the "lay days" had expired, and the £30 alleged to have been forfeited were paid under protest, in order that the plaintiffs might not be put to the inconvenience of having a portion of the cargo detained — a course with which they had been threatened. The plaintiffs were not only the consignees of the cargo, but they were also the owners, and as such they were liable for what was called "general average." On the 27th day of December a demand was made upon the plaintiffs on account of "general average." The plaintiffs did not consider themselves bound to sign the bond, and refused, and the delivery of the cargo was stopped for three days in consequence—such three days forming a portion of the 20 "lay days." Then the plaintiffs signed the bond, and the delivery was continued. His Honour, in delivering judgment, recapitulated the facts given in evidence, remarking that the defendants on the arrival of the "Hope" in Bristol, requested the plaintiffs to give them a bond to secure payment of their share of average loss incurred during a collision in the Channel, but the plaintiffs refused to sign a bond, although they expressed their willingness to pay the average, when ascertained. They disputed the right of the shipowner to demand such a bond, and his Honour considered that the shipowner could then have exercised his right of lieu for general average, but, as the consignees had no means of ascertaining the amount claimed, the shipowner, before putting such lien in force, and stopping the delivery of the cargo and incurring demurrage, should have first stated what sum he claimed. There was, however, no such demand of any particular amount, and no refusal to pay. The plaintiffs, indeed, always admitted their liability and their readiness to pay. From the custom as to unloading timber ships, the captain had no control over the work, and the consignee had no power to hasten the delivery. His Honour considered that there was such a default by the shipowner as to disentitle him to reckon as part of the twenty "lay days" the three days occupied by the non-discharge of the cargo, the stoppage being caused by the claim for average. As to the £30, therefore, the plaintiffs would have judgment. The claim for oak would be disallowed, as the master's signature to the bill of lading did not bind the owner, and from the mode of shipping it on board it seemed that a less quantity could not have been delivered, but the plaintiffs would have judgment for the staves lost, as it was clear the delivery had been carelessly made, and the witness actually saw some of them thrown into the water instead of on the raft. Judgment for the plaintiffs for the sum of £31 13s. 5d.

Our Office Table.

At a recent meeting of the British Archæological Association, Mr. Vanderpant exhibited a bronze urn, or rather tomb, said to have been exhumed in the Etruscan Necropolis of Perugia. It was supposed to have contained the ashes of Tanaquilla, wife of Tarquin, fifth king of Rome. Mr. Holt exhibited two fine wood carvings by Hans Springeuklee, an intimate friend of Albert Durer, to whom they had been presented on his fifty-third birthday, 24th of May, 1553; they represented Adam and Eve in Paradise, and a figure resembling Durer's "Great Fortune." Mr. Cuming exhibited the wedding-ring of Martin Luther, bearing his own and his wife's name inside. This is the property of Mr. F. Gauss, banker, of Vienna, in whose family it has been preserved for 250 years.

The "New York Herald" (Feb. 22) is very much elated with the share of honours that has fallen to the United States in connection with the Paris Exhibition. The Secretary of State at Washington, it says, has received a tabular statement "which shows that, with all the drawbacks and obstacles which the United States representatives laboured under, they are number one in grand prizes, and exceeded every nation except France in the general proportion of awards to exhibitors, and in the proportion of gold and silver medals, and "honourable mention." Austria, Prussia, and North Germany, slightly exceed us in their proportion of bronze medals to their number of exhibitors. In the general average, we are just double the rate of Great Britain and her colonies. Taking all things into consideration," exclaims the "Herald" exultantly, "this is considered, perhaps, the most marvellous triumph at a competitive trial of the results of the inventive and industrial energies of the American people, yet we were far from being fully or fairly represented. Taking this as a criterion, however, the national pride may well be flattered by the evidence of our capacity to compete with the world."

At the last fortnightly meeting of the Liverpool Architectural Association, Mr. Kilpin, presiding, Mr. Audsley read the paper of the evening, on "French Church Architecture." The paper, which we understand was the introductory one of a series on the same subject, was very favourably received.

A German engineer states that oxide of chromiam is the best substance for polishing steel. The article can be easily prepared by heating bichromate of potash to redness. It is also used for painting on porcelain. One equivalent of chromic acid is reduced to oxide of chromiam, and, on well washing the residue of the ignition, neutral chromate of potash is washed away, and the ignition is left behind.

An inquest was held the other day on the body of an infant, who was killed by falling down a dilapidated staircase in one of the wretched dwellings of the Borough. The child, who was only a year and a half old, was being carried up the stairs by her "nurse," a girl of fourteen, when the latter slipped and fell headlong to the bottom of the flight, crushing the child under her. The most important and serious piece of evidence was given by the medical man, who stated that the staircase was not only without balusters, but was most awkwardly constructed, and that this was the fourth case in which a person's life had been lost through falling backwards on it.

The vast area of the metal portion of the roof of the New-street Railway Station, at Birmingham, is now being re-covered with Vielle Montagne zinc, by Messrs. Ash and Lacy, of Birmingham. The zinc used is 16-gauge, and more than one hundred thousand square feet will be required to complete the work. The old roof of corrugated galvanized iron has been thoroughly worn out during thirteen years.

M. Charles Méryon, the famous French etcher, died recently at a *maison de santé*, at Charenton. He was principally known by his admirable etchings of Parisian streets and buildings.

The Metropolis Tramway Bill was thrown out on the motion for its second reading in the House of Commons last week. The chief opposition to the scheme, as might naturally be expected, came from the London General Omnibus Company, the monopolists of our street passenger traffic.

We understand that the exquisite cabinet from the Paris Exhibition, manufactured by Messrs. Wright and Mansfield, of Great Portland-street, and which was awarded a gold medal, has been purchased by the authorities of the South Kensington Museum.

Our attention has been directed to an inadvertency in our report of Professor Kerr's lecture, which tends to occasion a little confusion of ideas. When we said that, in defining his view of the word *Architecturesque*, the lecturer stated that it "signified the picturesque in architecture, or architecture worthy of being painted," we should have put the case thus: that the *architecturesque* is that *architecture-essence* which corresponds to the *picturesque* as the *picture-essence*.

The bad light given by oil and candles in the barracks at Perth has greatly distressed the soldiers. Gas being very dear, the authorities have resolved to introduce the lime light. Very satisfactory experiments have been made. The Government contractors state that the price of the light will cost less than half the price of the cheapest gas, and the only objection is, that in the small rooms the light is too good.

The new transparent cement, which has been called "coaguline," the production of Messrs. Kay, Brothers, operative chemists, Stockport, is said to be rapidly growing into use as an article of commerce and scientific application. Its adhesiveness and tenacity are remarkable. Glass, leather, wood, stone, ivory, bone, and minerals can be pieced and joined by it, and so tenacious is it that it will resist a strain of 22 lbs. or more. Heat or cold, fire or water, are successfully resisted by coaguline, and so far as its durability has been tested the cement is perfect. For piecing glass or crystal its uses are admirable, because its transparency renders the junction imperceptible, and its adhesiveness, in fact, makes the broken glass or crystal as good as new. This, at least, is the opinion of the "Manchester Weekly Times."

"Walpole's wailings," as we hear the new railings in Park-lane are called, are nearly finished. It is a satisfaction to notice that they are both neat and substantial, and must be pronounced an improvement. Workmen are now busy finishing the pavement of the newly-widened lane itself.

The "Journal of the Archæological Institute" is sadly in arrear. The "Athenæum" states that the last number published is that for December, 1866! The work will soon be valuable to archæologists solely from an antiquarian point of view.

The Committee of the Art Exhibition at Leeds have given notice that their galleries are quite full, and that therefore further contributions cannot be accepted.

"Argus," in the "Bolton Chronicle," says, when speaking of painters in France, "they introduce talent and produce greater results without the aid of trade unions." Every boy, before he receives his indentures at the termination of his apprenticeship, passes an examination, theoretical and practical. The theory consists in being well versed in the names of colours, shades, and styles of decoration. Designs are placed before him, of which he is expected to give a description. The practical test is ability to mix, blend, and produce any shade of colour the examiners may require; to draw simple ornaments from copies, and straight lines of various breadths and even thickness. The utility of this will be recognised by any practical decorator. A room requires decorating: the artist makes a sketch of the room, on which he writes the names of the colours he requires putting on the various parts. The sketch is given to the workman, who is expected to carry out the instructions to the letter. That done, the workman gives place to the artist, who finishes the whole. The ordinary French working painter, in his knowledge of colours, equals, in many cases excels, the so-called artistical decorators of our country.

The experiments now in progress at Woolwich Arsenal on the manufacture of gas from a mixture of Trinidad bitumen and coal remind us of the recent use of various waste materials for the purpose in Germany. Among these are the residues of the manufacture of paraffin, and the refining of petroleum oils. With each of these materials a large quantity of permanent gas of a highly illuminating power was procured. Another substance experimented with was the waste grease from the woollen manufacture, which yielded a smaller amount of gas. From a review of all the experiments, however, it is concluded that the use of bituminous oils, in combination with coal or peat for the production of gas, offers no advantages, as regards price, over ordinary coal gas. In small works it may be profitable when manufacturers use up their own waste products.

We have recently seen notices of the extended use of alkaline silicates in Germany for the preservation of building materials, both stone and wood. The latter application may be noticed here, with the remark that such a fire as that which recently occurred at Charing-cross Station could not have happened if the woodwork had been protected by the means noticed. The cost is but small, and the immunity it gives from fire is complete. According to the expired, and almost forgotten, patent of De Wylde, the woodwork is first saturated with a very dilute solution of silicate of potash, as nearly neutral as possible, and, when this has dried, one or two coats of a stronger solution are given. When lives are lost by fire almost daily, it seems strange that such means of protecting wooden staircases and flooring should be neglected.

Since the morning of Monday week twenty-one fires have occurred in various parts of the metropolis, all of which have been attended by the Metropolitan Fire Brigade under Captain Shaw. The causes were thus described: sparks from fires, 6; defects in flues, 2; heat from stove, 1; children playing with matches, 2; candles and hot ashes, 3; chemicals boiling over, 2; and causes unknown, 5.

A public meeting of the inhabitants of the ward of Farringdon has been held to promote the removal of the Fish market from Billingsgate to Farringdon market. The idea is not a bad one. Not more than a third of the whole supply reaches Billingsgate by water, and it is not in proximity with any metropolitan line of railway. With a more central position, Farringdon offers the advantage of much more room. If anything should come of the scheme, we trust it will not prove quite so miserable a failure as the present vegetable market.

The second general meeting of the Architectural Institute of Scotland for the present session was held in Edinburgh on Tuesday, Mr. J. D. Peddie presiding. The Secretary, Mr. James Gardner, read a paper, "Notes on Spain," in which he gave a narrative of a trip to the Peninsula, describing the principal cities, their architectural features, and the cathedrals, churches, and other ecclesiastical buildings.

Mr. Holmes, of the British Museum, who was sent out to Abyssinia by the Government for the purpose of collecting antiquities, has, we hear, already secured a chalice said to be of the fifth century, and also several manuscripts.

Since we drew attention to the dangerous condition of Temple Bar, we have actually seen workmen stopping up the cracks in the stonework of the Bar with mortar! This is simply monstrous. There is now a general alarm in the public mind about the critical state of this monument, and people are beginning to be afraid to pass under it. One of several correspondents writes:—"Five weeks since an eminent surveyor pointed out to me an extensive crack in the stonework of the Bar, saying that he thought it was not quite safe, and last week another surveyor made the same observation. Now, the old City barrier may, for all I know to the contrary, stand for 50 years or more; but I pass daily to and from business between the Ludgate station and the Strand, and in future I shall prefer the apparently safer route through the Temple." Of course the Bar is doomed, it must come down sooner or later, and, if this be so, considering the feeling of uneasiness which its insecure state occasions in the public mind, we can only hope that it will be removed without delay.

A crowded meeting of the inhabitants of St. George the Martyr, Southwark, was held on Wednesday night at the Pilgrim Hall, Buckingham-square, New Kent-road, for the purpose of expressing opposition to the erection of a mortuary, furnace, and shaft in a small burial-ground in the Old Kent-road, as being obnoxious to the health of the inhabitants, and destructive to the property in the neighbourhood. Mr. William Knox, the chairman, said the vestrymen of the parish had decided on erecting a large deadhouse, with a furnace to burn infected clothing, on the Lock burial-ground in the Old Kent-road, the space being only forty yards square, and in which were buried at least 35,000 bodies. It was intended to crush down those bodies four feet, or that they should be carted away in the parish dust carts. Would they tamely submit to have their property injured and their lives endangered in such a manner? Were the vestry to be permitted to spend £1,600 of parish money at the dictation of a couple of medical men, when a railway arch would be far more suitable for the purpose, and could be rented at a few pounds a year, fitted up at a trifling outlay, and would not be injurious to any one? Mr. Attenborough proposed the following resolution:—"That, if the vestry of the parish carry out their avowed intention of crushing in the bodies interred in the Lock burial-ground, and build thereon a common dead-house, with disinfecting room, furnace, and shaft, it will, in the opinion of this meeting, be a wicked violation of the sanctity of the grave, a constant cause of infection and disease to persons residing in the locality, a very serious injury to the neighbouring property, and a discreditable waste of the parish funds. Therefore this meeting hereby pledges itself to use every lawful means to prevent the vestry from outraging and violating the public feelings by either carting away or crushing in the bodies interred in the Lock burial-ground, and building the dead-house and disinfecting-house thereon." To this resolution was appended a protest, containing eight sections, as an inducement to the vestry to alter their decision. The chairman put the resolution and protest as one motion, and it was unanimously carried.

MEETINGS FOR THE ENSUING WEEK.

Mon.—Society of Engineers,—On "Engineering in India," paper by Mr. F. C. Davies, 7:30.

Tues.—Institution of Civil Engineers,—Renewed discussion upon Mr. Sanberg's paper on "The Manufacture and Wear of Rails." 8

Wed.—Society of Arts,—On "Railways and their Management," by R. F. Fairlie, Esq.

Fri.—Society of Arts,—Cantor Lectures, "The Bleaching Power of Chlorine Bleaching Powder, its Manufacture, and Application to the Bleaching of Calico, Linen, and Paper Pulp, the Manufacture of Chloroform, &c.," Illustrations.

Sat.—Associated Arts Institute,—On "Genius," paper by Marmaduke A. Langdale, Esq.

Trade News.

TENDERS.

Barking.—For the erection of four houses at Barking, Essex. Mr. J. W. Dennison, architect:—

Stokes	£1350
Brett	1266
Withers (accepted)	1090

Bathford.—For a new house, at Bathford, near Bath. Mr. Hans F. Price, architect, Weston-super-Mare:—

W. H. Newman, Bathford (accepted)	£1748 12

Berkhampstead.—For new vagrant ward to the Berkhampstead Workhouses. Mr. W. Brown, architect:—

Chappel, Tring	£1080
Nitingale and Jeffery, Lambeth	1043
Wilkins, Berkhampstead	998
Honour, Tring	954
Webb, St. Alban's	922
Nash and Mathews, Berkhampstead	857
Harris, Berkhampstead (accepted)	785
Cook, Berkhampstead	772

Bletchingley.—For carcases of house and of stable offices at Castle-hill, Bletchingley, Surrey, for James Norris, Esq. Mr. James Wylson, architect. Quantities furnished by Mr. Dan. Cubitt Nicholls. Amounts exclusive of bricks, rubble, stone, and sand:—

	House.			Stables.		
Thomas Little	£6177	0	0	£1435	0	0
Edwin Bowman	6390	5	0	1096	6	0
Wm. Rentmore	6226	0	0	1034	0	0
Patman and Fotheringham	5656	0	0	1368	0	0
W. Barnes	5585	0	0	1270	0	0
J. M. Macey	5135	0	0	1332	0	0
Wm. Carruthers	5321	0	0	1267	0	0
Morris Regis, sen.	5041	7	10	1386	5	1
J. and W. Sanders	5167	0	0	1187	0	0
G. Myers and Sons	4967	0	0	1200	0	0
Hill and Keddell	4947	0	0	950	0	0
Edward Conder	4658	0	0	1136	0	0
Jackson and Shaw	4615	0	0	1179	0	0
Piper and Wheeler	4870	0	0	910	0	0

BURTON-ON-TRENT.—For new infirmary and dispensary, Burton-on-Trent. Mr. Edward Holmes, architect. Quantities supplied:—

Jeffery & Pritchard, Birmingham	£3250	0	0
Horsley, Brothers ,,	3044	0	0
Lovatt, Wolverhampton	2990	0	0
Matthews, Birmingham	2891	0	0
Gregory, Burton-on-Trent	2884	15	0
Maddocks ,,	2860	0	0
Trow and Son, Wednesbury	2829	0	0
Willman & Wigley, Burton-on-Trent	2813	0	0
John Hadfield ,,	2797	0	0
Smith and Chamberlain ,,	2774	10	0
Bowler and Beck ,,	2740	0	0
W. Clarke ,,	2621	11	0
Mason ,,	2620	0	0
J. Lilley and Son, Measham	2616	1	0
W. Nelson, Dudley	2613	0	0
Neale and Son, Leicester	2592	0	0
Hardwick and Son, Birmingham	2591	0	0
Lowe and Sons, Burton-on-Trent	2488	0	0
G. Lilley and Son, Ashby	2360	0	0
Hunter and Bennett, Burton-on-Trent (accepted)	2312	16	10
J. and W. Webb, Birmingham (too late)	3211	0	0

CLEVEDON.—For new market for Clevedon Local Board of Health. Mr. Hans F. Price, architect, Weston-super-Mare:—

R. Newton, Wraxall (accepted)	£1120

CLEVEDON.—For a weighbridge-house for Clevedon Local Board of Health. Mr. Hans F. Price, architect, Weston-super-Mare:—

Bennett, Portishead (accepted)	£289

EAST BARNET.—For addition of new aisle and entire re-seating of St. Mary's Church, East Barnet, Herts. A. Rowland Baker, architect. Quantities by F. W. Hunt:—

Rhodes and Roberts	£1261
Carter and Sons	1225
Dove, Brothers	1078
Brass (withdrawn)	1020

ENFIELD.—For alterations and additions to residence, Brigadier-hill, Enfield, for F. G. Catlin, Esq. Mr. Thomas J. Hill, architect:—

Saunders	£765
Sabey	762
Patman, Brothers	729
Field and Sons	727
Bayes	657

HITCHEN.—For erecting a pair of semi-detached villas, for Miss Hall. Mr J. Shilcock, architect:—

Butterfield	£749
French	735
Jeeves	731
Stapleton	719
Ansell	672
Allen (accepted)	670

LONDON.—For new warehouses and offices, No. 61, Coleman-street, for Mr. Charles Titterton. Mr. G. J. Loe, architect. Quantities supplied by Mr. T. R. Nixon:—

Colls and Co.	£2150
Adamson and Son	2137
Axford and Co.	2100
Hart	2080
Rider and Son	2087
Winder	2077
Gammon and Son	2071
King and Sons	2060
Wells	2030
Hill and Keddell	2025
Conder	2022
Wills	1978
Crabb and Vaughan (accepted)	1848

LONDON.—For alterations and repairs at 35, Old Jewry, for J. Bremner, Esq. J. Edmeston, Esq., architect:—

Hawtrey	£726	17	0
Walls	725	0	0
Piper and Wheeler	694	0	0
Colls and Sons	643	0	0
Jenkins	608	0	0
Browne and Robinson	589	0	0

LONG MARSTON.—For farm buildings at Bret House Farm, Long Marston. Mr. W. Brown, architect:—

Durley and Son	£640	0
Newman	601	0
Fleet and Rickards	532	10
Tompkins	526	0
Honour	518	0
Smith and Fincher (accepted)	457	0

LONGTON.—For the erection of a Catholic Church and Presbytery, Longton, Staffordshire, for the Rev. J. Marsam. Mr E. W. Pugin, architect:—

Collis and Hodgson, Longton	£10174
Hugh Yates, Everton, Liverpool	9990
John Eaton, Ashton under Lyne	9930
Alfred Barlow, Stoke-upon-Trent	1600
Edward Hughes, Liverpool	9440
Hall and Son, London	9250
Hodgson, Ramsgate	9190
Heveringham, Wolverhampton	9150
Trow and Son, Wednesbury	8870
Richardson, London	8865
Crutchley, Wolverhampton (Presbytery only)	2400

NEWHAVEN.—For new schools and parochial meeting-room, Newhaven, Sussex, for the Rev. E. P. Southwood:—

Parks	£1047	0	0
Simpson	1045	0	0
Card and Son	1037	0	0
Lee	960	0	0
Kirk	950	0	0
Holloway and Son	930	0	0
Morling	897	17	0

PLYMOUTH.—For building additional wing and stables to Ridgway-house, Ridgway, Plymouth. Andrews and Son, architects and surveyors:—

Marshall	£1289
Berry	1114
Clarke	1046
Condy, Brothers	1030
Jenkins	1006
Call and Pethick	983
Harvey	994
Price	959
Bishop	925
Elliott (accepted)	924

PLYMOUTH.—For new shop-front and stables to No. 3, Mount Pleasant-terrace, Plymouth. O. C. Arthur, Esq., architect:—

Condy	£440
Marshall	427
Call and Pethick	390
Finch	366
Bullerd	365
Marshall	345
Elliott	343
Clarke	341

WILLESDEN.—For detached villa on the Stonebridge-park estate (five to be erected). Mr. Bassett Keeling, architect. No quantities supplied:—

Woodbridge	£1548
Linn	1279
Snowdon (accepted)	1185

WISBEACH.—For St. Augustine's Church, Wisbeach. Mr. William Smith, John-street, Adelphi, architect:—

Cave and Halliday, Greetham	£3090	0	0
Bell and Sons, Cambridge	2883	0	0
Cooke, Wisbeach	2875	0	0
Bennett, Lynn	2761	0	0
Brown, Lynn	2751	10	0
Rust, Norwich	2750	0	0
Law, Lutterworth	2730	15	0

WILMSLOW.—For two villa residences, for Mr. John Beaumont. Messrs. Picton, Chambers, and Bradley, architects. Quantities supplied:—

Bowden and Edwards	£3345
Neill and Sons	3320
Gothard	3300
Thompson	3275
Hughes	3100
Royle and Mellor (accepted)	2980

PROPERTY SALES.

MARCH 2.

AT THE MART.—By Messrs. Bromley, Son, and Kelday. Leasehold shop and premises, No. 6, Hope-terrace, Uxbrige-road, Notting-hill, let on lease at £57 10s. per annum, term 37 years from Midsummer, 1867, at £35 per annum—sold for £200.

MARCH 3.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Leasehold house and shop, No. 328, Goswell-road, with yard and stable in the rear; also two ground rents of £7 and £4 per annum, arising from two houses adjoining, term expiring at Midsummer, 1877, at £15 18s. 6d. per annum—£180.

Freehold two residences, Nos. 7 and 8, Duncombe-road, Hornsey-rise—£1095.

MARCH 4.

AT THE MART.—By Mr. Searle.—Leasehold three houses, Nos. 1 to 3, Black Raven-court, Seething-lane, City, producing £101 18s. per annum, term 77 years unexpired, at £44 per annum—£120

Leasehold house and shop, No. 26, Seething lane, City, term 7 years unexpired, at £36 per annum—250.

MARCH 5.

AT THE MART.—By Mr. Newbon.—Freehold plot of building land, having a frontage of 292ft. to the Hornsey-road, by a depth of 295ft., together with the four messuages and buildings thereon—4,900.

Leasehold house, No. 103, St. Paul's-road, Upper-street, Islington, annual value £60, term 60 years from 1842, at £8 per annum—600.

Leasehold four houses, two with shops, Nos. 28 to 31, Upper Bemerton-street, Caledonian-road, Islington, producing £124 per annum, term 99 years from 1845, at £6 per annum each—£1240.

Leasehold premises, known as St. Andrew's School, No. 22A, Storey-street, Caledonian-road, let at £45 per annum, term similar to above, at £6 per annum—£425.

Leasehold two houses, Nos. 40 and 41, Rutland road, Victoria Park-road, Victoria-park, term 99 years from 1862, at £8 per annum—530.

By Messrs. Scobell and Jenkinson.—Leasehold shop and premises, No. 54, King William-street, City, term 16 years unexpired, at £267 5s. per annum £310.

By Mr. C. S. Barker.—Leasehold residence, No 26, Williamson-street, Albert-square, Clapham-road, annual value £60, term 99 years from 1864, at £7 10s. per annum—£560.

MARCH 6.

AT THE MART.—By Mr. Robert Reid.—Leasehold house, No. 15, Carlton-terrace, Harrow-road, annual value £42, term 78 years unexpired, at £8 per annum—£440.

Leasehold residence, No. 173, Euston-road, let at £65 per annum, term 40 years unexpired, at £16 16s. per annum—£570.

Moiety of freehold business premises, No. 64, Long-acre, let on lease at £94 per annum—£1,120.

Moiety of freehold business premises, No. 65, Long acre, let on lease at £94 per annum—£1,310.

Moiety of two freehold houses, and shops, Nos. 17 and 18, Fetter-lane, City, let on lease at £30 per annum—£365.

Moiety of freehold workshops, stabling, and premises in King's Head-yard, Duke-street, Lincoln's-inn-fields, let on lease at £65 per annum—£1,300.

Moiety of the White Horse freehold public-house, No. 2, King's Head-yard, adjoining above, let on lease at £50 per annum—£580.

Moiety of a freehold house, No. 1, King's Head-yard, adjoining above, let on lease at £22 per annum—£295.

Moiety of a freehold public-house, The John of Gaunt, 10, Duke-street, Lincoln's-inn-fields, let on lease at £60 per annum—£690.

Moiety of a freehold house, with workshops and premises, No. 14, Duke-street, let on lease at £30 per annum—£400.

Moiety of a freehold house and shop, No. 12, Duke street, let on lease at £30 per annum—£290.

Moiety of a freehold house, No. 10, Duke street, let on lease at £60 per annum—£450.

Moiety of a freehold ground rent of £45 per annum, secured upon Nos. 14 to 16 Devereux-court, Strand—£600.

Moiety of a freehold public-house, known as the Bull, Milford lane, Essex-street, Strand, let on lease at £60 per annum—£940.

Moiety of freehold house, shop, and warehouse, situate in Milford lane, Strand—£800.

Three fourth parts or shares of a freehold ground rent of £110 per annum, secured upon freehold premises in Milford lane—£2,060.

Moiety of a freehold ground rent of £60 per annum, secured upon houses, shops, &c., in High-street, Shoreditch—£930

Moiety of a freehold property, Nos 6 to 8 Bow-church-yard, City, let on lease at £260 per annum—£4,500

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William John Burgis, Sutton, Surrey, stonemason, March 24, at 11.—John French Field, Wood street, Upper Clapton, builder, March 25, at 2.—Browning Scotting, Wilton-road, Shepherd's Bush, builder, March 23.—James W. Woodnough, Hoxton square, Hoxton, bricklayer, March 16, at 2.

TO SURRENDER IN THE COUNTRY.

Joseph Gwinnett Bayley, West Bromwich, builder, March 20, at 12.—Thomas Brading, Ryde, builder, March 25, at 11.—George Wood, Mold Green, near Huddersfield, stonemason, March 23.—William Browning, Whitstable, Kent, painter.—John Steele, Hanley, Staffordshire, joiner.—Henry Mackenzie, Worcester, builder.—William H. Daniels, Gloucester, builder.—Alfred Hayes, Chatham, boat-builder.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

April 6, J. J. Rawlings, Melbourne, Cambridgeshire, engineer.—April 17, W. Miller, Lewisham, builder.—April 21, G. Gale, Sherborne, builder.—April 21, F. W. Vigus, Exeter, timber dealer.—March 26, J. P. Edwards, Holyhead, builder.—April 2, G. T. Ellis, Liverpool, architect.—March 26, C. Casbolt, Balsham, bricklayer.

DIVIDENDS.

A. Newland, Cobham, builder, March 26.—Ebenezer Jones and Joseph C. Jones, Rathbone-place, Oxford-street, engineers, March 23, at 11.—George E. Mills, Cambridge, builder, April 15, at 11.—William Ezard, Filey, Yorkshire, joiner, March 25.

DECLARATIONS OF DIVIDENDS.

Edward Corney, Littlehampton, Sussex, builder.—Henry J. Ledger, Hulme, Lancashire, builder.

PARTNERSHIPS DISSOLVED.

Naylor and Harper, Rawden, Yorkshire, joiners 'and builders.—Oliver and Johnson, Middlesborough, builders.—Firth and Co., Sheffield, builders; as far as regards W. Whittle.—Morris and Greenwood, Rotherham, plumbers.—J. Bee and C. Kershaw, Oldham, Lancashire, joiners.—R. Penketh and W. Hill, St. Helen's, Lancashire, painters.—T. Palframan and J. Johnson, Dewsbury, Yorkshire, painters.—W. Hooker and S. Bagnall, Croydon, Surrey, plumbers.—J. Kemp and G. Kemp, Dartford, Kent, builders.

BANKRUPTCIES ANNULLED.

William Farrar, Red Lion Wharf, Hoxton, stono merchant, March 2.—Thomas Harvey, Fulham, builder.—John Oldham, jun., Grange, Lancashire, builder.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10		
Quebec, red pine		3	10	4	15		
,, yellow pine		2	15	4	0		
St. John, N.B. yellow		0	0	0	0		
Quebec Oak, white		5	15	6	15		
,, birch		3	10	4	10		
,, elm		3	10	6	0		
Dantzic oak		4	0	6	0		
,, fir		2	5	3	5		
Memel fir		3	0	3	15		
Riga		3	0	3	5		
Swedish		2	2	2	9		
Masts, Quebec red pine		6	0	7	0		
,, yellow pine		5	0	6	0		
Lathwood, Dantzic fm		5	0	7	0		
,, St. Petersburg		8	10	9	5		
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.							
Quebec, white spruce		13	0	19	0		
St. John, white spruce		13	10	16	10		
Yellow pine, per reduced C.							
Canada, 1st quality.		17	0	18	10		
2nd do.		11	0	12	0		

Archangel, yellow		£11	0	£12	0		
St. Petersburg, yel.		10	10	11	0		
Finland		7	10	8	10		
Memel		0	0	0	0		
Gothenburg, yellow		5	0	10	0		
,, white		8	0	9	0		
Gefle, yellow		9	0	10	10		
Soderham		9	0	10	0		
Christiania, per C., 12 ft. by 3 by 9 in. yellow		12	0	15	0		
Deck Plank, Dantzic, per 40 ft. 3 in.		0	16	1	8		
PUMICE STONE pr ton		6	0	8	0		
OILS, &c.							
Seal, pale	per tun	40	0	40	0		
Sperm body		0	0	0	0		
Cod		33	0	0	0		
Whale, Stb. Sea, pale		38	0	0	0		
Olive, Gallipoli		73	0	74	0		
Cocoanut, Cochin, ton		54	0	55	0		
Palm, fine		39	10	0	0		
Linseed		34	0	34	0		
Rapeseed, Eng. pale		38	10	0	5		
Cottonseed		34	0	41	0		

METALS.

IRON:—							
Welsh Bars in London	per ton	6	5	0	6	10	0
Nail Rod	do	7	5	0	7	12	6
Hoops	do	8	5	0	9	0	0
Hoops, Single	do	8	7	6	9	0	0
Staffordshire Bars	do	7	5	0	7	15	0
Bars, in Wales	do	6	7	6	6	0	0
Nailrods	do	7	5	0	7	12	6
Foundry Pigs, at Glasg. No 1	do	2	12	6	2	14	0
Swedish Bars	do	10	5	0	10	10	0
STEEL:—							
Swedish Keg, hammered	per ton	14	15	0	15	0	0
Swedish Faggot	do	0	0	0	0	0	0
COPPER:—							
Sheet & Sheathing, & Bolts	per ton	82	0	0	6	0	0
Hammered Bottoms	do	92	0	0	0	0	0
Flat Bottoms, not Hammered	do	87	0	0	0	0	0
Cake and Tough Ingot	do	72	0	0	72	10	0
Best Selected	do	80	0	0	82	0	0
Australian	do	81	0	0	89	0	0
Y. l. Metal Sheathing & Rods	per lb	0	0	7	0	0	7½
ZINC:—							
English Sheet	per ton	26	0	0	26	10	0
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0	0

* And 5 per cent. discount if laid upon the new system

SPELTER:—							
On the Spot	per ton	20	0	0	0		nett
QUICKSILVER	per btl	6	17	0	0	0	0
REGULUS OF ANTIMONY							
French	per ton	4	0	45			
LEAD:—							
Pig, English	per ton	21	5	0	0	0	
,, Spanish Soft	do	19	0	0	0	0	0
Shot, Patent	do	22	10	0	0	0	0
Sheet	do	20	10	0	20	15	0
White	do	27	0	0			

THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 20, 1868.

DWELLINGS OF THE LABOURING CLASSES.*

AMONG the philanthropic societies which have laboured most earnestly to improve the dwellings of the working classes, both in town and country districts, a foremost place is due to the Society for Improving the Condition of the Labouring Classes. Mr. Roberts was for many years the hon. architect, and is now a vice-president of that society. In his former capacity he designed all their model improved dwellings and renovations of old ones. He has also designed a great variety of improved labourers' cottages and lodging-houses for the society, which have been extensively reproduced in various parts of the country. The model houses erected by the Prince Consort at the Great Exhibition of 1851, and now standing in Kennington Park, were also designed by him, and have proved most capable of adaptation to varying circumstances, and most successful in subsequent attempts at dwellings improvement. His book, therefore, deserves all the consideration which lengthened practical experience can claim; and the great number of plans (many of which have been executed) given in the appendix render it indispensable to everyone who desires practically to understand the subject. It is also exceedingly valuable as an authentic record of the precise aims of the philanthropic societies, and the measure of success they have attained. Their objects are thus stated by Mr. Roberts:—

> Those who practically commenced this movement in 1844 proposed to prove by experiment what had previously been often asserted:—1. That houses having good drainage, efficient ventilation, an ample supply of water, and combining everything essential to the health, comfort, and moral habits of the labouring classes, may be built and let to them at rents not exceeding those generally paid for very inferior and unhealthy dwellings, yielding, at the same time, a fair return on the capital so invested. That old buildings may also on the same principle be improved, and rendered healthy dwellings. 2. That, under the influence of efficient sanitary regulations in regard to his dwelling, the working man and his family may reasonably expect a much larger measure of health and life than statistical returns show that they generally enjoy, and which fall greatly short of the portion shared by the more wealthy classes. 3. That the improvement of the dwellings of the working classes will greatly conduce to raise large masses of this portion of the community from the state of moral and social, as of physical, degradation in which they are sunk.

The second and third of these objects, it is universally admitted, have been fully attained. The average annual death rate of the tenants in the improved dwellings is only 17 per 1,000 as compared with 23 to 24 per 1,000, now the general average in the metropolis and the large towns of England, and the returns of medical officers show that in these houses, some of them situated in the worst localities, there has been a considerable diminution, if not an almost total absence, of epidemic disease. The houses are also stated to have had not only a direct influence for good upon the manners of their occupants, but to have created in their neighbourhood a demand for comforts and conveniences which formerly tenants were content to do without. Nocturnal uproars in adjoining streets are said to have gradually diminished, and finally ceased altogether. "They have in their ameliorating influence," says Mr. Roberts, "thus acted as silent monitors, reproving disorder, and encouraging cleanliness and propriety." This creation of a demand for improved accommodation illustrates the different spirit in which Mr. Roberts deals with the subject to that of Professor Kerr, in his paper read before the Institute last year, wherein he most strongly deprecated the introduction of any "sentimental" feeling in the matter whatever. It will also be remembered that he quoted certain statistics from a former edition of this work, showing that 63½ per cent. of working class families inhabited single rooms, and from this fact he inferred that any larger accommodation was altogether unnecessary. We pointed out this unfair inference at the time, and brought down upon us the wrath of the learned Professor. In this new edition, Mr. Roberts himself takes the opportunity to complain of what he justly calls the "misuse" of these statistics. He says further:—

> Both the premises and the conclusions of Professor Kerr, in his paper "On the Problem of Providing Dwellings for the Poor," read at the Royal Institute of British Architects, appear to the author most erroneous, and he can only attribute to the want of a more intimate acquaintance with the subject his having put aside what he termed "all sentimental considerations," as well as the imagining that he viewed it from the sensible and practical point—namely, from a purely business point of view, as based upon figures and calculations.

The chief philanthropic societies for improving labourers' dwellings were established before the Limited Liability Acts were passed, and their promoters could only gain protection from unlimited responsibility at the hands of the then Government by consenting to a clause in their charters of incorporation limiting their profits to 5 per cent. Although there can be no doubt that this limitation was required, and consented to with the very best intentions, we cannot help considering it as an unfortunate departure from the first of their three objects as stated by Mr. Roberts, and which was so justly held by H.R.H. the late Prince Consort as of primary importance to the adequate extension of the work. We have found the fact not to be very generally known, even to persons presumably conversant with the subject. It is, however, of great importance in estimating their financial results, and accounting for the small extent to which their models have been imitated by wealthy capitalists. As a rule, their tenements have been let at rents rather below what may be called the market value, and the returns to the subscribers have naturally also ruled somewhat below a capitalist's estimate of the market value of money. A year or two back, the Metropolitan Association became alive to this fact, and raised the rents of their family dwellings to something nearer their true value, although they are still so cheap that it is a privilege for a working man to get into one of them. The result has been an increased percentage ranging from 4½ to 6¼ per cent. on dwellings which in 1861 produced only from 2⅝ to 5 per cent. This looks at first sight like a violation of their charter, but it is justified by the return upon the whole operations being kept within the prescribed limits, and never exceeding as yet 3½ per cent. It is this latter fact alone which capitalists have given themselves time to look at, forgetful that the operations of the societies embrace many other objects than the simple erection of dwellings for families; such, for example, as the testing of new methods of construction and arrangement, the carrying out of untried experiments in improvements, the provision of lodging-houses for single people, and of laundries, &c., together with the necessary agency for circulating information for the public benefit. Upon some of these objects it would have been idle to expect any but the very smallest profit, and upon others there has been an absolute loss, as will be seen from the following particulars culled from among the mass of valuable statistics given in Mr. Roberts's book.

	Locality.	Number of Inmates	Cost.	Profit.	Loss.
				per cent.	per cent.
LODGING HOUSES FOR SINGLE MEN.					
Society for Improving the Condition of the Labouring Classes	George St., Bloomsbury.	104	6,426	4¼	
"	Charles St.	84	1,163	13 3·5	
"	Hatton Garden.	54	1,077	7 7·10	
Metropolitan Association	Albert Chambers, Mile End.	234	13,772	1⅝	
"	Soho Chambers.	128	1,422	—	19
LODGINGS FOR SINGLE WOMEN, &c.					
Society for Improving the Condition of the Labouring Classes	Portpool Lane.	125*	9,533	3	
"	Portpool Lane	—	3,140	—	
"	Laundry.				

* And 20 families.

	Locality.	Families accommodated.	Cost of building.	Returns in 1866.
			£	per cent.
FAMILY DWELLINGS (MODEL BUILDINGS)				
Society for Improving the Condition of the Working Classes	Streatham St., Bloomsbury	51	8,916	4
Metropolitan Association	Albert St., Mile End	69	11,365	4½
"	Albert Cottages, Mile End	33	6,371	5
"	Albion Buildings	29	2,981	6½
"	Ingestre Buildings, Soho	60	9,852	5¼
"	Nelson Square, Bermondsey	108	23,051	5¼
"	Pancras Square, St. Pancras	110	18,396	6¼
"	Queen's Place, Dockhead	10	111	5⅝
"	Victoria Cottages, Mile End	36	7,469	only occupied eight months
OLD HOUSES RENOVATED.				
Society for Improving the Condition of the Labouring Classes	Wild Court	1	3,365	5 0-10
"	Clark's Buildings	80	1,161	7
"	Tyndall's Buildings	1	2,699	6 7-16

The other philanthropic associations subject to like conditions in the metropolis are the Marylebone Association, which has renovated five groups of buildings at a cost of £16,439, and pays its proprietors only 2 per cent.; the Central London Dwellings Improvement Company, which has renovated eight old buildings at a cost of £10,080, and pays 3 per cent.; and the Strand Buildings Company, which has erected one new building in Eagle-court, Strand, at a cost of £5,000, and pays 4½ per cent. These three associations let at very reduced rents indeed. There are, however, two other societies, formed under the Limited Liability Act, subject to no restrictions as to returns, and confining their attention to improved dwellings, viz., The London Labourers' Dwellings Society (Limited), which had expended, at the date of their last report, £29,583 in renovating old houses, and pay continually 5 per cent.; and the Improved Industrial Dwellings Company (Limited), which had likewise expended £63,775 in new buildings, and also pay 5 per cent. continuously. These payments are, of course, somewhat less than the actual nett rentals, being the balance left for division among the shareholders after payment of the

* "The Dwellings of the Labouring Classes, their Arrangement and Construction, with the Essentials of a Healthy Dwelling, with Plans and Elevations of Dwellings adapted to Towns and to Rural Districts," by HENRY ROBERTS, F.S.A., F.R.I.B.A. Fourth edition, revised and enlarged. London, 1867.

management and contingent expenses of the companies. A general view of the whole body of statistics will show that certain departments of the great work of dwellings improvement may be entered into by the private capitalist with the certainty of a safe and sufficient return. If the societies above cited, notwithstanding their being restricted by the very terms of their existence to a small profit, their having tried new experiments for the public benefit, and letting at rents below those charged by other landlords, can yet make a rental exceeding 5 per cent., it is surely possible for the private owner, profiting by the result of their experiments, not hampered with their restrictions, having no expenses of a society, and letting at a fair but not extortionate rental, to provide decent and comfortable homes for his tenants, and yet retain a rental quite sufficient for any reasonable man. We hold the possibility of this to be amply demonstrated by the book before us. We have not space to describe all the efforts of private individuals which this book mentions; there are several, as Miss Burdett-Coutts, Mr. Gibbs, Mr. Peabody, Mr. Hilliard, and others. The result of their investments has never been a loss, and we have a general impression that where the owner has practically looked after the laying out of his money, the result has been much better than in either of the societies.

Among the improvements introduced by Mr. Roberts in the construction of improved dwellings was the formation of fireproof floors upon arches of hollow bricks. The extra cost of these is stated at 12s. per cent. on an entire contract of £7,370. A full description of these floors is given with drawings, and remarks upon hollow bricks for general use. He also recommended in his first edition, published in 1850, the use of concrete formed with clean coarse gravel, sharp sand, and one-tenth portion of Portland cement, and worked up between two planks on a frame, within which the concrete may be poured, as forming a substantial wall for cottages. Under the head, "The Essentials of a Healthy Dwelling," we have, among many other things, a number of most useful hints on the choice of a locality and its improvement by drainage, &c., the supply of pure water, the dryness and warmth of the building, the number and dimensions of the apartments, and on light and ventilation. With respect to the influence of light on physical health, a subject of which but little is known, we find it noticed that it was observed by Sir James Wylie at Petersburg, that in hospital rooms without light only one-fourth of the patients left cured, as compared with those who occupied properly lighted rooms. This reminds us of that old obstacle now happily swept out of our way—the window tax, which was a serious difficulty in the way of our early dwellings reformers. Mr. Roberts, however, overcame the difficulty in Streatham-street, by giving entrance to each suite of apartments from a gallery supported next the quadrangle by a series of arcades, each embracing two storeys in height, the slate floors of the intermediate galleries resting upon iron beams. The tenements were thus rendered separate dwellings, and, having fewer than seven windows each, were exempt from the window tax. This plan alone saved the society between £70 and £80 per annum. They were also exempted from the house duty, which was imposed in place of the window tax, it having been decided, upon an appeal to the judges, that every tenement which has a distinct entrance from the street is entitled to a separate assessment. The heavy pressure of rates and taxes is, however, still loudly complained of, being never less than from 30 to 40 per cent. on the gross rental. We are afraid there is no chance of alteration in this respect, all other kinds of house property being charged in a similar proportion. Among the legislative measures of late years may be mentioned the Public Health and Nuisances Removal Acts passed in 1848 and 1849, amended by many subsequent acts; and an act in 1851 enabling parishes or boroughs, with a population exceeding 10,000, to build new houses, or adapt old ones, for better lodgings for labourers, and to defray the expenses out of the poor rates. A knowledge of the practical working, or non-working, of this enactment should be gained previous to the passing of Mr. Torrens's proposed measure. The act for regulating common lodging houses was passed in 1851, and has had the happiest effect. Its advocates now desire to see its provisions extended to all tenements whatever, let at low weekly rents. The most important legislative encouragement, however, has been the act of 1866, enabling the Public Works Loan Commissioners to make advances for the erection of labourers' dwellings at reduced rates. The Industrial Dwellings Company and the Metropolitan Association have already availed themselves of the privilege, and we trust to see it more and more extensively used every year. There is work enough for every agency, whether legislative, philanthropic, or commercial, to clear away the dens, only let them not get in each other's way, or either of them attempt to do the work of the others. The legislature can give valuable aid by clearing away legal obstacles to the acquirement of property needing improvement, and it may also facilitate the transfer of small holdings.

The philanthropists have hitherto done valuable service in erecting so many useful models for our guidance, and a wide field is still before them. The poor we have always with us, and philanthropic efforts should be used for them, and them alone. No more dwellings for respectable artizans should be erected by semi-charitable funds. Our friend Jack Plane, who belongs to a trade society, and knows something about the rate of wages, and the law of supply and demand, and such like matters, is no client for the philanthropists. He is an independent man, working for a fair day's wage, and willing to pay a fair week's rent. Respect his independence, and let it be known that the buildings erected in future by such societies are for the really poor—those who can pay but 1s. 6d., 2s., or 2s. 6d. a-week. These can only be housed more decently than now by the hand which is willing to lend expecting little or nothing again, and we feel assured that, if it were made to be publicly understood that their future efforts would be confined to such, the operations of the societies would be aided by increased contributions from many who now refrain from giving. The notion of dwellings improvement for artizans being a paying investment is a growing one, and, if left to work freely, will increase, provided land can be found for building upon, and by-and-bye Jack Plane himself and his fellows will wake up to it, and we hope to see the workmen of London and our great towns dwelling, not only in comfortable homes, but homes which they have built by their united exertions, and paid for by their individual efforts and self-denial.

THE SEWAGE QUESTION AND BOROUGH SURVEYORS.

MANY of our pages testify to our interest in the question which has been called—and not without reason—the question of the day, viz., how to dispose of the sewage of the towns of this country; but the rude experience of cholera and epidemic fevers has done more to convince the thoughtless multitude of our town councillors that the subject must be attended to than anything we have or could have said. Nevertheless, we have the satisfaction of knowing that what we have said on this subject has been to the point, and is now acknowledged to have been right in the main. We have seen how angry the controversy has been about the question of small pipes *versus* "elongated cesspools" and "sewers of deposit," and we have discerned elements of truth in each of the disputants, and out of the chaos of passion we have endeavoured to bring something practical and useful to light. What if the old Board of Health did insist too strongly upon their small pipes, did not the engineers go too far in the other way when they said that every sewer ought to be large enough for a man to pass through it? We have come to regard this question in a more practical light now, but we are not yet emancipated entirely from the ignorance of those days, or rather, we were not a few years ago. It is not long since a flourish was made about the successful drainage of a town where it turned up, in course of discussion, no traps or special means of ventilation of the drains and sewers had been thought necessary, and were not attended to; and on this vital question of ventilation of the drains and sewers how little do we know, or rather, how little do we put in practice what we do know about it. To purify the atmosphere of a town, or rather, to prevent its contamination, is the great object of all drainage. However magnificent the works, however well proportioned and constructed, if this one requirement of their proper ventilation be neglected, it is enough to destroy entirely their efficiency. Decomposition of, and the consequent formation of gases from, the refuse animal and vegetable matter of the sewers and drains cannot be prevented, but they can be conducted to places where they will be harmless, viz., to the tops of the chimneys of the houses, and there dissipated in the upper air. This should be done at the head of every house-drain, so that, by affording a free outlet for the sewage air when the drains are flushed with water in heavy showers of rain, it is prevented from bursting through the traps in and about the houses upon such occasions. The best means of effecting this object is to carry up a flue of half a brick square along with, but entirely independent of, the fire-flue when the house is being built, and to connect the upper end of the house-drain with this flue by a pipe laid underground. In the case of houses already built, but which must yet be drained, a pipe carried up the gable end of the house, or, where there is no gable, to a point above the eaves of the roof, answers the purpose of ventilation. The ordinary sort of rain-water piping is sufficient for this purpose, say 4in. diameter. Very beneficial results have attended this plan, where it has been put in practice, in respect of the health of the town.

In the various forms of practice of the science of engineering, and the art of building, many forms of practical knowledge are requisite, and in this matter of town drainage our town surveyors are surely in possession, after the last twenty years' experience, of more practical information on the subject and its requirements than our eminent engineers can be; for their extensive practice in railways, harbours, and other large works has necessarily taken their attention away from the lesser works, in point of magnitude, of town drainage.

Now that attention is being so urgently given to these works, because of the powers given and about to be given to the river authorities of the country to prevent their pollution with town sewage, and railways, and other large works requiring the joint capital of speculators, not being just now able to command the confidence of capitalists, we see our engineers turning their attention to this sewage question, but with such crude ideas upon the subject as we might have expected from men who have thought the whole thing beneath their notice as long as there was other work to be done of a more pleasant character. We think, as we have said, that it is to our sanitary engineers we must look for assistance in the sewage question, and we expect to find in our experienced town surveyors all the qualifications necessary to a settlement of it. We believe the chief features of construction proper to sewers and drains to have been

settled, and generally agreed upon; but, in the matter of the disposal of the sewage on the land, the question is not so well closed, and admits of a great deal more being said in addition to the great deal that has been said during the last few years, and it is with the view to the elucidation of the truth in this matter in the quickest possible manner that we say the town surveyors ought to be called on, or those of them who have anything to bring forward specially bearing on the question of the disposal of the sewage.

The suggestion was recently made in the *Times* that Government shall take some one town and apply the system that to it seems the best, and then that all other towns should take that as a precedent, and, supposing it to be faithfully reproduced, that its adoption shall exonerate the town authorities from legal proceedings in respect of the sewage outfalls. This is a good suggestion, but it does not go far enough. We do not believe the Government is in possession of any information on this subject that is not known to the country generally, and, therefore, has no special method to propose but the best of those that have been brought before the notice of the Commission that has lately sat in several towns, and taken evidence to prove the best system to be adopted.

The process of utilization that has hitherto had the greatest success is that of spreading the sewage over land laid out in form to receive and appropriate it. The sewage loses in its passage over the land many of its deleterious ingredients, and flows into the river in a tolerably pure state. In doing so it promotes the growth of plants immensely. Rye grass is the crop that grows most favourably by these means. Five, or six, or even more crops of it are cut every year. Cowkeepers assemble in its neighbourhood, and give a good price for it; and it is, therefore, profitable where a ready sale in London is found for as much milk as can be produced. Equally favourable results cannot be expected everywhere, and yet everywhere must the sewage be used. The Rivers Pollution Commissioners have recommended this method of surface irrigation, but we take it that that is only because it was the best method that had been brought before them, and could show the greatest amount of actual success. We have every reason to believe that that Commission has done its work so far in the most creditable manner, but still the question arises—is this system of surface irrigation to be everywhere adopted? We think it very important to decide this question at once, and it is to this end that we have suggested that the town surveyors of the country should be called upon for any knowledge they may have of this subject. Our town councillors have the common quality of being slow to perceive the advantages of anything new. Anything that is proposed must be supported by the most self-evident proofs of its advantages, or else it is hard to get it tried. This state of things is well enough in one aspect—that of protecting the interest of the ratepayers, and preventing the adoption of wild schemes of so-called improvement—but it is a sad bar to real improvements.

The improvement in the method of utilizing sewage now under notice is that of "Subsoil irrigation," instead of the method of surface irrigation which we have described. Before the year 1855 we are not aware of its having been tried, but in that year Mr. Wilkins produced some great crops of potatoes and other roots at Reading by subsoil irrigation. In various parts of the country gentlemen have conveyed the outflowing liquid of their cesspools through pipes laid therefrom under the surface and spread around in all directions, fertilizing the earth wonderfully. These pipes have been the common sort of drain-pipes, 3in. in diameter, with open joints to allow the escape of the sewage, which is soaked up by the soil, and the mere water surplus sinks into the ground, as the rainfall does. The rising of the sewage up from the pipes to the roots of the crops is probably due to the force of capillary attraction of the soil, but that the liquid is soaked up by the soil and held for the plants to feed upon there seems to be no doubt. It is this contact with the roots and rootlets of the plants that purifies the sewage.

A peculiar system is in practice at West Worthing which is reported favourably of. Another wholly different system is in practice, or will be soon, at Ealing. This, even, is said by some persons to be all-sufficient for the purpose of purification: it is not a utilizing process at all. Then we have the simple act of filtration through gravel, and the prepared clay process of Dr. Bird. Of the many failures of a chemical treatment of sewage, with the intention of completely purifying it, we need not say anything here. Everything seems to indicate that we must use the sewage of towns in fertilizing the land. Following out the suggestion of the town surveyors bringing forward their plans, we would say, that when a selection has been made, let each one of the plans that seems worthy of a trial be tried practically in a town of moderate size. It is with this view that we say the suggestion of the *Times* does not go far enough. Suppose there were three plans radically different in principle (and we do not think there would be more), each of which possessed features the truth or error of which seemed worthy of being proved, we would suggest that each one be tried on a commensurate scale and for a sufficient length of time by the Government, and upon this result let our future operations be dependent. What if this work should occupy two or three years more—if it ascertain the best plan, the time will have been well spent, and our rivers may well remain two or three years longer as they are with such a result in view. Many schemes would be proposed, no doubt, if we may judge by many of those which were proposed at the time of the institution of the metropolitan sewerage, which need occupy very little of the attention of Government, but this ought not to stand in the way of the adoption of the course we have suggested. The few that are worthy of attention will soon be perceived.

When the result has been arrived at, the authorities of the town in which the plan that proves the most successful shall have been adopted will, as suggested before, repay to the Government the expenses incurred, and thereupon that example should, we submit, become a precedent for all other towns. Looking at the general interest of the country in the settlement of this question, we are quite of opinion that a few thousand pounds of the Imperial revenue would be readily granted by Parliament for this purpose. We hope to see some member of practically enterprizing character take up this subject in the House of Commons during the ensuing session. The Government, we are sure, will not obstruct but assist legislation on this important subject. The suggestion that was made a short time ago—that the rainfall upon the roofs of buildings in all towns ought to be caught in cisterns, and used and sent gradually into the sewers—might well occupy attention at the same time.

The owners of "cottage property" in towns are those who most obstruct the authorities in their movements towards improved sanitary conditions, and for these gentlemen it is necessary to make compulsory laws. Very often, non-resident as they are, they care nothing whatever for the health of their tenants. They, unfortunately, cannot see the injury to their own property that accrues when epidemics sicken and kill their tenants, and render them unable to pay their rent, but force them to leave their houses. Be this as it may, however, experience proves to us unmistakeably that the owners of cottage houses in a town will do nothing until they are compelled to do something.

When these things are fully gone into, it is seen how necessary it is to determine whether the authorities of those towns who have already sewered and drained their towns are to be required to lay down other and larger sewers to take the excessive storm-waters, or whether their present sewers are to be rendered sufficient for the purpose of efficient sewerage, by making use of the old drains and original watercourses to carry off the surface water of the streets into the rivers or other natural channels; and, if it be determined that they ought to do so, then to enact that it be compulsory on the authorities to scavenge the streets daily, to employ a fixed number of scavengers in proportion to the population or to the length of streets—it is immaterial which way it be taken—and generally to legislate in the spirit and in pursuance of the good beginning of the Health of Towns Act and the Towns Improvement Clauses Act. In determining which is the best way to use town sewage on land by practical experiments, the question of how much land in proportion to population is required for the beneficial use of the sewage will resolve itself, and when it has been ascertained, it may well be embodied in the further legislation on this subject which is called for. In setting forth the necessity for further inquiry, it is not at all necessary for us to condemn or seem to cast the least reflection on the work that has been done by the Royal Commission, who have inquired into this subject so industriously during the last few years. What they have done could probably not have been better done, but it does seem extremely desirable at this very moment to ask whether the conclusions they have been able to come to are those upon which we must finally rest, or whether further inquiry should be at once begun and carried on to the exhaustion of the question, before the country is committed to the surface irrigation of land with town sewage as the final measure of sanitary science.

THE "TORSO" AND MODERN MANUFACTURED ART.

So much has been said and written about art, that one feels almost ashamed to inflict more on the wearied patience of the few who are really interested in it; but, though so much breath and paper have been expended during the last few years, it is not a little singular to note how very small indeed the practical result has been. This cannot be from want of capacity in those who, like Pugin and Ruskin, have advocated systems of art action so ably and strenuously: it must rather be from the fact of such systems being, in some way or other unperceived by the authors themselves, either obsolete or impracticable. Certain it is that no system of art action has in these modern days been able to perpetuate itself. The whole of them, without one single exception, have died out with their authors and proposers. Why is this? Greek, Roman, Italian, Elizabethan, Gothic, have neither of them grown into national styles, fitted for every purpose, and nationally and universally acceptable. This is not a little to be regretted, for, had the time and energies thus uselessly spent been employed in furthering some plan of artistic action capable of national growth and progressive improvement, how very different would have been the present position of art and architecture, and artists, and, perhaps, of common workmen.

But there is a still more singular circumstance to be noted respecting modern artistic action, and one which has not received due attention: it is that modern art, everywhere in Europe at least, is a perpetual attempt to reproduce the forms and arrangements of the past and obsolete art, while it is well known that the art of the past itself was the result, not of copying pre-existing forms and arrangements, but of the necessities and aspira-

tions of those who invented them, and brought them to the state in which the modern man found them—not simply to admire and wonder, but to copy and attempt to reproduce. Let us, for a moment, confine our attention to one single example, a fragment of antiquity perhaps the most celebrated and universally accepted of all—the "Torso," and see what the time, and dominant system of art action, does with it, and then how itself was brought into being, for this will conduct to the true, and only true, way of vigorous and living art action and art result.

It may be useful, in the first place, to call attention, for a moment, to the evidence—the modern evidence, at least—on which the fame of the Torso rests. Sir Joshua Reynolds, in his lecture on "Form," says of it, "As a proof of the high value we set on the mere excellence of form, we may produce the greatest part of the works of Michael Angelo, as well as most of the antique statues, especially that of the Torso. But, as a stronger instance that this excellence alone inspires sentiment, what artist ever looked at the Torso without feeling a warmth of enthusiasm as from the highest efforts of poetry?" And this, he continues, proceeds from "the perfection of this science of abstract form." I cite this as not merely the opinion and taste of Reynolds, but as embodying the opinion and taste of the Royal Academy, the chief of our modern art institutions, and as sufficient proof, as far as evidence can go, of the esteem in which this famous fragment of antiquity is held. It is, as we shall see, but a feeble reason for so much celebrity, but the world of artists has no more, and, to the majority, it will be enough. No one need be reminded of the numberless drawings of all kinds that have been made of it—good, bad, and indifferent—of engravings and cuts of every size, and models in clay, by students of all degrees of excellence, all going to prove the worth of the original, and the inexhaustible wealth of it as an object of study and imitation. It would be very difficult indeed to say anything in praise of the Torso of the Vatican which would, in the estimation of painters and sculptors, be thought exaggerated or above its merits. No difference of opinion, I believe, exists about it; the world is agreed on it; it is the *ne plus ultra* of art. It is important to note all this, because this famous fragment of the skill of the artist workman is one among the very few of universally accepted instances of perfection in art, as far as perfection is possible to limited human powers.

Sir Joshua, as we have seen—and the reader must be asked to read what he has said with some care—founds the surpassing merit of the Torso on mere form or drawing, as it is sometimes called, for whichever way you look at it it is all-right and well-nigh faultless; but the fact really is that this element of form, however correct, would not have placed the Torso on the pinnacle of art it now stands on—something more and far more difficult of attainment was necessary to accomplish the feat: it was to breathe life into the marble. Every part of it is alive, and this life it is that gives to this fragment as it is (and it must have done this in a still higher degree when whole and perfect) the power that it has over the beholder. It is the result of superlative observing powers in the artist sculptor the author of it, and equally superlative powers of mind and hand executively. It is an autograph in stone. Works of this kind, so few in number, are generally thought to be the result solely of imagination, and are called poetic, from the supposed fact of their being the product simply of the mind of the artist; his imaginative faculty is thought to have created them, and, in the words of Reynolds, the great Academy authority, "It is the privilege of the artist to distinguish the accidental deficiencies, excrescences, and deformities of things: from the general figure he makes out an abstract idea of their forms, more perfect than any one original." Nothing can be more significant than this, and it is the almost universal idea. "Get rid of, and abuse," he continues, "all singular forms, customs, particularities, and details of every kind," and "learn to design naturally by drawing figures unlike to any one object."

I have simply cited these strange notions from this great authority for the purpose of showing how much there is yet to be said on the true nature of artistic action, and how completely they are refuted by this very fragment of artistic and workmanlike skill—the Torso, for, if any work of art ever yet brought into being owed its strength to details and observation of Nature and imitative copying, it is this "Torso." The strength of it is its natural truth. It is not inventive, but imitative, and a most wonderful example of art memory for minute details and finish. I must not forget to mention that it is copied on the Academy medal as the one chief and central object of antique art.

Very much more might be said about it, but my main object in this communication is, not to point out in detail the merits of the Torso, but to call attention to the strange fact that no one in this great country and metropolis, the head-quarters of artists and academies and art, has ever or can ever see it! Let any one who is now curious about it try. Where is there in London a plaster cast of the Torso, fairly taken from the marble original in the Vatican museum? In the antique school of the Royal Academy, you will say at once. Alas, no! there is a cast there, it is true, but, for all that can be seen of the genuine marble surface and cutting, it might as well be a mere copy by some untaught student; nay better, for the Academy specimen is so grubbed up with paint that all the minute details and finish which make up the life and vigour of the original are completely lost and hidden under it. It is, in effect, a "restored" copy of the Torso, and not the Torso itself. No wonder Reynolds said what he did. If other places be searched for it, the like result will be found, and the like disappointment met. At the Crystal Palace and South Kensington Museum so thick is the paint or white composition laid on every figure, both old and new, that no artistic touch or hand workmanship is or can be visible. The figures, whatever they are, are like painted dolls—all life and vigour and workmanship has been fairly painted out! The Torso cannot be seen in London: a journey to the Vatican is imperatively necessary to see it. And yet it is the central figure of the antique and of Pagan art, and the goal to which the modern man cannot attain; he can only try and see what he can do, and gradually, as a student, near it, and then stop.

What a pity, therefore, it is that, with all the wealth of our academies and departments and art societies, some effort is not made to obtain a copy in plaster of this fragment of a figure, simply oiling the surface for transparency and colour sake. I should merely suggest this as a commencement, to begin with the best, and so in time to educate the public, and, for that matter, the artistic eye to the perception of personal and individual artistic skill and finish. Art has, in these days, almost entirely disappeared; art manufacture has conquered it and taken its place. There is, as it seems to me, but one way of beginning anew—to look on the remains of past art, as it has been left us, rejecting all additions and restorations, as they are called. The antique is now only to be seen, as through a smoked glass, darkly and falsely, and to begin all over again, as I hope to show, is only to be done by seeing clearly first what others have accomplished in past and less artificial times. Everything that now is, and every influence, is against this, but there is always one comfort, that truth is truth, in art as in all else, and must eventually prevail.

I hope to be able to show this, and to point out wherein the present and modern system of art action fails, and necessarily must fail, for it is as nearly as possible the reverse of the old system. The Torso was produced through the study of and following Nature—our modern art by the study of the "restored" Torso. The old artists were veritable workmen, and wrought themselves hand as well as mind; the modern artist is not a workman, but a foreman and superintendent and employer of workmen, so that, as an artist, he is dead. The old art societies, if there were any, must have consisted of working men—of artist workmen (and the phrase is thoroughly descriptive); our modern art societies are composed, as everybody knows, of those who do nothing themselves, and whose artistic faculties, whether much or little, are never called into exercise; while the real workers and artists, however feeble their powers may be, are too low down in the social scale, and too obscure and contemptible, and too much crowded together, to form societies composed of individuals with personal and well-marked human and artistic powers. Thus the old art, and the new and modern art, are as far apart as two things can be—the one consisted of artist and workman in one man, the other of artist and workman as separate individuals, having really nothing in common, and working not with, but against each other!

C. Bruce Allen.

BUILDINGS AND EARTHQUAKES.

We have the report of a paper on certain aseismatic arrangements, designed for the preservation of buildings and other structures in countries subject to earthquakes, read before the Scottish Society of Arts last week by Mr. David Steveuson, C.E., Edinburgh. The subject is new and interesting. Having noticed the observations made, under the auspices of the Royal Society of London, by Mr. Robert Mallet, C.E., on the great Neapolitan earthquake of 1857, Mr. Stevenson stated that his attention had been directed to the matter, not as a speculative question, but by the Government, as a problem of practical engineering. In 1858, a treaty was entered into with the Japanese that their ports were to be opened to British traffic, while, for the safety of our mariners, the coast of Japan was to be efficiently lighted and buoyed. The Japanese applied to the Government of this country to advise them as to what was necessary to light the coast, the difficulty consequent on the frequent earthquakes which occur in Japan (sometimes once a fortnight for months together) being pointed out. Mr. Stevenson explained the device he had proposed to the Board of Trade for rendering buildings aseismatic, and illustrated it by diagrams and models. The new construction is based on the principle of breaking the continuity between the earth, which is affected by the shock, and the superstructure which rests on its surface; and the break is effected by the aseismatic joint, which, in the case of lighthouse apparatus, consists in placing the iron table on which the apparatus rests on balls of metal, working in cups formed in the under-side of the table. These balls rest in similar cups formed on the upper side of a lower table. When the lower table is affected by a shock, it is at liberty to move freely, without affecting the apparatus above, which, by reason of its inertia, remains unaffected. The motion being *qua qua versal*, also renders its action the same from whatever direction the shock may come. The aseismatic action has been successfully tested by experiments, and the Government have ordered the whole of the lights about to be erected on the Japanese coast, and which are being constructed in Edinburgh, to be made on the aseismatic principle. As the adoption of the principle is neither difficult nor costly, while it is very efficacious, there seems every probability that it will ultimately be adopted for all architectural or domestic arrangements in countries subject to earthquakes of a destructive character.

As a striking instance of the increase in the value of property in South London, it is mentioned that in 1855 the Angell Town estate, North Brixton, yielded £300 yearly. The rateable value of the houses built upon it is now £27,620.

THE COMBUSTION OF FUEL.

RECENT scientific discoveries, we are told for our consolation, should do much to lessen the alarm of those who fear the exhaustion of our coal fields. Economists, it would appear, have speculated on the possible discovery of some method of producing heat independent of coal, and the decomposition of water has been regarded as a probable expedient. With our present knowledge and appliances, it appears not be difficult, thinks the *Mining Journal*, to realize this proposition, even in competition with coal, at least in a small way. The agents are obvious—wind power, a magno-electric machine, oxygen and hydrogen gasholders, and the electrolysis of water. The result would be that oxygen and hydrogen would be available for the production of the heat which would be required. For use in the arts the oxy-hydrogen furnace would offer advantages far above any other known, and results could be reached impossible with the lower temperature of the coal fire, while the flame would be free from deleterious substances common to coal. Owing to its gaseous form, and the intensity of its heat, this fuel, our contemporary argues, would be manageable in many ways impracticable with coal. For instance, seams could be hard-soldered with great rapidity with the jet of the compound blow-pipe, and it is thought probable that the joints of steam boilers could be treated for welding in a suitable oxy-hydrogen jet. These hoped-for results, however, have yet to be realized. The history of progress in the combustion of fuel, and its apparatus, is extremely curious and interesting. The four great combustibles known to us are wood, coal, peat, and petroleum. These consist principally of carbon and hydrogen, the only bodies to be found in abundance, which burn easily in the atmosphere, without disengaging very pernicious vapours. The first three materials have been used as fuels from time immemorial; in fact, we have no certain knowledge of the date of their first production. Wood, as being the most accessible, it is reasonable to suppose was first in use, and the discovery of charcoal must have followed by accident, probably not long after. Fossil coal is mentioned by Theophrastus as being used by smiths, and Pliny speaks of an ancient people as burning a kind of peat. The discovery in America of that wonderful agent petroleum belongs to more recent times. Mr. S. M. Kier, of Pittsburgh, is stated to have been the first—in 1849—to refine petroleum, which flowed up naturally; and about ten years afterwards a Mr. Bissell had the credit of first conceiving the idea of boring for oil, and a Mr. Drake that of sinking the first well. The last gentleman found very ancient pits, "from fifteen to twenty feet in depth, and from five to eight feet in diameter, carefully walled round their sides with jointed wooden beams, which the petroleum of the soil had completely preserved from decay." It is only within these few years, however, that this liquid fuel has been made available for a vast variety of useful purposes. Since the time when men first hit upon the idea of rubbing two pieces of wood together to obtain fire—the only mode known even now in some uncivilized countries—what an infinite variety of discoveries and appliances have from time to time been made in connection with the combustion of fuel. In one of his recently published volumes of "Abridgments of Specifications of Inventions in the Patent Office," Mr. Bennet Woodcroft has taken great pains to furnish us with a consecutive history of the processes for the preparation and combustion of fuel. From his laborious researches we are able to trace the successive steps in the development of inventions of this class from the earliest times. It has to be noted, however, that patents for property in the application of novel ideas in the arts only began, as he tells us, to be granted in the seventeenth century, and several important processes invented in this country as well as in others have never been patented. There are, however, published documents which supply the gap in the record, and these Mr. Woodcroft has carefully collected, and the result is a complete history of the greatest value. From an examination of these documents we gather, for instance, that the general method of procuring a warm in-door climate in Pompeii was by burning charcoal in a brazier on the pavement in the middle of the room, and allowing the vapour to exude at the door and window. And E. Péclet, a French writer, informs us that the first fireplaces employed consisted of a space beneath the body it was wished to heat, and into which the combustible was supplied. At a later period, when the necessity was recognized for covering up the fireplace to prevent the loss of heat, it consisted of a close space, furnished with a single opening for the supply of air and of the fuel. It was a long time after that grates for receiving the fuel were invented. Their discovery was probably occasioned by the use of coal, which burns badly without a grate. Andirons, or "firedogs" for the hearths on which wood is burnt, are mentioned in an assessment made in 1290 at Colchester. In these we have the origin of the modern grate. These "cobirons" continued to be used in countries where wood is burnt for heating apartments, and they may still be seen in some of the hotels of Paris. In 1785, Dr. Franklin invented a revolving grate with a circular fire-cage, and so made as to be capable of being turned round after being lighted, in order to bring the fresh coals under the burning coals, and thereby prevent the development of smoke. The oldest certain account of chimneys occurs in the year 1347, though those of Winwall House, in Norfolk, are believed to have been built anterior to this date. It would also appear that the manufacture of artificial fuel is due to Sir Hugh Platt, who, about the year 1594, attempted to introduce into England for use in common fireplaces a mixture of coal and loam, according to "the manner of Jukeland in Germainie." The date of the first application of coke as fuel is not certain, though Dr. Percy mentions in his "Metallurgy" that "in 1769, Jars announced the fact that coke was made in England not only in piles, but also in a closed furnace." Sea-coal, it has been said, was first brought to London in 1357, but we find it was used in the metropolis in 1306. In that year Edward I., by a proclamation, "prohibited the burning of sea-coal in London and the suburbs, to avoid the sulphurous smoke and savour of the firing," and in the same proclamation commanded all persons to make their fires of wood. It would be impossible to trace the multifarious improvements that have since been made in the construction of our domestic fireplaces, or in various apparatus and means for the production of heat, which an advanced knowledge of science has enabled us to employ. In a scientific sense, as Mr. Woodcroft remarks, air is fuel. "A jet of oxygen gas, which, of course, does not burn in common air, is consumed in a jar containing hydrogen, in the same way as a jet of hydrogen burns in the atmosphere or in a jar containing oxygen. And just as with the carbon and hydrogen, air has also to be carried to the space where it is to be used, by either a direct expenditure of heat (or work), as with a chimney, or indirectly, as with a steam jet, a bellows, or a fan-blower. It is only lately that any other combustibles than carbon and hydrogen have been employed on a large scale, and for any important purpose. In the Bessemer process of making steel and malleable iron, heat generated from the combustion of the silicium, and of a small portion of the iron itself, as well as the carbon, is utilized." The history or progress in the combustion of fuel, and its apparatus, it is here shown, does not exhibit an advance in parallel lines with the advance of chemical knowledge, as might be expected. "The true chemical nature of combustion was only explained towards the end of the last century; and both the inventions of the hot blast, and of the plan of increasing the heat of molten metal by injecting air, were apparently made without an initial reference to chemical theory. The late great discoveries, principally in America, of liquid fuel were not made by the aid of geological science, but simply by accident. Even the gas furnace, the most scientific modern plan for burning fuel, seems to have been originated in a desire to utilize the fire gases from the tunnel head of a blast furnace, and it was already partly forestalled in the old reverberatory furnace. It is, in fact, to the gigantic laboratory of general metallurgical operations, and more especially to those operations carried out in the blast furnace itself, that we also owe such improvements as the production of coke, the burning of anthracite coal, the hot blast with its water tuyere, and the blast engine. On the other hand, the more recent developments of the gas furnace are much more the results of scientific investigations, and we may expect that, in future years, practical progress in the rational combustion of fuel and the production of heat will advance simultaneously with physical science." The recent discoveries alluded to at the outset of these remarks may be accepted, among other proofs, that it will be so.

WENLOCK ABBEY.*

NEXT in interest to Tintern Abbey, amongst the ruins of the early religious houses of England, we would place Wenlock Abbey. As Salisbury is among the cathedrals, Wenlock is among the abbeys, a true and unique example of Early English or Lancet Gothic architecture. Here we find the vertical tendency culminating in every part, without depression in its section. It seems as though it had grown up from some vital and inherent principle of development, rather than from the agglomeration of minute parts under the cunning of man's handiwork, and reminds us of the well known imagery of Bishop Heber, used in describing the temple at Jerusalem, in which no sound of hammer or of axe was heard. Immediately upon entering the precincts we came to some rich Norman work, belonging, doubtless, to the original foundation; it is to the right as you enter. This work seems to have been of much earlier character than any which we had noticed at Haughmond Abbey, and, in some parts, appears to represent specimens of what has been denominated the Saxon style. We enter through the centre opening of a Norman triplet, with quaint figures in the spandrels, and enrichments, though rude, both bold and crisp; the walls within this elaborate screen reveal some highly ornate interlaced Norman arcading on the right hand, the quasi prototype of the Early English, or Lancet style, and, if it be such, as some suppose, we shall here find in the same building both the type and the prototype, joined together by easy gradations, as we pass from arch to arch and from pier to pier. On the left hand wall the arcading is plainer: in this portion of the ruins was the chapter-house, which measured 60ft. by 30ft. At the extreme end of the right hand, or western wall, we noticed a very curious square-headed opening, with a grotesque face in the centre of it, and a double-headed saurianesque chimera on each side, of very early character, approximating the Runic or Hiberno-British period. The existence of the stone lintel, with its peculiar so-called Runic ornaments, incorporated with the remains of an abbey having a Norman foundation, seems to us very significant, and serves, we think, to favour the theory propounded in a work, entitled "The Towers and Temples of Ancient Ireland," by Marcus Keane, M.R.I.A., viz., that the Normans merely copied the remains of an earlier architecture of Cyclopean character, with square lintels and sloping jambs, as in the old round towers of Ireland, that bear upon their masonry ornaments very similar to these double-headed figures, which we noticed upon the lintel of the square-headed opening in the Norman chapter-house of Wenlock Abbey. The ornamentation of the walls of the chapter-house is peculiar; up the reveals of the

* From a paper read by Mr. H. H. Vale, F.R.I.B.A., at the Liverpool Architectural Society.

arches are some curious elongated quatrefoils or paterae, and a very rich chevroned string course. Some of the capitals of the shafts of this arcading are still in block uncarved, which bears out the idea that much of the carving of the early ecclesiastical structures was left after the completion of the edifices to be carved by the monks during their hours of leisure. Passing through a breach in the wall of the chapter-house, after crossing a level reach of velvety greensward, we come to the gable end of the prior's house, with bold, well grouped, projecting chimney-shaft, with windows at the sides, the whole forming such a gable as those which the elder Pugin has introduced so frequently, and with so much effect, in his domestic buildings and presbyteries.

Wenlock Abbey was dedicate l to Saint Milburga in 680; some portions of the chapter-house arcading would seem almost to belong to that period; the abbey would appear to have been re-erected by Roger de Montgomery, Earl of Shrewsbury, in the year 1080, for the monks of the Cluniac fraternity. The dimensions of the minster were 301ft. long, the transept 166ft. long, the nave, erected in 1127, measured 156ft., the choir, the work of Earl Roger, in the eleventh century, measured 156ft., and the lady chapel, of fifteenth century work, was 48ft. long. A large portion of the north transept remains nearly intact, with the exception of the roof. The remainder of the abbey can now only be read in fragments, but such noble fragments as will well repay perusal. It is said that the Abbey of Paisley, that best bit of true twelfth century work in Scotland, was colonized from Wenlock, about the year 1161.

The area of the abbey buildings was thirty acres. The principal entrance to the abbey was by a gate on the north side of the precincts, which appears to have been flanked by two square towers, one of which remains. The church of Holy Trinity, outside this gateway, was a vicarage belonging to the abbey, together with the rectory of Little Wenlock. The great cloister court, encompassed by the refectory, dormitory, and chapter-house, the sites of which we traversed on entering the ruin, is to the south of the nave. Crossing over the area of the nave from the site of the cloisters, we came to the bases of the great shafted piers which supported the central tower; these huge pillars we found on measurement to be each fifteen feet in diameter—the size, in fact, of many a modern church tower. They are superb, and in part reveal to us the grandeur of this abbey in its golden prime. Standing on the site of the great central tower, with these enormous clustered pier bases, one at each corner, we see around us such marvellous fragments of early Gothic architecture as but very few ruins besides can boast. The gigantic clustered nave piers in rows; the shadowy groined aisles; the double lancet triforia; the attached triplet wall shafting, running up to a stupendous height, and corbelled delicately as to a needle point below the great gables, filled with exquisite lancets, rising tier above tier in well-balanced grouping; the bold, yet simple, moulding of the arches; the spirited and broadly carved capitals, with foliage in high relief; and the beautiful bosses to the triforium labels—one and all combine to make up an unrivalled picture of mediæval power and loveliness. The details consist principally of hollows and beads. The nave piers, each about four feet in diameter, are clustered to the lancet-shape upon their plans, but without fillets, and brought almost to a feather edge; in fact, it will be seen that the general idea conveyed to the mind, by all the forms around us here, is one of intense Gothicity undiluted. Sharp gables, sharp arches, needle pointed corbels, lancet shaped piers, thorn pointed foliage, vertical lines uncut by horizontal members, all give rise to a sentiment of sublimity and of aspiration above the grovelling earth—ideas which are developed by the study of all true Gothic buildings old as well as new; but it certainly appeared to us that the ruins of Wenlock Abbey were preeminently calculated to produce such impressions upon the mind. The lower parts of the interior walling were built of coursed rubble, plastered as a ground for painting. The bold independent spirit of the Gothic mind is shown in a peculiar piece of constructive masonry, at the junction of the piers of the south transept gable with the piers of the eastern aisle of this transept: it is worthy of the study of every architectural student, as it is an evidence that a difficulty well mastered becomes a beauty well won. Several of the exterior shafts of the clerestory lights have gone. It is the vastness of this abbey ruin which strikes one most forcibly, vastness not only in the sense of area but of section and of cube, a profound excavation indeed in some old quarry must have been made to supply the stone for the building of this abbey, and many a hundred details must have been supplied to the handicraftsman by the designer or designers before this stupendous pile rose to its completion. Now the broad lights and deep hollows of gloom, and long perspective rows of shafts and arcades, work upon the imagination as a spell, and impress an unfading charm upon the memory.

BUILDERS' CHARGES FOR TENDERS.

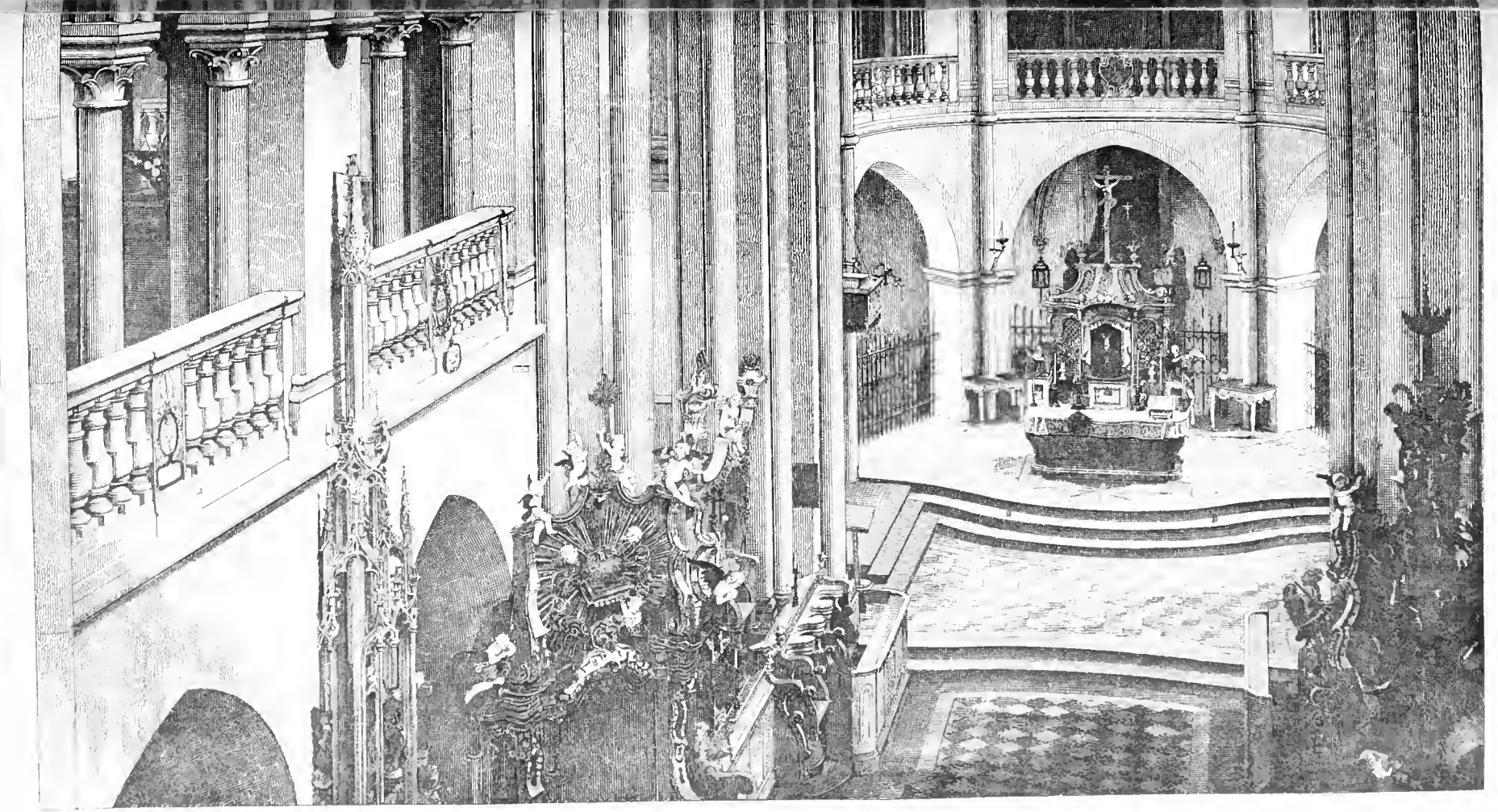
A CASE of considerable interest was tried in the County Court, at Gloucester, last week—Jones and Son *v.* Rees. The plaintiffs are a firm of builders at Gloucester, in a large way of business. The defendant is a leading promoter of a Welsh undertaking for the erection of English Congregational churches in South Wales. In June, 1866, a committee, of which Rees was chief acting member, having appointed Mr. Paull, of Manchester, to be architect for the new church to be erected at Swansea, directed him to obtain tenders in limited competition from five firms, including the plaintiffs'. Quantities were supplied by the architect. No condition was made as to the lowest or either tender not being accepted. The tender of plaintiffs was the lowest, but, being somewhat in excess of the architect's estimate, he was authorized to communicate with them with a view to reducing the work. One of the firm consequently went to Manchester, and all particulars were arranged and duly reported upon by the architect to the committee, who, after some delay, wished to enter into a contract with plaintiffs for the carcase only of the building. The amount of this having been settled upon and agreed to by plaintiffs, the committee found they had been too sanguine as to obtaining funds, and they desired to proceed with the foundations by daywork, under the superintendence of a clerk of works approved by the architect. Plaintiffs demurred to such a course, but on the desire of the architect consented to withhold claim for compensation, and accept a fair amount for their time and expenses in the journey to Manchester. The foundations of the church having been completed up to the ground line, the works were suspended till the spring of last year, when the committee found themselves able to enter into a contract for the superstructure. The architect was then commissioned to re-open negociations with plaintiffs and ascertain if they would take the work at the rates upon which their original tender was based. They consented to do so with a few modifications which the architect arranged, and terms of contract were prepared. Plaintiffs were called upon to provide responsible sureties, which they did, and an appointment was made with the architect to meet and settle all details for a contract. This appointment was set aside by a telegram from the committee, followed by a letter stating that "for many reasons" they had decided not to enter into a contract with plaintiffs, and directing the architect to arrange for the work to be carried out by Messrs. Thomas and Co., of Swansea, whose original tender was next in amount above that of the plaintiffs. Whereupon plaintiffs sent in a claim of £35 11s. 9d, consisting of the following items:—5s. per cent. on the amount of the original tender, £11 4s. 9d.; expenses to Swansea for local information for preparing tender, £5 5s.; journey to Manchester, £10 10s.; second journey to Swansea in 1867, for further local information, £5 5s. The committee rejected the claim, hence the action by plaintiffs. Mr. Paull gave evidence as to the above, and Mr. Neville of Abergavenny, and Mr. Jacques and Mr. James of Gloucester, gave evidence as to the fairness of plaintiffs' charges, and cases where demands under similar circumstances had been paid to builders for estimates. On behalf of defendant, Mr. Watkins and Mr. Rees, of Swansea, two fellow competitors of plaintiffs in the limited competition, were called to prove that under no circumstances were builders' tenders ever paid for; but Mr. Watkins admitted he should consider he had a claim for compensation in a similar case to this, and would have sued in one or two instances in his own experience, if he had known he could recover. Defendant admitted the item of £10 10s. in plaintiffs' bill, and plaintiffs withdrew the last item of £5 5s. The judge decided for the plaintiffs in the other three items with costs.

STREET WATERING.

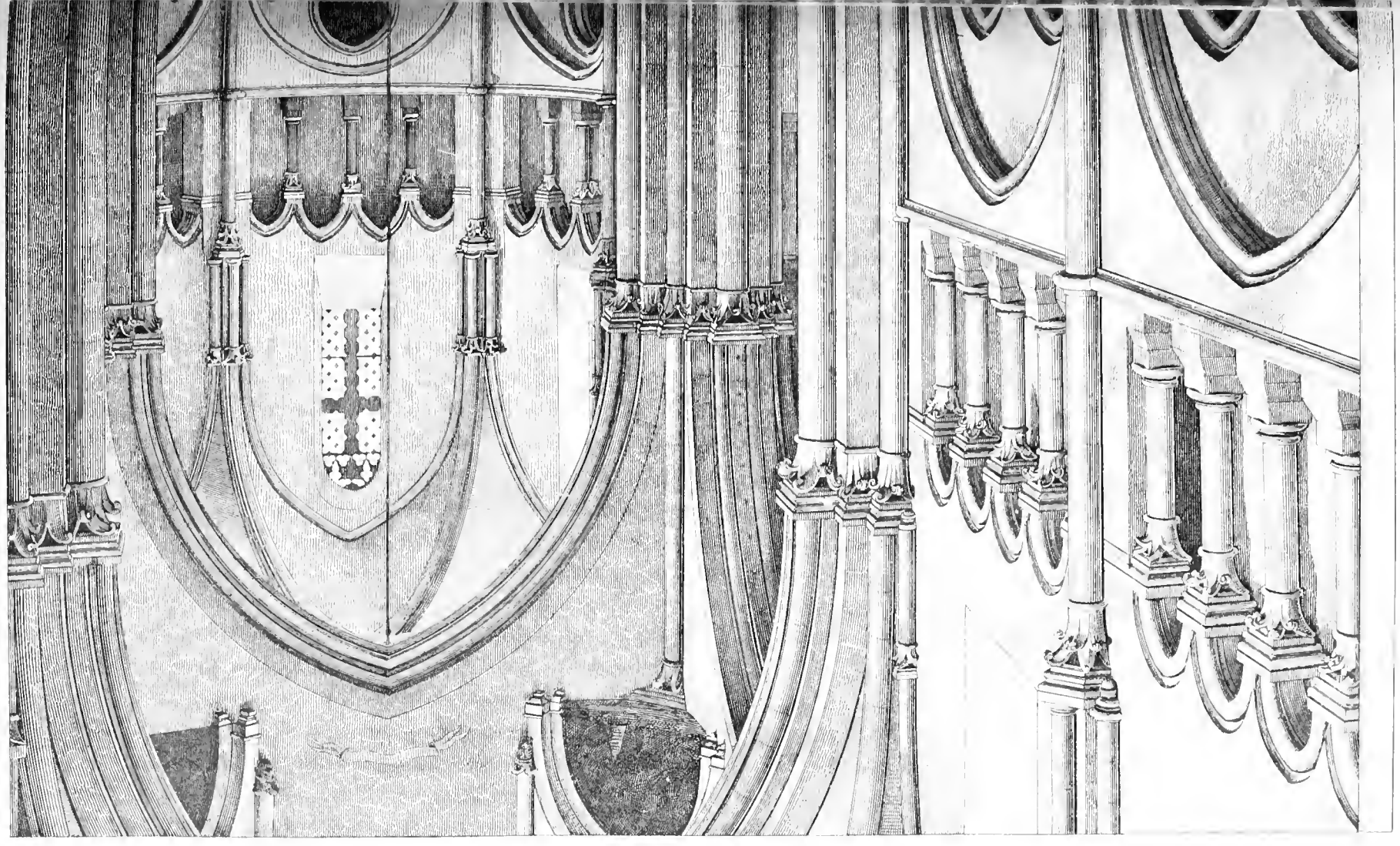
MUD in winter and dust in summer, says Dr. Whitmore, medical officer of Marylebone, in his last monthly report, are prominent amongst the many discomforts to which the inhabitants of London are periodically subjected, and it is very difficult to say which is the greater evil of the two. By means of the latter, when blown about by equinoctial winds, the population out of doors become half-choked and wholly smothered; it spoils to a great extent goods which are exposed for sale by retail tradesmen, and, being composed for the most part of organic matter in combination with pulverized granite, it constitutes a nuisance not only intolerable as regards personal convenience, but in many respects also injurious to health. As a remedy for this evil, the system of street watering hitherto adopted has been found to be altogether ineffective. The object to be attained is simply to lay the dust, but, as in the hot dry days of summer a light sprinkling of water would evaporate entirely in a few minutes, it becomes necessary to use water in considerable quantities, the result of which is that the streets and roadways are at once rendered miry, and, for some time at least after each watering, almost, if not altogether, impassable for ladies and other lightly shod pedestrians.

With an obvious consciousness of these facts, and with a laudable consideration for public comfort and convenience, the vestry, Dr. Whitmore goes on to say, has recently entered into a contract with Mr. J. W. Cooper, the patentee of the improved system of street watering, to water the streets and roadways of this parish with his composition during the coming season, and, judging from such experience as I have been able to acquire respecting it, and assuming that he is supplied with all necessary means and appliances, I should say that it promises to be a success, not merely as it affects public convenience, but the pockets of the ratepayers also, since the amount to be paid to Mr. Cooper is less by upward of £1000 than what has hitherto been paid to other contractors for street watering in the ordinary way. Mr. Cooper further claims for his patent that it will effect a considerable saving of the cost at present incurred in the repair of our macadamized roads, that it will prevent the roads becoming slippery in frosty weather, and that the chemical salts used in his composition, being antiseptic in their properties, are valuable in a sanitary point of view, inasmuch as in hot weather, and especially during the prevalence of cholera or any other epidemic disease, they will act as deodorants and disinfectants. The composition used by Mr. Cooper consists of a solution of the chlorides of calcium and sodium. A well known-property of these chlorides is that they are highly deliquescent, absorbing moisture rapidly when exposed to the air. With regard to the former salt—*i.e.*, chloride of calcium—by some authorities it is stated that, when exposed for a certain time in a moist air, it will take up more than its own weight of water. The retention of moisture therefore by these salts serves to keep the roads in a damp condition for a much longer period than when plain water is applied to them; for, whereas by the usual system of watering, or, more correctly speaking, deluging, three applications per day will hardly suffice in very sultry weather to prevent the dust from blowing, one application of Mr. Cooper's composition at intervals of two or three days will, it is said, accomplish the object. Another point favourable to Mr. Cooper's process is, that the materials used by him are perfectly harmless and innocuous; were it otherwise—were the feet of horses or other animals to become in any degree affected injuriously by it, or were it destructive to shoe-leather or anything else that would ordinarily come in contact with it—such objections would necessarily be fatal to its continued use.

The Science and Art Department of the Committee of Council of Education, at South Kensington, has issued a memorandum intended to explain several points referred to in the committee's minute of the 21st December last. We have already given the principal points of that minute, and it will be sufficient to state that the paper now issued explains minutely the conditions under which the department is prepared to assist the artizan classes who may show an aptitude for scientific instruction, by aiding local efforts in founding local scholarships and local exhibitions.



Limburg · Cathedral . Interior · looking · West.



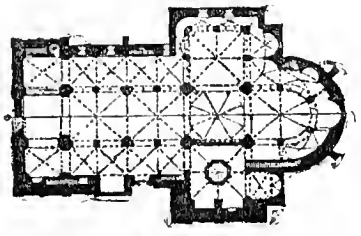
LIMBURG CATHEDRAL.

THOSE who were fortunate enough to see the exquisite drawings which were exhibited as illustrations to the paper read by Mr. H. W. Brewer at the Institute of Architects on Monday last, will have a lively recollection of the two charming views of Bamberg by that artist. Between Bamberg and Limburg, on the Lahn, there is a considerable resemblance; both cities are more like dreams of the picturesque than sober realities; at any rate so they would appear to the untravelled denizen of a monotonous and uninteresting English town, or to one whose highest aspirations are after the vapid modern Parisian type of architecture. Limburg, however, has suffered so grievously at the hands of the improvers of the present century, that to conceive it, in its full mediæval glory, needs now considerable imagination, and a reference to more happily left alone places, like Bamberg. The Cathedral crowns the highest point of the town, as of old, and has been fortunately less injured than most of its compeers. It is more compact and, therefore, perhaps more happily grouped than the one which I have selected to compare with it—the noble towers of which are well known to be imitations and fair rivals of those of Laon. But it is in its surroundings that Limburg Cathedral falls so far short of Bamberg. The architect alone can see that the streets of the former town are quite as quaintly planned and the forms of its houses as good, as those which made up the glorious foreground in the two pictures I have above referred to. Of every atom of their ancient detail, however, a clean sweep has been made, and whitewash, yellow dab, or a cloak of slating, has replaced the richly wrought wooden framings, carved brackets, and other features, which still delight the eye in that and other of the cities of the more eastern and southern parts of Germany.

On the present occasion, however, my remarks should be confined to the interior of this Cathedral of Limburg, as explanatory of the very accurate view which they have to accompany; but the impression of the contrast between the outer aspects of the two places had been so recently received, that I could not lose this opportunity of expressing the feelings it aroused. There is, however, sufficient scope for their indulgence provided by similar incongruities visible without quitting the view of the interior, which is given in the engraving of the BUILDING NEWS for this week. This, from its size and clearness, is exceedingly valuable, and it is an excellent example of the advantages which can be conferred upon the profession by its means, through the aid of photography.

I fear, however, that the professors of this cognate art will hardly be kind enough to supply such material at their own costs and charges very much longer, for they certainly receive little encouragement at the hands of either the profession or the public. The view in question is an admirable rendering of one of those issued by the Architectural Photographic Society for the last season, and the difficulties which had to be surmounted in order to procure it would not be readily credited by anyone who had not the same opportunities as myself of knowing what they were, and at what cost and by what patience they were surmounted. In the very able criticisms in the BUILDING NEWS upon those photographs, regrets were expressed at the non-multiplication of the views of this particular building, and this advice in the interests of the society was undoubtedly correct; but, seeing that, as I happen to know, the whole of the combined subscriptions of the society would not cover the cost of the negative of that photograph alone, I am afraid it has little chance of being followed, the fault of which will not lie at the doors of Messrs. Cundall and Fleming, the enterprizing photographers to the society.

Perhaps, as I have now the opportunity, not often enjoyed, of answering the questions put from the pulpit of criticism, I may refer to the following statement made in the article I have referred to:—"In fact, this is just one of those examples which ought to have been photographed from every available standpoint—east, west, north, or south," and to say that, to the best of my belief, this was done. A view was given of the west front, which was obtained at very great personal risk to Mr. Fleming and myself, by hoisting the camera on to the top of a narrow wall overhanging a precipice, with one of its legs propped upon a tombstone, and amidst a gale of wind, and the position of my companion during the operation was so critical that I could not breathe freely till it was done. We then jointly searched the neighbourhood for a second standpoint within half a mile in vain, none being practicable without the aid of a balloon, as the cathedral stands on the brink of a precipice on three sides, and has buildings adjoining it on the fourth.



PLAN OF LIMBURG CATHEDRAL.

However uninteresting these details may be, I feel called upon to give them, as I find the difficulties in the way of photographers not at all appreciated. One is asked continually by professional men, who ought to know better, why views were not taken which would entail such trifles as removing houses, cutting down trees, or erecting scaffolds, and one feels rather inclined to suggest that for once they should try to carry out some of their hasty suggestions. *Mais revenir à nos moutons.*

In the view the spectator is looking from the western organ gallery towards the chancel, and in the foreground is one of the compound bays of the sex-partitely vaulted nave, with its four vertical divisions foreshadowing the arrangement so common in the Gothic of the Isle de France, and the peculiarly German Romanesque feature of the lower arcade opening to the aisle, plain even to baldness, having square unmoulded archivolts. A glance at the similar feature in the chancel shows the simply moulded impost, which, with a corresponding plinth, are the only decorative members of the square piers, irrespective of the vaulting shaft. The detail of the aisles is, as in most German churches, as plain or bald as the nave piers, being divided into square compartments, one corresponding to each half of the compound bay of the nave, divided by semicircular transverse arches on ¾-cylindrical columns, and the vaultings are domical with unribbed semicircular groins. The *Mannerchor (Mannshaus)* is the first storey over the aisles, forming a spacious gallery, and, as is usual in early German churches, is the finest feature, to which the lower arcades have been sacrificed, for it is obvious that, had they been lofty and elegantly proportioned, this gallery would have been thrust so much higher as to have been practically useless, whereas its object was to provide accommodation for the males of the congregation, their better halves being seated below. The openings to this gallery consist of couplets of pointed arches, with large rolls and edge mouldings to the archivolts, comprised beneath similarly moulded relieving arches; the bearing shafts are detached, with well and simply carved capitals and deep and bold abaci, the mouldings of which are continued round the intermediate piers and vaulting shafts, and form a strongly marked stringcourse at the level of the arch-springing line. The effect of this *Mannerchor* is sadly injured by a detestable modern rococo balustrade, which it is devoutly to be hoped may soon be removed. It does not appear that there was originally any parapet in this example, other than possibly a moveable one placed behind the columns, or, as in the triforium of Westminster Abbey, it may have been left unguarded. Sometimes, however, very excellent examples of parapets are to be found, as in the church of Notre Dame at Coblentz. Above this gallery is a blind passage in the thickness of the wall, open to the interior by an arcade of four arches to each half of the compound bays—these have similar bold detail to the arcade below, with high double plinths: above this passage is a single plain semicircular-headed clerestory window under each pocket of the vaulting.

The material of the bearing shafts in the *Mannerchor* of the chancel is black marble, and of the rest a delicate rose-coloured stone, and the effect of these is very charming. The shortness of the nave to such a church is quite remarkable. It consists but of two sexpartite bays, eastward of the compartments between the western towers, which is open to the nave, and through which the gallery is continued. The vaulting shafts to the main pier and responds (of which that next to the crux arch is seen in the view) run from the floor to the springing without interruption by the strings or bands; the intermediate vaulting shafts, and those to the chancel, have the stringcourses carried round them as bands. A curious feature is the small bundle of shafts which form the lower—the stilted part of the ribs, and which rest upon the carved capital of the vaulting shaft, the abacus of which is brought to a point to receive the small shaft of the central rib. The crux piers are simple and bold square piers, with ¾ shafts in face of each, and nook shafts, the latter running up (as might well be dispensed with) and losing themselves in an inane sort of way under the pendentives of the central lantern. The pendentives, in themselves, with two archivolts carried on small angular corbels, the space under being treated like the head of a niche, would be well enough but for some barbarous modern paintings which disfigure them.

The horrible glass in the easternmost clerestory window is another blot upon the interior, while the pavement, altar, choir grilles, stalls, pulpit, and throne, together with the gallery balustrades above-mentioned, are foils to the dignified and simple architecture of the building. The graceful Gothic canopy of the sacrament-haus in the foreground on the left hand is, however, the sort of foil one would desire as a set off to these Romanesque and Early Gothic churches. The vile jumble of rococo scrolls, gilt suns, and sprawling cherubs beyond should be swept out and made a bonfire of with the utmost expedition, as of course all architects would allow. But the public still echo the ridiculous laudation of the trumpery pulpits of Belgium, and I doubt not that many of your subscribers will only regret the friendly shadow which obscures the atrocious detail of these monstrosities. Leaving them, therefore, to the pleasures of imagination, I must conclude this description.

JOHN P. SEDDON.

[By an error of the lithographer, the illustration is said to represent the west end of the cathedral. As will be at once seen, the view is taken looking east towards the chancel.]

Dante's house at Florence is reported as being in the most filthy condition. It is gutted of its contents, and the windows are broken and unglazed, owing to the obstinacy of the proprietor, who, like the owner of the less famous houses in Stamford-street, will neither sell, let, nor repair the building.

SANITARY CONDITION OF THE WHITECHAPEL DISTRICT.

One of the most valuable improvements effected in this district since the formation of the Local Board is a constant supply of water to the poor. There are now fifty-three places supplied with water direct from the main by water-waste-preventers, and by means of these appliances the inhabitants can obtain pure water at any time in sufficient quantities for all household purposes. While the people are benefited the water companies are not injured, for Mr. Liddle, the medical officer, in his report for 1867, just issued, states his belief that less water is required to be delivered under the new system than under the old plan of the standing tap. The poorer parts of the district, which were a few years back in a disgraceful condition there being then upwards of seventy courts supplied on the intermittent system, are now as well provided for as any other London district. The dwelling-houses of the poor are still in a very unsatisfactory state. In many of them the tenants have to descend two and three flights of stairs into the cellars to deposit ashes and refuse, and to obtain water. In some cases, owing to the total want of any public control, the landlords have done away with the passage through the cellars into the back yards; and, instead of converting the lower room into a passage, have made a door in it leading thither, so that all the tenants of the upper parts of the house have to pass through this room to reach the yard. The cellars of some of the houses are less than 5ft. in height, and only to be reached by step ladders. Damp, and badly paved, in many cases not paved at all, as they are, landlords permit them to be inhabited. Thirteen of these cellars and sixty-five houses have been closed during the past year by the sanitary officers, as unfit for human habitation. From such a state of things as this, disease and pauperism are inseparable, and to it is owing in no slight degree the periodical returns of destitution now witnessed in East London. The Local Board and their officers seem to engage vigorously in their work, and a thorough house to house visitation is kept up, but additional compulsory powers are greatly needed. Take, for instance, the New Metropolitan Buildings and Management Bill brought into the House of Commons last session by Mr. Tite and Col. Hogg. Should this bill become law, all existing Building Acts will be by it repealed. "Under the existing law," says Mr. Liddle in his report, "houses can be enlarged by what is called a 'lean to,' although it may so prevent the due entrance of light and air as to render them unhealthy. The evils of the present mode of crowding together dwelling-houses will greatly increase, unless prevented by stringent powers in the new Building Act." Among 254 clauses in the bill there is not one that regulates the proper construction of either privies, water-closets, or ash pits. The act, also, very imperfectly provides for the ventilation of houses, and sanctions their being built back-to-back. This needs looking to. If the proposed law does not prohibit the future erection of unhealthy dwellings, it will benefit the public very little by abolishing existing nuisances.

GLASGOW ARCHITECTURAL SOCIETY.

THE CITY IMPROVEMENT SCHEME.

At the last meeting of the Glasgow Architectural Society, the City Improvement Scheme was under discussion—Mr. John Honeyman presiding.

Mr. Thomson read a paper on the subject, of which the following is a summary:—It is clear that, except in the great thoroughfares, the rate of rent which may be drawn from shops and warehouses depends very much upon the amount of population in a locality, and of course the value of property depends upon the rent. In the most densely populated area in the plan, the superficial space of ground set down to each inhabitant is about three and a half square yards. I have made a diagram showing an area of 352,440 square yards, including surrounding streets, upon which may be accommodated very considerably within the requirements of the New Police Act a population of 10,224—that is, about 3·63 square yards to each inhabitant—only a small fraction more than in the worst locality. I make it up thus:—There is space in the plan for 112 tenements; those towards the surrounding streets contain 124 shops and 2272 apartments, which in the lower localities mean houses. These apartments are each over 10ft. square; and, allowing 9ft. for the height of ceiling, gives over 900 cubic feet, which by the Police Act provides space for three adults; or, taking children in account, about 4½ individuals. It will be seen that the plan shows a block of ground 1068ft. by 330, having streets for general traffic surrounding it, and subdivided by narrow streets for local traffic only. Keeping in view the statement made by Mr. Stevenson, that the way to secure motion in the air is to make the open spaces unequal, I have shown a leading street 80ft. wide on one side, 60ft. on the other, and two cross streets 50ft. wide each, whilst the subdivisions or streets are each 32ft. wide in the middle and 16ft. at each end. The main feature of the plan is that the spaces are all open at the ends. There is, instead of a continuous line of building towards the leading street, a series of detached tenements of 48ft. in length with 16ft. spaces between. These lead alternately into streets covered overhead with glass, and lanes providing access to coal and dustcarts. Glasgow is notorious for the mortality amongst children. These covered streets are intended chiefly as playgrounds for the young, where they may run about under shelter and out of danger from carts and other vehicles. But the warmth which would result from this method of building would be conducive to the health and comfort of all. As to the expense, I propose to build the walls of these roofed streets of nine-inch brickwork, the difference between which and our ordinary stone walls would be more than sufficient to provide for the glass roofs; and, as each apartment could be ventilated by flues carried up in the gables beside the smoke flues, no harm could arise from the spread of contagious disease.

After some discussion, in which the plan was favourably spoken of, it was agreed to remit the whole matter to a committee for consideration, and to prepare a memorial to be submitted to the Commissioners under the Improvement Act—the committee to report to a special meeting of the society.

BUILDING AND LAND SOCIETIES.

The directors of the London and Provincial Benefit Building Society, in their report presented to the fourth annual meeting last week, record the satisfactory progress of the society's affairs. The withdrawals have been large, though not so large by £500 as in 1866. The advances amounted to £1,446 2s. 2d. By the resumption of advances the contingent fund has benefited, and there is now to the credit of that fund a balance of £114 15s. 9d. The retiring directors, Messrs. Caiger, Lawton, and Payne, were re-elected.

The annual report of the Middlesborough and Cleveland District Permanent Building Society, which has just been published, states that upwards of £52,000 have been advanced on improved mortgage during the three years of the society's existence. After writing off the interest due to investors at 7 per cent., and all other charges, and carrying a further sum of £300 to a reserve fund, there will be a balance of £2,666 19s. 9d. for future division. The shareholders now number nearly 1,000, and altogether the progress of the society has been exceedingly rapid and satisfactory.

WATER SUPPLY AND SANITARY MATTERS.

The Sewage of Glasgow.—At the usual meeting of the Association for the Consideration of the Sewage Question at Glasgow, Mr. James Robertson read a paper giving details in reference to a scheme which he proposed for the purification of the Clyde, and the improved sanitary condition of the city. One feature of the scheme was the introduction of an independent system of piping to be used in connection with the water-closets in the city only, while the present system of sewers would be employed for the purpose of carrying off the surface water, the refuse of public works, &c. Mr. Robertson claimed for his scheme that it might be carried out with greater ease than the plans suggested by others, while he had no doubt that from its adoption a considerable revenue would accrue. He estimated the cost of the various works, barges, and the necessary appliances at £400,000, the interest of which would be £20,000 per annum, and the annual cost of carriage, &c., at £13,000, so that the annual expense altogether would be £33,000.

Mr. Filliter, C.E., of Leeds, has prepared a scheme, at the instance of the local board of Castleford, by which every house would be provided with an abundant supply of water for £7,000, and an annual charge for working expenses of little more than £100. Some of the owners and ratepayers, however, thought that so large an expenditure was not necessary, and at a recent meeting the local board was recommended to advertise for schemes.

The Duke of Devonshire, who owns extensive mill property near Keighley, has withdrawn his opposition to the bill of the Bradford Corporation, on receiving an assurance that all reasonable protection shall be afforded to the interests of his Grace and his tenants.

The Chatham Local Board of Health have decided to purchase twenty acres of land, adjoining the Maidstone-road, for the formation of a new cemetery.

SCHOOLS OF ART.

The Second Grade Examination in Model and Perspective Drawing, in connection with the Newcastle School of Art, has just been held. About 65 pupils took papers for model drawing, and 17 for perspective, and the students' performances were forwarded to the authorities at the South Kensington Museum, in the ordinary course.

The distribution of the prizes to the students of the Lambeth Schools of Art took place in the class-room, Miller's-lane, Kennington. The students who received silver medals were W. W. Ouless, and James Redfern; the bronze medallists were Ellen Miles, and Robert Stocks; and the winners of first and second prizes of the Sketching Club are respectively Ellen Miles, and William Symous. Mr. Edward Cresy delivered an address on Architectural Sculpture, referring for illustration to a collection of casts which, having been presented by him to the school, adorn its walls.

The new school of art at Canterbury, instituted by Mr. Thomas Sidney Cooper, and known as the Sidney Gallery, was opened to the public on Wednesday.

Building Intelligence.

CHURCHES AND CHAPELS.

Satisfactory progress is being made in the restoration of the church of St. Lawrence, Reading, and it is hoped that it will be re-opened by the middle of May. The church is said to rank nearly first in the county.

The little church of St. Thomas à Becket, Newton Tracey, Devon, has just been restored. It is a very ancient building, having been built by Sir William Tracey, in expiation of the murder of Thomas à Becket. The roof has been restored throughout, a small chancel aisle added, and the porch rebuilt. The church has also been re seated. Hamhill and red sandstone has been employed for the dressings, the old masonry being used in as far as possible. The whole of the works have been carried out by Mr. James Bale, of Bideford, from the drawings and instructions of Messrs. Gould and Son, of Barnstaple.

Messrs. Warner and Sons have been commissioned to supply a peal of six bells, at a cost of about £500, to the new church of St. Philip and St. James, Clifton.

The Bishop of Lichfield consecrated a new cemetery at Wednesbury last week. The cemetery comprises twelve acres of land, situated in a suitable spot outside the town, and was purchased for £5,400. Plans for the chapel, lodge, &c., were prepared by Messrs. Horton, of Wednesbury, and the work was entrusted to Messrs. Trow and Son. The chapel, which cost a little over £2,000, is built in the modified Early English style, and is surmounted in the centre by a stone-ornamented spire, about 50ft. high, springing octagonally from a square base. The edifice is built of red brick, relieved with blue, and Bath stone. A covered roadway runs through the centre, and this divides the Episcopal from the Nonconformist portion of the building.

A new pulpit has been erected in the church of St. Mary, Stoke Newington, by Messrs. Farmer, from the designs of Mr. Gilbert Scott. The pulpit is supported by columns of variously coloured marbles, and enriched with mosaic work and relievi. It completes the interior of one of Mr. Scott's best works.

The church of St. Thomas, at Stanhope, Durham, was re-opened last week by the Bishop of Ripon. The building dates from the thirteenth century. A new roof has been constructed, the high pitch of the ancient one being retained. The walls of both aisles have been taken down, and widened, and the church has been entirely re-seated. Mr. Ewan Christian was the architect, and Mr. G. Gradon, of Durham, the contractor.

A new Welsh Presbyterian chapel was opened on Sunday, at Prince's-road, Liverpool. The building is in the Gothic style, with a strong Early French bias in all the details. It is in the form of a T, and affords accommodation for 1100 persons. A tower and spire, at the north-east corner, rise to an altitude of 200ft. The chapel is built of grey tinted Yorkshire stone, with yellow sandstone dressings. Messrs. W. and G. Audsley, of Liverpool, were the architects.

The Earl of Limerick, Provincial Grand Master of the Order of Freemasons, has consented to lay the foundation-stone of the new nave of Bristol Cathedral. The same body propose completing the restoration of the lady chapel in St. Mary Redcliffe Church, Bristol, which will, it is said, when finished, be one of the most interesting examples of ecclesiastical architecture in England.

A very fine new reredos is in course of erection in Worcester Cathedral, at the cost of the Dean, as a memorial of the late Mrs. Peel. The expense is £1,500. It is mainly constructed of beautifully veined alabaster, designed by Mr. Gilbert Scott, in the Early English style. The reredos consists of a centre and two wings. From the foot pace rises a plain wall with a moulded base to a height of four feet, where it finishes. Above this are five trefoil-headed niches, divided by shafts of polished marble, with carved capitals supporting the richly-moulded arches, above which are lofty gables, having an elaborately-carved cresting, instead of the more usual crockets, and terminating in ornamental finials. Around the arches are spherical inlays of lapis lazuli, and in the spandrels are sculpture heads of the apostles, surrounded by mosaic. The central niche is considerably larger and loftier than the others, and has additional shafts of polished red granite, spirally banded with gold, the finial being of great size, and ornamented with large inlays of lapis-lazuli and cornelian. A band of rich gold and marble mosaic extends round the arch, and the spandrel above contains a cross formed of malachite, red and black marbles, and spar. In the centre is a seated statue of Our Lord, crowned, and in the act of benediction. The Evangelists, SS. Matthew, Mark, John, and Luke, occupy the side niches. From the upper part of the central gable rises a lofty canopy supported on four shafts of verd antique, from the capitals of which spring arches and gablets, the whole being surmounted by an elaborate pinnacle, terminating in a cross, enriched with coloured marbles, at a height of 24ft. above the sanctuary floor.

A memorial church dedicated to St. Stephen the Martyr has been erected at Delhi. The style of architecture is Lombardo-Gothic. A peculiarity is that the altar is placed at the west end in order to admit of the main entrance, which is in the east, being open to the native heathen. A narthex, or unconsecrated outer court, is formed by a small portion divided from the body of the church by pillars.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting at No. 7, Whitehall, on Monday, the Rev. Robert Tritton in the chair; there were also present the Rev. A. Borradaile, Canon Nepean, Canon Jennings, Messrs. John Boodle, George Cowburn, J. F. France, Edward Hussey, William Rivington, Edward Thornton, and Rev. George Ainslie, M.A., secretary. Grants of money amounting to £810 were made in aid of the following objects:—Buildings new churches at Frosterley, in the parish of Stanhope, near Darlington; Hereford, St. James's; St. John's, in the parish of St. George's-in-the-East; and Westgate, in the parish of Weardale, near Darlington; rebuilding the church at Ellesmere Port, near Chester; enlarging or otherwise increasing the accommodation in the churches at Breinton, near Hereford; Crowmarsh, near Wallingford, Oxon; Christ Church, Frome, Somerset; Harroldstone West, near Haverfordwest; Minster Lovell, near Witney, Oxon; Stoke Ash, near Eye, Suffolk; Wendover, near Tring; and Wildford, near Ware, Herts. The grant formerly made towards building a church at Blackheath, in the parish of Hales-Owen, near Birmingham, was increased. The society likewise accepted the trust of sums of money as repair funds for the churches of Aldwark, near Easingwold, York; Baguley, St. John, near Manchester; Birkenhead, St Peter; Cheltenham, St. Peter; and New Ferry, St. Mark, near Birkenhead. This was the last meeting in the society's financial year, and during the last twelve months it has aided in building 32 new churches, rebuilding 23, and enlarging and restoring 72 churches, at an outlay of £6,760, but, owing to the limited funds at the society's disposal, the grants have been much smaller than the committee could have wished, in some instances barely sufficient to remunerate the applicants for the expense and trouble of complying with its very reasonable and just requirements. His Grace the President has appointed Tuesday, April 28, for a public meeting of the society, at Willis's rooms. The Archbishop will take the chair at three p.m. precisely.

A new Roman Catholic chapel was opened at Mossend, near Motherwell, N.B., on Sunday last. The building will seat 500 persons, and is of a very plain description.

BUILDINGS.

A block of buildings intended to provide improved accommodation for respectable artizans and their families on the flat system has been erected at Reading, by Mr. J. H. Blagrave. It contains four shops on the ground-floor, and twelve residences above. Each house has a separate front door and is entirely separate from the rest. The larger sets contain a living room, two bed-rooms, scullery, pantry, coal store, &c. The smaller have only one bed-room. The various residences are reached by stone staircases, communicating with open stone balconies. The rentals vary from 3s. to 5s. per week. The materials employed are white brick with stone dressings. Messrs. W. & J. T. Brown were the architects, and the contract was taken by Mr. Barnicoat at £2,350.

Mr. H. H. Vale, F.R.I.B.A, at a meeting of the Liverpool Architectural Society, recently exhibited a design for a house which he was constructing in the South of England, without chimneys. The flues were carried downwards into a tunnel which conveyed the smoke to a shaft in a tower eighty or one hundred feet high. He remarked that he did not altogether approve of the idea, but clients would sometimes have their own way. As a rule, architects, Mr. Vale thought, would be sorry to dispense with chimneys.

The work connected with the erection of the new Masonic Hall, at Halifax, was commenced on Monday. The contractor is Mr. Charnock, of Halifax, the work having been let for £3,500. The hall will be 64ft. by 55ft., and will contain a spacious room in the Corinthian style of architecture. There also will be a club-room, banquetting hall, &c., and accommodation for the hall-keeper.

We understand that the erection of the new buildings of the Charterhouse, at Godalming, has been placed in the hands of Mr. P. Hardwick, who has completed his plans, and will immediately submit them to the Governors for approval.

The corner-stone of a new Roman Catholic school at Masborough was laid on Tuesday last. The style of architecture is simple Gothic, the walls being of brick with stone dressings. The cost of the building will be £900. Messrs. Hadfield and Son, of Sheffield, are the architects, and Mr. Ripley, of Masborough, the contractor.

The new pier and sea-wall have been commenced at Saltburn, the former to extend 1,500ft. into the sea, so that passengers may be landed at the lowest possible tide. An extensive sea-wall, fitted for a promenade, is also being carried along the foot of the cliff, under the personal superintendence of Mr. Barry, one of the contractors for the stone work. Mr. John Anderson is the contractor for the new pier, which is to be composed of wood and cast-iron.

Mr. W. H. Wyatt, chairman of the Board of Guardians of St. Pancras, has just issued his report for the last nine months, in which he says that they have purchased three and a-half acres of land at Highgate on which they are to erect a hospital. He says:—"Thanks to the precise and positive instructions given, the cost of the building is estimated at £60 per patient, a result which cannot fail to be highly satisfactory. The Board have also selected a most eligible site of thirty-seven acres at Leavesden, near Watford, for the erection of schools. The land was secured at little more than £1,000 per acre."

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—J. B.—R. L. B.—S. G. M.—C. C.—H. H. S.—T. R.—H. G.—E. W. J.—J. A. H.—C. B.—I. M. S.—A. F. P.—P. E. M.—W. W.—I. I. E.—A. P. W.—A. R. T. F.—A. W.—I. and F. G.—W. C.—H. J. P.—I. P. S.—G. B. & Sons, Edinburgh, with photograph.—W. H. R.—I. B.—G. S. G.—J. H.—W. C.—F. A. B.—N. R. T.—W. W.—W. S.—E. W. P.—B. J. T.—I. N.—A. R.—I. P. S.—E. W. G.—W. B.

I. P.—"Art Folia e," which first appeared in the BUILDING NEWS, is published separately at £2 2s.

I. R. B.—The articles on "Construction and Design" are not published in a separate form.

I. L., Inverness.—The drawing alluded to is copyright, and we cannot use it without the consent of the proprietors.

Correspondence.

PUGIN v. BARRY.

To the Editor of the BUILDING NEWS.

SIR,—"We owe it to the bounty of Providence that the completest depravity of the heart is often strangely united with the confusion of the mind." Can I be condemned for applying in a degree these words of Junius to Mr. Talbot Bury? Granting, for a moment, that the drawing of the throne from which Dr. Barry's frontispiece is photographed is, according to Mr. T. Bury's opinion, "wholly the work of Sir Charles Barry," still this cannot in any way alter the fact that Mr. Herbert actually saw my father prepare the original design. Instead, therefore, of disproving anything, Mr. T. Bury only confirms my alternative assertion that Sir Charles copied the design which Mr. Herbert saw my father make. To either conclusion Mr. T. Bury is perfectly welcome. When, however, he can explain away my father's visit of five days to Sir Charles Barry, for the purpose of "making-out in general drawings every portion of the designs for the House of Lords' fittings, including a new design for the throne," it will be quite time enough for him to dispute the authorship of the drawing photographed in Dr. Barry's pamphlet.

With regard to Mr. T. Bury's statement, that my father never used his initials separately, I have but to say that, on referring to my father's compositions and drawings, I find his initials introduced in eight or ten different ways—sometimes in the framework of the sketches, and sometimes in various portions of the compositions themselves—in fact, "dropped into all kinds of places," as Mr. Herbert, on his authority as an eye-witness, testifies to have been my father's habit. I regret that Mr. Talbot Bury should have formed a habit of a very different nature—that of giving opinions which generally prove to be utterly without foundation. I cannot imagine why, on the present occasion, without helping on the contest in any way whatever (and, certainly, after all his subterfuges and contradictions, without the remotest chance of being believed), he should rush hastily into print to record an opinion which is manifestly dictated by spleen, and written far more for the purpose of hitting me through my father, than of defending Sir Charles Barry. He has the insolence to give Mr. Herbert the lie, by implication, apparently for the ridiculous satisfaction of being thought an important personage in the matter; and, in the usual "confusion of his mind," is totally unconscious of the hollowness of his professed friendship for my father, on the one hand, and of the fatal blow he is giving to the pretensions of Sir Charles Barry, on the other. He commits three offences at once; and I may, therefore, be pardoned for suggesting that it would be more prudent, and far more to his credit, if, for the future, he would endeavour to "think it his duty" to hold his tongue, instead of hazarding groundless explanations, and presuming to throw doubt on the solemn declarations of a man like Mr. Herbert, my father's life-long friend.—I am, &c.,

E. WELBY PUGIN.

Ramsgate, March 17.

PUGIN v. BARRY.

Sir,—Surely, when it was sought to establish the identity of Pugin's hand in the throne drawing by a search thereon for his initials, the case espoused in his favour was sent begging. How Mr. Herbert could have overlooked the awkward and very plain fact that no man's work ever depended, for proof of its authorship, less upon a signature than did Pugin's, I cannot comprehend. Pugin's style and touch, which were invariably strikingly peculiar and unmistakeable, gave the fullest and only reliable signature his work could bear. Failing this all becomes doubtful, nor can I understand how any array of initials can explain the difficulty away. The drawing in question is as opposite in touch to that of Pugin as Daniel Maclise's is to that of Fra Beato. Pugin's handling was always deliciously delicate, clear, and flowing. That of the throne drawing is, on the contrary, emphatically square and heavy in touch, mechanical rather than artistic, with a mannerism of dotting for point in traceried and carved detail utterly foreign to the easy grace and lightness of Pugin's line. If I could believe that the little wormy wriggles from which Mr. Herbert evolves Pugin's initials his custom was to put them in monogram form) were intended for letters at all, I should be met by the difficulty arising from my belief that the manly frankness of Pugin's nature would not have permitted him to smuggle his initials into a House of Parliament drawing in the covert way suggested. Had Pugin broken through his custom of not signing his House of Parliament drawings, he would have done so openly and distinctly. However minute the scale, Pugin was always clear in his dainty touch, by which he could indicate a swish-tail lion within a circumference little bigger than a pin's head. If he had resolved to put his own initials on the drawing, and he chose the parapet of the throne for them, they would have been indicated in fifteen cut characters, which, with the naked eye, none could mistake.—I am, &c.,

J. R. Clayton.

311, Regent-street, London, March 18, 1868.

ORGANS.

Sir,—In reference to the letter of your correspondent "J. C. J.," I would briefly remark that, if I had read in any musical journal the opinion that architecture had very much declined in the present age, I should have considered that journal singularly well informed. As to the tone of an instrument, it must be purely a matter of taste. There is no absolute law of taste—no law by which you can say one is right and the other wrong, but there is the weight of universal or historical opinion. As far as the continent is concerned, Willis could not be spoken of in comparison with Schulze or Cavaillé, and, on a question of music, the world considers a German verdict of higher value than an English one. The favourable opinions your correspondent cites have only insular value, and would meet with no attention in Paris, Brussels, Berlin, Cologne, Dresden, Munich, Prague, Vienna. Mr. Lewes is spoken of as only a fair specimen of an English organ builder, but I would ask, where can you find such excellent work and finish in every detail as in his organs? As regards Willis, does your correspondent allude to the organ which was in the first Exhibition of '51, now in Winchester Cathedral, or to the one exhibited in '62, and lately in the Agricultural Hall—if not to either, to which specimen is my attention directed? If the winding of the organ is an essential point, where shall we find a successful specimen by Willis? There is an organ at Kingston lately erected, where a man and two boys were seen blowing, and six consecutive chords could not be produced on the full organ. If what is called good pipe metal be not essential to tone, why have artists of all ages worked from one-third tin and upwards? The diapasons of St. Paul's were much better than ordinary spotted metal, and I expect they are so still, as the Dean and Chapter took the precaution of keeping them under lock and key during the repairs. It would be impossible for anyone to defend Willis without preaching up common metal. It would be an insult to compare Willis with Schulze and Cavaille in reference to tone; Schulze would laugh at Willis's fine work, and Cavaille would do the same at his *harmonic flutes* and *reeds*, scarcely knowing what it all meant. Cavaillé's chief voicer, who was lately in England, on going into Lewes's workshop, expressed his surprise at the high finish of the workmanship he saw there. The greatest proof of the general excellence of Mr. Lewes's work is that he is daily drawing over to his side those who are really interested in the advancement of the art of organ building, and he obtains clients who are satisfied to pay advanced prices, knowing that they receive value for their money.—I am, &c.,

Warrington Taylor.

190, Euston-road.

Sir,—I have read with much interest the letters that have appeared in your impressions of the 6th and 13th inst. on Organs. It appears to me to be a subject deserving of much attention, in a point of view architectural as well as musical. In the design of a church, it is general for the architect to give much of his attention to the details of his building. I refer especially to such objects as the pulpit, reredos, font, and even benches, on which often much taste and talent is displayed, and yet the organ, which occupies most space, is scarcely thought of, if not wholly ignored. The most that the architect will undertake is to provide a chamber for its reception, which, in nine cases out of ten, is so constructed as to destroy the effect of the sound, or at best to absorb a large percentage of its volume. It is time we should have something better than the stop, chamfered and panelled deal case, and the single row of gilt or illuminated pipes (an expedient adopted to hide the heavy look of the metal as used in England). We might learn a lesson from our continental neighbours, and not let slip an opportunity of displaying our skill in wood work, and producing an object that would not only be beautiful in itself, but would materially assist in the general effect of our designs. With regard to the musical view of the question, your correspondent "J. C. J." can have but a slender acquaintance with Germany, for no one who has travelled much in that country will deny that much still remains for us to do before we can equal them in an art manufacture in which they have always excelled.—I am, &c.,

Robt. C. Edwards.

34, Albion-road, Hampstead, March 14, 1868.

MANCHESTER NEW TOWNHALL.

Sir,—The usual equivocal Report for which Messrs. Donaldson and Street are somewhat famed having now gained publicity, perhaps, before the final decision in this important competition is made, an abstract criticism of that report will not be considered intrusive. To condense the report into as concise a form as will be intelligible, it would seem to stand as follows:—"Nos. 6, 4, 7, 5, are the finest designs of the whole series, and, with regard to relative merit, may be considered to stand in the order in which we have placed them." This is in reference to them from an "architectural point of view—site, climate of the district, and the purposes for which the building is required." Now, to an ordinary human being, this would seem to point out No. 6 as the foremost man. Nothing of the kind. Messieurs the judges, in three luminous paragraphs, declare that, for "general arrangement of plan, light, and ventilation," the palm is due to No. 5. On this ground, and on this alone, in which the numbers stand, 5, 6, 4, 7, they "both concur in recommending the design No. 5 for adoption."

Again, in paragraph second, in which, as regards "general arrangement and simplicity of plan," No. 5 is considered best, how can it be reconciled to that part of the first paragraph in which, for the "general purposes for which the building is required," it is placed last on the list? The report concludes, as mentioned before, with recommending the adoption of design No. 5; but winds up with a magnificently broad hint to its author that it lacks dignity in its most important features, and requires additional study. As a non-competitor in this what must be considered most unfortunate competition, it is impossible to regard the report in the light of anything but a specimen of the most unprofessional indecision. The conclusion is especially condemnatory, and leaves the reader nought to infer, but that, for the comparatively trifling advantages of light and ventilat on alone, No. 5 is worthy of pre-eminence over its fellows. As the question of plan and elevation is awarded to No. 6, in the first paragraph, I will close these remarks with a suggestion that the final decision be delayed until the designs are publicly exhibited, and that a resolution be formed by the City Council to invite such members of the profession as are willing to forward their opinions for consideration, whence probably a clearer opinion of the respective merits of the designs may be obtained than we at present seem likely of obtaining.—I am, &c.,

W. S. O.

Sir,—Your correspondent "Mancunium," who, I presume, is an architect, might have strengthened his case by the use of a little more accuracy in his inferences from the Referees' Report. Where does he find the position assigned to "St. Valentine," as a work of art, to be the lowest? I read it fourth in the list of "eminent men" for whose competitive interests he is so concerned. And further, what authority has he for condemning "St. Valentine's" interior architecture? If he will re-examine the report, he will find the allusions are to the light air-courts upon which the corridors look, and not to the apartments of the building. If error this be, it is one, according to the report, shared in by most of the competitors. I strongly sympathise with "Mancunium's" desire to have a building of which the city of Manchester, and, for the matter of that, the whole country, may be proud, but I confess to more confidence in the likelihood of such a result from a skilful plan to begin with. One fact, and that a very important one, should not be overlooked—"St. Valentine" has the first place for economy of design, and this, in the present position of architectural practice, is no mean commendation. A great deal lies under this, and, from one point of view, it transcends all questions of design. As a rule, it lessens a man's chance of success in a competition to adhere very honestly to the sum placed at his disposal. How does this test of cost affect "No. 6," the advocacy of which is so ardently taken up by "Mancunium?" Under that head it has no special place assigned to it, and, most probably, had "St. Valentine" allowed himself the same latitude as that inferentially presumed to have been taken by "No. 6," his design would have held a superior place. Theoretical estimates are fallacious, it is true; but, if Messrs. Donaldson and Street's opinion in this matter be not entertained, I would refer your readers to the report of Mr. Gardiner, the official surveyor of the estimates of the recent Law Courts designs, where Mr. Waterhouse is credited with the first place in accuracy of estimate, the extremes of discrepancy among the competitors ranging from £600,000 to £1,500.

B.

CHAPEL ARCHITECTURE.

Sir,—Your recent remarks on Chapel Architecture perfectly accorded with my own experience and sentiments. In all parts of the kingdom I have found chapel architecture displaying the same distinguishing characteristics — offensive pretentiousness, combined with meanness of materials and construction. From the little "Bethel" in a back street, with its one compo apron front, to its most pretentious rival in a leading thoroughfare, possibly a "church of the Congregational Independents," bedizened with vulgar ornament (an architectural Jezebel enforcing notice, though exciting disgust), all, to the eye of taste, are equally bad. The very transparent and puerile trick of trying to make an open and undivided area appear as nave and aisles on the show front, seems a universal practice with chapel architects. What a vast amount of perverted ingenuity has been expended in accomplishing what is simply an embodied lie! The aping of church architecture in the matter of towers and spires, lately become so general, is a monstrous absurdity. Chapels frequently have no bell, and never more than one small tinkler, yet an enormous shell is erected, perhaps 150ft. high, to hold a kernel of, say, 12 inches diameter. The only respectable chapel I have ever seen was one built from the designs of the High Church architect, Mr. Butterfield, and I earnestly recommend all Dissenters, whatever their shibboleth, or distinctive appellation, for the future to pocket their prejudices, and solicit the good offices of the younger school of church architects, such as Burges, Brooks, Bodley, or E. W. Godwin, if they at all care to have in future buildings artistic feeling, and those still more important qualities without which no edifice is a fitting place of worship, namely, solid, sound construction, with unaffected, truthful treatment.

P. E. M.

PLUMBERS' WORK.

Sir,—Under the above heading, which appears in the Building News of the 6th inst., Mr. J. A. Bunker states in the paper he read before the Architectural Association, that a plumber who really understood his business should be able to cast

lead into sheets as thin as 4lb. to the foot superficial, which is not correct. It is an impossibility to cast lead so thin as that to be of an even thickness, the average size of mould (say) 16ft. long and 6ft. wide, the lightest weight per foot that can be guaranteed of an even thickness being 6lb. per foot. With respect to the mould he is pretty correct, but, as regard the pan, he is not correct, the pan being generally made of strong sheet copper or iron rivetted together, and left quite smooth inside (wood lined with sand is sometimes used in temporary casting shops) The pan has not a slit in the bottom, nor is it made to move along with rollers down the sides of the mould, but is acted upon by a long wood lever attached to the same with wheels and chairs. The mould is prepared with damp sharp sand by the wood strike (pretty correctly described by Mr. B.), a plumber being on each side of the mould to prepare the sand of about 2in. in thickness, which is then planed smooth with a light copper plane. When all is ready, the pan being nearly the same width of mould, and filled with lead from the copper, about one third more than the weight required for the sheet being in the pan, the pan is tilted over on to the mould by the lever, the men following the lead down with the strike. The surplus lead runs into another pan at the bottom of the mould, a hole being in the middle of the same; an iron cart on small wheels receives the surplus lead, which is taken back to the pot. The principal feature in casting lead is the proper temperature of the molten lead, when thrown into the mould, preparing the sand, and following the lead with the stroke, which is only got by practical experience. A plumber that knows how to cast lead is very rare indeed to be met with now. The remarks respecting laying lead are very practicable, and I would recommend in all cases in gutters 2in. drip, and never less than 1½in. fall in 10ft. With respect to joints to pipes, plumbers seldom (or never) use the blow-pipe, but the solder, plumbing strike, and wiper. The safest plan is certainly to have air pipes to soil pipes, care being taken that the outlet is some distance from any windows. The best plan for waste pipes is to lay a separate pipe for that purpose into a drain, and branch the pipes from cistern sinks, and baths into the same. Never allow a waste pipe to empty on to a roof, or into a sink, as an overflow may be the result in either case.—I remain, &c., MATTHEW HALL.

11, Bulstrode-mews, W.

Intercommunication.

QUESTIONS.

[772.]—GEOMETRICAL ELEVATION OF MOULDED CHAMFER.—Can any one inform me how to draw the

geometrical elevation of a moulded chamfer with stop, the stop to be plain, and at an angle of 45 deg. on each face?—PUPIL.

[773.]—PHOTOGRAPHS.—I see in the BUILDING NEWS of the 14th ult. an account of the exhibition, at a meeting of the Scottish Architectural Association, of some particularly fine photographs, one of the best of which was the Madonna di San Sisto, by Raphael. Can you, or any of your readers, inform me whether these photographs are private property, or whether they are anywhere on sale? and if they are on sale, where I should write for particulars of size, price, &c., as I wish very much to get a thoroughly good photograph of the Madonna di San Sisto, from the original painting at Dresden? Or, if these are not for sale, I should like to know the best place where such a photograph might be obtained, as well as where I can get the best photographs from Turner's original paintings and etchings.—INQUIRER.

[774.]—STRENGTH OF WROUGHT IRON GIRDERS.

—I should feel obliged if you or any of your readers would furnish me with a simple rule for calculating the strength of wrought iron girders formed of boiler plate and angle iron, as per sketch; also for a lattice girder, 40ft. in clear bearing, to carry 10 tons equally distributed.—J. WALKER.

[775.]—COMPETITIONS OF DRAWINGS FROM EXISTING BUILDINGS.—I should feel obliged by one of your readers (once a competitor) explaining the mode of procedure in a R. I. B. A. or other competition of drawings from existing buildings—a country church for instance. Is the parson's sanction to be first obtained for the purpose of taking the dimensions and sketches and necessary memoranda, &c.?—CONSTANT READER.

[776.]—LACQUERING.—Can you, or any of your readers, oblige by informing me if there is anything I can put in the lacquer, which is sold at chemists, so as to give the work a glossy appearance when finished?—JOHN LANDSKY

[777.]—ARCHED PRINCIPAL RAFTERS.—Perhaps some of your readers will oblige me by giving some information regarding roofs constructed with circular principal rafters of laminated deals.—A. M. M

REPLIES.

[744.]—HOLLOW BRICKS.—Full particulars about hollow bricks, and where to procure them, may be obtained at the offices of the Society for Improving the Condition of the Labouring Classes, No. 21, Exeter Hall. Mr. Chadwick considers that walls built of hollow bricks are much superior to those usually constructed either of stone or the standard brick.—BUILDING CLERK.

[747.]—REMOVING MATERIAL.—I beg to inform "C. W." that, if there is a clause to the contrary the contractor can do as he pleases about the removal of the material or plant. Frequently, however, there is an express clause inserted in the specification to the effect "that all plant and material upon the ground is the property" of the company, or of the party paying for the work. The reason of this is, that in measuring up large works a proportion is allowed for material upon the ground. Thus, in railway work, suppose a contractor has the iron girders upon the ground, although not fixed in position, yet in making out his monthly certificate he would be allowed a sum of money for them. Evidently, in this case, it would be direct fraud to remove them—L.

[753.]—STOCK BRICKS.—The question of your correspondent appears to me rather vague. Why should not bricks be made of any other size than what they usually are seems the drift of it; and why should 9in. by 4½in. by 3in. be what may be termed the standard size? The answer is, that many years ago it was illegal to manufacture bricks except that particular size, and, although the restriction has been removed, the custom continues.—TILER.

[760.]—QUANTITIES.—I think the new number of Weale's series, entitled *Quantities and Measurements*, by Mr. Alfred Charles Beaton, likely to prove useful to your correspondent. With respect to his second question, I should say "decidedly not." CONTRIBUTOR.

[763.]—FILTERING.—Line the bottom of the tank with fine gravel and sand. If you want the water very pure, use a layer of charcoal; but the disadvantage of this latter material is, that it is rather expensive, and also after a time requires renewal. It makes, however, a first-rate filter.—S. X.

[766.]—SMOKY CHIMNEY.—Will you allow me to suggest to "Smoky," as a remedy for the evil he complains of, the putting of a tall-boy upon the top of the chimney marked A in the cut. The case he mentions has often come under my notice, and I have known the experiment to succeed perfectly.—FLUE.

[767.]—THE BUILDING ACT.—I do not think the District Surveyor could interfere in the case put by "Building Owner." It is his duty to prevent buildings being erected contrary to the act; but if he allows them to be put up he cannot serve the parties with a notice for infringement two years after.—CLERK.

[767A.]—BEAD AND FLUSH FRAMING.—In answer to Mr. Gilbert R. Redgrave's question in your Intercommunication column last week, I think he is right. It certainly would be the best way, and for the matter of time, I, or any joiner, could do it the one way very nearly as quick as the other. His way has, in my opinion, all the advantages he mentions; and, besides, it is "truth," and does away with the abomination—sprigging—at very little extra cost.—A JOINER.

[767A.]—In reply to the correspondent, I maintain the bead should be worked upon the panel, not the framing, for this reason—when the bead is worked upon the framing, and the rail shrinks, the mitre opens, and our old friend, the painter, is called upon to stop the gap; but when worked upon the panel, the shrinkage of the panel compresses the mitre, and the services of our friend, the painter, are not required.—W. N. ATKINSON.

[770.]—SMOKY CHIMNEYS.—In answer to "R. F. S." I beg to say that, having to replace a broken chimneypot on a cottage flue, the labourer was directed to put up an ordinary 6in. drain pipe, but not having one, he used a 6in. pipe with a 4in. skew junction, and that it has completely cured the chimney of smoking, it having been at times before intolerable. Since then I have adapted it to other chimneys with the like success.—R. JOHNS.

WAGES MOVEMENT.

At a meeting of the Operative Masons' Society, held on Monday, the 9th inst. at Nottingham, it was resolved, by a small majority, to withdraw the notice given in January last for a reduction of five hours per week with working time; and an intimation to that effect has already been received by the local builders.

On Monday last a conference was held at Birmingham between a number of the master builders and the labourers of the town to discuss the notice received from the latter for an increase of one farthing per hour upon the current rate of wages. At present, the wages are 4¼d. per hour, or 20s. per week in summer, and 17s. 10d. in winter, for 56½ and 50½ hours' work respectively. The men supported their application by arguments of increased cost of living and provisions, while the masters stated that the depressed state of trade would not warrant any increase, and pointed out the fact that they spontaneously gave an addition last year of one farthing per hour to them in common with the other trades; and, in the face of the fact that their scale of prices were arranged for this year's work, they could not accede to the men's request. The conference then closed, with the understanding that if the labourers were not satisfied they would submit the name of some gentleman whom they would be willing to accept as an umpire, with the view of submitting the question at issue to the decision of a court of arbitration.

STAINED GLASS.

Messrs. E. and S. Beer, of Exeter, have just completed a memorial window for a North Devon Church. The subject represents the four scriptural acts of saving charity. They have also just finished a three-light window for another North Devon church, representing SS. Mary the Virgin and Mary Magdelene.

The new east window of St. Michael's Church, Basingstoke, has been filled with stained glass by Messrs. Lavers, Barraud, and Westlake. The subject is the Ministry of Angels, illustrated by the five principal events of the Annunciation, the Nativity, the Crucifixion, the Resurrection, and the Ascension. Beneath these are five minor events—the Angels visiting Abraham, St. Michael contending with Satan, Daniel in the lion's den, and the Translation of Elijah.

A stained glass window has been erected in the church at Fawley, Hants. The subject is Our Saviour's charge to St. Peter—"Feed my sheep: feed my lambs."

LEGAL INTELLIGENCE.

PLUMBER'S SPECIFICATIONS DEPARTED FROM.—Gee *v.* Wilson.—The plaintiff, a painter and plumber at Stafford, brought an action against the defendant, the patentee of "Wilson's Hot Water Apparatus," in the County Court at Stoke, to recover the sum of £8 5s., damages arising from a patent copper cylinder, supplied by the defendant, being defective. Plaintiff, it seemed, was engaged in 1867 to do the whole of the painting, glazing, and plumbing at a house built at Hartshill. Amongst other work was the erection of the patent apparatus, which had been invoiced to him. After it had been fixed it was found that it would not work. The consequence was that there was considerable loss of time occasioned to the plaintiff, who had to go from Stafford to Hartshill several times, and claimed on that account £2; a plumber had to be engaged seven days at 5s. a day, bricklayers and others had to be employed, and the total amount of the expenses thus incurred amounted to the sum claimed. The defence was that there was no defect in the cylinder up to the present time, and that the plaintiff had not properly erected it in the first instance. The Judge, after hearing the evidence, gave judgment for the defendant, considering that, in erecting the apparatus, there had been a departure from the specifications.

STRANGE CONDUCT OF A LOCAL BOARD.—Bragg and Another *v.* Lidstone.—The plaintiffs were builders and contractors, and the defendant was clerk to the local board at Paington, Devon. It appeared that the board had accepted the tender of the plaintiffs to erect buildings and offices for £2,174, and when the architect certified that a certain sum was due, pleaded their inability to enter into a contract with the plaintiffs. Mr. Cole, who appeared for plaintiff, said the board was constituted in 1863, they wanted offices, and were desirous of combining them with local police and other offices. In September, 1863, after the present contract was entered into, four of the members retired by rotation, and four agricultural gentlemen were elected. These gentlemen were opposed to a large expenditure on public works, and at a full board it was determined to repudiate the contract. Mr. Coleridge, appearing for the defence, stated that the only parts of the works needed by the board were a collector's room and offices, and with all the rest the ratepayers of Paington had nothing to do with, being entirely erected for county purposes. He might be prepared afterwards to admit the liability of the board to pay for such portions as were necessary for their purposes, but that would be a matter for arrangement. It was stated that Mr. Belfield, the late chairman of the board, was the owner of the land on which the buildings were erected. The judge deprecated further litigation in the matter, and said Mr. Belfield had the power to compel the board to do substantial justice, for he might say if they repudiated the contract they should repudiate the lease, and so prevent them from going on with the buildings. He suggested that it was possible that Mr. Belfield might be induced to consent to an arrangement by which the land that was really required for the purposes of the board should be granted to them, and the rest of the land and building turned into account some other way. His lordship's suggestion was adopted, and a verdict was accordingly taken for the plaintiff by consent, subject to a special case.

Our Office Table.

In consequence of the great complaints made by the public against unauthorized persons who are in the habit of prowling about Westminster Abbey offering themselves as guides, only, however, to exact money and mislead visitors, the Dean and Chapter of Westminster intimate that they are anxious to give every facility for seeing all parts of the abbey to persons of respectability. The nave and transepts are open to the public at all times, from nine to six in summer, and from ten to four in winter. In order to see the Royal and private chapels, any visitor who sends in his address to the Dean or one of the Canons, or who leaves his address at the entrance of the chapels, has permission to see them at leisure. Artists who desire to sketch, on application to the Dean, can obtain the necessary order for a twelvemonth. The disgraceful habit which even educated persons have of touching and disfiguring whatever they ought not to touch, has, we are informed, rendered the superintendence of guides absolutely necessary for the protection of the monuments in the Royal tombs and chapels. The small payment for seeing the chapels forms a fund for paying these guides, who are forbidden to receive any other gratuity. Any surplus is devoted to the decoration of the abbey. For those who can dispense with the explanations of the attendants, guide-books, containing a full account of all the tombs, can be procured within the abbey.

Recent letters from Abyssinia give us some of the native notions of sacred art. The church at Attegrath is ornamented within by rude pictures of saints and incidents in Biblical history, executed without any ideas of perspective. Nor is the absence of art redeemed by antiquity, as they have been finished little more than half a century. Among other errors by the artist, critics have discovered a glaring anachronism in one design. The subject is the passage of the Red Sea—Moses, standing on the farthest bank, is shaking his rod with mocking irony over Pharaoh, whose horse is rapidly being submerged; while the Egyptian infantry, already nearly engulfed, are holding their firelocks over their heads.

Collectors have long disagreed as to what kind of china was made at the first manufacture of this ware in England, which is known to have been established at Bow, in 1744, and what mark distinguished it from that of other manufactures In trenching for a drain at the lucifer match works of Messrs Bell and Black, at Bow, the cutting has intersected a waste heap, and many fragments have been found, consisting of knife handles, cups, and plaster moulds for casting the ornaments in relief. The curator of the Geological Museum has been thus enabled to identify, as of Bow manufacture, two perfect specimens in the ceramic collection of the museum. No distinguishing mark has yet been found in any of the specimens.

A new electric organ is announced. Mr. Barker, organ builder, Paris (who is the inventor of the pneumatic lever), has just patented in France and England a complete system for applying electricity, to supersede the ordinary mechanical key and draw-stop action in large organs. The patentee has already built a grand electric organ of forty-two sounding stops and eight couplers for St. Augustin's, Paris, and another for Salon, near Marseilles. As the largest organs may now be played through a cable of insulated wires, positions hitherto wholly impracticable can be turned to account. The organist, with his various claviers, can be placed in any direction, and at any distance away from the organ, the touch being equally delicate and rapid on every manual, whether used separately or coupled. Bryceson, Brothers, and Co. have the concession for working this patent in Great Britain, either as regards new organs, or applying the electric action to existing instruments.

The next congress of the Archæological Institute will be held at Lancaster in July, with the Right Hon. Col. Wilson Patten, Chancellor of the Duchy of Lancaster, in the chair.

The Emperor of the French and Mr. S. Clair-Deville have been working together with a view to the discovery of some means of using petroleum instead of coal, as a generator of steam for locomotives. They have, however, not being able to overcome the explosive qualities of petroleum.

The excavations on the site of the old White Hart Hotel at Bath have brought to light several relics of the past, in addition to those previously mentioned. The most important are a fragment of a fine churchyard cross of rich Norman work, bearing part of an eagle, the emblem of St. John; a solid mass of masonry, believed to have been the raised platform of the Roman temple; a circular well, fifteen feet deep, the walls of which were entirely composed of fragments from the abbey buildings, mostly of Norman and Early English date. In cleaning out the well, the lower portion of a fine Perpendicular column was found, and an interesting collection of fragments of pottery. More recently, the foundation of the south wall of the Roman temple has been discovered, but one course only of the immense stones was remaining. One stone of this course was about five feet in length, and had a sawn face, leading to the inference that the stone-saws used by the Romans could not have been less in length than those used at the present day. Close to this south wall a beautiful glass mask was found, which had been originally attached to a glass vessel; and not far from this locality half of the stone mould for casting metal ornaments, some of which are preserved in the museum of the Literary Institution Bath, was also found.

After two years spent in fruitless communications between the Metropolitan Board of Works, the Metropolitan Railway Company, and the Gas Company, the board have determined to complete that portion of the Embankment between the Temple and Blackfriars-bridge as originally proposed, so that there is, after all, a probability of the present generation witnessing the completion of the undertaking.

We learn that, owing to the exorbitant price—£8,000 per acre—demanded by Sir Thomas Wilson, the negotiations for the purchase of Hampstead-heath for the public have, up to the present time, not been successful. At a recent meeting of the Marylebone Vestry it was resolved that the representatives of the Vestry at the Metropolitan Board of Works should be requested to make a further move in the matter, with the view of bringing it to a satisfactory conclusion.

Some further discoveries of lacustrial antiquities have recently been made in the environs of Faux-Vives, near Geneva, situated on the banks of the lake. Several ornamental objects have attracted special attention.

A correspondent of the *Kent Coast Times* has suggested that a statue should be raised to the memory of the late Augustus Welby Pugin, in Ramsgate. He suggests that £400 or £500 be raised for the purpose.

A new invention has been attracting public notice in the United States, which threatens to supersede the use of common house paper for covering walls. A delicate and simple machine has been constructed, which will take a portion of a tree, after it has been cut the right length and width, and shave it up into thin ribbons as wide as a roll of house paper, making one hundred or one hundred and fifty to the inch. These rolls of wood are placed on the walls by paper-hangers with paste and brush, precisely in the same manner as with paper. The wood is wet when used, and it is found to work easier than paper, because it is much more tough and pliable. Any kind of wood can be selected to suit the taste, and the ordinary kinds are very cheap as well as handsome. The wood can be oiled, varnished, or shellaced, and then washed at pleasure, and thus kept perfectly clean. It will not crack or split in using, and when on the walls stands like solid work. Ceilings may be finished to correspond with the walls, either in plain wood or in panels of any of the rare woods.

A correspondent of the *Manchester Guardian* asserts that an anonymous donor has determined to give £100,000 to promote technical education, and which will probably be apportioned to Owen's College, Birmingham and Glasgow.

It has been intimated to Sir John Musgrove, the president of St. Thomas's Hospital, that the Queen has consented to lay the first stone of the new building at Stangate. The ceremony will probably take place early in May.

The enlargement of the bathing lake at the east end of Victoria-park is nearly completed, and will form nearly twice its former dimensions in length. The average number of bathers during the season was upwards of 50,000.

The committee of the Corporation of London, charged with the care of the old burial ground at Bunhill-fields, have given notice to the relatives and friends of those who are interred there, to the effect that they are about to proceed at an early date with so much of the said act as directs that the said grounds shall be laid out with ornamental and other walks, in order to its being used and enjoyed as an open space accessible to the public. The committee before proceeding to lay out the walks invite all parties who may be interested to visit the burial-ground for the purpose of recognizing and identifying the graves, tombs, and vaults in which their relatives or friends may be interred. Persons desiring to visit the ground will be permitted to do so, free of charge, upon application to the keeper, between the hours of 9 a.m. and 6 p.m.

In reply to Mr. Samuelson, Lord R. Montagu said, on Tuesday night, that the report on technical education by secretaries of legations had been printed by the Foreign Office, and formed a thick octavo volume. Within two months the whole of the reports and appendices would be in the hands of members of the house.

No. 5, Devonshire-square, Bishopsgate-street, one of the old city mansions, containing about twenty spacious rooms, and a grand staircase of oak, was on Wednesday destroyed by fire.

We regret to learn the death of Mr. Ball Hughes, the sculptor, which took place at Boston, U.S., on the 5th instant, at the age of sixty-two. Mr. Hughes was born in London, and emigrated to America in 1829. He was a pupil of Baily for seven years, during which time he gained several important prizes in competition. The Royal Academy gave him a large silver medal for the best copy in bas-relief of Apollo. The Society of Arts awarded him a silver medal for a copy of the Barberini Faun, the large silver medal for the best original model from life, and a gold medal for an original composition, "Pandora brought to Earth by Mercury." Mr. Hughes executed a number of works both in this country and in the States, some of them of great excellence.

A correspondent writes to us—"Your remarks the other day, on the position and prospects of the Cobden statue at Camden Town, have evidently had some effect with the authorities of St. Pancras. The large and ungainly-looking hoarding, of which the bill-stickers have made such good or such bad use, has been removed, and a small neat paling now encloses the plinth of the monument, leaving the steps leading thereto and the lamp-posts open and unenclosed. The site of the monument has also been cleared of all the rubbish which disfigured and gave it the appearance of a ruin, or rather a thing never intended to be completed. Let us hope that the St. Pancras Board have now resolved to make an effort to have the statue of the great freetrader placed upon its pedestal without delay. I am not aware how the funds stand, but I am sure there are many of the inhabitants of Camden Town who, like myself, would willingly subscribe their mite if need be to assist in getting this desirable monument finished."

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2130 J. HOOPER. Improvements in Ventilators Dated July 20, 1867.

The patentee claims constructing and arranging or combining the parts of a ventilator substantially as described and illustrated, whereby a series of flaps or doors covering a corresponding number of openings in the body of the ventilator may be simultaneously raised or simultaneously lowered, so as to open or close to the required degree the said openings in the ventilator.—Patent completed.

2131 B. P. FRANZONI. A New or Improved Method of Hardening Plaster, Plaster Castings, and the like. Dated July 22, 1867.

This invention consists in submitting plaster or materials or articles made of plaster, such as plaster castings, for the purpose of hardening, and, consequently, of rendering the same more durable, to a bath or solution of glue.—Patent abandoned.

2150 W. SIMPSON and W. HOWITT. Improvements in the Construction of the Roofs of Horticultural and other Buildings and Structures. Dated July 24, 1867.

The patentees claim constructing the principals of the roofs of horticultural and other buildings and structures hollow instead of solid, and of tubes or pipes and sockets, either separately or in combination with longitudinal pipes, rods, or bars, as described.—Patent completed.

2184 T. JONES. IMPROVEMENTS IN LOCKS AND LATCHES. Dated July 27, 1867.

This invention consists of the addition of the mechanism herinafter explained to locks and latches having spring bolts with bevelled ends, which mechanism has for its object to prevent the bolt of the lock or latch being forced back by pressure applied to its end. This invention, as applied to a spring latch having a barrel lock, is as follows:—Immediately over the bolt is a lever turning upon a pin in the latch case. This lever is pressed upon by a spring, that end of the spring which presses on the lever being of a V or convex shape, and bearing upon a projection on the lever immediately over the pin on which it turns. The projection is also of a V or convex shape. On the barrel of the lock is a projecting piece which, on turning the barrel, comes against a projection on the under side of the lever, and raises the long arm of the lever, or that end of the lever turned towards the bevelled end of the bolt. The lever remains in the raised position during the further motion of the barrel and the withdrawal of the bolt. After the opening of the door and the withdrawal of the key the lever retains its raised position until the closing of the door, when the forcing back of the bolt causes a shoulder on its inner end to strike against the tail of the lever, and depress the long arm of the lever, causing it to engage at the back of the head of the bolt, and to prevent the motion of the bolt inwards. The bolt cannot now be forced back by the insertion of a tool or instrument between the door and door frame. The introduction and turning of the key effects the raising of the lever and the liberation of the bolt in the manner before described. The lever is retained in one or other of the positions described by the V-shaped end of the spring pressing upon one or other side of the centre of the V-shaped projection over the axis of the lever. In order to enable a person inside the room to liberate the latch bolt without the use of the key, a small knob outside the latch case may be connected through a slot in the latch case with the lever. By means of this knob the lever may be raised and the bolt liberated.—Patent completed.

2158 C. H. MURRAY. IMPROVEMENTS IN MACHINERY FOR MOULDING CLAY FOR MAKING BRICKS, TILES, AND OTHER ANALOGOUS ARTICLES FROM PLASTIC SUBSTANCES. Dated July 25, 1867.

This invention consists in constructing the dies or apertures in brick-making machines, through which the plastic material is delivered, with movable hollow boxes or vessels, provided with perforated sides, and supplied with any suitable lubricant, which, by exuding through the perforations in the boxes, will lubricate the desired parts.—Patent completed.

2114 J. HARGREAVES, IMPROVEMENTS IN UTILIZING CERTAIN MATERIALS OR PRODUCTS OBTAINED DURING THE MANUFACTURES OF STEEL AND IRON. Dated July 19, 1867.

The patentee claims, first, the use of steel slag and steel cinder for the manufacture of glass by means substantially as described. Second, the use of steel slag for the manufacture of carbonates and hydrates of soda or potassa by means substantially as described.—Patent completed.

2125 W. TAYLOR. PIPES FOR VENTILATING, HEATING, AND VAPORIZING HOT-HOUSES, MALT-HOUSES, AND OTHER BUILDINGS AND RESIDENCES. Dated July 20, 1867.

The patentee claims, first, the application of chambers or passages to pipes for receiving hot water, &c., so that such chamber or passage may receive water or other liquid to be evaporated, whilst they at the same time act as conduit for the passage of air for ventilation, and thereby moisten as well as heat the air so supplied for ventilation, whereby hot-houses, malt-houses, and other buildings and residences, may be ventilated, heated, and vaporized, as described. Second, the method of forming the joints of pipes used in heating hot-houses, malt-houses, and other buildings and residences, as described.—Patent completed.

MEETINGS FOR THE ENSUING WEEK.

TUES.—Institution of Civil Engineers,—Continued discussion upon Mr. Sandberg's paper on "The Manufacture and Wear of Rails," 8.

WED.—Geological Society, 8

Society of Arts,—On "Horse as an Article of Food," by A. S. Bicknell, Esq.

FRI.—Architectural Association,—On "The Ruined Churches of Orkney and Shetland," by Sir H. E. L. Dryden, Bart.

Society of Arts,—Cantor Lectures, "Chlorine and its Compounds with Oxygen—Chlorate of Potash, its Manufacture and Remarkable Properties—Hydrochloric Acid, or Spirit of Salt, Its Production and Application in Arts and Manufactures, viz., Galvanizing of Iron, Sal Ammoniac, Chloride of Tin, &c.;" illustrations.

SAT.—Associated Arts Institute,—Exhibition of sketches, subjects, "The Old Farmhouse," and the "Siege of Corinth," Byron.

Trade News.

TENDERS.

The contract for the erection of the new high-level bridge from Newcastle to Gateshead has been let to Messrs. Panton, of Sunderland, for the water piers and iron work; and to Messrs. Walter Scott, of Newcastle, for approaches, &c. The estimated cost is about £35,000.

CHEPSTOW.—For additions and alterations of Chepstow Union:—

Stephens and Co.	£880 15 0
King and Godwin	685 0 0
T. and W. Jones	640 0 0
W. Roberts	535 0 0
J. Thorn (accepted)	480 0 0

BRIGHTON.—For workshops, Marlborough-place. Mr. J. Berney, architect:—

Oliver	£748 0 0
Loader	680 0 0
Dobson	600 11 0
Dallimore	587 0 0
George	569 0 0
Sawyer	540 0 0
Farr	516 0 0
Hall	473 0 0
Jackson	466 0 0
Lockyer	450 0 0

ENFIELD.—For additions to Bull's Cross National Schools, Enfield. Mr. Thomas J. Hill, architect:—

Rivett	£563
Bayes	520
Field and Sons	512
Patman, Brothers	508

EXETER.—For Congregational Church, Exeter. John Tarring, architect, 69, Basinghall-street, London, and Torquay, Devon. Quantities supplied:—

	General estimate.	Spire in Bath stone.
Such	£9836 19 0 ...	£3157 0 0
Perram	6561 12 8 ...	297 10 0
Call and Pethick	5544 0 0 ...	250 0 0
Moatt and Sons.	5540 0 0 ...	140 0 0
Kenshole	5450 0 0 ...	110 0 0
Force	5220 0 0 ...	40 0 0
Luscombe	5150 0 0 ...	10 0 0
Tozer	5085 0 0 ...	0 0 0
Stephens and Son	4442 13 2 ...	150 0 0
Pollard and Son	4400 0 0 ...	0 0 0
Bragg and Dyer (accepted)	4278 0 0 ...	80 0 0

HULL.—For the enlargement of the Port of Hull Society's Sailor's Orphan Home, Park-street, Hull. Mr. W. Botterill, architect. Quantities not supplied:—

Hutchinson	£3405
Barritt	3317
Clarkson	3280
Jackson	3236
Habbershaw	3220
Sergeant	3177
Marshall	3146
Halls (accepted)	3081

HULL.—For the erection of Wesleyan Sunday-School Premises, George-yard, Hull. Mr. W. Botterill, architect. Quantities not supplied:—

Steele and Darnelly	£1225 0 0
Halls	1190 0 0
Barritt	1173 12 0
Raynard	1152 8 0
Waller	1130 0 0
Marshall	1108 15 0
Brown	1031 0 0
Habbershaw	1004 8 0
Hutchinson	1000 0 0
Jackson (accepted)	993 5 0

LEWES.—For alterations and additions to the Sussex County Prison, Lewes. Mr. H. Card, county surveyor:—The quantities of the first seven were furnished by Mr. J. C. Lansdown, of London; those of the latter by Mr. B. H. Nuon, of Brighton:—

Perigoe	£16154 8 8
Nutt and Co.	14400 0 0
Williams	13378 6 2
Patman and Fotheringham	13285 0 0
Henshaw	12778 0 0
Hughes	12569 0 0
Nightingale	12352 0 0
Berry	12110 0 0
Kirk	11990 0 0
Howell	11715 0 0
Hall	11445 0 0
Cheesman and Co.	10900 0 0
Chappell	10690 0 0
Perry, jun.	10444 0 0

SOUTH DEVON.—Restoration of Aveton Gifford Parish Church, South Devon. Mr. Henry Elliott, architect:—

Matcham	£3700
Stevenson and Crocker	3150
Call and Pethick	2644
Condy, Brothers	2440
W. C. Elliott	2397
J. Bone and Son	2380
Ruth and Son and C. Ruth jun.	2341
John Steer	2241
Hannaford and Luckraft	2170
John Wilcocks (accepted)	1997

SOUTHALL.—For Band-room and Training-kitchen at the St. Marylebone Schools, Southall. H. Saxon Snell, architect:—

Harding	£835 0 0
Till	817 0 0
Enstace	798 0 0
Keys	795 0 0
Manley and Rogers	790 0 0
Wardle and Baker	770 0 0
Gibson Brothers	745 0 0
Brown (accepted)	732 15 0

STOKE-ON-TRENT.—For the erection of new School Buildings for Zion Chapel (Methodist New Connexion). Messrs. R. Scrivener and Sons, architects, Hanley:—

Collis and Hudson	£475
Turner	448
Barlow (accepted)	435

SYDENHAM. — For Works, Wall's-road. Mr. Nicholas Lake, architect:—

Henshaw	£1430
King and Sons	1380
Wills	1284
Dubbin	1150

WIMBLEDON.—For new wing and stable buildings to Urmston-lodge, Wimbledon, for Frederick Thompson, Esq. Mr. J. H. Good, architect. Quantities supplied by Mr. L. C. Riddett:—

Nicholson	£2670
Burton and Morelaad	2626
Colls and Sons	2342
Aviss and Son	2316
Webb and Son	2300
Adamson and Son	2270

PROPERTY SALES.

MARCH 10.

AT THE MART.—By Messrs. Driver and Co.—Copyhold estate, situate in the parish of Peldon, Essex, and known as Pete Tye Farm, containing about 109a. 1r. 22p. of arable and grass lands, with farm house and buildings—sold for £3375.

By Messrs. Price and Clark.—Leasehold, five houses, Nos. 33 to 37, Warren street, Chapel street, Pentonville, producing £150 per annum, term 12¾ years unexpired, at £20 per annum—£710.

Leasehold two residences, Nos. 151 and 153, Lupus-street, Pimlico, producing £117 per annum, term 65½ years unexpired, at £19 per annum—£1,100.

Leasehold residence, No. 13, Ethingham-street, Pimlico, annual value £60, term 65½ years unexpired, at £9 per annum—£510.

Leasehold residence, No. 412, Old Kent road, annual value £75, term 59½ years unexpired, at £11 per annum—£840.

Leasehold five messuages (four with shops) No. 79, 81, 83, 85, and 87, Rodney-road, Walworth, producing £115 14s per annum, term 15¼ years unexpired, at £15 per annum—£490.

Leasehold, four messuages, Nos. 61, 63, 65, and 67, Chatham-street, Rodney-road, producing £87 2s. per annum, term 9¼ years unexpired, at £8 per annum—£240.

Leasehold, five houses, Nos. 55, Chatham-street, 9, Chatham-place, and 7 to 9, Little Chatham place, producing £77 6s. per annum, term 10 years unexpired, at £6 16s. per annum—£190.

MARCH 11.

AT THE MART.—By Messrs. Fuller, Horsey, Son, and Co.—Leasehold residence, known as Essex lodge, Upper Clapton, let at £160 per annum, term 70 years unexpired, at £20 per annum—£2350.

By Messrs. E. Fox and Bousfield.—Leasehold residence, with grounds, stabling, &c., known as Castle-hill-lodge, Upper Norwood, term 99 years from 1860, at £100 per annum—£4850.

Freehold house and shop, No. 153, Grove-street, Camden-town, let at £63 per annum—£1390.

Freehold residence, No. 157, Grove-street, Camden town, let at £44 per annum—£740.

Freehold residence, No. 156, Grove-street, Camden-town, let at £44 per annum—sold £720.

Freehold ground rents of £8 1s. per annum, secured on No. 154, Grove-street, Camden-town—£185.

MARCH 12.

AT THE MART.—By Messrs. Brown and Roberts.—Leasehold two residences, Nos. 9 and 10, Cleveland-terrace, Hyde-park, producing £230 5s. per annum, term 90 years from 1852, at £24 per annum—£3050.

Leasehold stable, No. 6, Porchester mews, Hyde-park, let at £35 15s. per annum, term 85½ years from 1853, at £2 per annum—£650.

Leasehold improved ground rent of £35 per annum, for about 71 years, secured upon houses, shops, and stabling in Leinster-street and Porchester-mews, Hyde-park—£630.

Leasehold profit rental of £60 7s. per annum, for about 30¾ years, arising from the "Rosemary Branch Tavern," and 25 houses at Peckham—£780.

Leasehold house, No. 19, Park place, Lower Park road, Peckham, let at £46 4s. per annum, term 65½ years from 1823, at £6 per annum—£270.

Leasehold residence, No. 413, Old Kent road, term 19 years unexpired, at £10 10s. per annum—£215.

By Messrs. C. C. and T. Moore.—Freehold ground rents of £50 per annum, arising from 14 houses in Levofre-road and Lefevre-terrace, Old Ford—£995.

Freehold, five houses, Nos 1, 2, and 3, Upper North-street, and 1A and 1, Evans street, East India-road, producing £92 11s. per annum—£1,125.

Freehold, two houses, Nos 53 and 54, Evans-street, Upper North-street, producing £39 18s. per annum—£530.

Freehold, four houses, Nos. 27 and 28, Northey-street, and 11 and 12, Oak-lane, Church-row, Limehouse, producing £72 16s per annum—£600.

Freehold, two houses, Nos. 98 and 100, Devonshire street, Globe-road, Mile-end, producing £42 per annum, and a freehold ground rent of £4 per annum, secured upon No. 96, Devonshire-street—£645.

MARCH 13.

AT THE MART.—By Mr. Frank Lewis.—Leasehold residence, No. 107, Adelaide-road, Haverstock-hill, annual value £100, term 77 years unexpired, at £15 15s. per annum—£1,145.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

James Gardner Anstin, Manor place, Walworth surveyor March 26, at 1.—A. G. Bowe, and Joseph Eccleston, Clarendon-street, Harrow, painters.—Robert Duff, Hugh-street West, Pimlico, builder, March 26, at 1.—Elijah Herbert, Mardon-road, Bermondsey, plasterer, April 1, at 11.—Frederick George Smyrk, Guildhall Chambers, asphalte contractor.—Thomas Barton, Upper Norwood, builder, April 17, at 1.—William Paul, Sandridge, Herts, builder, April 9, at 11.—Thomas Smith, Pickering-place, Bayswater, builder, April 6, at 11.

TO SURRENDER IN THE COUNTRY.

George Hunt, Bury St. Edmund's, plumber, March 28, at 11.—Christopher Gale, Whitby, builder, March 25, at 11.—John Hurton, Fiskerton, carpenter, March 26, at 11.—Thomas Dale Kirkham, Lower Broughton, near Manchester painter.—Edward Lindley, Bloxwich, contractor, March 26 at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

April 17, T. Keen, Stratford, builder.—April 28, J. Pyne, Exeter, carpenter.—April 22, W. Smith, Hull, joiner.—April 2, U. H. Jones, Liverpool, builder.—April 14, J. Busby, Princes Risborough, plumber.—April 2, E. Rimington, Sheffield, joiners' tool manufacturer.—April 23, G. Knight, Albert-road, St. John's Wood, contractor

—April 17, J. Young, Goole, builder.—April 2, E. Cowin, Hulme, joiner.—April 21, A. Rogers, Trevethin, contractor.—April 17, A. Lever, Bolton, stonemason.—March 25, T. Skirr, Darlington, joiner.

DIVIDENDS.

March 26, R. Johnson and J. Addie, York-street, Lambeth, late merchants.—April 17, W. H. Patcheler, Leatherhead, builder.

PARTNERSHIPS DISSOLVED.

Benfield and Collins, St. Leonard's-on-Sea, builders.—Carr and Dodd, Newcastle-upon-Tyne, builders.—Cryer and Edmondson, Shipley, builders.—Davies and Beeston, Llanidloes, contractors for railway works.—Bass and Smith, Horninglow, near Burton-upon-Trent, timber merchants.

DECLARATIONS OF DIVIDENDS.

J. R. [illegible] Sunningdale, contractor, div. [illegible]

BANKRUPTCIES ANNULLED.

Thomas Francis, Leabridge, lime merchant, March 13.—William Cooper Wilson, Gray's Inn Chambers, builder, December 21.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak .... load	£11 10	12 1	Archangel, yellow ..	£11	0	£12	0		
Quebec, red pine	3 10	4 15	St. Petersburg, yel....	10	10	11	0		
" yellow pine ..	2 15	4 2	Finland	7	10	8	10		
St. John N. B. yellow	0 0	0 0	Memel	0	0	0	0		
Quebec Oak, white ..	2 15	5 15	Gothenburg, yellow	8	0	10	0		
" birch	3 10	4 10	" white	8	0	9	0		
" elm	3 10	5 0	Gefle, yellow	9	0	10	10		
Dantzic oak	4 0	6 0	Soderham	9	0	10	10		
" fir	2 5	3 5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	11	0	15	0		
Memel fir	3 0	3 15							
Riga	3 0	3 2							
Swedish	2 2	2 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	3		
Masts, Quebec red pine	6 0	7 0	Pumice Stone per ton	6	0	8	0		
" yellow pine ..	5 0	6 0	**Oils, &c.**						
Lathwood, Dantzic, fm	5 0	7 0							
" St. Petersburg	5 10	9 2	Seal, pale.... per tun	39	0	0	0		
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Sperm body	103	0	105	0		
			Cod	35	0	0	0		
			Whale, Sth. Sea, pale	38	0	0	0		
Quebec, white spruce	13 0	19 0	Olive, Gallipoli	73	0	74	0		
St. John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	54	0	55	0		
Yellow pine, per reduced C.			Palm, fine	39	10	40	0		
			Linseed	33	15	34	0		
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	38	0	0	0		
2nd do.	11 0	12 0	Cottonseed	34	0	40	0		

Metals.

Iron:—

Welsh Bars in London .... per ton	6 5 0	6 10 0	8
Nail Rod .... do	7 5 0	7 12 6	2½
Hoops .... do	8 5 0	9 0 0	
Hoops, Single .... do	8 7 6	9 0 0	
Staffordshire Bars .... do	7 5 0	7 15 0	
Bars, in Wales .... do	5 7 6	6 0 0	3
Nail rods .... do	7 5 0	7 12 6	2½
Foundry Pigs, at Glasg. No. 1 .. do	2 12 6	2 15 0	nett
Swedish Bars .... do	10 5 0	10 10 0	2½

Steel:—

Swedish Keg, hammered .... per ton	15 5 0	0 0 0	2½
Swedish Faggot .... do	0 0 0	0 0 0	

Copper:—

Sheet & Sheathing, & Bolts .... per ton	82 0 0	8 0 0	
Hammered Bottoms .... do	92 0 0	0 0 0	
Flat Bottoms, not Hammered .. do	87 0 0	0 0	
Cake and Tough Ingot .... do	72 0 0	73 10 0	3
Best Selected .... do	80 0 0	82 0 0	
Australian .... do	81 0 0	89 0	
Y. L. Metal Sheathing & Rods .... per lb	0 0 7	0 0 7¼	

Lead:—

Pig, English .... per ton	21 5 0	0 0	
" Spanish Soft .... do	19 0 0	0 0 0	2½
Shot, Patent .... do	22 10 0	0 0 0	
Sheet .... do	20 10 0	20 15 0	5
White .... do	27 0 0		

Tin:—

English Block .... per ton	95 0 0	97 0 0	
do Bar .... do	94 0 0	97 0 0	3½
do Refined .... do	97 0 0	98 0 0	
Banca .... do	94 0 0	0 0 0	nett
Straits .... do	91 10 0	0 0 0	

Zinc:—

English Sheet .... per ton	26 0 0	26 10 0	2½
Devaux's V. M. Roofing Zinc .... do	26 10 0	0 0	

* And 3 per cent. discount if laid upon the new system

Spelter:—

On the Spot .... per ton	20 0 0	0 0	nett
Quicksilver .... per btl	6 17 0	0 0 0	

Regulus of Antimony

French .... per ton	4 0	45	

THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 27, 1868.

ST. PANCRAS' SCHOOLS, LEAVESDEN.

THE award of the premiums for this competition was made on the 19th of this month, the drawings having been for a few days exhibited in the Vestry Hall of St. Pancras' parish. The competing architects are eight in number, or rather seven, if we count Messrs. Giles and Biven, the successful competitors, as one. Their names are, respectively, Messrs. J. E. Knightley, 106, Cannon-street, City; F. Chambers, 15, Bow-lane, City; Messrs. Giles and Biven, Craven-street, Strand; Andrew Wilson; R. H. Burden, 507, Oxford-street; M. P. Manning, Mitre-court Chambers, Temple; and F. Peck, Furnival's-inn. Of the wisdom which prompted the authorities to select a site in the country for the education of the immense number of children which so large a parish cannot fail to throw upon their hands, there cannot be two opinions. An eligible piece of ground on the high road between Watford and St. Alban's has been chosen. It is about 1500ft. in length, and averages 700ft. in width, lying north and south, bounded on the south by the high road, and accessible on the north by other roads. To suit this condition of site all the competitors have placed the buildings on precisely the same spot, with the exception of the chapel. The main building is at the northern extremity of the ground, the infirmary midway on the western side, and the gas-house in the extreme south-western corner, the approach being in all cases from the main road. The instructions require that "every part of the building is to be of the plainest design," and "facilities for the escape of inmates in the event of fire."

The design of Messrs. Giles and Biven, which obtained the first premium of £150, is neither the best nor the worst. It contains the usual features with which we are perfectly well acquainted. A central portion in the long front to accommodate the administrative department, and to look pretty when visitors arrive; a central building, stretching back, to contain dining-hall, kitchen, &c., and communication with the other buildings in the rear; a wing for boys on the one side, and another for girls on the other, both sides to match; a tower, with a clock in it, over the visitors' entrance, and the thing is done. When the Princess Charlotte learned to draw in water colours, she was more distinguished for rapidity of execution than anything else. In the intervals between the lessons she was in the habit of making studies of considerable size, insomuch that her master was fain to have paper made expressly for her. On his next visit the drawing would be exhibited with much triumph, with the remark, "You see, Sir, it is done.' But how was it done? As we said, the premiated plan is neither the best nor the worst. Its merit is an extreme simplicity pushed to excess, and this simplicity is aggravated by an attempt to ornament the central portion. The execution of the drawings is thoroughly workmanlike. The interiors of the chapel, dining-hall, and school-room show a good and substantial style. Indeed, with the exception of the attempt at ornament in the central portion, this design has marvellously little of what is termed "humbug" in it. Owing to an unaccountable misconception of the requirements of the Poor Law Committee, 500 feet have been allowed to each bed, instead of 300 as actually required. At all events, merely cutting off the ends of the building, would make all right. This seems to us impossible. The building, therefore, is of greater length than required. The material is yellow brick with red bands. The provision for escape from fire seems inadequate. The playgrounds are enclosed in such a manner that they form a sort of quad. The noise would be appalling, to say nothing of the suggestion of exercise in a prison yard. The estimate was £30,000, and, if any of the designs can be carried out for the money, this one certainly can. The second premiated design, £100, is by Mr. Frederick Peck, of Furnival's-inn. It is by far the handsomest of the set, the style being fair domestic Tudor. The arrangement is superior to that of most of its rivals. The infants are kept quite apart on the north side, and there is a fire-escape stair, in the form of a small tower, to each of the dormitories, leading at once to the outer air. The chapel is about 200ft. from the main building, but situated at the west side. The execution of the designs is very good. The material is red brick with stone dressings. In this design ample provision, namely, seven staircases, is made for escape from fire. The estimate, £30,000, seems much too low, but Mr. Peck is confident, from his experience of similar works, that it would not be exceeded. It is no more ornamental than dozens of other charitable institutions in the neighbourhood of London. The Dramatic College, the Printers' Almshouses, and, for aught we know, the Charitable Grinders' Retreat, cost more, in proportion to size and accommodation, but the instructions regarding "plain design" are set at naught. The central clock tower might be pruned with advantage, and this is all we can say in the way of censure. Mr. Manning's design, which obtained the third prize of £50, has faults, but there is no doubt it is superior to that of Messrs. Giles and Biven. In our opinion the position of the chapel is not well chosen. It is thrown forward about 200ft. from the centre of the main building. The elevations are quite plain, in red brick. The outline is good, but we must protest against the two windows at the ends of the projecting wings. They are not only disfiguring, but absolutely needless. A void should always occupy the centre of a wall space, a pier never. Seven staircases for escape from fire are provided. The execution of the drawings is skilful, and, with the exception of the faults above-named, the building is admirably suited to its purpose. The estimate is £27,450. The instructions appear to be strictly adhered to. The design by Mr. Knightley contains a good plan. The elevations are of red brick, but the style is nondescript, and the building throughout inferior to those premiated. Mr. Chambers's plan is objectionable, two immense wings being thrown forward, the effect of which in perspective would be most unsatisfactory. This experiment, even in palaces, where cost is no object and where proportion can be obtained at will, is most hazardous, but, in a lofty three-storey building of extreme simplicity, it is altogether wrong. The infant department is not sufficiently separated from the rest. Yellow bricks with red bands form the material. The style is nondescript. Mr. Wilson's plan is not bad, but the attempt to vary the skyline has not been attended by fortunate results. The material is yellow and red brick, and the style, if any, is Victorian. Mr. R. Burden's design is next in merit to those obtaining the premiums. Considering its purpose, it is not inappropriate, though very plain. The playgrounds are enclosed. The material is yellow brick, with the slightest amount of red banding in the central and wing buildings. The style is not very pronounced, but is characterized by horizontality. With regard to the second and third designs, the committee have not judged amiss, but the first will scarcely find favour with the Poor Law Board, who will narrowly compare the designs with their own positive instructions. The ability to pass the Board is the crucial test, and we should not be surprised to see the Vestry compelled to reconsider its decision.

PAPERHANGINGS.

THE choice of a decorative covering for the interior walls of our dwellings is a matter of some importance, as we all know. A new invention, it appears, is attracting attention in the United States, and threatens, we are told, to supersede the use of common paperhangings. A machine has been constructed which will take a portion of a tree after it has been cut the right length and width, and shave it up into thin ribbons as wide as a roll of house paper, making one hundred, or one hundred and fifty, to the inch. These rolls are placed on the walls precisely in the same way as with pieces of paper. Certain advantages are claimed for the woodhangings, as we may call them, over the ordinary material. It is said, for instance, that the wood, which is wet when used, is found to work easier than paper; it can be oiled, varnished, or shellacked, and then washed at pleasure, and so kept perfectly clean; the wood will not crack or split in using, and when on the walls it stands like solid work; and, lastly, woods are of great variety, and admit of any amount of ornamentation. Granting the advantages, there are, on the other hand, certain disadvantages which, as it seems to us, would attend wood as compared with paper hangings. It might be questioned whether they could ever be made to look so light, varied, and cheerful as paper. Even a wall covered with the lighter kind of wood, or different varieties of wood, and done in panels, as is suggested might be done, would still have a certain sombre and heavy effect under whatever treatment, besides being expensive. Moreover, it might suit a hall, a library, or a dining-room, but would not be appropriate to a drawing-room or to bed-rooms. There would be little harmony or contrast of colour, and no relief to the eye. Again, the very solidity and durability of the work might be considered an objection. It would last too long. If paper fades soon, it is inexpensive, and can be easily renewed by the substitution of a fresh paper, giving fresh effect. It is one of the advantages of paperhangings that the commonest and cheapest are often the most agreeable or prettiest, while, from their infinite variety of pattern and design, every taste is consulted. A very large number of houses, in large towns especially, are always changing their tenants—houses of the middling and cheaper class more particularly—and a "fresh paper" is the usual complement of a new tenant. Many persons, it is well-known, find in migration a change really beneficial; they get relief from the various "ills that flesh is heir to" in a change of residence, with its new surroundings. Wall decoration plays an important part in this domestic account. A varnished or polished wood wall might be kept clean with little trouble truly, and it might, under certain conditions, be made to have a rich, warm look, but it would present nothing for the eye to rest upon, and we cannot see that it would possess any real advantages to render the adoption of woodhangings desirable, at least, for ordinary dwelling-houses. The idea seems more adapted to some public buildings—the interiors of public halls, for instance—though even here the usual methods of decoration are to be preferred on many accounts. For one thing, this new lining would render a building much more liable to fire, and would, of course, greatly facilitate it when a fire did happen. And the danger would only be increased were the walls oiled, varnished, or shellacked, as recommended. Sanitary reformers object to paperhangings—and, indeed, to all lath and plaster walls whatever—because of their absorbency of moisture and damp, and, in closely crowded habitations, of their absorbing of miasma. For which reasons they advocate walls of concrete construction, since these give a washable surface, and, therefore,

a more healthy dwelling, concrete having also the additional merit of being fireproof. What we should lose in appearance and taste, say they, we should gain in health, comfort, and safety. There is force in the argument, though there can be no doubt that paper-hangings, judiciously selected, are the most appropriate and agreeable covering for dwellings generally that ingenuity has yet devised. The manufacture of this elegant substitute for the ancient tapestry hangings of our forefathers, has undergone a gradual succession of improvements, and has now reached a high state of beauty and perfection. Of the three kinds of paper now in general use, the plainest and cheapest, which is usually composed of figures of one or more colours, is supposed to have been invented by M. Breitkopf, of Leipsic, who, at all events, brought it to great perfection. The invention of the velvet or flock paper is ascribed to an artist named Jerome Layner, in the reign of Charles I., about the year 1631; and that of satin or silver paper may be said to date from about the same period, the inventor, in this instance, being one John Hautsch, of Nuremberg. Paperhangings have increased in popularity ever since. The manufacture has undergone endless changes and improvements, as regards the designs and colours of the paper, but the principle of the manufacture has suffered little change. The invention of the paper machine, by which any length of paper may be obtained, effected a very great improvement in paperhangings, which could formerly only be printed upon separate sheets, and were much more inconvenient to print as well as to apply to the walls. Very much depends, as we have already said, on what sort of paper may be selected for a wall. Taste has of course a great deal to do with it, but not everything. Considerations of comfort, cleanliness, and convenience, ought certainly not to be overlooked. A paper should not only be pretty, handsome, or splendid, it ought to be suitable. Will it be useful as well as ornamental, is a question to be borne in mind in selecting most things, and, in the matter of choosing paperhangings, the question ought not to be forgotten. Rules for guidance in the selection of paper cannot be given, but it may be stated generally, as a safe piece of advice, that, as a rule, choice should not be made of green, on account of the arsenic which enters so largely into its manufacture. There is one kind of green paper made which is so very objectionable that it should be entirely prohibited from bed-rooms, and admitted very sparingly, if admitted at all, into any part of a house. Green ought to predominate in our furniture, but, though paper of this colour is often the most elegant to look at, it is not to be recommended as a hanging. Any other colour, in fact, is preferable.

MODERN GOTHIC FURNITURE.

NOT many years ago, the popular idea of Gothic furniture was aptly illustrated in Pugin's "True Principles." The plate, showing a collection of so-called Gothic furniture, is in satire little inferior to Hogarth's celebrated "Perspective." We may, however, congratulate ourselves on a marked improvement in furniture designs, and, if we have not attained excellence, we, at least, are earnest in the pursuit of it. Architects of eminence are found designing furniture, and manufacturers find it to their interest to pay for such designs, and, though the schools vary in their notions, the effort is decidedly upward.

Comparing the upholstery of twenty years ago with the furniture of the present day, we find matter for congratulation, and, if we even confine ourselves to what has been done within the last three or four years, it will be seen that, although there is much room for improvement, steady progress is being made. Where there used to be redundancy of ornament, we now see elaborate simplicity. Where formerly the construction was ingeniously concealed, it is now paraded with, perhaps, too much pomp. Where almost everything essayed to pass for what it was not, now things assert themselves most unmistakeably for what they are. At present the danger seems to be in this over-assertion, for, although it is one of those failings which lean to Virtue's side, it is a failing none the less, and, although protest against long-continued error is praiseworthy, it should not be urged with too much instance. When every joint seems to say, "See how close I am;" when every brass-headed nail proclaims its freedom from the humbug usually associated with brass-headed nails, we are apt to think that the piece of furniture "doth protest too much." This very earnestness is, however, a sign of vitality, needing only the correction which time and experience always administer. It must have been observed that the leading upholsterers have eagerly availed themselves of artistic talent, specimens of which have frequently found a place in our columns. Messrs. Burges, Butterfield, Street, Bevan, Talbert, and Jefferson are no ordinary designers of furniture, and, although they differ in their ideas of what furniture ought to be, they all produce designs of great merit. At the present moment, however, some excellent specimens of Gothic furniture are to be seen at the premises of Messrs. Gillow and Co., 176, Oxford-street, from the designs of Messrs. Bevan, Talbert, and Jefferson. Amongst other things a complete dining-room and bed-room suite of furniture is on exhibition, and a drawing-room suite is in course of manufacture. The sideboard, by Mr. Bevan, is, like the other articles of oak, solid and plain. The back is filled in with tiles manufactured expressly. The effect is very good. Variety is given by a sparing inlay of coloured woods, but there is no paint whatever. The dining table corresponds in style, and the chairs are simple, comfortable, and substantial, without being the least heavy. For carpets and curtains, the latter both in damask and muslin, Messrs. Gillow and Co. have obtained many beautiful designs, and no one can see them without being struck with the immense improvements which have taken place in Gothic design even within the last five or six years. If, however, we look back to what was done for the Exhibition of 1851, we have difficulty in persuading ourselves that the designers were not idiots, although we know very well that such was not the case. For the most part, they were "prosperous gentlemen," and had done nothing worse than commit the usual professional Pecksniffianisms, for which they compounded by paying the real author regularly, if not liberally. As a rule, they possessed much, and gave tithes in proportion. They took care of those of their household, and looked keenly after the interests of number one; but, with all this, they could not form any idea of what Gothic furniture should be.

The bed-room suite is complete even to the crockery. The soap-dish is not as other soap-dishes, the ewer is unique, and all is in perfect keeping with the style. The wardrobe, toilet table, bedstead, &c., are plain, but handsome, oak being used throughout; and, if the designs possess any faults, they certainly cannot be charged with redundancy of ornament or inconsistency in style. Besides these sets of furniture many articles of great elegance are to be seen; notably, an ebony cabinet, which was exhibited at Paris, and a drawing-room cabinet by Mr. Talbert. The latter is of large size, composed of walnut and other dark woods, relieved by satin and other light-coloured woods. There is marqueterie work in the panels, and the metal work, by Richardson and Slade, is of uncommonly good design and execution.

Some of the bed-room furniture in various woods, such as teak, ash, and even the humble birch and sycamore, is well worth notice. The teak is of excellent colour, and, exhibited in the form of a wardrobe, with a slight inlay of white and black wood, leaves little to be desired. Our own especial fancy is for the Venetian style of black, with a delicate inlay of white. By polishing some portions and leaving others dead the most beautiful effect can be produced. It can never be vulgar, can never be out of fashion, and when properly treated is not lugubrious in appearance. It has, in the eyes of the ladies, another merit—it suits the complexion. Without the black mantua or mantilla the Limenas or Sevillanas would scarcely be the fascinating creatures travellers report them to be, and we well know that a lady never looks better than when in widow's weeds. The modern process of producing black, or ebonized furniture, as it is called, is by soaking a soft wood, such as poplar or lime, in a strong dye. The black thus obtained is equal to ebony, with the advantage of being in pieces of almost any size, whereas it is well known that ebony can only be procured in small pieces, the expense of working which practically excludes it from the market. The Messrs. Gillow have recently applied machinery to the manufacture of furniture with great success. It unites economy with accuracy, and may be used, as we have seen, for fluting a column so small that an ordinary pencil cannot be laid in the flutes. The sawing, planing, and turning on a large scale are comprehensible enough, but the delicate operations for which an immense machine is made available are truly astonishing. With regard to the Gothic furniture to which we have referred, it should be stated that it is not made to order, but rather as an example, so that persons about to furnish a Gothic house may see what Gothic furniture is, and thus give their orders with their eyes open.

THEATRES.*

THE over-development of the balcony system in some of our modern theatres may be regarded as the firstborn of that subsidence of architectural forms which has been already noticed. It is about ten years since that Mr. T. H. Wyatt, the architect, or Mr. Webster, the manager—for no one knows the limits of responsibility in theatre building—imported the *balcon*, and adapted it with decided caution to the new arrangement of the Adelphi Theatre. Since then the unfortunate *balcon* has been twisted and pulled about in a most merciless manner, and finally applied to each tier or gallery in curves which are non-concentric. It is simply impossible to imagine anything more repulsive in a galleried circular interior, from whence all architectural form has been banished, than these excentric curves. We might have rested contentedly (it is the proper thing in these days to rest) with the banishment of all architectural features—we might have almost been thankful to get into a building that was free from all architecture—for we should then be sure of escaping even the chance of recognizing any of the coarse, false, and slavishly imitative work for which this second half of the nineteenth century is already so famous. Circular or semicircular galleries, one over the other, or in advance of one another, and with construction visible or simply whitewashed, so long as they were concentric and flat, would, I venture to say, be far more grateful, or rather less disagreeable, than the most elaborately "decorated" theatre designed on the *balcon* system, where curves and proportion and interior perspective are either neglected or not comprehended. But the evil of the system is not merely one of appearance, for it is very clear that, by projecting the lowest gallery in the form of a balcony, there must be such a difference between the levels of the pit floor at the high-

* Continued from page 178.

est, and the balcony floor at the lowest, in order to get headway and breathing space, that the best levels for seeing the stage must either be left in mid air, or one part of the auditory must be sacrificed to another. When, however, we come to the full extension of the pit, the case is entirely one of a few bad seats at the back of the pit *versus* the rest of the house. Will the rest of the house protest against this inconvenience? or, with characteristic British patience, will they calmly sit it out and suffer this or any other loss by which their pet, the manager, can add a few pounds to his income? At some of our theatres the dress circle, as we yet know it at the Haymarket, has no existence. At the Olympic, for example, there is no dress circle—what is called and charged as "dress circle" is really the upper circle, for its lowest floor level is more than 9ft. above the stage. The same may be said of the Princess's, the Queen's, and indeed of every theatre where the pit extends beneath the dress circle; the only difference is that of about 2ft. more or less, the less to the sacrifice of the pit the more to the further sacrifice of the rest of the house. What is really wanted is the total abolition of the pit as the place of the groundlings; its retention to the present day is only another instance of the way in which everything theatrical is choked by prejudice, and the what-has-been-must-be theory. No one probably will hesitate to admit that the pit seats in the old Haymarket house are second to none as regards position. This is evident enough now, but it would be still more palpable if Mr. Buckstone could be bold enough to give up his pet footlights. It requires neither argument nor example to show that the pit or area of the house is by far the best place in the house. To a certain extent this has been recognized by dividing the front portion of the pit from the back, and letting the front seats, or stalls, as they are called, at a price considerably higher than other seats in the house. Let it be fully recognized, and the frequenters of the pit would soon settle into other portions of the house, the dress circle would resume its old position as to level, there need be no objectionable tunnelings under the dress circle, we might start with an architectural base, we should secure consistency by letting the best places at the best prices, we should add to the comfort of every one in all parts of the house from the gallery to the stalls, we should, we believe, add to the pocket of the manager (chiefest of considerations), and we should receive the thanks of the great majority of playgoers, if we had but the small modicum of courage necessary to withstand the grumbling of that most conventional of play-goers—the frequenter of the pit.

Another evil which we are threatened with is the undue publicity of private boxes. If we pay for a "private box," we expect a box that shall be private, and not to find ourselves the possessors of four seats (two useless) framed off with a great show of curtains that won't run, and partitions that don't part. Of course the private boxes—and, indeed, all the arrangements—of such theatres as the New Royalty or the Prince of Wales's are beyond criticism. There are, however, certain theatres, of which those just mentioned are two prominent examples, that are disgraces as public buildings to everyone concerned, from the Lord Chamberlain downwards. The only wonder is that they have not been burnt down long ago, or that any company could be induced to effect an insurance on them. Narrow passages, narrow and tortuous exits, wood everywhere, gas everywhere, and, indeed, these two last in such close proximity that in some places the wood partitions are too hot to touch—it is, I repeat, matter for wonder that the Lord Chamberlain should ever have licensed them, or that he should continue to countenance such incommodious and dangerous structures.* E. W. Godwin.

* To be continued.

FURNITURE AND INTERIOR DECORATION.*

THAT kind of domestic embellishment called decoration is generally believed to be a costly luxury. It may be rendered very expensive according to the manner of its execution, but, as its essential beauty consists of design and harmony, these need not of necessity be extravagantly asserted. It may be supposed that the last great precepts in decoration were pronounced at the late Universal Exhibition. All the elements of the beautiful were there certainly, but there was no fitting illustration of their effect in combination, and this was one of the greatest wants felt by those who went as students to the Champ de Mars. It should have been the care of the Government to have shown, in composition, the ornamental resources of French manufacture. As it was, visitors were bewildered by the multiplicity of splendid fragments, the effect of which, in application, they could not possibly conceive. The quality of these bespoke the highest executive accomplishment, but their utmost excellence did not appear, because there was no means of seeing those beautiful parts associated in effective unison. A faculty for the production of fragmentary designs is not necessarily a power equal to the accomplishment of a harmonious combination. Merit in detail is lost in faulty composition, but judicious arrangement gives value to even indifferent material. These observations and other remarks that follow are suggested by a perusal of a brochure on decoration, by M. E. Guichard, of Paris, who deals with his subject as a fine art. His style is somewhat flippant, and his illustrations by no means happy, when he departs from the direct line of precept, and, although much that he brings forward may not be intelligible even to his own countrymen, yet his propositions may lead some to address themselves less conventionally to a study susceptible of a very high degree of refinement. The rule with our neighbours as to drawing-room decoration is white and gold. With this they profess that they can never go wrong, of what kind of colour soever may be the draperies and cabinet work in the room. The details are sometimes exquisite, but the general effect, as being left to chance, is more frequently than otherwise extremely offensive. The discrepancies of the *salle à manger* are thus described by the writer:—"Let us enter," he says, "the dining-room—the dining-room of the nineteenth century. Here, by a happy chance, there are two rooms, one for ordinary occasions, and the other for gala days. In the former the draperies are of woollen reps, and the panels are embossed paper. On whatnots and other convenient articles of furniture are set forth miniature cups and dolls' toys. But what is become of you, oh! beautiful ornamental dishes of bygone days? and why are you not present, *chefs d'œuvres* of our modern porcelain? A chandelier hangs immediately over the table. Either change this chandelier for a smaller, or let the ceiling be made to harmonize with it. The former alternative is the simplest, the latter the more costly. . . . . But what is this odour that assails the nostrils? . . . . . The reps furniture and embossed paper indiscreetly proclaim the substance of yesterday's dinner. These materials are, indeed, very tenacious of the perfumes of recent banquets."

In adverting to the bad taste prevalent in the fitting up of what is called a *salle à manger d'apparat*—that is, a banquetting-room of the first class—the writer says that even in such instances the wealthy proprietor is entirely in the hands of ignorant and unscrupulous adventurers. The draperies are heavy. The table, the chairs, the sideboards—all the moveables, indeed—are of black wood; and, to complete the funereal aspect of the place, nothing but the black plumes are wanting. M. Guichard would replace this by furniture of oak, or some other wood of warm tint, and decidedly condemns chairs on which are carved the entire coat of arms of the host, much to the discomfort of the guest at table. We are then invited to consider the modern French drawing-room, which is a mere monotony of white paint and gilding. The description will apply to any number of first-class saloons. The doors, the panels, the wainscots, the ceilings, the cornices, the arabesques, and compositions in relief, are the universal white and gilt; but the stereotyped pattern is easy of execution, for, white being the negation of colour, it is not necessary to seek effective contrasts and harmonies. With the absolute condemnation of high-toned decoration, without reference to the amount of light in the apartment, we cannot agree, for in France, as well as in England, there is a very great proportion of drawing-rooms for which this kind of decoration is alone suitable.

In order to correct this state of things the remedy proposed is one which would require a course of study too prolonged and close to be generally followed, but it is, nevertheless, the basis of all that is excellent in decoration—it is, in short, the study of Nature, which we would simply interpret as pictorial effect, breadth, and harmony. As a model, a landscape is chosen in which the near objects—trees, herbage, flowers—are present with all their importunate details, while in the distance all definition is lost in the blending of the whole as it recedes from the foreground. This affords us the perspective of colour for daylight; for evening or night another description is given. The application of the precepts gathered from the lesson—say for daylight effect—is as follows:—Let your carpet be bright and rich in colour towards the centre, whence, both in tone and hue, it should gradually decline to the extremities. The seats of the chairs must be bright in tint, but for the fabric with which the backs are covered the colour should be somewhat lowered, and the wall or panelling should yet more be reduced in tone (and different in colour if desirable), and the tables should be as light in tint as possible. If this be judiciously carried out the effect will not only be strikingly brilliant, but it will very much increase in appearance the size of the room. A landscape is a wide field to propose as a model for the embellishments of a drawing-room, but, after all, it is from Nature that every touch of the beautiful proceeds.

Of the conventional drawing-room M. Guichard says that its garniture presents nothing but violent contrasts, shown by deep red sofas and arm-chairs relieved by white and gold. The lady of the house perhaps places herself in one of these seats, which has the effect of suddenly changing her complexion to a livid hue; and this is not the least objectionable result attendant on the false apposition of colour. According to the principles here laid down, and taking the complexion of a family, or an individual, whether dark or fair, as the keynote of the entire symphony, the decorations of a room might be so divided as to set it forth to the greatest advantage.

It is unnecessary to accompany the writer through the details which he prescribes as indispensable to the perfection of his scheme of decoration. Many of his propositions are open to objection. It cannot be denied that there is room for every improvement in decoration. Even in middle-class houses the exercise of taste is less costly than vulgar parade. The difficulties of a successful result do not readily show themselves to the observer; nevertheless, the embarrassments may have been many, but they have all yielded to well-directed study of colour and composition. "Proceed," says the writer, "from analysis to synthesis; and, above all, remember that the sixteenth, seventeenth, and eighteenth centuries are already far behind us. Times

* De la Meublement et de la Decoration Interieure des nos Appartements. Par M. E. Guichard, architecte-decorateur. Paris.

fortunes, and manners have changed. Study them as they exist, and adapt your art to the exigencies of the time. The charm of art is in nowise weakened because it has tempered itself to the Greece of Pericles, to the Rome of Agrippa, to the Italy of Leo X., to the France of Francis I. and Louis XIV. Methods, or 'styles' so called, of embellishment are exhaustless, and those which are now historical have been appropriate to the times of their prevalence respectively. It may, therefore, be reasonably asked, why a distinctive character is wanting to the ornamental art of a period which, in all else, surpasses the utmost cunning of all historical time!"

ORGANS.

"De gustibus non est disputandum." Upon musical questions this is even more true than in the sister arts. Still there are in these matters some data to go upon. It is at least very questionable how far the opinion of foreigners upon the art of Englishmen is of much value. The Paris Exhibitions have shown pretty plainly that in some branches of art the French at any rate entirely misunderstand us, and fail completely to appreciate any of the excellencies of our best work. It is even denied that we can paint landscape. Turner himself is scarcely esteemed of any value. I am not a whit more prepared to accept the verdict of foreigners upon musical sound than I should upon poetry or painting, certainly not when the quality of sound produced abroad happens to be different from what we produce. The fashion of Englishmen to disparage their own countrymen, not only of the present day but of all others, has done endless damage in a hundred ways. The gilt bronze royal effigies at Westminster are of great beauty and merit, so, contrary to the most direct evidence, "they must have been done by an Italian." The portrait of Richard II., over the scrubbing of which there has been so much congratulation, is so delicately drawn that it also "appears to be Italian." In consequence, the curious diaper for the background, so distinctive of English work, was destroyed, and with it the English character of the painting. If the tone of an organ is really so much a matter of taste as your correspondent affirms, it is rather amusing to find him dogmatising about it as he does, and in his former letter connecting it with a material that has nothing on earth to do with it. I need scarcely point out to any of your readers but Mr. W. Taylor, that, though an English verdict upon the question of music may be of far lower value than a German one—a position, by the way, which I entirely deny, and which is contradicted by facts—there is no more critical audience than an English one, nor can you have music better rendered in any country than in our own. I would also say, with the late Mr. Edward Taylor, that, in all branches of music where fashion has allowed fair play to the artist, England has never been a whit behind the foreigner, no matter of what nation. In some things, as in the glee and anthem, we have never been equalled. Still, even supposing that an English verdict upon music is not of the same value as a German one, it by no means follows that the German verdict upon organs is of the same superior importance. It is rather curious to observe how much it is the fashion of Englishmen to preach up foreigners at the expense of their own countrymen. In the last century and the beginning of this Italy was everything in music. I remember seeing in an old number of the Lady's Magazine a passage where it said you might as well expect some impossible thing, I forget exactly what, to happen, as to hope for musical taste in a German. Mozart and Mendelssohn have altered that opinion—possibly it may be France that will in our children's time be held up to the worship of Englishmen in this matter. I have not much acquaintance with the German organs; but I have most minutely examined, by the courtesy of Mr. Rogers, the Doncaster organ, which is acknowledged to be a particularly fine specimen of Schulze's work, and immediately afterwards that great work at Liverpool, which, by the way, has lately been wonderfully increased in power and beauty, and I can affirm that the Liverpool organ is in every respect entirely superior to that at Doncaster, which, with much that is beautiful, is still old-fashioned and almost retrograde. There are evidences throughout the work of indecision and rule of thumb work that would be perfectly amusing to such a man as Henry Willis. Talk about windage, why this much-vaunted instrument has the same antiquated apparatus which in this country has been superseded for a century or more, bearing about the same comparison to what our best builders do as the old state carriage and eight would do to an express train on the Great Western. While upon this subject, I will only remark that, whatever difficulty the present organ-blower (an old man I believe) may find with the Kingston organ, that, at its inauguration, two of Mr. Willis's boys blew it, though it is a very large organ, with pneumatic levers and sub and super octave couplers. I need not say that on that occasion the full organ was used, not for a chord or two, but at the pleasure of the accomplished organist, Mr. Hopkins, who opened the instrument. I will only add that, whether we take the gambas, flutes (harmonic), diapasons, or reeds, this organ can scarcely be surpassed. Singularly enough, too, the whole of the metal of this organ is spotted. One is almost tempted to ask Mr. Taylor whether he knows what spotted metal means? He tells us that the metal of Father Smith's pipes in the St. Paul's organ are much better than ordinary spotted metal. If so, why have they not spotted? The fact is that they contained, and contain, for they have not been recast or altered in quality, only one quarter of tin, and, therefore, the metal does not reach a spot. So much for your correspondent's assertion as to the practice of the "artists of all ages." I suppose Mr. Taylor is not aware that Mr. Willis completely rebuilt this organ about three years ago. So far as any locking-up of pipes was concerned, it is only true so far as that the *cathedral doors were shut at night*. Any further locking-up is a mere myth. The Dean and Chapter, when they employed Mr. Willis, had doubtless the fullest confidence both in his abilities and his honesty, nor, as far as I can learn, were they at all disappointed in either. In my opinion of the excellency of the Kingston organ, I am fully borne out by the unequivocal expressions of admiration of Mr. Hopkins, who opened it, and of Mr. Turle, who was present at its inauguration. Winchester organ is notoriously one of the finest cathedral organs in the kingdom. I have never heard this impugned.

Mr. Taylor does not, perhaps, know that the builder whom I casually mentioned as among those most famous in England, is now constructing the great organ for the Royal Albert Hall of Arts and Sciences, with, among other things, 32ft. metal pipes, the diapasons to be of pure tin. He is also doing one for the Alexandra Palace at Muswell Hill, which we shall all have an opportunity, in a very few weeks, of hearing and inspecting. They will both, I am told, have some extraordinary mechanical improvements. It will in my opinion be wiser in Mr. Taylor to suspend his judgment till these are before the public. It will give your readers some idea of the importance of these instruments, when I tell you that the least of them will contain more than 100 stops! In the face of such gigantic affairs as these, with mechanical appliances as simple, beautiful, and astonishing as any of our steam machinery, all either original or at least original in their application and extension, it can only raise a smile when we are told that, after all, Lewes "is your man."

I do not for a moment mean to imply that Mr. Lewes may not be a rising man, or that organ building may not be more his *forte* than architecture, to which I believe he devoted his younger years. What I object to, as positively ridiculous, is thrusting him forward as *the* English organ builder, when, as far as we know, he has never built a really large organ at all. That this is the case is proved by an advertisement of his which occurred lately in the *Musical Standard*. *In this he offers to build a large organ for some townhall or public building, at prime cost!* It would, therefore, seem more agreeable to fair play and common sense to wait till he has constructed a first-rate instrument before we adjudicate upon his abilities. Loving music and all connected with it as I do, I should be the last person in the world to disparage a really rising man. If Mr. Lewes should show himself to be the rival of Willis, Schulze, and Cavaillé-Coll, no one will be more happy to acknowledge it and welcome the acquisition to the musical world than myself. At present I am not aware that he is known, except as a builder of small country church organs, and not always a successful one. Mr. Schulze may or may not laugh at Mr. Willis's flue work. I have personally known first-rate painters of the present day laugh at Van Dyck and the old masters. This, however, I know, from a very careful comparison of the two, that, whether he may laugh or no, he cannot come near the tone of Willis. His Doncaster organ is simply a fine specimen of the organs of 150 years ago. Willis's is as much superior to that, as are Erard's or Broadwood's grand pianos to the old harpsichord. That Cavaillé would do no such thing, I happen to know for certain. He is particularly intimate with Mr. Willis, and they mutually esteem each other's great talents. M. Cavaillé has frequently been heard to say that, if anyone wants to study the new improvements in organ building, he must come to England, and he has, in fact, frequently sent his friends to Mr. Willis and others to see their works. The fact is, that Germany, Belgium, and France have had to copy English mechanism, as I find in a work, a few years old, published on the Continent, the contrivances that were really developed in England by Hill and Willis in 1851. Notwithstanding your correspondent's opinion to the contrary, there is not a question that architecture has made rapid strides of late years, though still there is far too much mere copying—too much fear of getting out of the beaten track of precedent. Fortunately organ building has been able to forsake the old routine, and strike out a new and original scope for itself. A man like Mr. Willis has not now to ask himself whether his tone is like that of the Haarlem organ. He makes up his mind what tone he wants to get, and goes straight forward to get it, and usually succeeds in a marvellous manner. Of course there are many who will lift up their eyes and say that his tones are not a bit like their old favourites, which is likely enough; but the time will come, if it has not come already, when the soft emasculated tones of the old-fashioned organ will be no more desiderated than the pleasant tinkle of the spinnet or harpsichord. Of this I am quite sure, that England has nothing to fear from foreign organ builders, except so far as she is so often and so fatally influenced by fashion, without taking the trouble to examine for herself. We are naturally a musical nation—a very musical nation; in critical power second to no other. It will be a great pity if we allow ourselves to be talked into a neglect of our national organ builders, and thus stop the progress of an art which, under the hands of such a man as the builder of the Liverpool, Albert Memorial, and Alexandra Palace organs, seems likely even still to develop in a manner that will astonish us all.

J. C. J.

DECORATIONS OF THE NEW FOREIGN OFFICE.

On Wednesday evening last, Mr. Disraeli held a brilliant reception in the grand saloon of the new Foreign Office. "The building," says the *Daily News*, "has only been out of the hands of the contractor since last Thursday, and great exertions have been necessary to make it ready for last night's reception. The entrance was from the Downing-street gateway, the visitors alighting on the right-hand side and passing into the lower corridor, which runs from east to west the length of that wing of the building. The walls of this corridor are panelled in vellum and tint and amber, with dado of green. For the occasion the openings in the walls were covered with crimson cloth, and a plentiful supply of exotics formed an agreeable avenue for the visitors to pass through. The grand staircase is situate at the centre of the lower corridor, on the left-hand side. It starts from the centre, working up right and left on to the corridor on the principal storey. The basement pillars of the hand rail of the staircase are made of fine Devonshire marble, highly polished, the hand rail is of dove-colonred marble, the balusters of fine alabaster, and the strings and courses of black marble. The lower stage walls are of amber colour, charged with honeysuckle pattern in gold and black. The dividing panels are of black, with arabesques of tridents and dolphins, with the royal initials in gold; the royal arms emblazoned in full colour and gold forming centre features. The upper stage walls are of soft toned green powdered, with ornament in white, black, and gold, dado of deep green panelled with black lines, with fret in black and yellow for borders. The various marbles used in the lower staging are Irish green, Devonshire, Dove, Sienna, Princes red, and black,

enriched with gold mouldings. This staircase is lighted during the day from the south by seven windows, and at night by two corona gas chandeliers suspended from the ceiling on either side of the domed centre. The roof of the staircase is deeply coffered—the panels contain ornaments in bold relief, treated richly with gold, the mouldings being of green, of pale greyish hue. The central portion of the roof will display a rather flat cupola with pendentives, the latter to bear figures of the quarters of the earth, the former a series of figures representing various nations, arranged beneath a zodiacal circle, and a vault of pale blue powdered with stars. The corridor on the principal storey is supported by columns of British granite, over the capitals being a decoration of frieze. In the principal corridor the columns are of Devonshire marble, surmounted by a decorated frieze, the ceiling being of pale blue, charged with ornaments in gold. The grand corridor is divided into seven arches, each arch on either side being ornamented with most elaborate designs in stone work, in the nature of arabesque, comprising scroll work interlaced with flowers, fruit, animals, &c., in pleasing variety, and of great beauty of workmanship. The rooms on both sides of the grand corridor were used last evening as refreshment and retiring rooms. The grand centre to which the company converged was the Secretary of State's saloon. This magnificent room is lighted by five windows, three looking out upon the enclosure in St. James's-park, and the other two in the direction of the Duke of York's column. A magnificent chandelier, suspended from the centre of the ceiling, supplemented by small candelabra fixed round the walls of the room, most effectively lit the room last evening. Of the apartment itself it is only necessary to say that the walls are prepared in sage green bordered with black. The field is powdered with ornaments in gold and black, and the border enriched with an intricate arabesque in gold. The ceiling of the room is coffered in octagons, geometrically arranged, decorated in pale green and gold, the girders being panelled with ornament in porcelain, white in relief on amber tint. The general effect was most agreeable. The principal saloons were most brilliantly illuminated under the superintendence of Hancock and Rixon. At ten o'clock the visitors began to assemble, and comprised the elite of society at present in town, as well as several members of the Royal Family."

PARLIAMENTARY NOTES.

In the House of Commons on Friday, Mr. Schreiber asked the Vice-President of the Committee of Council on Education whether his attention had been called to recent discoveries on the site (hitherto lost) of the manufactory of old English porcelain at Bow, as announced in the Building News last week. The honourable member expressed a desire to know whether Lord Montagu would enter into communication with Messrs. Bell and Black, with a view to the further prosecution on their property at Bow of discoveries so important and interesting in the history of English art. Lord R. Montagu said it was true that interesting specimens of old English china had been discovered at Bow, and that some specimens had been sent to the Museum of Practical Geology, where they had been identified as of the same kind as specimens before existing, but of hitherto unknown manufacture. Messrs. Bell and Black have offered to reopen the diggings, if it was thought that it would be of any advantage to the study of the history of English ceramic art.

TECHNICAL EDUCATION.

On Tuesday evening last Mr. Samuelson moved for a Select Committee to inquire into the provisions for giving instruction in theoretical and applied science to the industrial classes. In an interesting speech he canvassed the working of the schools under the Science and Art Department, showing that the results were unsatisfactory, and that a great improvement in scientific education was necessary for the development of our manufacturing prosperity; and he held out a strong hope that it would, at the same time, promote the literary and general education of the working classes. The motion was seconded by Mr. Dixon and supported by Mr. Baines, who held that a strong case for inquiry had been made out, but preferred that it should be by a Royal Commission. Mr. Bazley was inclined to trust for our manufacturing progress to the inventive genius, enterprize, and self-education of our manufacturers, rather than to technical education, and exhorted them to put their own shoulders to the wheel, instead of appealing to the State for help. The duty of the State, he insisted, was to give a good primary education, and with that we need not despair that the English workman would keep pace with the world. He denied that we were retrograding in any branch of manufactures, and he deprecated the interference of the State in the education of the workshop. Mr. E. Potter took entirely the same view as Mr. Bazley, and denied that it was the duty of the Government to supply a kind of education which the manufacturers themselves had done so little to promote; and Mr. Bagnall argued that technical education was more needed for the class of managers and overlookers than for the working men. Lord R. Montagu held it to be proved beyond doubt that in many branches our manufacturers were being closely pressed by foreign competition, though this did not arise so much from the deterioration of our processes as from the improvement and increase of Continental manufactures, and the completion of the foreign system of railways. He mentioned numerous cases within his own knowledge in which foreign manufacturers had successfully competed with us even in our own markets, and the cause he held to be that though we had iron, coal, cheap transit, intelligent, industrious, and tasteful workmen, we wanted technical education. After an elaborate discussion of the meaning and objects of technical education, he laid it down that the duty of the State did not go beyond giving the workman such knowledge of the natural laws applicable to his calling as would enable him to exercise it with the greatest effect. The State had to do with the brain, the workshop must perfect the hands. He traced the improvements effected in many branches of our manufactures by the educational movement which was the result of the Exhibition of 1851, and he argued that the chief things to be avoided were the establishment of special schools and of State manufactures for the encouragement of trade. The recent Minute of Council for the creation of industrial schools, he explained, had been very successful, and he concluded by acceding to the motion for a Committee. Mr. H. A. Bruce dwelt on the importance of elementary education, and Mr. Henley defended the working-classes from the imputations of ignorance recently made against them, the motive of which, he hinted, was not altogether disinterested, inasmuch as he had noticed in the reports that these highly-educated foreign workmen invariably worked longer hours and for less money. He ridiculed the suggestion that a trade could be taught in school; the workshop was the only training-school. The Committee was agreed to, after some observations from Mr. Paget and Mr. Acland.

THE THAMES EMBANKMENT.

The *Times*, in an article on this subject, says, "The public will rejoice to hear that they have really a prospect of soon enjoying some of the benefits they have long promised themselves from the Thames Embankment. We have reason to believe that the whole of the completed part of the Embankment will be forthwith prepared for public traffic. It is not easy to estimate the boon which will thus be conferred upon the busy portion of the metropolis. The two chief centres of life in London are now the City and Westminster, and the transaction of business—which means the maintenance of the activity of the Empire—depends on the communication between those two centres. At present they are united by an indirect, a tortuous, an obstructed, and a narrow lane, which it is a mockery to call a thoroughfare. If the streets of a city may be compared to the veins of a complex animal, the Strand constitutes a kind of aneurism in the most vital part of the body. It would, indeed, have been an inexcusable waste if the fine space of ground already reclaimed from the mud and refuse of the river had been allowed to remain unoccupied merely because there was more to be added to it. 'Half a loaf is better than no bread,' and the portion of the Embankment already constructed is considerably more than half. Let us, for a moment, consider more precisely what will be gained. The lawyers, in the first place, and the great hive of Parliamentary as well as legal industry which is concentrated in the Inns of Court, will be placed in direct and easy communication with the Houses of Parliament and the chief Courts of Law. A glance at the map will show that, even apart from the crowded state of the Strand, this is a great gain. Charing-cross is the centre of an arc, of which Temple-bar and the Houses of Parliament are the two extremities, and of which the river or the Embankment is the string. We shall, in fact, go straight across the arc instead of going all round it, and when we add to this that we escape the delays of the Strand, it is probable that more than half the time now consumed between the two places will be saved."

The same paper suggests that the roadway, or at least the footway, of the Embankment should, for the present, be admitted into King's Bench-walk, in the Temple, and thus be placed in communication with the street leading thence to Blackfriars-bridge. For foot passengers we can see no reasonable objection to this arrangement. If the Templars should object to any part of their precincts being disturbed by carriage traffic, they may remember that they themselves will be at first more benefited than any one else by the improvement, and might, therefore, gracefully consent to make some temporary sacrifice. But the great and obvious advantage of such a plan would probably be sufficient to insure its adoption, if the construction of the Embankment renders it feasible. To discharge the traffic of the Embankment into Fleet-street solely by the narrow streets west of the Temple must, in some degree, occasion the same inconvenience as is experienced at the junction of Park-lane and Piccadilly. If any portion of it could find its way into Bridge-street, so as to unite with the main stream where that broad thoroughfare crosses Fleet-street and Ludgate-hill, we should probably escape all confusion, more especially as the Corporation have already commenced the works which are to widen the bottom of Ludgate-hill.

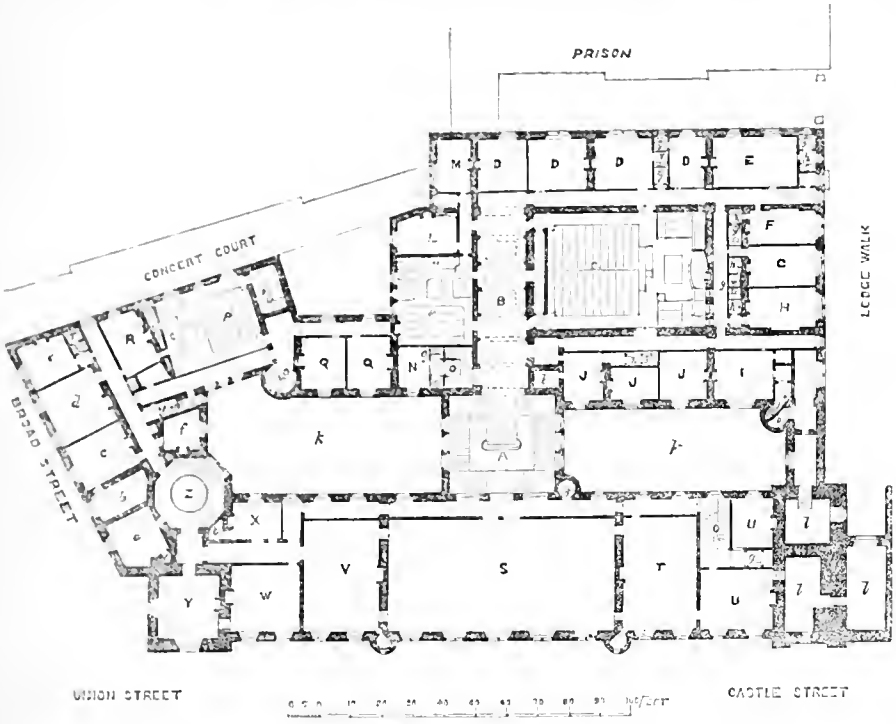
BUILDING AND LAND SOCIETIES.

The United Building Society, Birmingham, held its eleventh annual meeting last week. From the report it appears that the receipts for the past financial year had been £14,293 15s. 7d., forming in the aggregate nearly £153,000. The profits, inclusive of the reserve and deferred premium fund, amounted to £1,657 1s. 2d. The directors request the auditors to add 5 per cent. compound interest to the credit of all the members. This would leave a balance of £812 15s. 10d. in favour of the society. The report further announces that Mr. George Dixon, M.P., had accepted the office of president of the society, in the room of Mr. Wm. Scholefield, M.P., deceased.

The eleventh annual meeting of the Exeter Freehold Land Society was held last week to receive the report of the directors. The society has to be congratulated on the satisfactory progress it has made. The report shows extremely favourable results. We find that the number of members at the end of the year was 724, holding 1,096 shares, an increase of 118 members and 224 shares. The total of the receipts in the year amounted to the large sum of £8,050 7s. 6d., and the profits realized amounted to £1,110 4s. 5d. This enabled the committee to pay a dividend of 7 per cent. per annum, to carry £100 to the reserve fund, and a balance of £100 to the credit of the ensuing year's account. Since the establishment of the society there has been 429 allotments purchased, at a cost of £20,000, and above 100 houses have been built upon them, at a cost of £30,000.

Though the past year was one of great commercial depression, the directors of the Halifax Permanent Benefit Building Society, in their fifteenth annual report just issued, congratulate the shareholders on the continued progress of the society, as compared with former years. The total receipts for the year was £113,396, being an increase of £19,976 on the last year. As many as 2,045 shares had been taken up by 741 new members, or 73 shares more than the previous year. The withdrawals paid to members had been £15,365, less by £6,031 than last year. In the deposit department there had been invested £43,074, an increase upon the former year of 103 depositors and £11,498. The withdrawals amounted to £22,830, £5,727 more than last year. The sum lent upon mortgage during the year had been £50,397, being £8,918 more than the previous year. This being the bonus year, the directors recommend that £290 should be carried to the reserve fund, and the remainder appropriated for bonus among the members.

PLAN OF NEW TOWNHALL, ABERDEEN.



REFERENCES.

A. Principal Staircase.
B. Corridor.
C. Court Room.
D D. Witnesses' Room.
E. Procurators of Court Robing and Consulting Room.
F. Counsels' Robing Room.
G. Judge's Room.
H. Jury Room.
I. Sheriff's Room.
J. Procurator Fiscal's Room.
K. Small Court Room.
L. Sheriff's Room.
M. Jury Room.
N. Officer of Court's Room.
O. Staircases.
P. Borough Court Room.
Q Q. Witnesses' Room for Borough Court.
R. Magistrates' Declaration Room.
S. City and County Hall.
T. Large Committee Room for County.
U U. Rooms for Clerk of Supply.
V. Council Chamber.
W. Town Clerk's Office.
X. Clerk's Room.
Y. Record Room.
Z. Staircase.
a, Council, Record, and Sasine Office
b b. Safes.
c. Chamberlain's Office.
d. Chamberlain's Clerk's Room.
e. Deputy Town Clerk's Office.
f. Town Officer's Room.
g g. W. C.'s, lighted from Roof.
h h. Lavatories do.
k k. Open Courts.
l l. Strong Rooms in Old Tower.

NEW TOWNHALL, ABERDEEN.

WE give this week an illustration of the new townhall about to be erected in Aberdeen, at a cost, including the site, of about £60,000. The building is in the Gothic style, but strongly impressed with the well-known characteristics of the old Scottish architecture. The most striking feature is the tower, which rises without a break to the height of 72ft., and is 28ft. square. The great hall on the first floor is 76ft. by 46ft. by 48ft., and the edifice will have a frontage in Union-street of 200ft., and in Broad-street of 115ft. It will be built of granite, and will, probably, be the most picturesque building yet attempted in that hard material.

LIVERPOOL ARCHITECTURAL SOCIETY.

SEVERAL topics of interest were brought forward at the meeting of this society held last week. Mr. Kilpin, the president, made some remarks with reference to the local building bye-laws. At a previous meeting it had been determined to present a memorial to the town council praying for a revision of the local building act and bye-laws, but the chairman explained that it had not been yet sent. With respect to the building act, Mr. Kilpin said that the absurdities were so flagrant as to require immediate consideration and, if possible, an effectual remedy. Mr. Shoolbred said he had put up a roof covered with zinc in Liverpool, and the amount of timber he had been obliged by the building act to put into it amounted to 450 per cent. compared with what would be required in London or elsewhere, and it added 160 per cent. to the cost of the framing of the roof. This additional amount of timber in no way conduced to the strength or stability of the roof, but, on the contrary, weakened it considerably by adding an amount of dead weight the supporting frame was not calculated to bear. Mr. R. Jahns exhibited a new surveying instrument, of which he is the inventor, called the auto-planograph, the object of which is to dispense with the necessity for measurement with the chain in surveying operations. This instrument, according to the inventor, enables everybody who is able to read to take a very exact land survey of any kind, and of the most complicated shape, without taking any dimensions whatever on the ground. At the same time, the instrument draws the most crooked outline of any estate on the spot while working on the drawing-board, and all this is mechanically done by only managing the instrument in a very simple manner indeed. The instrument shortens immensely the necessary time of taking a survey, acting automatically, and the more difficult and complicated a survey in measuring with the chain or other instruments, the greater the advantage in working with Mr. Jahn's instrument, not being obliged to take any constructional lines, angles, or points whatever. The instrument would particularly become highly valuable wherever surveys were required to be done in the shortest possible time. Mr. H. H. Statham, junr., afterwards read a paper entitled "What is an Architect?"

CHURCH OF ST. NICHOLAS AT BLOIS.

THIS church consists of a nave of four bays, with aisles, and a narthex between the two western towers, transepts of two bays each, and choir of two bays, with double aisles on either side, the outer ones terminating easterly in small apsidal chapels. The choir finishes with a fine chevet of seven compartments, with three radiating chapels, but the most peculiar portion of this church is a circular lantern at the intersection of nave and transepts, vaulted in eight compartments, with ribs springing from corbels; each compartment has a two-light window. This lantern rests on pendentives of the type seen in the Byzantine domed churches of southern France. The choir bears evidence of having been erected in the twelfth century, but the nave is of later date. The church abounds in beautiful sculpture; we give illustrations of four of the capitals from the chevet, but there are many others equally characteristic.

CAST-IRON STOVES.

THE French Academy of Sciences has lately been discussing the unhealthy effects of closed cast-iron stoves. The result of experiments is to show that cast iron, when heated to a certain extent, is pervious to some gases and vapours, and allows the poisonous products of coal combustion to filter through it, so that a room warmed by a cast-iron stove soon has its atmosphere vitiated by carbonic acid. Hence the headaches and feeling of oppression of which many persons often complain who are obliged to sit long in apartments so heated. The Academy has appointed a committee of chemists to report fully upon this subject. A short time since, a physician of Chambery, in Savoy, was struck with the circumstance that an epidemic fever occurred in Savoy every winter, and he fancied that he had traced the cause to the use in the cottages of cast-iron stoves. It turned out from experiments made that hydrogen, carbonic acid, and carbonic oxide actually passed through the walls of the stoves, and the epidemic was thus accounted for.

SANITARY CONDITION OF LIVERPOOL.

THE annual report of Dr. Trench, medical officer to the borough of Liverpool, has just been issued. A slight improvement is perceptible in the death rate, it being 29·4 per 1000, or 3 per 1000 less than the average rate which has prevailed during ten previous years. Dr. Trench reviews at some length the work of court improvement which has been carried out under the provisions of the Local Sanitary Act of 1864. Three presentments have been made by the grand jury at the instance of the medical officer, and these presentments, besides ordering the total demolition of 384 houses, directed alterations to be made in 108. They required also the removal or the conversion into water-closets of 647 privies and open cesspits. "The one principle (says Dr. Trench) which chiefly regulated the plans of improvement was a desire to obtain the greatest amount of direct ventilation, and of the ingress of air and light to the houses of courts, at the least sacrifice of property. It is not, therefore, without interest to know that the demolition of 384 houses will directly benefit, by the open space thus acquired, 2174 houses, without weighing at all the other advantages to the neighbourhood and the town which will follow the eradication of hotbeds of contagious disease." The cost of the three presentments will amount to £75,509.

Some startling incidents are given in the report of overcrowding and indecent occupation. In 62 instances adult sons and daughters slept in the same room with their parents, and in three instances in the same bed. In 152 instances adult daughters slept in the same room, and in 56 instances in the same bed, with their parents. In 99 instances adult sons slept in the same room, and in 37 instances in the same bed, with their parents. In 214 instances adult sons slept in the same room, and in 158 instances in the same bed, with their mothers. In 37 instances adult daughters slept in the same room, and in 27 instances in the same bed, with their fathers. In 59 instances the mother, with her adult sons and daughters, slept in the same room, and in 21 instances in the same bed together. In 12 instances the father, with his adult sons and daughters, slept in the same room, and in 6 instances in the same bed together. In 7 instances a mother, adult son, and a female lodger slept in the same room, and in 2 instances in the same bed together. In 64 instances a man, his wife, and a female lodger slept in the same room, and in three instances in the same bed. In 12 instances, a man, wife, and male lodger slept in the same room. In 39 instances adult brothers and sisters slept in the same room, and in 20 instances in the same bed. "Surely," says Dr. Trench, "the position of these people is worthy of the consideration of the legislator, the moralist, and the teacher."

BLOIS:

CAPICALS · FROM · APSE · ARCADE · + · CHVRCH · OF · S · NICHOLAS:

The Building News, Mar. 27th 1868

The New Town Hall, Aberdeen.

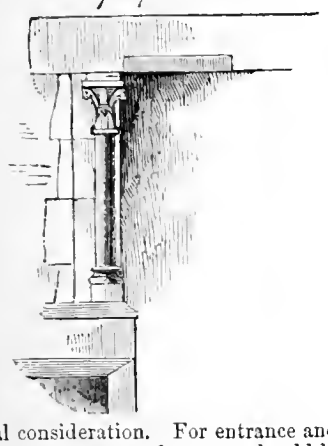
PEDDIE & KINNEAR, ARCHTS

Edwd J Harty, Lith

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—NO. XIII.

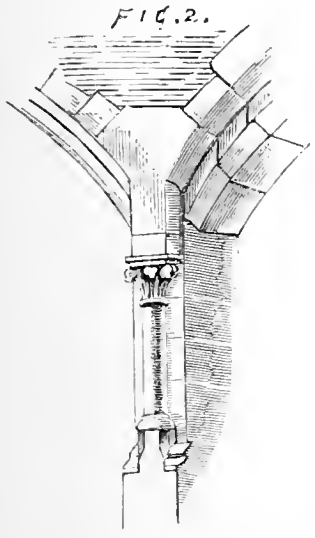
IN our public and domestic structures, the treatment of doorways and window openings, as these become more or less expressive of the character of the building, demands

FIG. 1.



special consideration. For entrance and exit, size and significance of purpose should be conveyed either by boldly recessed or splayed jambs, or by the addition of porches or lobbies externally or internally. The ordinary aper-

FIG. 2.



ture made in the thickness of the outer wall, which, in the majority of cases, is necessarily slight, affords little or no opportunity of obtaining effective depth of reveal of arch. Often, however, the ordinary thickness of wall

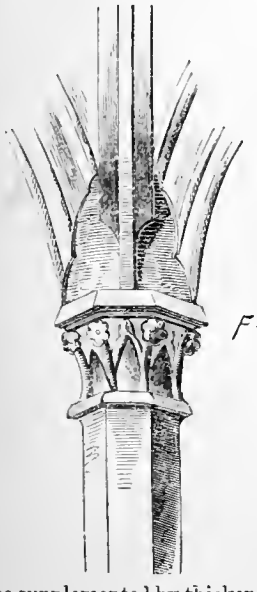
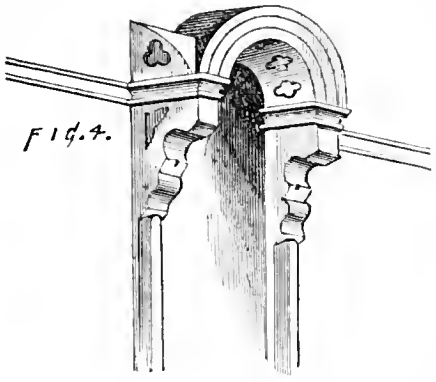


FIG. 3.

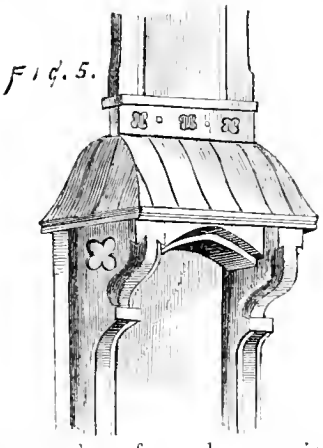
can be supplemented by thickening out, and a splayed recession of jamb may be obtained that gives all the effect required, at the same time strengthening the wall at the entrance. If external, this thickness can often be carried up one or more storeys, emphasizing the windows also, and forming a centre more or less marked. Angle shafts are, I think, eminently appropriate and artistic, both in position and material, for the jambs of doorways and

FIG. 4.



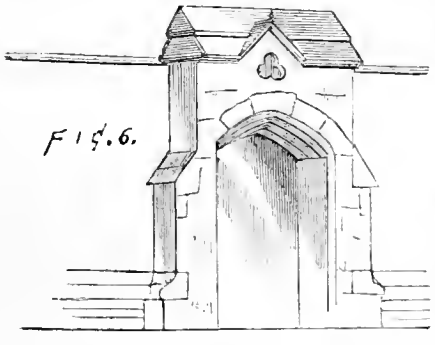
window openings, especially the former, and even flat-lintelled openings admit of their introduction (fig. 1); frequently, however, they are introduced for the love of display, being ostentatiously paraded wherever a simple splay or moulding would have done better. Thus we often see them perched on corbels, doing double service in supporting the heavy

FIG. 5.



crushing members of an arch; or again, often so slender and isolated as to appear the ludicrous mimicries of more substantial supports. The writer has occasionally noticed a central brick pillar surrounded by puny slate or marble shafts that give one the impression rather of iron bars or props, highly suggestive of buckling than of the artistic accessories of a stable shaft of masonry; and this defect is often quite as apparent when these pillarets

FIG. 6.



are tied or banded to the central shaft as in some of our Early English examples as seen in Salisbury and Chichester Cathedrals and Westminster Abbey. Figs. 4, 5, and 6 show designs for emphasizing door and window openings, and serving the office of hoods to them.

The "hangers" of the forthcoming Royal Academy Exhibition will be Messrs. Maclise, Sydney Cooper, and Calderon.

ARCHÆOLOGY.

The twenty-second annual meeting of the Sussex Archæological Society will take place in August next, in the Tunbridge Wells district, though the exact locality has not yet been determined on. The society appears to be in a flourishing condition, and Vol. XX. of its transactions is now in the press.

Mr. J. H. Parker, of Oxford, who is spending the winter in Rome, has lately read before the British Archæological Society there, a paper on the walls and gates of Rome in the reign of Servius Tullius, which he has been able to trace out in their entire compass.

At the meeting of the British Archæological Association on Wednesday evening, Mr. Holt exhibited the iron lock of the *dressoir de sacristy* of the parish church of St. Michael, Beauvais, a very beautiful specimen of the ironwork of the fourteenth century. Mr. Bailey exhibited Roman remains exhumed about two years since in Lombard-street, and bearing marks of fire, so far confirming the account of the fire of the time of Boadicea. It was announced that on the next evening Mr. Gordon Hill, who had been unable to attend on this evening, would read his paper on the "Discoveries at West Hampnett Church," and Mr. S. Cuming a paper on "Siguacula found in London."

During the demolition of an old house in High-street, Linlithgow, Scotland, in the course of last autumn, two interesting examples of decorative painting of the latter part of the sixteenth century were brought to light. On removing the comparatively modern plaster ceiling of the two rooms on the first storey, it was found that the underside of the flooring and joists of the room above were painted over their entire surface with heraldic and foliated designs. These had been executed in water-colour tempera, which, when exposed, was found to adhere very slightly, owing to the decay of the surface of the wood. The ceiling of another room was occupied with the heraldic blazons of fifteen barons and twenty-two earls of Scotland. Corouets were painted over the escutcheons of the earls, that of the Earl of Arran's differing from the rest in being foliated. A third room contained five escutcheons of Scotch nobles; the rest of the ceiling was filled with a conventional design, surrounding a terminal female figure, an emblem of the sun, human heads, griffins, and birds. The beams of both ceilings were decorated with a guilloche pattern in black. These interesting paintings formed the subject of a paper read before a meeting of the Society of Scottish Antiquaries last week, by Mr. T. E. Cooke, who has presented drawings of the ceilings to the society.

COMPETITION.

THE Metropolitan Asylum District Board have awarded, by the voice of the special committee, the first premium of £250 for the best plans and designs to Mr. Giles (Giles and Biven), for the asylum at Leavesden; the second, of £150, to Mr. A. Wilson; and the third, of £100, to Mr. F. H. Pownal. The following are the names of the competing architects, with their estimates:—Messrs. Tolley and Dale, £65,000; Mr. W. Lee, £82,000; Mr. F. H. Pownal, £108,800; Mr. A. Wilson, £91,000; Mr. J. Giles (first premium), £66,700; Mr. T. Worthington, £94,300; Mr. H. Jarvis, £78,000; Mr. M. P. Manning, £92,000; and Mr. J. E. Knightley, £125,000.

NOTICES OF PUBLICATIONS.

"Terra-cotta Chimney-shafts, Pots, &c." Parts 1 and 2. By J. M. BLASHFIELD: Stamford.

MR. BLASHFIELD, of Stamford, has published two parts of a work on the uses and application of terra-cotta. The work consists entirely of illustrations of terra-cotta chimney-shafts, chimney-pots, balustrades, panels, or perforated tracery ornaments, terminals, &c. He says, in the very few sentences of letterpress which accompany the illustrations, that Portland cement should not be used for filling in the interstices of terra-cotta work, as it is invariably disposed to expand in hardening, and frequently when used for such purpose bursts the work. Though the work is issued in parts, it does not pretend to be anything but a superior trade catalogue.

"A Treatise on the Petroleum Zones of Italy." By E. ST. JOHN FAIRMAN, F.G.S.: London, E. and F. N. Spon.

THE clear skies, the serene beauty, the marble quarries, and the vineclad hills of Italy have been

themes of observation for ages. We are now told by the author of this pamphlet, that Italy has another source of wealth, namely, petroleum. He says that he has witnessed very distinct indications of it in various places, and more especially in the provinces of Modena and Reggio. He says:—"We know from the testimony of the most ancient writers that petroleum has been known to exist in the spots I have indicated from time immemorial. Herodotus, Pliny, Spallanzani, Valisneri, Humboldt, &c., &c., &c., all speak of the Salse of Querzuola and of Sassuolo, and bear testimony to the fact of oil being collected by the peasantry from the surface of the oil springs for household purposes. In considering the enormous revenue obtained in America from this precious material, and the almost fabulous fortunes made by private individuals thereby in an incredibly short space of time, I have been led to believe most sincerely that the like splendid results would be obtained in Italy, were it possible to induce either the Italians themselves or foreign capitalists to engage in an enterprize which offers such fair hopes of a successful issue. I have explored the petroleum zones in that stretch of country which extends from the south of Milan to the south of Bologna, and along the confines of Modena commencing at Pavullo, and in several places I have detected the undoubted presence of petroleum; and in those spots more particularly described in this work, the indications are very strong."

"The Builder's and Contractor's Price Book for 1868." Revised by George R. Burnell: London, Lockwood and Co.

This well-known compilation is before us, but, difficult as it is to give judgment as to the merit of any severely technical work, a price book is certainly the most unsatisfactory. If the calculations in such a work are found to be clearly arranged and correct, it will, by weight of its own merit, command a sale; therefore, to say that this book has been through many editions, is, perhaps, the best praise that can be given. But something must be wrong somewhere in the manner of putting together the prices of these works, when they all differ to such an extent. Of three which lie before us, we will compare the prices for three items taken indiscriminately, and they will be found to differ seriously:—In bricklayer's work, take place-bricks laid dry in wells, &c., and the prices given in the three books are £9 5s., £10 9s., and £10 10s. respectively. In joiner's work, deal doors, 4 panel square, 1½in., the prices in the three books are, per foot super, labour, and nails, 5d., 6d., and 6½d. In mason's work, Yorkshire stone, labour on moulded work, per foot super, there are three prices in the three books, *i.e.*, 2s. 9d., 2s. 6d, and 2s. to 3s. 5d. We repeat that these prices are not picked out, but chosen from hazard. When the doctors differ to such an extent who can believe in their prescriptions?

WATER SUPPLY AND SANITARY MATTERS.

The Castleford Local Board offer a premium of £50 for the best water scheme for supplying the town with water.

The first stone of the new drainage works at Gibraltar was laid on the 20th ult. by Lady Airey, wife of the commander of the city and fortress. The works were designed by Mr. Edward Roberts, assistant surveyor of the War Department, under the direction of Major-General Frome, Commanding Royal Engineer. The contractors are Messrs. A. Kyan, of London, and the amount of the contract £35,000.

A complete system of drainage for the rapidly developing district of Westbury-on-Trym, which is separated from Clifton by the Durdham Down, is contemplated.

The Banbury Board of Health appears to be getting over its difficulties in the matter of applying the sewage to the land. The pipes have been laid and a reservoir built for some time; but, when they intended to commence, the condenser of the engine became too hot for working, and they had to leave off pumping to give it time to cool. This difficulty has now been overcome, but another has presented itself in the passage of the sewage under the two lines of railway, which interpose between the greatest part of the farm and the river. It is easy for it to cross, but the difficulty is to raise it again to the proper level to irrigate the remaining portion of the property.

Liverpool.—The Health Committee of the Liverpool Corporation were engaged, at their meeting last week, in discussing the subject of "jerry" building in that town, and several points of considerable importance were elicited. Dr. Trench, the medical officer of health, stated that, in spite of the efforts of the Health Committee, "jerry" builders and others managed to evade the laws and erect buildings hundreds of which were mere living tombs. He also pointed out as a curious fact that, while many of the streets through which the north-west breezes (prevalent at Liverpool) could blow direct from the sea were comparatively healthy, the streets nearest the mouth of the river had been for the most part built so as to exclude the westerly wind, and that in those districts fever and other diseases were rarely if ever absent. It was, he said, painful to think that, while the town council could vote thousands of pounds for parks, in which the working population could have but very moderate enjoyment, it seemed almost impossible, with the present legal enactments, to purify and cleanse quarters of the town where fresh air, light, and cleanliness were so necessary. Mr. Robinson, a member of the committee, said it was a lamentable fact that in Liverpool, the richest port of the United Kingdom, one in every eleven of the residents in the parish was in receipt of parochial relief—20,000 persons being out-door, and 5,000 in-door paupers. It also transpired that the Liverpool magistrates last week had fined two builders of the "jerry" class for building houses without mortar, street sweepings having been employed as a substitute.

Building Intelligence.

CHURCHES AND CHAPELS.

A south aisle is being added to Lillington Church, Warwickshire, similar to that recently erected on the north side of the edifice. Additional accommodation will thus be afforded for over one hundred persons, and at the west end of the new aisle space will be appropriated to the organ. Mr. W. Ballard is executing the work.

On Saturday last the new church of St. Peter, Birkenhead, was consecrated by the Bishop of Chester. The church, which is entirely built of brick, will, when completed, consist of a nave and aisles of five bays, chancel aisles, and chancel. Of these, however, only the nave and aisles with western narthex are as yet finished. The church will accommodate about 700 at a cost of £2,500, all the seats being free. Mr. David Walker, of Liverpool, was the architect, and the late Mr. John Hogarth, of Rock Ferry, the contractor.

The amount subscribed for the restoration of Holy Trinity Church, Hull, is £17,075. The tender of Messrs. Simpson and Malone for restoring the south side of the nave, at a cost of £3,450, has been accepted. The work will be at once proceeded with.

A new Moravian Chapel has been opened at Baildon, Yorkshire. The style is Gothic. The building will accommodate 600 at a cost of £1,400. Mr. S. Jackson, of Bradford, was the architect.

The laying of the foundation stone of the new nave of Bristol Cathedral is fixed to take place on the 17th of next month.

The twenty-eighth annual meeting of the Ripon Diocesan Church Building Society was held last week at Leeds. We regret to notice that, in consequence of a falling-off in the annual subscriptions, the society will be obliged, as it states, to diminish the scale on which grants had been hitherto made, and thus to impair the usefulness of the institution. The Bishop of Ripon, who occupied the chair, in moving the adoption of the report, gave one or two interesting statements of the society's labours during the twenty-eight years of its existence. It had contributed to the erection of 109 new churches, had augmented church accommodation in 47 different churches, and had provided altogether 66,396 additional sittings. The society had also been instrumental in erecting 148 parsonage houses, and had augmented the endowments of 77 poor livings. For the accomplishment of these objects it had raised and expended £88,595, though altogether these objects had required £472,710, and, deducting from that sum the £88,595, it appeared that the society had been the means indirectly of calling forth no less a sum than £384,115.

BUILDINGS.

On Thursday week the foundation-stone of the new District Schools of St. Titus, Liverpool, was laid. The design will be of a plain character, executed in grey bricks and stone dressings. The building will accommodate 500 children at a cost of £4,000. The architects are Messrs. Culshaw and Sumners, and the contractors, Messrs. Borroughs and Son.

A considerable improvement is now being effected at the corner of Fenchurch-street and Gracechurch-street, one of the busiest points in the city. The church of St. Benet is nearly demolished, and a large space of the opposite corner of Fenchurch-street has been rounded off and added to the roadway, affording room for another line of vehicles.

A central market is proposed to be erected at York-road, Battersea, by a joint stock company. Houses are rapidly springing up round the site, and seven railway lines already communicate with it. The land taken for the purpose adjoins the Thames, and it is intended to form a wharf for landing cattle.

New almshouses have been recently erected at Shepton Mallet. They accommodate four persons, and each comprises a living room, pantry, and bedroom. The walls are built of local stone, hammer dressed externally with Doulting quoins and dressings. Mr. Ferrey was the architect, Mr. Fudge, the contractor for masonry, and Mr. Stock, for carpentry, both of Shepton Mallet.

The new dock at Williamstown, Australia, the memorial stone of which was laid by the Duke of Edinburgh, will, when completed, be 420ft. in length over all, and 400ft. long on the floor within the entrance. It will be 97ft. in width on the top, and the entrance will be 80ft. wide in the clear. At ordinary spring tides there will be a depth of water of 24ft. 6in. on the sill at low water, and 27ft. at high water. The entrance will be closed by an iron caisson. The dock is built of the basaltic stone of the neighbourhood, known as bluestone, and is estimated to cost when complete, with pumping engines, &c., £185,000. The works of the dock were commenced in November, 1864 and its completion is expected by the end of 1869. Engineer, Mr. W. W. Wardell.

On Monday afternoon the foundation-stone of a new Masonic Hall was laid at Gateshead. The style adopted is Gothic, and the building will be entirely of stone. The estimate is £,1500. The hall was designed by Mr. Thos. Oliver, of Newcastle, and the contractors are Messrs. N. and R. Reed, also of Newcastle.

The Banquetting Hall, almost the only remaining portion of the old Mansion of Crosby Hall, Bishopsgate street, has been again adapted to its original purpose. It is opened as a city dining and refreshment rooms. The walls have been richly coloured, but the old constructive forms of Gothic stonework are plainly discernible. Mr. F. H. Francis is the architect, under whose supervision the works have been carried out by Messrs. Wallace, Gordon, and Co.

The Select Committee on the House of Commons arrangements, according to the *Owl*, have at present under consideration plans submitted by Mr. Barry for the construction of a new house, to be built across the east court, near the Speaker's residence. The entrance is to be from the present chamber, which it is proposed to convert into a vestibule. The new building will seat about four hundred and ninety members, and will be sixty-three feet square, with division lobbies thirty feet wide at either side. If sanctioned by Parliament it can be built and opened within two years at a cost of about £100,000. The committee are decidedly opposed to any suggestions for a tribune from which members should address the house.

The authorities of Islington are about to build a workhouse for 1000 inmates, with all the necessary offices. Although the architect's estimate was at £30,000, there have been so many alterations and enlargements of the original plans and elevations, that the work will it is now calculated cost £70,000

The erection of the new buildings for the Charter-house school at Godalming has been placed in the hands of Mr. Hardwick. An important Governors' meeting will be held as soon as practicable to consider the plans.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—P. and B.—S. A.—1 E. A. G.—A. M—B. and Sons—I. S.—F. and B.—W. W.—I. I S —I. M. S.—K and I Co.—W. Y.—1 C. I.—E. G. D.—B and C. E. P.—I, N.—E. G. S.—I. P. S.—S. H. R.—C. W. M. H.—W. H W.- I. R T.—T. and R B.—A W.—1, W. R.—I. A.—I. B. and Co.—R. W.—I. H.—X. Y., don't remember. —G. T R.—R P.—G. E. R.—W. R. W.—Col. S —Rev. D. H.

A Constant Reader.—Mr. Roberts's work on the "Dwellings for the Labouring Classes," is published by the Society [for Improving the Condition of the Labouring Classes, 21, Exeter Hall, Strand. Write to the secretary.

Correspondence.

PUGIN *v.* BARRY.

To the Editor of the Building News.

Sir,—So far as it is likely to serve his cause, Dr. Barry's lately published "postscript" had as well not been written. His arguments are weak and inconclusive. He charges Mr. Pugin with raising the question about the photograph drawing in order to take the matter "off the broad basis on which it had been placed." This, I am sure, is not true. The question of the authorship of the throne drawing has given greater popularity to the controversy, and many strangers to Mr. Pugin, including the present writer, have publicly expressed their opinion, but it is not just to make Mr. Pugin answerable for his anouymous and unknown friends. Dr. Barry says, that the initials in dispute refer to the Prince of Wales, and are accordingly placed where they might naturally be expected to be. I positively deny this. On reference to this design it will be seen that these historical letters are on the inside of the brattishing of the throne canopy, where no initials but those of the sovereign could reasonably be placed. The canopy over the seat of the Prince of Wales is on a much lower level, and quite distinct from the canopy of the throne. Moreover, the letters being on the back of the brattishing would, if executed as shown, be either invisible, as on a shield, or, if open cut, be seen reversed. If Sir Charles Barry was the clever author of this design, is it likely, with his fastidious carefulness, he would have made such a blunder as this? The letters, so it appears to me, are not a part of the design, and were only inserted as proofs of authorship by him to whom the initials belonged. Initials are not shown in any other part of the canopy as drawn, nor are any in the executed work. The reiterated statement about Pugin's practice of signing by a cipher is wide of the mark—exceptions prove the rule. The Doctor advertises his continual willingness to exhibit the original drawing to the Institute. Why does he not do it? Not only let the Institute see it, but the public. Only those who fear the truth need fear the light. *Fiat lux!*—I am, &c.,

Justitia.

Sir,—It is not necessary for Mr. E. Pugin to go to the aphorisms of "Junius," or any other party, for the language of personal abuse, so long as his own vocabulary is so very rich. I shall not imitate him either in his quotations or his own vernacular, but I will again assert that his statements, generally, have been untrue; that his subterfuges and contradictions have been apparent, and that his absurd and unjust assumptions have not been believed, as they were evidently made with a view more to his own advantage than for his father's honour. As regards the authorship of the drawing in question, I am as certain as I am of my own existence, that it is Sir Charles Barry's and not A. W. Pugin's. Mr. E. Pugin charges me with contradicting Mr. Herbert, or, to give his own choice expression, "having the insolence to give Mr. Herbert the lie"; but he forgets that I am one of the many who are prepared to do the same thing. Mr Clayton has done so in your last edition; besides, many other persons who have seen the original drawing will support me; amongst those I will ask Mr. Pugin if his brother-in-law, Mr. J. Powell, has not seen this drawing also, and has informed him that I am right and Mr. Herbert wrong?

Now, as to the design for the Throne, Mr. Herbert seems to have a "strange confusion of the mind" when he states he "so well remembers Mr. Barry sending Mr. Pugin the design for this Throne," which he calls a "testa," in disparagement of it. Now, if Mr. Herbert, on Mr. Pugin's behalf, repudiates this design, how is it that he now is so anxious to claim it for Mr. Pugin by false statements? or, how is it that Mr. Herbert, who expresses so much esteem that he would "gladly have made a bridge of gold for Mr. Barry" (see letter in Building News, March 6), should not have gone in an honourable way to the said Mr. Barry and have satisfied himself before he made the grave charge against him in the *Standard* that he was passing one of Pugin's drawings off as having been made by his father, as, in the letter of Feb. 24, where he states, "The photograph is taken from the actual drawing made under my eye"; and, further, "the man who could have made this drawing must have had your father's (Pugin's) power of doing all that he accomplished before and after." Mr. Herbert continues that he is "shocked at seeing that Messrs Barry should have made so grave an error."

Now that the authorship of this drawing is beyond a doubt, these statements cannot be facts, and the public will be "shocked" at the very hurried way in which Mr. Herbert has "rushed" into print" to prove rather too much for Mr. Pugin, and will add them to the long list of mis-statements which have been so abundantly put forth to assist the absurd claims for honours which his father had repudiated both publicly and privately.

I do not desire to be drawn into further controversy with Mr. E. Pugin, as his letters are repetitions of mis-statements, with more or less of the element of personal abuse mixed up with them; but, as the question of the authorship of the drawing of the Throne is one of fact, and not of controversy, I have felt it to be a duty to give my positive evidence when I saw a grievous wrong being attempted.—I am, &c.,

Talbot Bury.

50, Welbeck-street, W., March 25, 1868.

[We have no desire to vindicate Mr. E. Pugin's style, as we think that he weakens his cause by the unnecessary introduction of unwarrantable epithets. Mr. Talbot Bury, in rebukiug Mr. Pugin, falls into a similar error. He accuses Mr. Pugin of advancing "absurd and unjust assumption, evidently with a view more to his own advantage than for his father's honour." This is about the worst charge one man can make against another. Mr. Bury goes on to disprove Mr. Herbert's statement. Mr. Herbert says, "I saw Augustus Pugin make the design for the Throne." His statement is direct, lucid, and consistent. He introduces circumstantial minutiæ to sustain the statement. Mr. Bury contradicts Mr. Herbert. He is as certain that Sir Charles Barry made the design for the Throne "as he is of his own existence." On what does this certainty rest? on the evidence of his senses? Did he see Sir Charles Barry do the work? Nothing of the kind. He only *infers* that the design was made by Sir Charles's own hand. Now, Mr. Herbert, whose testimony is unpurchasable and whose reputation is European, is certain that Augustus Pugin made the design, because *he saw him do it*. Mr. Herbert used the word "drawing" in the first place, but he subsequently corrected himself, and said he meant "design." If Mr. Bury can't see that his small wave of inference breaks into spray against Mr. Herbert's rock of certainty, he is not likely to continute anything important to the controversy. Mr. Bury not only questions Mr. Herbert's truthfulness—in fact, he is "one of the many who are prepared" to do it; but he questions Mr. Herbert's honour, or "he would have gone in an honourable way to Mr. Barry," and he questions his prudence for "rushing into print." The great majority, however, who do not rush into print will no doubt take another view of it, and will continue to regard Mr. Herbert as pre-eminently a veracious and an honourable man, and they will not think less of him because he has stepped forth chivalrously and tendered his unassailable testimony in vindication of a departed friend.—[Ed. B. N.]

Sir,—To meet the fatal objection, viz., that the Throne drawing bears no evidence of his father's style, Mr. E. W. Pugin now makes the suicidal admission that it may be a copy of his work, made by Sir Charles Barry to hide a dreaded evidence of his aid. On the contrary, Mr. Herbert, upon whose testimony so much reliance has been placed by Mr. E. W. Pugin, avers confidently that he saw the drawing in question while progressing under the hand of Mr. Pugin, whose initials in signature he states he has lately, by aid of a lens, discovered thereon.

These statements obviously destroy each other; for, firstly, if the drawing bears initials signifying Mr. Pugin's authorship, it cannot possibly be a copy by Sir Charles, whose object, in the otherwise superfluous process of reproduction, would be, according to Mr. E. W. Pugin, not to give evidence of Mr. Pugin's work, but expressly to conceal it. Secondly, if the drawing is an original by Mr. Pugin, Mr. Herbert, in remembering to have seen it in progress, would remember also to have been astonished that his friend should belie his natural style by working in one foreign to it

It is not at all necessary, as Mr. E. W. Pugin suggests, to doubt, in rejecting Mr. Herbert's evidence, his entire sincerity in giving it; such a doubt concerning such a man is out of the question. On the other hand, there is no unfairness in supposing that Mr Herbert may be mistaken as to the exact details of a passing incident which took place a quarter of a century ago.

At the Arundel Society's rooms there was exhibited lately a collection of drawings referring to the Throne. One of these, a general design for it, was, beyond all possibility of doubt, by Mr Pugin, the full evidence of whose hand was patent in every touch. It was quite unlike the drawing previously referred to, equally in manner of design and style of draughtsmanship. As in the case of all his other numerous drawings for Houses of Parliament work which I have seen, it bore no initials in signature, but it was freely treated with decorative lettering—clearly, though delicately, defined in fifteenth-century character—in accordance with the general style of the design, and Mr. Pugin's habitual consistency in this respect

By the light of this drawing, which is, no doubt, the one Mr. Herbert saw in progress, reasonably under no surprise as to its style of manipulation, it is easy to understand the mistaken impression under which he has given his opinion in this matter. But, apart from the question of draughtsmanship, there is, I believe, in the disputed drawing, intrinsic evidence which goes far indeed to prove Sir Charles's authorship as to design therein. The repetition of vertical and horizontal lines in uniform order, natural to one trained in a Classic school, and much displayed in the design of the river front of the Houses of Parliament, has been often, justly or unjustly, the object of censure against Sir Charles—notably by Mr. E. W. Pugin himself—who has described how different its treatmeot would have been at the hands of his father; and yet this confessedly un-Puginlike symmetry of square forms and general motive of design are no more stamped upon the river front than they are upon that of the Throne. The general rigidity in the lines of the Throne, and absence of curved forms, which were prominently displayed, and, I think, evidently enjoyed by Mr. Pugin in his version of the same subject, recently shown at the Arundel Society's rooms, were at the time when the work was carried out felt by those, including myself, who were engaged upon it, to be Barry-like without doubt, and therefore essentially un-Puginesque.

The question raised on the Throne drawings represents the key of Dr. Barry's position; for, holding it, he will prove what I think need never have been doubted—that the scope of Sir Charles's powers in design extended far more over elaborately detailed work than Mr. E. W Pugin admits. On the other hand, Mr. E. W. Pugin, could he carry the position, would, after all, prove no more than has been known, and on all sides freely admitted, in honour of his father's genius in designing work more or less of the kind about which so much has been said.—I am, &c.,

John R. Clayton.

311, Regent street, W., London, March 25.

P.S.—It will be obvious that the phrase "15 cut characters," in my letter of last week, was a misprint for "fifteenth-century characters."

Sir,—Mr. Herbert having doubtless quite enough to occupy his time and attention, may I ask space for a few remarks on the letter in your journal from Mr. Clayton, which, rather flippantly, reflects on Mr. Herbert's artistic, no less than his intellectual perceptions?

1. Mr. Herbert is known to be a great artist, and he was the most intimate friend of the late Mr. Pugin; but I have yet to learn on what ground Mr. Clayton rests his pretensions to sit in judgment on Mr. Herbert's convictions or theories on Mr. Pugin's "nature." Mr. Clayton seems to have been originally a modeller of Mr. Pugin's sketches, and is now, I believe, eminent as a glass stainer, but I think these are scarcely qualifications entitling him to place himself on a level with an artist, who can form a better estimate of touch and feeling than either architect or modeller. The photograph in question has been submitted to several artists of eminence, who are conversant with Mr. Pugin's style, and with one coosent they all recognize in it those characteristics which mark it as his. How it can seriously be considered as "entirely different" to his passes my comprehensioo, for the most cursory glance at it will convince anyone who ever saw one of Mr. Pugin's etchings that at all events it is a very successful copy or imitation of his style, and a complete verification of Mr. Edward Pugin's assertion that Mr. Talbot Bury informed him "Sir Charles Barry had so successfully mastered Mr. Pugin's touch, that he scarcely knew his own drawings." Are there any more such drawings said to be the work of Sir Charles Barry?

2. I beg to remind Mr. Clayton that Mr. Herbert did not "seek to establish the identity of Pugin's hand in the Throne drawing by a search thereon for his initials"—he had previously pronounced it to be Pugin's from a simple recognition of his style and touch. He said, "The man who could have made this drawing must have had Pugin's power of doing all that he accomplished before and after." This judgment of an artist on the production of a brother artist, coupled with the fact that Mr. Herbert with his own eyes saw Mr. Pugin make the drawing for the Throne, must, in the judgment of all disinterested persons, outweigh the most plausible considerations against it. It was when Mr. Herbert's testimony met with a flat and scornful denial that he instituted a search for the initials in the expectation of finding them, and his discovery only confirmed a decision at which he had arrived irrespective of it, although it seems to me perfectly immaterial whether the original drawing is Sir Charles Barry's or not—without Mr. Pugin's mind it could never have existed.

3. The photograph, we are told, is reduced from a large

original drawing, defaced and dirty, whereupon Mr. Clayton immediately argues that it is not Pugin's, because it does not come up to his delicately executed drawings. Can anything be more absurd than to declare it never was an etching at all, and then to decide on its authorship as though it were? Is it probable that such a sketch would be as daintily touched as an etching of one of Mr. Pugin's volumes of compositions? Mr. Clayton's compliment about the "swish-tail lions" cuts both ways. If that interesting animal could be clearly drawn within a circumference little bigger than a pin's head, why not A W P, which equally interesting "wormy wriggles" (so strangely taking the form of Mr. Pugin's well known initials), let the Messrs. Barry say what they will, in the words of a living architect a natural enema of Pugin, *pere et fils*, "nothing can ever wash out." Will, however, anyone believe that Sir C. Barry admitting that he made the drawing in question, had in his mind *Arthur Wallace Princeps*, when he introduced the letters "A W P" on the Queen's Throne, and not on the Prince of Wales's?

I take this opportunity of saying that in the volumes of the late Mr. Pugin's etchings and drawings, now in my custody, his name and monogram appear in fifteen different ways, so Mr Talbot Bury, as usual, is wrong.—I am, &c.,

T. J. Burton.

21, Savile row.

P.S. After being informed by Dr Barry that out of the 3000 working drawings made for the Houses of Parliament, only 70 for internal fittings by Mr Pugin can be found, we are now told that "a drawing of the Throne by Mr. Pugin for the estimate drawings (in 1850) is still extant." It was surely unnecessary for Mr. Herbert to notice any description of the nature and object of the estimate drawings by Mr. Gibson and Mr. Banks, as we were informed that they amounted to 200. How then could Mr Herbert assume their existance in order to argue that they had been destroyed, when their existence was confessed?

Intercommunication.

QUESTIONS.

[778.]—STONE CARVING.—I shall be glad if some of your correspondents will kindly give me a little information as to stone carving, stating the various tools required, and the stone used, and what books are published on the subject in a cheap form.—H. C.

[779.]—AGREEMENTS.—I shall feel obliged to any of your readers who will inform me whether a sub-contractor can force a builder to pay for work he may have done, if the sub contractor has not got a copy of the agreement that was drawn up when he took the work to do, and if the agreement should be stamped or not?—A Constant Reader.

[780.]—PLANS THE PROPERTY OF ARCHITECTS.—May I ask you to answer the following question for me? An architect, having designed plans and made specifications for a building, the property of a Joint Stock Company, Limited, and received the usual commission for them, and for the superintendence during the erection of the building, at its completion, upon being asked for the original plans, &c., states that they remain the property of the architect. Is it usual for architects to retain their designs, or to give them to the person or persons at whose order the plans were made?—Nemo.

[Drawings are always considered to be the property of the designer, for a case in point see Murray v. Giles in the Building News for November 29, 1867.]

[781.]—MOUNTING DRAWINGS.—If you, or any of your readers, will inform me through the "Intercommunication" of a method of mounting drawings, I shall feel obliged.—T. M.

[The kind of drawings to be mounted ought to have been mentioned; if they are water-colour drawings or plans, place them face downwards upon a clean dry board, wet the paper with a sponge (taking care that the water does not run under to the face of the drawing), and then, when the paper is saturated, take it up carefully by the corners, put it in its place upon the mounting-board, and stick down the edges with very liquid glue, place clean blotting paper over the drawing, and a drawing board or book of the size of the mount, and leave it until dry. Great cleanliness and care must be used in the whole of the operation.]

[782.]—FRENCH IRON SHUTTERS.—Can any of the readers of the Building News inform the writer the name and address of the makers of the plate iron shop shutters so extensively used in Paris, and whether the French firm have any agents in England of whom particulars may be obtained?—A. H.

[783.]—DILAPIDATIONS.—Will you, in the replies to the next number of the Building News, inform me of the best work upon dilapidation of residences connected with the clergy or laity, the price and where to be obtained.—W. King, Ashford.

[The latest work upon dilapidations, lay and clerical, is by Morris, published by Simpkin and Marshall, price 4s.]

[784.]—"PRACTICAL BUILDER" AND TREATISE ON CIRCLES AND RAMPS.—Will you be so kind as to inform me in your Correspondence, as early as possible, first, the title, in your opinion, of the best "Practical Builder"; second, the best treatise on circles, ramps, twists, and oblique arches?—N. D. B.

[785.]—PAYMENT FOR MEASURED WORK.—I am a builder, and have erected buildings for a person, as per agreement, to be measured and valued by a certain licensed surveyor employed by me. He measured the work at the appointed day, for which I paid him his demand of £2 2s. He gave me a lump sum of his valuation, and refuses to give a detailed estimate. The proprietor refuses to pay without a detailed estimate. Can I, by law, compel payment with the lump sum? if not, can I sue the surveyor to recover damages?—W. M. L.

[W. M. L. cannot recover from his employer, for measured work done, unless he produces a detailed account. If the surveyor agreed to measure and value the work for the fee of two guineas, you are entitled to a detailed account from him; but, unless he made a special arrangement with you for that sum, he is entitled to 1½ per cent. upon his valuation of the work, for which fee he will, no doubt, furnish you with the detailed estimate you require.]

[786.]—QUALIFICATIONS FOR DISTRICT SURVEYORS.—Will you, or some of your readers, be kind enough to inform me what are the qualifications necessary for a district surveyor? Could you inform me upon what subjects candidates for certificates of competency to act as district surveyors are examined by the Institute of British Architects?—Colonies.

[Information as to the subjects beyond the Metropolitan Building Act which examiners of the R. I. B. A. require, may be obtained from the assistant secretary, C. L. Eastlake, Esq. The meetings of the Board of Examiners will be held on the last Fridays in April, July, and October, 1868.]

[787.]—MEANING OF BEING ARTICLED.—Would you, or any of your numerous readers, kindly inform me what is the meaning of being "articled" to an architect, and what benefit is derived from being articled?—T. V. A.

[The term "being articled" means the same as "apprenticeship." From "articles of indenture" the benefit supposed to be derived is, that the master engages to teach what he knows, and the pupil engages to work for his master at all reasonable or usual hours. But, architecture being at present an open profession, the only formality which is often gone through before a man takes up with the work, is to order a brass plate with his name, and Mr. before it, get a clerk who can do the work, and obtain clients if possible.]

[788.]—WATERWORKS AND RESERVOIRS.—I require a good work upon designing and constructing of waterworks and reservoirs. Please inform me in your next number the best work or works to purchase, with latest improvements for filters to same, &c.?—G. H.

[789.]—COST OF GRAVING DOCK.—Would you have the goodness to inform me in your next issue about the cost of an ordinary graving dock?—Workman.

[Under favourable circumstances, with materials near at hand, and good foundations, an ordinary graving dock might be built for about £8,000. It is quite impossible, however, to give an accurate estimate without knowing the particulars of the site and size of dock. Within our own experience graving docks vary from one hundred to five hundred feet in length. A slip, which will answer the same purpose as a graving dock, only not so effectively or conveniently, may be constructed for about a third of the above sum.]

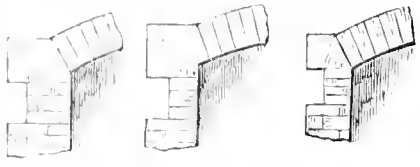
[790.]—BOOK OF DESIGNS FOR CARVINGS.—I have been told there has been recently published a book of designs for carving stone, such as basins, tree-nuts, and carvings of every kind, so as to get a pleasing variety. I should be much obliged by being informed where I could obtain the above designs?—W. F. H.

[791.]—MEASURING WORK.—I am in a fix. The shop where I work has started piece work (Laxton's book). Could you, or any of your correspondents, inform me where to get the price of my work made out; if so, you would oblige an old subscriber?—A. Y.

[If the correspondent "A. Y." cannot measure his own work from the prices given in "Laxton's Price Book," he had better apply to a respectable surveyor, who, for a small fee, will put him into the way of it, or if he writes more fully, stating exactly his trade and difficulties, he will probably find his queries answered through the "Intercommunication" column.]

[792.]—SECTION OF ROADS.—Will you, or any of your readers, inform me whether roads less than 15ft. wide should have one or two water-tables? I refer particularly to the roads under the management of Highway Boards and their surveyors.—G. P. D. P.

[793.]—SHAPE OF ABUTMENT STONES.—Is there



any rule for the shape of abutment stones, either in Classic or Gothic; or is it purely a matter of taste?—F.

[794.]—APPRAISERS' LICENCE.—Would you kindly inform me whether an architect requires an appraiser's licence, or any other licence, to enable him to measure off a building, and determine the value of the extras, &c.?—J. H. Smith.

[It is not necessary for an architect to take out an appraiser's licence, or any licence whatever.]

[795.]—LACQUERING SILVER.—Will you please to let me know how a silver surface is lacquered; and whether a green lacquer can be obtained, and where?—X. H.

[796.]—MEASURING PROPORTIONS.—There is a plan, I am told, of measuring the proportions of objects when sketching in the open air. If there is such a method, I should be glad to know how it is done.—Juvenis.

[797.]—HALF-TIMBERED ERECTION.—What are the best methods of building half-timber erections, so as to keep them perfectly air-tight?—W. W.

[798.]—DECAYED STONE.—What is the best way to preserve stone that is much decayed, supposing that it is inside work, and that it is important the present face should not be disturbed?—Free Mason.

REPLIES.

[740.]—KAMPTULICON.—Kamptulicon does not wash like oilcloth; but it appears somewhat useless to lay any covering down upon a floor which rots oilcloth. I should recommend your correspondent to take up his flagging and lay down a 2in. coat of asphalte, mixed with fine dry gravel and sand, which would make a hard and dry floor.—K.

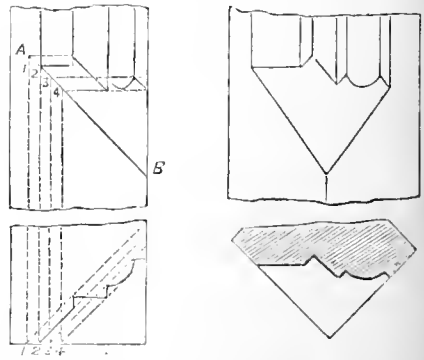
[741.]—GOTHIC WINDOWS.—I should be inclined to consider the work alluded to as "moulded work," which, in such instances—especially when the moulding is small—is measured by the foot super. At the same time, the cubical contents of the stone should be calculated as it comes in from the banker.—Granite.

[748.]—BORING GLASS.—This somewhat difficult operation may be safely performed by the following means:—The instrument to be employed is a steel drill, not tempered too highly; and the precaution must be adopted, in the first place, of wetting the surfaces of the glass in the proximity of the intended hole with a solution of spirits of turpentine and camphor gum, and feeding the drill in its progress with the solution, in precisely similar a manner to that in which the fitter keeps the drill wet with soap and water whilst boring through wrought iron. The glass must be drilled quickly, but lightly.—Glazier.

[752.]—CREOSOTING.—Your correspondent does not appear acquainted with the fact that balks of timber intended for piles or sleepers are only creosoted by means of powerful pressure, the solution being forced into them. Some description of timber would never absorb 10lbs. of creosote to the cube foot; and one of the great disadvantages attendant upon the employment of the native woods in India for railway sleepers is that they are of so hard and close a texture as to defy all attempts to creosote or otherwise increase their durability by impregnating the pores with a preserving solution.—S. L.

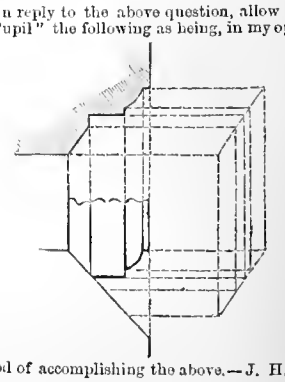
[765.] HOW TO MAKE LACQUER.—Will you allow me to inform your correspondent that the base of all lacquers consists of shell-lac dissolved in spirits of wine, and that a good proportion for mixing is a pint of purified spirit to three ounces of pulverised lac. The mixture should be digested for some days at a moderate heat, and subsequently cleared by settling and straining. The addition of gamboge and anatto, either separately or in different proportions, affords various degrees of colour. The former imparts a pale yellow, and the latter an orange tint. A golden colour is produced by using two parts of gamboge to one of anatto, and any other tint can be obtained by adding the colouring matter. To lay on the lacquer after it is prepared, the article must first be thoroughly cleaned, if necessary by the use of an acid, and the operation performed by a proper brush. It is necessary to repeat it four or five times to bring out the colour.—M. M.

[772.]—GEOMETRICAL ELEVATION OF MOULDED CHAMFER.—The enclosed sketches, will, I think, show "Pupil" how to get the elevation of moulded chamfer, stopped, on plane face, at an angle of 45 degrees. Fig. 1



is a front elevation; fig. 2, angular elevation. Lay down the section of moulding as in fig. 1.; draw the lines 1, 2, 3, 4, on plan, parallel to the plane of the stop, touching all the angles of moulding. Draw the line A. B. in elevation, and from 1. 2, 3, 4 on plan draw lines to intersect A. B. From these points of intersection draw the lines 1, 2, 3, 4 to intersect the vertical lines of moulding at right angles. Observe the points that each line pass through on the plan, and by drawing lines through corresponding points that intersect the vertical lines it will give the elevation of the mouldings on the stop. Fig. 2 is traced from fig. 1.—J. Richards.

[772.]—In reply to the above question, allow me to suggest to "Pupil" the following as being, in my opinion, the



best method of accomplishing the above.—J. H. Spanton.

[773.]—PHOTOGRAPHS.—Photographs from Turner's National Gallery pictures are to be obtained, 17in. by 12in., from Marion and Co., 23, Soho-square.—S.W.

STATUES, MEMORIALS, ETC.

In September, 1865, the committee of subscribers to a national memorial to the late Prince Consort having chosen a design made arrangements for proceeding with the work. The design selected was by Mr. John Steell, R.S.A.; and consists of an equestrian statue of the Prince placed on a pedestal, with bas reliefs in panels, and groups of figures at the basement angles. The sculpture is to be in bronze, and the pedestal in granite. But sufficient progress has been made to enable one to form an opinion of the details and individual portions of the memorial. The statue is twice the size of life, and represents the Prince in the uniform of Field Marshal, as he appeared at the great volunteer review in 1861. Mr. Steell has completed in bronze three of the four bas-reliefs for the panels of the pedestal, and has sketched out the fourth. The two side panels are over 9ft. in length, and 2ft. in depth, and the end ones 3ft. in length, and 2ft. in depth. One of the side subjects is the marriage of the Queen, and contains upwards of eighty figures, the principal of which are in high relief. The other side panel contains an elaborate representation of the opening of the Great Exhibition of 1851 by the Prince Consort. The front panel will show the Prince at home, surrounded by his family. The four groups, which are to stand on a projecting base opposite the angles of the pedestal, each consist of three life-size figures, represented in the act of paying homage to the Prince. One of the groups is being modelled by Mr. Steell, and the others respectively by Messrs. Brodie, Clark Stanton, and Macallum.

The statue of Napoleon I., one of the *chefs d'œuvres* of Canova, which under the reign of Jerome stood in the Salla des Etats, Westphalia, has been found, it appears, in a haytoft of the garrison at Cassel. In 1812 it had been thrown down and broken. The French consul at Frankfort has made application to the Prussian authorities for the mutilated parts, in order to have them restored.

A memorial has been erected over the grave of the Scottish poet, Robert Tannahill, in the churchyard of his native town of Paisley. It consists of a pedestal about 4ft. square at the base, and 10ft. in height. The style is Roman, and the material grey granite. On the shaft is a polished plate, bearing the inscription, "Tannahill, born 3 June, 1774; died 17 May, 1810." The monument was designed and executed by Messrs. Gordon and Barclay, sculptors, Paisley.

WAGES MOVEMENT.

The journeymen painters of Penrith are now out on strike, in consequence of the refusal of the masters to concede to the demands of the men for an advance of wages to the extent of 2s. a week.

A considerable reduction has taken place in the metropolis in the contract prices of granite, road materials, and mason's and paviour's work. The contracts taken by the vestry of St. Pancras for the year ensuing show a considerable fall in the value of materials as compared with those expiring, and the following reductions, by contract, have also taken place in wages:—Masons from 6s. 8d. to 6s. per day; paviours, 6s. to 5s. 6d.; hammermen, 4s. 6d. to 4s.; stone dressers, 7s. to 6s.; labourers, 4s. 1d. to 2s. 6d.

LEGAL INTELLIGENCE.

ARCHITECTS' CHARGES. — The parties to this action were Mr. Peachey, architect, of Darlington, and the Rev. Ernest J. Towne, of Forcet. The action was brought to recover remuneration for work done, journeys made, and cost of goods sold. The defendant pleaded never indebted to all but £54, which amount had been paid into court. In 1864 the defendant employed Mr. Peachey to prepare plans for the erection of a parsonage house at Forcet. Tenders were obtained and the work was then begun. When nearly completed a misunderstanding arose, which ultimately led the defendant to inform Mr. Peachey that his services were no longer required, and he accordingly sent in his bill, desiring immediate settlement. The plaintiff, though he had prepared two sets of plans, had only charged for those which guided the building of the house, and the points at issue in the action were of a minor character, namely, as to the right of the plaintiff to charge commission upon certain building materials and labour which had been gratuitously supplied towards building the house, the cost of journeys, &c., and also as to neglect of the plaintiff. In reply to the plaintiff's evidence, it was argued that it was the duty of an architect to see the work properly done, and this had not been done in the present instance. In support of this it was stated that "stoothing" the house, which was in the specification, had not been done; defective nails used in the roof had rendered roofing over again necessary; windows and shutters were defective; and Mr. Ross—another architect—had to be employed and paid to finish the work, which, after Mr. Peachey had given his certificate of completion to the Ecclesiastical Commissioners, had to gain the sanction of that body, costing Mr. Towne no less a sum than £167. The witnesses on behalf of the defendant were Mr. Christian, the Ecclesiastical Commissioners' surveyor, who had given 71 items for alteration in the work before it could be passed as according to specification; and Mr. Ross, architect, who had surveyed the work after Mr. Christian, and entirely agreed with him as to the necessity of the alterations he had pointed out. For the plaintiff it was contended that he had been precluded by his sudden dismissal from seeing that the builder properly completed his work. After his dismissal he had no other course than to certify to the Ecclesiastical Commissioners, and when he did so all the work thus far done was performed with reasonable skill and care. The jury returned a verdict for the plaintiff—damages £5 8s. beyond the amount paid into court.

AN ARBITRATOR'S AWARD DISPUTED.—Edwin Hall *v.* John Madeley.—This case had been referred to the arbitration of Mr. John Webb, builder, of Silverdale. The plaintiff, for whom Mr. A. Tennant appeared, is a builder at Madeley; and the defendant, for whom Mr. Litchfield appeared, is a bricklayer at the same place. Mr. Litchfield objected to the award (which was in favour of the plaintiff, for £6 2s. 5d.), on the ground that there was misapprehension in appointing the arbitrator, the defendant supposing that he was a surveyor, whereas he afterwards found that he was a builder; that he did not examine the witnesses on oath; and that he did not take proper means of ascertaining the facts.—Mr. Tennant said it was a very serious thing to make a charge like that against an arbitrator.—Mr. Litchfield said he did not wish to say that the arbitrator had intentionally acted wrongly, but he had acted without understanding the matter.—His Honour said that there was no reason for disputing the award.

OBSTRUCTION OF LIGHT AND AIR.—Rolason *v.* Levy.—This case came on originally on motion for injunction, but, by arrangement, was heard recently, before Vice-Chancellor Malins, on motion for decree. The question raised was whether a man having demised property adjoining his own to another person for the whole of his term less one day, can have a remedy against him for altering the height and dimensions of buildings standing on such property, there being likewise a covenant in such demise that no building should be erected on the demised premises so as to obstruct the light and air between certain specified points. The plaintiff was a jeweller in Vyse-street, Birmingham, and on the 29th of September, 1863, executed the demise in question to the defendant, a watchmaker, of the adjoining house and a court-yard running at the rear between the houses, divided by a party-wall a few feet in height. The defendant had commenced building operations on the court-yard, and it was alleged by the plaintiff that such building not only encroached on the court-yard, but it was intended to carry up the erection a storey higher than the old buildings. This, it was also alleged, would materially obstruct the light and air coming to the plaintiff's ancient windows looking into the court-yard, and it was held that there was, on general principles, an illegal obstruction of light and air, and a breach of the covenant in the demise. It was contended, for the defendant, that the limits of the restoration in the covenant were too uncertain to give the plaintiff any remedy, and that on the question of ancient lights the law was, that the building being upon land which he had himself demised, he had no remedy. There had also been acquiescence.—The Vice-Chancellor, without hearing a reply, was of opinion that the plaintiff would sustain such a material injury to his light and air as, on the authorities, to entitle him to an injunction. There had also been a breach of the covenant, inasmuch as, whatever the lines in the plan meant, it was clear that everything within them was comprehended; and the whole width of the yard being 17 feet, it was obvious what the effect would be if that was reduced. The plaintiff and defendant were, in fact, landlord and tenant, the demise being an underlease; and, although perhaps the covenant contemplated some building, it was clear that the windows of the plaintiff were ancient lights, and the defendant had no right to interfere with them. There must be a perpetual injunction with costs.

MEETINGS FOR THE ENSUING WEEK.

TUES.—Institution of Civil Engineers,—"The City Terminus Extension of the Charing Cross Railway," by John Wolfe Barry, M. Inst. C. E. S.

WED.—Society of Arts,—"How to make Railways Remunerative to the Shareholders, Beneficial to the Public, and Profitable to the State," by Raphael Brandon.

SAT.—Associated Arts Institute,—"On Modern Art Treatment of Sacred Subjects," paper by J. P. Davies.

Our Office Table.

The Duke of Argyll, Lord Elcho, the Dean of Ely, and Mr. Bennet Woodcroft have consented to become vice-presidents of the Workmen's International Exhibition of 1869; and the Earl of Lichfield, Earl Spencer, and Mr. Titus Salt are guarantors.

Mrs. Siddon's house in Upper Baker-street (No. 27), which was condemned to be demolished in order to make way for the new branch railway to the "Swiss Cottage," is to be spared after all. The house in which the great actress lived and died is now the Portman Estate office.

It is complained that, although two marble drinking-fountains were, during the last recess, placed in what is commonly known as the Committee-room, Corridor, or Long Gallery, in the House of Commons, for the use of witnesses, &c., they have never been made available. Though committees have been sitting for some time, the fountains remain dry, and witnesses thirsty.

For a considerable time past the inconvenience arising from the smallness and the limited accommodation of the harbour at Scarborough has been greatly felt, more especially by those connected with the fishing trade. The Piers and Harbours Committee accordingly have resolved to expend £150 in procuring a report, with plans and estimates of the cost of a new western pier, having for its object the improvement and extension of the harbour.

Mr. John Mellor, of Derby, an antiquary, who states that he discovered the remains of King Alfred at Hyde Abbey, Winchester, and who recently visited Leicester for the purpose of examining the Abbey grounds, believes the church to have stood east and west, on the right hand, or south side of the second central garden wall, where he found the Lady chapel tiles curiously marked. He further says, "in this chapel the great Wolsey lies buried in a metal coffin, with suitable ornaments, such as episcopal mitre, gorgeous vestments, crozier, ring, and cardinal's shoes, and that a few well-directed endeavours might yet bring the coffin to light."

An American company recently hit upon a novel idea, and not a bad one either. The Loohiel Ironworks Company, near Harrisburg, Pennsylvania, promised their workmen a grand oyster supper if they would turn out 1500 rails in one month. The workmen turned out 1565, and the supper was given. Among the workmen were several negroes who sat down with the rest, and we are told were as kindly treated as the others.

An exhibition of arts and manufactures is to be held in Aberdeen next year, the arrangements for which are now far advanced. The exhibition will consist of two branches—one an art collection, including art manufactures; the other industrial, including material and machinery, as well as manufactures. It is intended that the whole collection exhibited shall be drawn from the northern counties of Scotland, except in respect to the works of native artists, and the products of native workmen's skill or ingenuity which will be sought for wherever they can be procured. The time of the exhibition will be the months of July, August, and September, 1869. The Queen has consented to patronize the undertaking, and the Prince of Wales allows himself to be named president.

In the competitive trials for drawing, conducted by the Science and Art Department, South Kensington, which took place on the 10th, 11th, and 12th inst., 588 schools contended. When the awards were made, the greatest number appeared for the Orphan Working School, Haverstock-hill. This establishment entered the lists for the first time, and sent up 161 boys, 71 of whom had their drawings marked excellent, 39 were adjudged proficient, 39 were considered fair, and 12 were passed over.

Mr. John Absolon has painted and presented to the governors of Guy's Hospital ten large sketches in distemper, which are intended to be hung in the convalescent wards of the hospital. The pictures are illustrative of the pleasures of labour, and are now on view at the Institute of Painters in Water Colours, Pall Mall. The proceeds of the exhibition, it may be added, are to be devoted to the relief of the patients of the hospital.

The arrangement of the third and final collection of the National Portrait Exhibition is now making good progress at South Kensington. There is no want of portraits: indeed the great difficulty is to find space for those already received. The exhibition will consist of portraits of eminent persons who have lived during the present century, and of many distinguished people who flourished prior to that time, forming a supplement to the whole series. In all there will be about 900 portraits, and efforts are being made to open the exhibition, which promises to be of greater popular interest than its predecessors on Easter Monday.

A curious interesting discovery is reported from North Stonington, Connecticut. Some time ago a lime-kiln was built with a dark reddish stone which abounds there it appears, and heating it to the temperature required the whole fabric melted as though it were lead. It has recently been discovered to be glass in a natural state. Specimens of the material were sent to a glass manufactory, and fine goblets have been made from them.

Mr. William Young, architect, suggests that the original drawing from which Dr. Barry's photograph, which serves as a frontispiece, is taken, should be sent to the forthcoming Architectural Exhibition, so that people may observe and judge for themselves. A very good suggestion.

The church building at Amherst, in the United States, for the Rev. J. L. Jenkins, is to have a pulpit built of the cedar of Lebanon, by way, as a New York paper supposes, of rivalling Mr. Beecher's new desk of olive-wood, which, it appears, was cut near the Garden of Gethsemane.

At the last meeting of the Town Council, Mr. Fulton, of Dundee, was selected from no less than 97 applicants to fill the vacant office of Borough Engineer and Town Surveyor to the borough of Newcastle, at a salary of £600 per annum.

The carpenters and joiners of the Manchester district have been directing their efforts towards the formation of a school for technical instruction in mensuration, drawing, elementary geometry, mechanics, stair construction, and other trade matters. A public meeting of those interested in this movement is to be held early in April, at the Hulme Townhall, at which the Mayor of Manchester is to preside.

Well may it be said that one half of mankind does not know how the other half lives. For illustrations of this statement let us refer to some facts mentioned by the Archbishop of York in a speech made by him before the president of the Poor Law Board on Saturday last. The right reverend gentlemen, quoting from the official inspectors of the Chesterfield Union, said that some of the beds in the infirmary are so near together as almost to touch, the rain drops through the ventilators in the ceiling on to the floor, and, in one instance, on to the bed. In one ward seven dirty and neglected children were found eating their dinners on the floor; the medicines are handed over to the patients themselves, who take them or not as they are inclined; there are no proper means of washing the sick, and only one towel a week is allowed for use in each ward. In the same infirmary an imbecile patient was lately beaten to death by a pauper wardsman for some trifling act of negligence. In the Shardlow Union there is no classification even of the sexes; at Ashton-under-Lyne the convalescent sick share the lunatic day-room, confinements take place in the general sick wards, and the fever wards are used for itch and other disgusting diseases. This state of things is more or less common to the Blackburn, Burnley, Bury, Chorley, Clitheroe, the Fylde, Haslingden, Oldham, and Preston workhouses. His Grace recommended that the reforms which have been made in the management of the London workhouses should be extended to those in the provinces.

The *City Press* records the death of Mr. John Mowlem, the senior partner in the firm of Mowlem, Burt, and Freeman, the well-known granite merchants and contractors. Mr. Mowlem's success in life is an instance of what may be achieved by industry, perseverance, and integrity. At the early age of seventeen he started from his native village of Swanage, in Dorsetshire, with his workman's tools upon his shoulder, to seek his fortune in the world. He soon found employment as a journeyman mason at East Cowes Castle, which was at that time in course of erection by Nash, the architect. Shortly after this he came to London, where he made another advance in his career, by being appointed foreman of the extensive works ordered by the Government to be carried out by Mr. Henry Westmacott, the statuary and mason, in which he gained considerable experience, and the confidence of all with whom he came into contact. Not long afterwards he commenced business as a stone merchant in Grosvenor-basin, Pimlico, passing through many struggles, borne with indomitable courage and perseverance, in order that he might rise to a position, and in which he ultimately succeeded, as in the year 1839 he obtained a contract with the City authorities to pave Blackfriars Bridge, in which work the description of paving-stone technically termed in the trade "narrow-cubes" was first used, and which has since become the principal paving in the London thoroughfares. In 1844 he rewarded his two assistants, Mr. Joseph Freeman and Mr. George Burt, by taking them into partnership, and upon them for the last fifteen years the care of the business has devolved, and who now succeed him. Mr. Mowlem was a citizen and liveryman of London. He died in the 80th year of his age, "a self made man," and the friend and benefactor of his fellows.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2253 G. W. DINSDALE. IMPROVEMENTS IN THE CONSTRUCTION AND MANUFACTURE OF TRAPS FOR WATER-CLOSETS, DRAINS, AND OTHER PURPOSES. Dated August 3, 1867.

The patentee claims, first, the construction of D or similarly shaped traps in two parts, the dip or inlet pipe being either formed as part of the shell or body, or in combination with the cover of the trap, as described. He also claims the construction of D or similarly shaped traps of earthenware in one or two parts, as described. Second, he claims the manufacture of D or similarly shaped traps by casting them complete in moulds with the dip and inlet pipe and outlet passage forming part thereof, the top or cover being cast or formed therewith, or separately therefrom, or in combination with the top or cover, as described. —Patent completed.

2273 F. RYLAND. IMPROVEMENTS IN PULLEYS FOR SUSPENDING WINDOW FRAMES, AND FOR OTHER LIKE PURPOSES. Dated August 6, 1867.

This invention consists of improvements in that part of pulleys for suspending window frames, &c., called the mortice plate. The patentee makes the mortice plate with semicircular ends, and he makes in the centres of the semicircular ends the holes through which the screws are passed to secure the mortice plate in the mortice of the window frame or other article. He also makes the opening in the mortice plate in which the bowl or wheel of the pulley works with semicircular ends.—Patent completed.

Trade News.

TENDERS.

The erection of St. Bartholomew's Church, Ruswarp, near Whitby, has been let to Mr. Robinson, of Whitby, builder, whose tender, £1,846 16s., was the lowest.

HANWELL.—For new building in Uxbridge road, Hanwell, for Baroness Wild. E. Welby Pugin, architect:—

Hill and Son	£2,400
J. B. Hodgson	2,355
J. Kelley	2,330

HORNSEY.—For the erection of a pair of semi-detached villas, at Hornsey. Mr. J. W. Reed, architect:—

Staines and Son	£2,988
Keys	2,987
Ebbage	2,900
King	2,873
Sale	2,827
Garrad	2,768
Hume	2,725
Carter and Sons	2,647
West	2,634
Russell (accepted)	2,445
Hunt and Elkington	1,965

KENSAL GREEN.—For an Oratory, Kensal Green, for Baroness Wild.

Hill and Son	£350
J. B. Hodgson	290

LONDON.—For new warehouse, No. 19, Basinghall-street, City, E.C. Mr. Herbert Ford, architect:—

Turner and Sons	£4133
Brass	4046
Piper and Wheeler	3877
Mann	3875
Crabb and Vaughan	3839
Brown and Robinson	3815
Pritchard	3740
Henshaw	3614

NEW MALDEN (SURREY).—For the erection of Five Pairs of Semi-detached Residences. Mr. W. Sim, architect:—

Kelley	£5,850
Brown and Robinson	£1183
Piper and Wheeler	1176
Brass	1127
Webb and Sons	1060
Hill and Keddell	990
Rivett	948
King and Sons	845
Crabb and Vaughan	728

LONDON.—For erecting two warehouses, Trinity-court, Aldersgate-street, City. Mr. John Collier, architect. Quantities supplied by Mr. J. S. Lee:—

Wilson (too late)	£5,999
Rogers and Richards	5,190
Axford	4,985
Carter and Sons	4,948
Nightingale	4,943
Keyes	4 793
Gammon and Sons	4,717
Scrivener and White	4,612
Deards	4,585
Langmead and Way	4,492
Crabb and Vaughan	4,474
Wood	4,389
Sharpington and Cole	4,339
Foale	4,035
Henshaw (accepted)	3,967

LONDON.—For the erection of warehouse, Whitecross-street. Mr. T. C. Clarke, architect:—

Killby	£1782
Turner and Sons	1772
Conder	1695
King and Sons	1690
Abraham	1635
Mortar	1627
Webb and Sons	1596
Kelley	1572
Scrivener and White	1476
Henshaw	1439

MANCHESTER.—The following are lists of the tenders delivered for the Grand Stand, Second-class Stands, Stabling for eighty horses, Fencing, Approaches, &c., for the Manchester Race-course Company Limited. Messrs. Thomas Bird and Son are the architects. Quantities were supplied:—

GRAND STAND.

Cochrane, Parker, and Co.	£6,957
Terras	6,628
Greenup and Co	6,400
Thompson	6,234
Neill and Sons	6,215
Warburton, Brothers	5,850
Johnson (accepted)	5,489

SECOND CLASS STANDS.

Cochrane, Parker, and Co.	5,073
Terras	4,856
Thompson	4,735
Greenup and Co	4,700
Neill and Sons	4,594
Warburton, Brothers	4,320
Johnson (accepted)	4,053

STABLING, FENCING, &c.

Cochrane, Parker, and Co.	5,150
Terras	5,084
Warburton, Brothers	5,020
Thompson	5,000
Greenup and Co	4,960
Johnson (accepted)	4,940

NORWICH.—For the Drainage. Contracts Nos. 5, 6, 7, and 8:—

Turner and Sawyer	£51,887 (!)
Elliott	51,552
Pickering	48,239
Dover	46,855
Hewitson and Yaxhall	46,542
Bennett	45,757
Moulson and Co	40,059
Thirst and Co	32,804
Plews	32,483
Morton and Sons	31,183
Floyd	30,579
Wainwright	29,500
Shrimpton and Co	28,874 (!)

SUSSEX.—For alterations and additions to the Sussex County Prison. Mr. Henry Card, County Surveyor:—

Perigoe	£16,154	S	6
Nutt and Co.	14,400	0	0
Williams	13,378	6	2
Patman and Fotheringham	13,285	0	0
Henshaw	12,778	0	0
Hughes	12,569	0	0
Nightingale	12,352	0	0
Berry	12,110	0	0
Kirk	11,990	0	0
Exton and Chapman	11,950	0	0*
Howell	11,715	0	0
Hall	11,445	0	0
Cheeseman and Co.	10,900	0	0
Chappell	10,690	0	0
Perry, jun.	10,444	0	0

* The omitted tender was from Messrs. Lansdowne's quantities.

WANDSWORTH.—For Plough Brewery, Wandsworth-road. Mr. Charles J. Shoppee, architect. Quantities supplied by Mr. Sidney Young:—

Macey	£5,989
Hart	5,949
Patman and Fotheringham	5,792
Mansfield, Price, and Co	5,742
Adamson and Son	5,695
Myers and Sons	5,589
Brass	5 547
Jackson and Shaw	5,300

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 3, 1868.

CAN FRESCO-PAINTING BE ACCLIMATIZED IN ENGLAND?

WHEN the decoration of the Houses of Parliament was under consideration more than a quarter of a century ago, it was intended that the paintings and other embellishments should be carried out in such a manner as to communicate a new impulse to our school of art. It was considered that an opportunity was presented of which advantage should be taken to elevate the public taste. Historical painting (so-called), presumed to be the leading feature of other schools, had been fostered by foreign governments; but, to English painters no such support had ever been afforded. A competition of cartoons was invited in Westminster Hall. The arena was open to all comers, and the walls were covered with large drawings executed according to the prescriptions set forth. But among the competitors there were many whose attention had never been engaged by anything beyond a water-colour drawing, or a small oil picture; and hence were painfully conspicuous all the defaults that attend a sudden transition from *genre* to history. About two years afterwards, an exhibition of large paintings in oil was held also in Westminster Hall, of which only three or four were considered worthy of acquisition by the Government. These were a "Death of King Richard the First," the "Burial of Harold," a "Battle of Trafalgar," and perhaps another. These works are never seen by the public—they are hung in one of the larger Court Rooms. Thus the available produce of these exhibitions may be said to be nothing, and the impetus expected to have been given to what is called high art was a miserable failure. This, however, was not the fault either of the Government or the painters. The former was ignorant of the course of preparation necessary to lead up to first-class mural painting, and the latter were led into error by an overweening confidence.

The first experiments in fresco were made in an upper waiting-room adjoining one of the corridors which leads to a series of committee rooms. Here it was determined that eight frescoes should be painted, the subjects to be chosen from the verse of Chaucer, Spenser, Shakspeare, Milton, Dryden, Pope, Scott, and Byron. The resolution was rashly made and hastily carried out. It may seem easy to point out errors and shortcomings in a retrospect, when everything is patent to inspection, but had any inquiry been made as to the suitability of our climate for fresco, the walls themselves (of the Poet's Hall) would have given a very decided answer in the negative, for during the winter they periodically stream with water.

It is now more than twenty years since the series was completed, and many of them now hang in rags; indeed, had they remained in the most perfect preservation, there are some which it would have been desirable to have removed, as deficient in quality for the ornamentation of the Houses of Parliament. Mr. Watts's picture was the first to show signs of decay, and now it presents, in some places, the appearance of having been scraped by an iron instrument. The first indication of dissolution is the discolouration in patches of the deeper passages of colour, showing under a microscope a luxuriant crop of fungi. As a rule, the destruction seems to have advanced from the dark tones to the middle and high lights. That is, throughout the series the lowest degrees of the scale exhibit the readiest tendency to decay, while the middle tones and the highest lights, as in Horsley's subject from Milton, and Armitage's picture, remain sound, and so on generally of all the upper tones of the scale which contained any considerable proportion of lime, or consisted of it almost entirely. Certainly in manipulation, and probably in the colours employed, no two of these pictures were worked in the same manner. It may be observed here that the oxides which were safely used in Italy could not be employed in England without risk of failure, and the reasons are obvious. The pallette in use among the early Italian fresco painters was necessarily limited and simple; and on this fact has been based an argument in favour of the stability of such works as those by Benozzo Gozzoli, in the Campo Santo, at Pisa, and the subjects in the Spanish Chapel in the Church of Santa Maria Novella, at Florence, painted by Memmi. These frescoes have stood for centuries, and what signs soever of decay they may show are not attributable to any failing of the means employed in the art, but to that of the surface on which the pictures have been executed. The subjects, by Mr. Watts, from Spenser—being, in fact, St. George and the Dragon—is professed to have been worked strictly according to the principles of the Florentine masters. But, curiously enough, this picture was the first to blister off, and the corruption of the paint surface declared itself soon after the panel had been finished.

When Dyce painted those beautiful frescoes that adorn the east end of the church in Margaret-street, he began his work after having had considerable practice in the art, and with all the benefit derivable from the experiments in the Poet's Hall. But these paintings also became discoloured, and their surfaces began to break up, insomuch as to render necessary extensive reparation by Mr. Armitage, who, we believe, expressed the utmost confidence in the permanence of his emendations, and also of those portions of Dyce's work which had escaped injury. Not having examined these decorations very recently we are not prepared to report their present condition.

The only picture in the Poet's Hall that shows no conspicuous marks of decay is Tenniel's "St. Cecilia;" all the others are more or less injured, and especially those on walls of which the outer side is exposed to the weather. In Herbert's magnificent picture, the "Disinheritance of Cordelia," the faces of Goneril and Regan were the first to yield. These, we believe, the artist has restored, but the mischief is spreading, and will extend to the entire panel. In Cope's "Death of Lara" some of the lower flesh tints remain sound; whereas, in others, these are the first to become discoloured. In Guiselda's "First Trial" there is extensive discolouration, but the reds and flesh tints yet remain clear; and similar observations will apply to the other panels. This alteration—that is, the destruction of the flesh tints in one picture, and their preservation in another—is evidence enough that no two of the subjects were worked in the same way. Throughout the series the lightest passages are those that have generally escaped injury. Thus, the white wings of the angels in Horsley's subject from Milton, and the plumage of the swan in Armitage's "English Rivers," remain in perfect condition. Descending from these, the highest toned draperies—pinks, light greens, and all colours largely diluted with what we may assume to be lime white—have also resisted change. But in the more intense passages, and especially those that have been retouched in *secco*—that is, hatched and stippled after the first painting has been allowed to dry—the mischief is most apparent.

An impression is prevalent, not only among the professors of the art, but also among those who would be its patrons, that fresco can be acclimatized in England, and hence the destruction of these works has been attributed to many causes, but not to the true one. The source of the mischief has been sought in different directions, and inquiry has been pushed even to the regions of abstruse science, to explain an enigma the solution of which was overlooked only in consequence of its extreme simplicity. There are, in a small temporary wooden erection at the western extremity of the Houses of Parliament, three pictures by Mr. Ward, ready to be fixed in the corridor of the House of Commons. These complete the series of eight. It is not, perhaps, generally known that the works in the corridors of both Houses are not painted on the wall, but on large slabs of slate faced, in the case of fresco, with the usual wet lime intonaco; but, for the water-glass method, with a preparation of lime, which is allowed to dry before being worked upon. All these pictures are placed in the wall in such a manner as to admit of a circulation of air behind the panel, an arrangement which is equivalent to a declaration that damp is believed to be the cause of the destruction of the paintings in the Poet's Hall.

We have mentioned the water-glass method of mural painting—that in which the works of Wilhelm Kaulbach are painted in the new museum at Berlin, and which has in Germany been regarded as an admirable substitute for fresco. Water-glass or stereochrome painting is simply water-painting in body colours, fixed afterwards with a chemical compound. Hence it will be seen that all the methods of enrichment available in water-colour painting may be used with effect in stereochrome, such as repeated paintings, stippling, hatching, and even glazing. When the picture is completed and perfectly dry, it is wetted with a solution of quartz powder and purified potash, to which is added a small proportion of a caustic alkali. This, in the actual fixing, is generally diluted with a proportion, equal to one-fourth, of water.

Herbert's grand picture, "Moses bringing down the Tables of the Law," in the Peers' Robing Room, is a water-glass picture; so also are Maclise's two great works in the Royal Gallery, "The Death of Nelson," and "The Meeting of Wellington and Blücher after the Battle of Waterloo." Both in the Royal Gallery and in the corridors half of the panels by Cope and Ward are in stereochrome. These water-glass pictures are of comparatively recent execution, yet Mr. Ward has found it necessary to repaint large portions of some of his works, discolouration having set in and advanced so rapidly as to threaten destruction to the entire surface. But here the first indication of decay is a white efflorescence which cannot be removed even by a wet sponge, and by this the colour is entirely superseded. What the ultimate effect might be is not known, the advance of the mischief having been arrested.

Many persons, with a little knowledge of fresco painting, but of no knowledge of the conditions under which these works were executed, argue that the lime of which the intonaco was prepared, was not sufficiently matured. The ordinary method of preparing the lime is to slake it, and leave it covered with water to ripen. It will not be safe to use it under three months. None of the frescoes in the Poet's Hall were painted on lime which had been less than six months under preparation; and now there is a large stock of lime in the cellars of the House of Commons that has been in a state of preparation for more than twenty years. If those artists who have had most practice in fresco painting be asked why they tried stereochrome, they will answer simply that their experience had taught them that fresco was not suited to our climate.

For the decoration of large buildings fresco recommends itself by its qualities of grandeur and breadth, but such is the delicacy of the painted surface that it will be liable to destruction in any other than in an equal and moderately high temperature, a condition which in our ordinary public edifices it would be difficult to observe. As a means of common domestic ornamentation it might be permanent, for the temperature of a drawing-

room or a dining-room would be favourable to its prolonged existence; but it is to be feared that in such a situation the means and manner of the art would importune the eye to the prejudice of the subject. There needs no lengthened inquiry to tell us that the works in the Poet's Hall have been destroyed by damp, and those in the corridors have been injured by the gas. For the latter a corrective is on its trial, but in the meantime all the evidence that we are able to collect on the subject leads to the conclusion that fresco refuses to be acclimatized in England.

ASYLUM FOR IMBECILES, CATERHAM.

A POWERFUL and well directed effort is at present being made by the managers of the Metropolitan Asylum District to provide accommodation of the best kind for the insane and imbecile. Vast establishments like Colney Hatch and Hanwell have long been acknowledged by medical authorities not to be so well suited for the treatment of the insane as those of moderate size. Ground has therefore been purchased at Leavesden, Caterham, and elsewhere, by the managers of the Metropolitan Asylum District, and competitions have been invited. In both Leavesden and Caterham competitions Messrs. Giles and Biven have been successful; the Leavesden plan having, in the opinion of the committee, such merits that they have adopted it for the Caterham Asylum. The list of competitors, ten in number, includes the following names: Mr. Henry Jarvis, who estimates the cost of his design at £76,500; Mr. Thomas Worthington, £89,000; Mr. Chambers, £80,600; Mr. F. H. Pownall, £75,100; Mr. William Lee, £83,000; Messrs. Tolley and Dale, £61,000; Mr. Thomas E. Knightley, £75,000; Mr. M. P. Manning, £90,000; Mr. A. Wilson, £78,000; Messrs. Giles and Biven, £66,700. The drawings were exhibited to the managers on the 20th at the Westminster Palace Hotel, when the first prize of £250 was awarded to Messrs Giles and Biven, the second of £150 to Mr. F. H. Pownall, and the third of £100 to Mr. A. Wilson. The competition was limited. As the committee have selected the Leavesden plan for the Caterham site, and have forwarded it to the Poor Law Board for approval, with slight modifications, we may presume that the plan will be adopted. What chiefly struck us in these designs was the immense number of windows in the day rooms. They are lighted on three sides, and contain no less than thirty-three windows, the room being 105ft. by 36ft. The plan is on what is called the Pavilion system, connected by a corridor on the ground-floor only. Of the necessity for a corridor on the second floor, the committee must be the best judges. Mr. Wilson has provided a second corridor. The designs all show three storeys, and the arrangement is very similar in all. It has always seemed to us that hospital or asylum work was very easy—the instructions are so precise, the hygienic requirements so thoroughly ascertained, so many similar institutions may be drawn upon, with the advantage of the comments of the resident officers, who know the advantages and deficiencies of the building. Besides all this little variety is permissible, and, as a single compartment or pavilion is all that requires designing, with the exception of the administrative department, we should have thought that most architects could produce a very good design, or at all events a decent elevation. This, however, is far from being the case, and whatever may be the merits of the plans, the elevations of the Caterham Asylum are as ingeniously bad as they could well be. Where extreme simplicity is imperative, we are aware that no large amount of architectural display can be expected, but there might be some proportion between wall space and openings, and the latter might be in the proper places. There can be no possible excuse for placing four lights in pairs at the end of the day rooms. Externally they are hideous, internally they are inconvenient. The room has, besides, twenty-nine windows opening to the outer air, and three or four opening to the stairs. This defect might so easily be remedied that we hope it will not be overlooked by the Poor Law Board. The material is yellow brick, with the usual bands of red. The way in which the drawings are got up is worthy of remark, the different parts being distinguished by colours. The male wards are coloured red, the female yellow, steward and male attendants' neutral tint, matron's and female attendants' green, and so on, so that the most inexperienced can see at a glance what portion of the buildings are devoted to any special purpose. It would be well if all competitors adopted this system. Of Mr. Pownall's plan little need be said; it is certainly not distinguished by any special merit, while the elevations are remarkable for an utter absence of anything like design. The windows are ill proportioned, the dormers being particularly bad. This design is the most ambitious of the three which have obtained premiums, but it is undeniably the worst. The material is red brick, and the style Italian, with cornices, strings, keystones, and the like of a light colour. This design is not one we should have thought of finding among the successful in a limited competition, or indeed in any other. The third set of drawings by Mr. Wilson is in arrangement very like the others; the corridors are, however, extended to two storeys. The style is Italian, and the arrangement is picturesque. The system of presenting gables to the view is not true Italian architecture. In the humble one-storey cottage the simple low-pitched roof is seen without cornice, but in buildings of any pretensions a cornice is necessary to form a tympanum. In Mr. Wilson's design this could easily be corrected. Mr. Pownall and Mr. Wilson obtained the second and third premiums respectively in the Leavesden competition. They ought by this time to know to a nicety the requirements of these institutions, and we hope if they again compete they will take in good part the remarks we have felt called upon to make regarding their elevations. In the cases of all three competitors there is not only room for improvement in the elevations, but a very real and urgent necessity for it. At present they do not promise to raise the somewhat low estimation in which architects are, we fear, held by the public. The other designs we did not see, and therefore cannot speak of their merits.

CONCILIATION.

WE are not about to write an essay on the propriety of submitting the Alabama dispute to the arbitrament of some statesman or potentate who may, by mutual accord, be selected for the purpose. All will admit that arbitration, if it can be practically applied, is a better method to settle disputes than war. And, if it be applicable to international matters, we see no reason why it may not be resorted to in order to prevent strikes, which are, to all intents and purposes, a species of war between employer and employed. There can be no doubt that strikes have been productive of incalculable loss and suffering, not only to those directly interested in them, but to the whole community. Mr. A. J. Mundella, of Nottingham, in the very able lecture he delivered at St. James's Hall a few weeks since, said that an intelligent leader and secretary of a trades'-union supplied him with a list of ten strikes, which cost the men alone upwards of a million sterling. But the loss of a million of pounds is, after all, but a comparatively small portion wasted in this way. In proof of this Mr. Mundella referred to the Sheffield file strike of last year, in which 3,000 or 4,000 who were directly concerned affected nearly 15,000 persons, causing much loss of wages to the men, and commission to the masters, and trade to the town, and left the men and the masters heavily in debt. The lecturer went on to say, "Consider what must be the condition of the homes of these men after all this; consider what a protracted struggle for them to regain their former comfort; consider, moreover, the hatred, malice, and uncharitableness that such a strike must engender. Is it surprising that, from the frequent recurrence of such scenes as these, we reap a harvest of conspiracy, intimidation, outrage, and crime?" The unseen results of a war are far more disastrous and enduring than the results which are seen and estimated. Strikes, and the spirit from which they spring, tend, by their turbulent action, to weaken the commercial life of the nation. This country has suffered more from their frequent occurrence than any other. The questions, then, that naturally arise are, what causes them, and how can they be prevented? Some employers fasten all the blame on the men, and the men, or a large proportion of them, return the compliment, and put the fault on the masters, and the consequence is a strong and ceaseless antagonism between Capital and Labour.

A glance below the surface will satisfy any unbiassed and intelligent person that neither master nor men are altogether in the wrong. Both parties have been influenced by a similar spirit; both have endeavoured to get as much as they could, without a very scrupulous regard to the means used to obtain it. On the one hand, we may have seen many, who, though at one time working men themselves, when they obtained the power, used it with merciless rigour. Vulgar, purse-proud, and exacting, they have regarded labour as a marketable commodity and nothing more, and the labourer as a machine, without being invested with any moral quality. On the other hand, we have seen the men sullen, dogged, and equally exacting, and, to make matters worse, we have seen these men enter into a combination to enforce, by organized effort, what they could not effect by individual action. Hence strikes. Combinations of the men have been met by combinations of the masters, and lock-outs have been resorted to as a counterpoise to strikes. There have been faults on both sides, and the fault not only rests on both, but it must be distributed over the community at large. The spirit of our commercial civilization is competitive. It cannot be denied that an all-absorbing spirit of selfishness has long since taken possession of a vast majority of our citizens. Men, in their eager haste to "get on," have disregarded the claims of their neighbours. In spite of what the Church, philosophy, and art have taught, this has been, and is, the prevailing spirit of the times. It is, therefore, idle for labour to put all the fault on capital, or capital to father all the fault of strikes on labour. It would be equally idle to put all the fault on both, as the whole community is more or less answerable for the results. The individual has been hurried on by the multitude, and all have, more or less, suffered. But we think we see the dawning of better times. There are not wanting indications that influential members of all classes are beginning to see that mistakes have been made, and that remedies may be applied. If, however, a better state of things is to be brought about, it can only be done by mutual concession. The employer must yield something, and the employed must follow his example. Hence the necessity for courts of conciliation and arbitration. These courts have, for many years past, worked well in France, and we see no reason why they should not be equally applicable to England. In fact, the experiment has been made in Nottingham with triumphant success. It is rather curious that certain towns in the kingdom have made a name, and have become historical, by devoting themselves to special movements. The mighty struggle that preceded the Reform Bill of 1832 derived its central

strength from Birmingham. The progunostications of men, who saw a little in the distance the pillars of the constitution crumbling before the touch of Reformers, remain unfulfilled. The equally great struggle which stirred the moral forces of the nation preparatory to the abolition of the Corn Laws and the destruction of the principle of monopoly in commerce received its inspiration from Manchester. Rochdale has already made itself a name for the practical attention it has given to the experiment of co-operation—an experiment which bids fair to introduce a vastly greater change in the social condition of the people of England than what has been, or what is likely to be, effected by the Reform Bill and free trade combined. And now we see another town—Nottingham—in which another movement, big with moral consequences, has commenced. Possibly many of the inhabitants of that town are not aware of the importance of the arbitration idea that, for seven years past, has produced in their midst such signal results; possibly they are not aware that they have in Mr. Mundella the man who is likely to make the name of their town renowned throughout the British Empire. Some of us in the distance who see with unprejudiced eyes, and who are ever ready to herald any messenger whose voice brings glad tidings, see in Mr. Mundella such a man. For years he has presided over a board of arbitration in Nottingham, which has prevented strikes, adjusted the claims of master and man, calmed turbulent passions, and produced general satisfaction. Previous to the institution of this board Nottingham was notorious for its frequent strikes, and for the social disturbances they produced. It had deservedly won an unenviable name for frame-breaking, and outrages against person and property. "The story," says Mr. Mundella, "of the relations existing between masters and workmen for a period of 150 years before the formation of our local board, is a history of contention, lawlessness, and crime." When the board was formed cynical people might have asked, "Can any good come out of Nazareth?" During the last seven years a change has come over the spirit of the place, a change that has already manifested itself in the improved appearance of the people in their social relationships and domestic habits. This change has been brought about by a strong and irrepressible desire on the part of a few men to do something like justice. These men, and particularly Mr. Mundella, have said by their acts to the working men, "Come, let us confer together. Let us talk over our mutual differences, and see whether there is not some other way of settling them than by angry words and angrier strife. Let us consider disputed matters, not as members of antagonistic classes, but as men; not as if our interests were necessarily hostile, but as if they were necessarily interdependent. Let us, in fact, negotiate on equal terms, in a forbearing spirit, and endeavour to buy and sell labour in a way most likely to promote the prosperity of all." Both parties have acted in this spirit, and both have participated in the results. What is good and applicable to the lace-workers of Nottingham, is good and applicable to the saw-grinders of Sheffield, the cotton-spinners of Manchester, the shoemakers of Northampton, or the building trades throughout the country. But to obtain results similar to those at Nottingham, the Nottingham spirit must be emulated, and the Nottingham example followed. A change is demanded by the exigencies of our commercial position, the new political relationships into which we are about to enter, and the social harmony of the country.

Perhaps the building trades have suffered more from strikes and their inevitable retinue of evil than any other trades. As a rule architects and contractors have spoken more bitterly against the men than any other class of employers. One can scarcely speak to an architect or a builder on the subject, but that he gets reminded of some instance where the men have refused to work on account of some absurd regulation, or possibly resorted to violence to obtain their ends. We have no disposition to screen the men. They have frequently acted unreasonably, unjustly, and cruelly. Have not contractors also sometimes acted despotically? Have they not sometimes treated, we may say looked down upon, the men with a kind of contemptuous regard? Our duty, however, at present is not to particularize faults or to administer blame, but rather to promote a plan whereby the sufferings of generations may be allayed. Goethe said that immediately you begin to thoroughly understand a thing you begin to love it. Let the masters consider themselves as if they were men; let them think that the men have to work, work, work, day after day, and year after year, for 6d., 7d., or 8d. an hour, as the case may be; that the vast majority have so worked since they were children, and will only discontinue to work when they discontinue to live. Let the men, on the other hand, put themselves in imagination in the place of the contractors; let them consider the calculations for tenders, the brainwork that is necessary, the ceaseless anxiety to get the work done, and to get money to pay wages, and the frequent loss a contract entails. Let both parties regard each other respectively in this way, and they will learn to respect and probably to sympathize with each other. If the strike system is to be abolished, and we feel sure it may, this is the way to approach the subject. It would be useless to attempt arbitration as a permanent mode of settling disputes without conciliation. Let the spirit exist, and the mode of action will soon follow. The mode adopted at Nottingham is very simple. Nine representatives are elected by the members of the trades'-unions, and nine representatives are elected by the manufacturers, and these men meet periodically, discuss matters in a friendly way, and determine the prices which shall be paid for different kinds of work. Though thousands of kinds of articles are produced, the price paid for the production of each is fixed by the board; and, strange to say, for three years and a half the board have arrived at their decisions without even voting. When a question has been fully discussed, and the members of the board have not found themselves unanimous, they have said, "Don't let us vote, let us try to agree;" and by mutual concession they have never left a meeting without having first agreed. The Nottingham board now governs the hosiery trade of Nottinghamshire, Derbyshire, and the north of Leicestershire; and the number of persons employed in these districts cannot be less than 60,000 persons. Now, if a principle can be applied where such a vast variety of articles are produced, and where the minutest calculations are necessary, it can, if the desire exists, be applied with comparative ease to all the building trades, where the machinery of production is less complicated. Where there is a will there is a way. The first thing required is the disposition, the disposition will bring the will, and the will make the way. There may be difficulties to overcome and prejudices to undermine before the end be obtained; but surmounting difficulties is only a healthful educational exercise. Conquerable difficulties are rather to be courted than shunned, as the task of destroying them involves a moral discipline which sweetens labour, and brings its own reward. The first thing necessary is the right attitude of mind. Around the Nottingham board hovers the spirit of perfect equality. The manufacturer feels that he is conferring no favour on the workmen by sitting with them, and the workmen's representative feels under no obligation to the manufacturer for his presence. They both meet in a common spirit for a common object, and they have so far shown a splendid moral example to the world. They have already done a work which has not only prevented strikes and brought social sunshine on their community, but they have contributed an important fact to the history of industrial development, and given mankind, as far as their seven years' experience goes, a guarantee of future peace. Lord Monboddo, judging from the past history of the world, said that war was the natural state of man, and any one acquainted with the spirit and aspects of our much-vaunted material civilization for the last fifty years might suppose that strikes were the natural offspring of our commercial activity. The Nottingham experiment has so far dispelled the illusion, and taught us that, if men will only meet each other in a respectful manner, listen to each other's claims, and act justly, contention may be prevented, and some of the waste places of the world may be made to blossom as the rose.

J. Passmore Edwards.

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday last, Mr. R. Phené Spiers, the president, in the chair. The minutes of the last two meetings were duly read and confirmed.

Messrs. A. W. Watson, H. Powell, E. Grant, E. Williams, G. B. Smithers, E. A. Browning, E. R. Walker, and G. B. Wilson were duly elected members of the association. Messrs. W. E. Bale, F. J. Holman, H. Blackburn, R. E. Farnall, Chas. Birch, Lyon, and Abbott, were nominated for election at the next meeting.

A letter from Mr. Blashill was read, in which, regretting his inability to be present, he wished to bring before the members the great value of Sir William Burnett's process of preserving timber. He was at present engaged in some work where the woodwork was very greatly exposed to damp, and he had found the Burnettising process most valuable, and therefore wished to commend it to his brother members.

Sir Henry Dryden said he had been asked to state his opinion to the meeting of Burnett's Patent Process for Preserving Wood. He had used the process for about twenty years and could testify to its very great utility, especially with inferior woods exposed to the weather, as gates, posts, and rails of ash and elm. He had also tested elm in cellars, preserved and unpreserved, with the same result. There were two or three modes of doing the work, not all equally effective.

Sir Henry Dryden, Hon. Mem. Soc. Ant. Scot., then read a paper on "The Ruined Churches of Orkney and Shetland," of which the following is an abstract:—There were, said Sir Henry, with regard to ancient churches of all kinds, four classes of persons with as many different opinions of ancient churches. There were Churchmen, who cared little about the antiquity of a building or any archæological or historical interest attached to it—all they asked for was that it might be rendered fit for public worship. Next, there were the artists, lovers of the beautiful, who, disregarding all other considerations, wished for beauty and high art. Then we had to encounter the antiquarians, who accounted it sacrilege to touch a stone of one of these buildings, regarding them, so to speak, as pages of the history of the country; and, finally, there were those, of whom he was one, who, while wishing to restore and fit for use these venerable relics, yet held in tender reverence their historical associations and their great value as relics of past ages.

The ruined churches of Orkney and Shetland were especially valuable. They were links in the series of places of worship which began with cottages and caverns, and culminated in the cathedrals of the thirteenth and fourteenth centuries. In England, owing to a dense population, the first churches have been supplanted by larger ones, in most instances, so that these northern buildings had no existing equivalents unless in Cornwall. This alone gave them a great value. Unfortunately from the Reformation to the present day the custom has been for the owners of these buildings to destroy or mutilate them, or to permit them to be so treated, and within the last twenty years considerable decay and demolition had taken place. Frequently a bushel of lime and a mason's labour

for a day would preserve a building for many years, but the trifling cost is grudged, and the structure falls. The churches and chapels of Orkney which he intended to describe were St. Ola's, or St. Olave's, in Kirkwall; Orphir; Brough of Deerness; Brough of Birsey; Wyre; Enhallow; Linton, in Shapinsay; and Egilsey.

The churches of Shetland which would be described were Culbinsbrough, Noss, The Ness in North Yell, and Uya. The others, of which he had plans and notes, were not of sufficient importance to describe to the meeting.

The group of the Orkneys is about 60 miles N. and S. by 30 E. and W. It is separated from the north point of the mainland of Scotland by about 12 miles of sea. It contains 27 inhabited islands of about 30,000 people. The group of the Shetlands is about 100 miles farther N. and E., and is about 70 miles N. and S. by 54 E. and W. It contains 25 inhabited islands of about 30,000 people. Orkney and Shetland were not attached to Scotland till 1468.

St. Ola's Church stands about W. by S. and E. by N. It consists of one parallelogram 35ft. by 18ft. inside. The south side abuts on a lane, and a house is attached to the west end, from which house into the chapel a modern doorway has been cut. The south wall is 2ft. 11in. thick, the west wall, 3ft. 6in. The original entrance is on the south, 17ft. from the exterior west angle. It is 3ft. 5in. wide, with a semicircular head, and continuous mouldings of a hollow, ornamented with four-leaved flowers and a filletted roll. The original height of the side walls is not now evident. They are now about 20ft. above the original floor, probably the ridge was about 24ft. high. The east end has no trace of an original window, but a modern one has been inserted. In the south wall near the east angle is a modern window, probably in the place of an original one. The other original windows cannot be traced. A few feet east of the entrance was a stoup or piscina. In the north wall near the east angle remains an ambry 1ft. 4¾in. wide, 2ft. 1in. high, and 1ft. 3¼in. recessed; the head is an ogee arch under a hood moulding, and it is flanked by buttresses with finials. The bottom of this ambry is 5ft. 1in. above the original level of the floor. The moulding resembles that at the entrance, except in having no flowers. In the east wall near the south angle is a smaller ambry, also ogee headed, and less ornate, the bottom of which is 2ft. 6in. above the floor. Close by the chapel, in 1855, a stone was found, having on it sculptured in relief apparently a shield under a mitre, too defaced to be recognizable, and below the shield "Robertvs . . . . . ." and a date or letters illegible. Bishop Robert Reid held the see from 1540 to the Reformation, and, as the mouldings point to the fifteenth century, perhaps the chapel may be a late example of the style, and be assigned to him. St. Ola's was probably the parish church, and not a chapel of ease. It was probably not till after the constitution of Kirkwall as a Royal burgh that the Cathedral of St. Magnus became the parish church, and St. Ola's became merged in Kirkwall.

The church at Orphir stands near the east end of the parish church; the larger and most interesting part was destroyed before 1758, to build or enlarge the present parish church. It originally consisted of a circular nave, and apsidal chancel added to its east part. The chancel remains, but only 9ft. on each side of it of the circular nave. Fortunately, a record of its size and form remains in "Sinclair's Stat. Acc., xix., 417," quoted in "Wilson's Prehistoric Annals, 598." It is there stated, "In the churchyard are the remains of an ancient building, called the Girth-house, to which great antiquity is ascribed. It is a rotunda, 18ft. in diameter and 20ft. high, open at top, and on the east side is a vaulted concavity, where probably the altar stood, with a slit in the wall to admit the light. The curvature of the two parts of the nave wall still remaining gives an interior diameter of about 19ft. The church is built of yellow Orphir freestone. The nave walls are 3ft. 9in. thick, well built; and the entrance was probably at the west, as in the other round churches. The chancel, which is little more than the apse, is 7ft. 2in. wide, and 7ft. 9in. deep or long, with walls 2ft. 8in. thick. The arch into it is semicircular, and forms part of a plain unribbed vault, as at St. Margaret's Chapel at Edinburgh. The impost of the vault arch is 6ft. 5in. above what appears to have been the floor, and the top is consequently 10ft. 6in. high. Outside the vault was originally probably a solid stone roof, the apex of which was about 14ft. from the floor. This would make the walls of the nave to be about 15ft. high. The chancel has no buttresses. There is one window in the chancel, in the east end, 2ft. 5in. by 10½in. clear opening, with jambs splayed inward, 1ft. 8in. wide. The outer edges are chamfered, and the head semicircular. The impost is at the same level as the vault; it has a groove for glass. It is probable that this church was connected in some way with Earl Ronald, who founded St. Magnus' Cathedral in 1138, and soon after went to the Holy Land. As he needed all his money for the cathedral, the church was not built by him, but probably by one of his wealthy followers, and we may thus fix on 1090-1160 as limits of the date of its erection."

The Brough of Deerness is on the east coast of Deerness, and measures about 400ft. north and south, by 240ft. east and west. The chapel is near the centre of the brough, and is a parallelogram 24ft. 5in. by 17ft. 4in. outside. The west wall is 3ft. 2in. and the others 3ft. 11in. thick. Only about 4ft. 6in. and 5ft. in height remain above ground. It stands nearly true east and west, the west end facing a little south of west. It is built of clay slate, from 1ft. to 3ft. long, and 2in. to 7in. thick. It has only one doorway at the west end, which apparently was only 2ft. wide, the upper part is gone, but it was probably square headed with a stone lintel. The jambs are not splayed, and have no rabbet for a door, nor is there any bar hole. Apparently, there was only one window, which is at the east end. The top is gone, so it is doubtful whether it was flat or arched; one jamb is gone, and the other somewhat mutilated, but 1ft. 9in. in height of it remains. The window had a clear opening of 1ft. 3in. with jambs splayed inside to 3ft. 6in. in width. It appears to have had the outer 11in. of the jambs parallel, and to have contained glass. In the north wall, near the east end, is an ambry 2ft. 4in. wide, not less than 2ft. 4in. high (the top is gone), and 1ft. 11in. recessed. It has no traces of a door. Spread over the face of the brough are foundations of at least 18 huts. They are mostly parallelograms of about 24ft. by 12ft. outside, and the walls 2ft. 6in. and 3ft. thick. They were for the use of devotees, who used this rock as a place of pilgrimage. A strong partiality appears to have existed in early times for selecting as sites for churches and monastic establishments small islands, isolated rocks, or promontories difficult of access. Indeed, throughout Europe, and in the East, numbers of peaks difficult of access bear such buildings.

The Brough of Birsey contains about 40 acres. The chapel is about 50 yards from the shore, at a point nearest to the mainland. It consists of nave, chancel, and apse, all well defined, and apparently built at the same time. The material is grey whinstone. It stands east and west, the west end facing a little north of west. The exterior length is 57ft. and width 21ft. 3in. The west wall is 3ft. 8in. thick, the north and south walls of nave 2ft. 9in., and the wall of the apse 2ft. 4in. There were no buttresses. The only entrance is in the west end, 3ft. 8in. wide. The jambs are parallel without any chamfer, and there is no rabbet for a door, nor appearance of hinges, and original plaster remains on the jamb down to the sill, and all across it. There is no appearance of the insertion of a wooden frame. Were there doors in these doorways? if so, how were they hung? In many cottages in old times the door was an animal's hide hung across the opening, and probably this may have been the case in these unrabbetted church entrances. In the north-east and south-east corners are two circular spaces, 5ft. 6in. in diameter, the south one of which contains a freestone stair step, and the north one some broken stone. Probably both were staircases, but how high they reached, and to what they led, we can only conjecture. One or both may have led to priests' rooms over the chancel arch or chancel or nave. We cannot conceive a rood loft to have existed here. The entrance to the chancel is 4ft. 3in. wide, of which 4ft. in height of the jambs remain. There is a step of only 2in., and from that to the east end of the apse was originally flush. The low position of the altar is peculiar. The chancel is 10ft. 9in. east and west, and 10ft. 3in. inside. Only one window remains in the north wall, which has lost its lintel. In this wall, just east of the window, and lower, is a square ambry, 3ft. high by 2ft. 8in. wide, and 1ft. 11in. in recess. Its use is not evident. It may possibly have been an Easter sepulchre. It is remarkable that the floor was originally level to the end of the apse, and no elevation given to the altar, which was probably at the chord of the apse; but in later times they built a reredos which blocked off the apse, and steps appear to have been then made to the altar. From what remains of the altar it appears to have been 4ft. 1in. by 2ft. 7in. The interior of the nave is of the proportion of the *vesica piscis*. The interior of the chancel is square. This church was possibly built by Earl Therfin, in about 1100; it is, however, more probable that it was built by his second son Erlend, father of St. Magnus.

The church at Wyre stands on a flat piece of ground about the middle of the island. It has no roof, and is much filled up. It consists of chancel and nave with a door at west end, and all built at the same time. Its exterior length is 35ft. 10in., and width 18ft. 4in. It stands west by south and east by north. The nave is 19ft. 9in., by 12ft. 10in. inside. The west wall is 3ft. 2in. thick, the north and south wall about 3ft. There are only two windows, both on the south side, but only one appears original. It has a clear opening of 1ft. 10in. by 8in., with a flat head. The jambs splay inward to 2ft. 3in. in width. The jambs of the chancel arch are 3ft. thick. The chancel is 7ft. 10in., by 7ft. 2in. inside. There is one window on the south which appears to have been round-headed, and 2ft. 7in. by 11in. There is no ambry and no altar, or altar-place. The exterior length of the nave is equal to the diagonal of the square of its exterior width. The chancel is nearly square.

The church at Enhallow was converted into a cottage long ago. It is of grey whinstone. The exterior length is 52ft. 8in., and the width 23ft. 4in. It stands east and west. The nave is 20ft. 7in. by 12ft. inside. On the west of this, and entered by a round-headed arch, is a building 7ft. 9in. and 7ft. 5in. inside, without any doorway to the outside, and only one small square window to the south, perhaps not original. Its position is that of a tower, but it is not likely a tower would have been added to so small a church. The size and character of the arch into it are against the notion that it was a priest's room. If we may suppose the west arch to have been the original entrance to the church, and that the south doorway was of later date, then this building may have been a sacristy. The chancel is 12ft. 8in. by 8ft. 9in. inside, set out symmetrically with the nave. Outside the south door of nave is a square addition, now only 6ft. high, containing a radiating stair of five freestone steps. Perhaps the stair led to a priest's room or parvise over the porch, or it led to a bell turret. The general history of the church may be thus conjectured. In the eleventh or twelfth century a chapel was built of nave and chancel at the east end of the nave, and an entrance in the west end of the nave. In the fourteenth century a new chancel arch was inserted, north and south doorways made, sacristy built at the west end, and a porch and parvise made outside the south doorway. At later dates other additions were made.

The chapel at Linton, in Shapinsay, closely resembles in size and form that at Wyre, and is probably about the same date.

The church at Egilsey consists of a chancel, nave, and tower, at the west end of the nave, and stands nearly east and west. The extreme length is 62ft. 9in., and the width 21ft. 7in. On the west of the nave is a tower, which is circular, which appears to have been built with the nave, and to have contained four chambers, including the one on the ground. The top of the tower is now about 11ft. wide, and 48ft. from the floor of the nave. It is stated that about 15ft. was taken off the top. Probably it was surmounted by a conical roof. There was a church in Egilsey in 1110, the year in which St. Magnus was murdered. The attaching so large a tower to the church shows this was a church of a superior order when built. Taking all into consideration, it seems probable to suppose Egilsey to have been built soon after the conversion of the islands to Christianity in 998, or if built before that it must be assigned to the beginning or middle of the ninth century.

The number of churches once existing in Shetland is extraordinary, but of these only a few can be given.

Culbinsbrough Church, on the north-east coast of Bressay, originally consisted of a nave, north and south transepts, and chancel, of which only lower portions of the north transept and chancel, and a fragment of the east wall of the south transept, remain. The chancel is 6ft. east and west, and 10ft. north and south inside. The interior of the church has been used as a burial place, and two altar tombs remain.

The chapel on Noss consisted of a nave and chancel, of which only a fragment of the north

wall of the chancel remains. The nave was about 18ft. 6in. by 14ft. and the chancel about 12ft. east and west by 10ft. north and south, as shown by the ridge in the turf.

The Kirk of The Ness is in North Yell, and is said to have been dedicated to St. Olave. It consists of nave and chancel, with bell cot on the west gable. The roof is gone. The nave is 20ft. 5in. by 14ft. 10in. inside. The chancel is 13ft. by 11ft. 3in. inside. Taking all the points, this church may probably be assigned to the fourteenth century.

The church on Uya or Uyea consists of nave and building like a chancel. The nave is 16ft. 9in., by 13ft. inside. The building like a chaucel is at the west end, and is similar to that mentioned in the case of Enhallow.

GENERAL CHARACTERISTICS.

There is no cross church in Orkney, and only one in Shetland. In Ireland there is no circular, octagon, or cross church, except of course the cathedrals and some monastic churches. There is no aisle in Orkney and Shetland. There are no plinths or basements to any of these churches. The doors are chiefly in the west ends. Both square and round heads occur; several have no rabbets (see Birsey); St. Ola, Deerness, and perhaps Uya have no chancels; but all the rest have decided chancels. There is no instance of a chancel door. Orphir, Egilsey, The Ness, Culbinsbrough, Norwick, Kirkaby, and Colvidale have, or had, chancel arches of the same width as the chancels. In England this fashion rarely occurs—where it does it is late. It is constructively weak. Enhallow has a chancel arch with projecting jambs of about the English proportion. Birsey, Wyre, Linton, perhaps Uya, and probably Noss, have, or had, very narrow chancel arches.

In our early churches, the chancels were small in comparison with the naves; and in cathedrals the ritual choir was under the cross, or west of it. They elongated the choirs in the thirteenth century, and soon placed the ritual choir east of the cross. Orphir and Egilsey have windows with circular heads. Birsey, Wyre, Enhallow, and Culbinsbrough have at least some windows with flat heads. The Ness has all flat. No instance remains of a double light, nor of a triangular head, which is not unfrequent in Ireland, nor of a transom. At Egilsey, Enhallow, and The Ness are no grooves for glass, or rabbets, or external chamfers. At Orphir and Birsey are the grooves and chamfers (see account of Egilsey). Of the six churches which retain the east ends—St. Ola, Orphir, Deerness, Wyre, Egilsey, and The Ness—four have no east window, except that in the latter there is a small opening high up in the east gable. In the early Irish churches it is very unusual not to have an east window. Probably no apse was without an east window. As far as can be made out at present, there was no step to the chancel and no platform for the altar, except the inserted step and altar at Birsey. In some, the chancel windows are singularly low, as at Wyre and Egilsey. No piscina remains, and only one sedilia, but several ambries. There are only four cases where we can judge of the pitch of the roofs. The Ness had a roof, inclining about 85 deg.; Egilsey, about 88 deg.; Enhallow, the same; and Wyre, about 95 deg. Probably all had rude stepped coping on the gables, and were covered with thatch, stone, and slates.

MONUMENTS.

The gravestones found in connection with these churches are of four kinds:—

1. Keel-shaped slabs placed horizontally on graves, as at Sandwick, in Unst, etched by Mr. Irvine.

2. Upright stones, nearly rectangular, with crosses engraved on them, as at Sandwick, etched by Mr. Irvine, at Norwick, and at some other places. This class includes the elaborate monument from Culbinsbrough.

3. The same shaped stones without any ornamentation, found at many of the old burial grounds.

4. Upright stones cut into the form of crosses, as at Uya.

The coffins were often formed of six or more slabs of stone. Mr. Irvine has sent the following information:—"I believe from the earliest times in Scotland the footstone of the grave was the chief stone, and not as now the headstone, and that the east face of the footstone was the principal face to be attended to, from the idea that the dead rose at the Resurrection to an upright position facing east. Compare the stone with the ancient incised markings from St. Peter's Church, Orkney, now in the Edinburgh Museum, with the one I have etched from Sandwick, Unst, and I believe it will be seen that the keelstone existed to both. Therefore I believe that the interment belonging to many of the standing stones will be found on the west side and not on the east."

PROPORTIONS.

The designs for churches in the ages of architecture were not made at random. Doubtless there existed certain rules of proportion, but they varied with times, places, and persons. Various attempts have been made in modern times to discover these rules, and in some instances with apparent success. It unfortunately happens that we have not often an intact ground plan, and if the original plan was simple the additions render it complex. In many cases these additions were made without any regard to the proportion of the original. It appears probable that these proportions were geometric rather than arithmetical—that is to say, made by simple operations of the compasses and rulers, rather than by any proportions of numbers. The small churches of the North are valuable from not having been altered by additions. Though in the foregoing notes the proportions on which the churches were built may not have been ascertained in all cases, yet in some the coincidences are too remarkable to be by chance. Although no doubt a system of proportions was extended to the elevations and to certain details, yet, as to most of these in the churches here enumerated, we are in ignorance, because most of the superstructure is gone.

It appears that there were, in fact, only three figures on which the proportions were founded; a circle, a square, and an equilateral triangle. For most purposes of proportion the circle and square are identical. The *vesica piscis* is two equilateral triangles on opposite sides of a common base, and hence equal in proportion to the half of one such triangle. There is, however, one proportion in which a square is not equivalent to a circle—the diagonal of the square, the proportion of which to the side is nearly as 10 to 7. The height or length of an equilateral triangle is to half its base nearly as 7 to 4. All these proportions are somewhat flexible, inasmuch as they may include the side walls and exclude the end walls, or the reverse; or they may include both, or they may exclude both; or they may be applied in one way to the nave, and in another to the chancel, and in another to the tower. But the proportion must not be deemed as ascertained unless the figure really fits within two or three inches.

DATES.

As to the dates of these buildings we have but little to guide us. Only fragments of the buildings are left, and those of the plainest description. Scotch architecture has some mystifying peculiarities. Dates have been suggested from architectural and historical evidence for Orphir, Birsey, and Egilsey. Orphir, 1090-1160; Birsey, 1100; Egilsey, 1000; Wyre has been assigned to the twelfth or thirteenth, The Ness to the fourteenth, and St. Ola's to the sixteenth century.

It may be fairly observed that there must have been churches erected in the fourteenth and fifteenth centuries. Where are the remains of them? Possibly some of the ruins described are of those centuries.

It does not appear impossible that from evidence yet to be collected a nearer approximation to the dates of these buildings may be got.

Mr. William White thought that, with reference to the compartment at the west end of the church at Enhallow, it was probably, as in a similar instance at Wigginton Church, near Tring, for the priest to receive visitors in, if he was non-resident; or it might have been a sacristy used for marshalling processions. He thought that the remarkable smallness of the chancel in these early buildings pointed to a very high development of ritual, and that the chancels were evidently set apart solely for the highest offices of the Church.

The President thought that it was very unlikely that many of the students of the association would have visited the buildings described in Sir Henry Dryden's very interesting lecture. With regard to Sir Henry's query of how were the doors hung in these old buildings, he thought there was no necessity for them to have been hung inside the building, but that they might probably have been hung on pivots, as in many Egyptian and Grecian buildings. He thought the question of geometrical proportion could scarcely be applied to such early buildings as these.

A vote of thanks to Sir Henry Dryden was unanimously passed, and the meeting terminated.

RIGHTS IN CHURCHYARDS.

An important and somewhat peculiar case has just been decided at the Kingston Assizes. It was an action by the late rector of Tooting to recover a sum of thirty guineas for allowing a burial to be performed in a particular spot in the churchyard. The claim was first put upon the ground of a special contract, and it was next put upon a general right to recover in respect of the "use" of the ground by the defendant, the executrix of the deceased. It appeared that in 1858 the old churchyard became full and was closed, an additional burial-ground being provided. There was, however, a part of the churchyard, called the "fore-court," which had been reserved, and in which no burials had been performed. A lady died in the parish who was much respected, and whose friends therefore desired that she should be buried in that part. Accordingly the plaintiff, as the rector, was spoken to about it, and he said he would consent, but only on condition of a charge or payment of £30. There was no express assent to this, but an agreement to pay what might be proper, and it was hinted that the sum asked was high. The interment accordingly was performed on the spot selected, and the plaintiff sent in a claim for £30 for "breaking ground in an unusual part of the churchyard." The claim was resisted as excessive, though there was no objection to pay the sum of eight guineas for burial fees. The case has been twice tried. It was tried at the last spring assizes here before Lord Chief Justice Bovill, who rather thought that the plaintiff was not entitled to recover, and accordingly there was a non-suit, the legal question being reserved. The Court of Queen's Bench doubted upon the legal right, but desired to have the question of special contract re-tried, and therefore the case came down again for trial on the matter of fact. The evidence of contract being as above stated, it was strongly urged by the counsel for the defendant that there was no evidence of a contract by the defendant to pay £30, because there was no evidence of authority in any one to pledge the executrix to that sum (the deceased lady, a governess, having died in reduced circumstances, so that there were not assets to pay such a demand), but that even if there was such a contract there was no right in law to recover, because there was no right in the rector to make such a contract. Every person dying in the parish, it was said, had a right at common law to be buried in the churchyard, and not even burial fees could be claimed, except by custom. And this was not a claim for burial fees, but for the use of the ground, or for allowing a burial in a particular spot; and, as to the former ground of claim, while it was admitted that the incumbent must of necessity direct where a body should be buried, he must do so in the exercise of a discretion vested in him for the common good, and was not at liberty to make a market of it and sell his consent or his withdrawal of dissent to interment in a particular spot. To allow such a course, it was urged, would be to open a door to the most enormous, excessive, and oppressive abuses; and as to the claim for the use of the ground by the executrix, it was said it was utterly idle; it was a right in the deceased person to be buried in a churchyard, and the burial at a particular spot, as already mentioned, was a mere matter of discretion in the clergyman, who, therefore, was entitled to recover the burial fees which were usual and customary, and which, it was said, the defendant had always been ready to pay. The learned Judge, having heard these objections urged and argued at some length, at first was disposed to reserve them, but, having considered them while counsel were addressing the jury, he had a communication with them, which resulted in their consent to withdraw a juror and enter a verdict for eight guineas, the amount of the burial fees.

The well-known church of St. Charles Borromeo at Brooklyn, New York, has been accidently destroyed by fire. Many fine paintings and other valuable church property has been lost; and the damage altogether is estimated at 42,500 dollars.

PURIFICATION OF THE CLYDE.

THE condition of the Clyde, the Scottish Thames, has long been anything but satisfactory. Since 1851, when the population of Glasgow had reached 385,000, reiterated complaints have been made by the inhabitants of that city of the foul state of the river in the dry weather of summer. Various schemes have been proposed for its purification, and for the better disposal of the sewage, by which it is at present contaminated. The latest suggestion is embodied in a letter from Mr. Michael Scott, C.E., of Westminster, to the Lord Provost. Mr. Scott describes his plan as a project for the removal of the sewage, the improvement of the river, and the opening of a new navigation. The argument by which he supports his plan is—that, if in 1841 the river was comparatively pure, and complaints of the admixture of sewage were not made till years afterwards, although Glasgow and its suburbs then contained a population of 300,000, it was because the sewage was so diluted as to render it practically innocuous. It, therefore, follows that, if the same proportion between the volume of the river and of the sewage existed now as in 1841, the purification of the river would be accomplished. The problem to be solved is, either the quantity of sewage discharged into the river must be diminished, or the quantity of the diluting water must be increased, and the last idea is the one Mr. Scott proposes to execute. He opposes all projects that have been formed for the utilization of sewage, believing that, from local and other causes, and with the present knowledge possessed by sanitary engineers, it would be impossible to utilize it profitably. His idea is to add such a quantity of water to the river as will restore it to its comparatively healthy condition in 1841. At that period the minimum flow of upland water was estimated at 22,000,000 cubic feet per day of twenty-four hours. If, then, says Mr. Scott, a similar additional quantity of pure water were thrown into the river every twenty-four hours, dilution of the sewage would be the same when the population had reached 600,000 as in 1841. But, as the extension of the water-closet system, and the erection of numerous chemical works, have materially added to the quantity of foul matter discharged into the river, his plan provides for the supply of an additional 60,000,000 cubic feet. He proposes to construct a canal on the south side of the Clyde, extending from Finlayston Point to the lower end of Mavisbank Quay. This canal would be formed on the foreshore for the first 7½ miles, skirting the river bank, until it reaches Rashielee, when, striking inland, it would cross the Black and White Cart rivers above Inchinnan Bridge, continue to the south of, and nearly parallel with, the Renfrew-road, and terminate in a basin opening into the Clyde at Mavisbank Quay. The depth of this canal would be 8ft. at low water, and 15ft. at high water, and the breadth at half-tide level would vary from 140ft. at the seaward end, with sloping banks, to 50ft. at the Glasgow end, with vertical sides. The action of this canal would be as follows:—At low water at the lower end of the canal, the canal gates would be kept closed, until the water had risen 3ft. From that time up to high water the water would flow into and fill the canal, and then the gates would again be closed. At the upper end of the canal the gates would be closed till the tide had fallen to within 3ft. of low water mark. They would then be opened, and a vast body of water would pour into the river until the succeeding tide had risen 3ft. The effect of this, according to Mr. Scott, would be that, the tidal water having flowed down seawards diluted by the water from the canal, the channel of the river for some distance below Mavisbank Quay would be filled with comparatively pure water. With the upper river he would deal differently. He proposes to dam the river at Dalmarnock Bridge or thereabouts, and he calculates that, the dam being closed for four hours after high water, it would pen 12,000,000 cubic feet, and, being then thrown open to the succeeding high water, the delivery would be 12,000,000 cubic feet already stored, and an additional 25,000,000, or a total of 37,000,000 cubic feet, the ordinary natural downflow being about 10,000,000 cubic feet. He believes the channel would remain filled with pure upland water, and that the return tide would be prevented from bringing up foul water by the fresh water flowing down and meeting it. In addition to the purification of the river, Mr. Scott believes that his scheme will afford great additional facilities for its navigation, and that the new canal he proposes to construct will aid trade and enhance the value of property on its banks. Such a proposal as that of Mr. Scott may be practicable as far as increasing the value of the Clyde is concerned, but the utilization of the sewage, and the consequent purification of the river, should first receive attention.

MUREZZO MARBLE.

WE have recently seen several specimens of this composition, and there can be no doubt about its utility and beauty for the ornamentation of buildings. Its close imitation of marble is surprising. Like scagliola, it is made of cement, but fibre being mixed into the material makes it strong, capable of receiving hard blows without being broken, and renders it more easily moved from place to place. It can be made to any size, large or small, from a waistcoat-button to a panel 6ft. or 8ft. square, or larger if necessary. Any kind of marble can be imitated and executed with such a finish that it requires a well-trained eye to distinguish it from the genuine article. Being cast in moulds, it can be applied to a variety of forms, such as panels, mouldings, chimney-pieces, columns, &c. It is enduring, as it is not affected by wet or subject to discolouration by its close contiguity to jets of gas. The cost of material is much cheaper than any other imitation of marble. We may, therefore, expect to see the extensive use of this new patented article for decorative purposes.

VILLA NEAR SHEFFIELD.

WE this week draw the attention of our readers to the design of a house lately erected for Mr. Stacey, pianoforte dealer, in the Victoria-park, Broomhill, a very pleasant and fashionable suburb to the now rapidly increasing town of Sheffield. The architects of this work, Messrs. M. E. Hadfield and Son, of the same town, have taken the opportunity of introducing in the bay-window a cleverly-executed relievo, from the design of J. F. Bentley, Esq., by Mr. Phyffers, of Pimlico, the well-known sculptor. The *motif* has been taken from Dryden's familiar lines:—

> At last divine Cecilia came,
> Inventress of the vocal frame.
> . . . . . .
> Let old Timotheus yield the prize,
> Or both divide the crown;
> He raised a mortal to the skies,
> She drew an angel down.

The materials used in the erection of the house are the fine pier points from Dunford-bridge, and the dressings of Grenoside stone. The roofs are covered with small green and grey Welsh slates, arranged in simple patterns, and crested with a bold ridging of red tile; the hips are terminated with epis of lead. The entrance hall has a mosaic pavement, executed by Messrs. Maw, from the architect's design. On the upper landing of the staircase, in a space specially assigned, is an organ, enclosed with a richly decorated case of wood and metal; above, the ceiling is vaulted and formed of wood; the keyboard is placed in a recess of the dining-room. The work has been carried out, under the architect's superintendence, by the builders, Mr. Wilson, and Messrs. Stack and Grayson, of Sheffield.

DRURY-LANE THEATRE.

"OLD Drury" within six days and nights underwent a very considerable alteration to prepare it for the opera season, which commenced last Saturday. The portion of the pit formerly under the dress circle has been converted into a lower tier of private boxes, and the same change has been effected in the dress and upper circles, and in the sides of the second, while the central portion of the latter has been commodiously re-seated with stuffed chairs to form the dress circle. Above this are three rows of excellent amphitheatre stalls. The pit space is entirely occupied by luxurious armchairs, the pit proper being abolished. The floors of the principal tiers have been raised, so as to secure additional comfort and excellence of view, and inner corridors constructed to diminish the otherwise extreme depth of the boxes. The whole of the walls are lined with chintz, which produces a general effect of light warm grey, and the boxes are enriched with amber satin curtains, balances, and arm-rests. The alterations were designed by Messrs. Marsh, Nelson, and Harvey, of Whitehall, and carried out by Messrs. Bracher and Son, of Great Ormond-street. The gilding was restored by Mr. Kershaw, of Baker-street, and the upholstery and general fitting-up were executed by Messrs. Green and King, of Baker-street, the decorators to the old Opera House in the Haymarket.

A NEW SYNAGOGUE.

THE new Jewish Synagogue, Thornhill-road, Barnsbury, the foundation stone of which was laid last December, on which occasion we gave the chief features of the edifice, was consecrated on Sunday last. The building is in the modern Italian style. The synagogue proper is 65ft. long, by 45ft. wide, and 35ft. high, it is divided into three bays by floriated coupled iron columns supporting galleries, which are carried round three sides of the building, and octagonal coffered ceilings. The east end is appropriated to the sanctuary, which is approached from a flight of marble steps, its arches are supported by columns formed of various rare marbles. The decorative plastering is from first to last of a scriptural and typical character, and has been conventionally designed and modelled from examples obtained from the Kew Botanical Gardens—thus we find the fig, vine, the date, the blue rush, the olive, and the palm and corn, emblematical of the various characteristic of Faith. Over the sanctuary are tables of stained glass representing the ten commandants in Hebrew characters, and at each side of same are two stained glass windows of geometrical design. The buildings are entered from a portico leading to a vestibule communicating with a spacious hall, from which the visitors enter the ground floor of the synagogue, committee-room, gentlemen's lavatories, umbrella and retiring-rooms, &c. The staircase consists of three flights of bold character, two at the side and one in centre, and leads to a large landing, communicating with the ladies' galleries, lavatories, retiring-rooms, &c. The basement is appropriated to a beadle's house, metre room, and furnace-room. The ventilation is simple and effective. The lighting is by sun lights (which are contrived to assist ventilation) and ordinary gas jets. The heating is by warm water, and the acoustics have been well considered. Although not yet decorated with colour, the general appearance of the building is light, pleasing, and decidedly ornamental, and the effect is produced by simple and inexpensive means, depending on the æsthetical elements of pure outline, good proportion, and studied disposition of arrangement. The total cost of the building, including all fittings, will not exceed £6,000. The architect is Mr. H. H. Collins, M.I.B.A., 5, Queen-street, City. The builder is Mr. Henshaw, City Wharves Basin.

MINERAL PASTEBOARD ROOFING.

THE *Moniteur* records some interesting experiments made the other day in presence of the Emperor of the French, by Messrs. Maillard and Co., with their roofing by means of mineral pasteboard. Certificates signed by the most eminent engineers and architects of the day, as to the impervious and durable quality of this new substance, having been laid before His Majesty, he consented to be present at certain comparative experiments on the combustibility of various systems of roofing. Three sheds, says the correspondent of the *Star*, were accordingly erected in the reserved gardens of the Tuileries—the first covered in by Muller tiles, the second by sheets of zinc, and the third by this newly-invented mineral pasteboard. Fires of equal intensity were lighted beneath each; the zinc roofing melted in ten minutes, that of tiles fell in at the expiration of twenty, whilst that composed of sheets of mineral pasteboard bore the weight of a man for the space of half an hour. The extreme lightness of this roofing, which naturally admits of very slight carpenter's work; its cheapness, imperviousness to rain, as well as the property of resisting fire, will prove of immense value in the construction of farm-buildings, where lime roofing now causes so many disastrous accidents. The Emperor, we are told, was struck by the fact that the introduction of this new roofing would reduce the tariff of insurance offices.

We believe that it is the intention of the Royal Society to memorialize the Government to erect a statue to Faraday, in Westminster Abbey, at the national expense.

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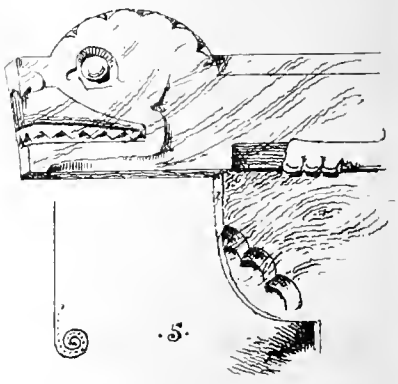
FINIALS · AND · BRACKET · ENDS ·

·4·



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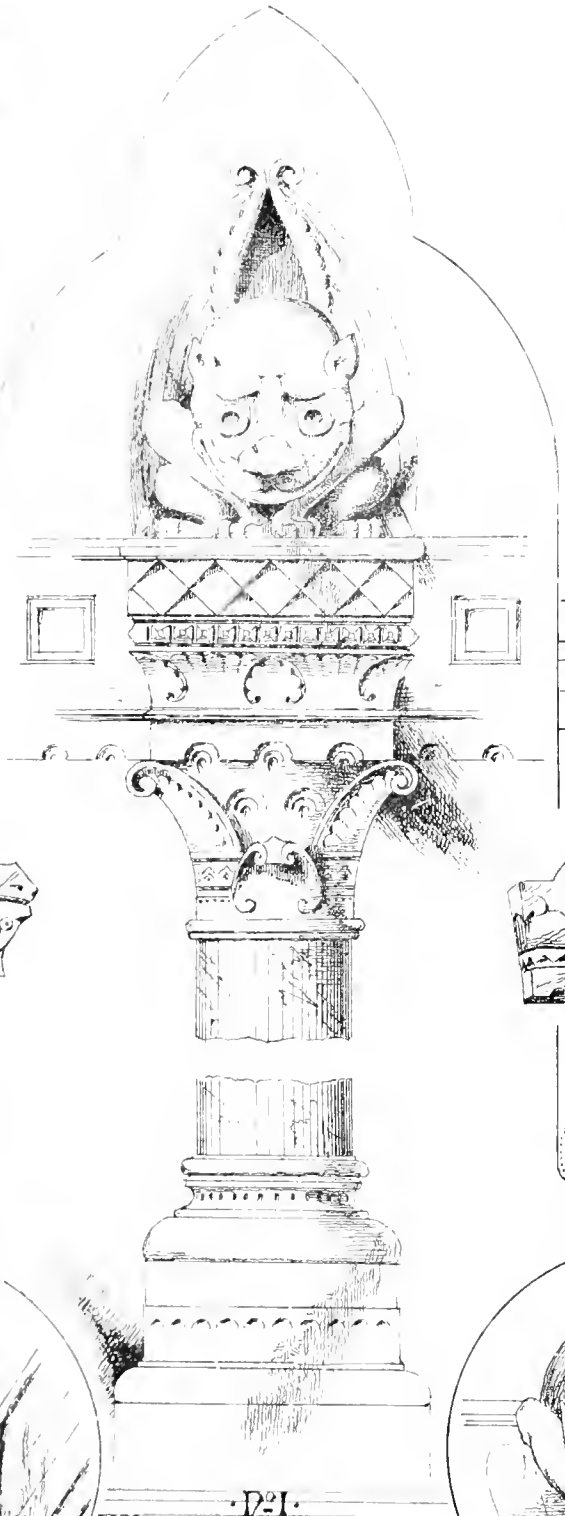

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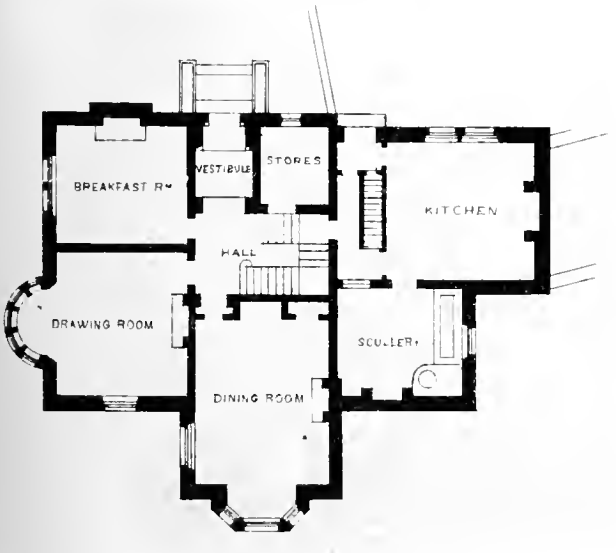
·GROTESQUES · BY · J · MOYR · SMITH·



GROUND PLAN.
$\frac{1}{32}$ of an inch to a foot Scale

MEDALLION OVER WINDOW

E. Wimbridge ath

VILLA IN VICTORIA PARK SHEFFIELD HADFIELD & SON ARCHTS

GROTESQUES.

ALTHOUGH the first impressive power of a building must always depend on the grandeur of its leading forms and general proportions, its right to achieve and maintain a complete hold in our favour must also be gained by the addition of beauty, fancy, or power in its details. Just as the plot of a novel or drama has to be backed by a careful delineation of incidents and characters to form a complete work, in like manner to the finest general scheme of a building must be added the careful working out of individual features and details. In all ages of art, the representation of animal forms has played a conspicuous part as an adjunct, or as a detail, and man, not always content with the representation of Nature as it is, has been prone to invent new forms or combinations of animal forms. The Egyptians had their sphinxes, their hawk and monkey head deities; Assyria, its gods, part human, part bird or quadruped; Greece and Rome, their centaurs, griffons, and chimera; and mediæval art its endless variety of grotesques.

In this representation of animal forms, as in everything else, there may be good or bad art. Art true or false, and human-headed bulls, sphinxes, and combinations of the same kind, like the rarer monsters of the show-booth, only show us what, in the natural course of things, ought to be avoided. There must be strong and apparent sympathy betwixt all the parts in a good grotesque, and no representation in sculpture of what would be abhorrent in actual life ought to be tolerated; and, though sphinxes, centaurs, and human-headed bulls were allowable when they served as symbols, their repetition or imitation by us would be vapid and unmeaning. To this same want of principle may be traced a great deal of the bad mediæval grotesque art, though the Gothic artists in a better period overcame the difficulty by giving the human head some of the attributes of the bestial body (say, horns or ears, as in figure 7), and so assimilated the whole. But the true rule to be followed is the imitation of Nature. Take her in her wildest or most humorous forms, in her quaintest conceits, *conventionalize* as *unnaturally* as you please, and the result will always be in some degree satisfactory. The representation of animal forms assuredly gives an amount of life to a design far beyond the reach of mere ornament, and the sketches submitted are only intended as suggestions to aid the revival of this very interesting section of architectural detail. No. 1 is intended as the finish of an ornamental pinnacle or buttress; Nos. 2 and 3 are pinnacle terminations; Nos. 4 and 5 are designs for timber bracket ends; No. 6 is a crocket, and No. 7 a gargoyle. (See lithographic engraving.) J. M. S.

RAILWAYS AND THE PUBLIC.

APPROACHED from any point of view the railways of the United Kingdom do not at present occupy a very enviable position. Presenting appearances of anything but good investments to the capitalist, their bad financial character is in no way redeemed by any benefit gained by the public at large. It is true that we travel with speed and security at a cheapness of cost formerly unknown; but the results obtained fall far short of what might have been done if the railway system had been originally harmoniously devised and carried out. The money that should have yielded a good return to the shareholders has been shamefully squandered by rival companies in Parliamentary contests, and the public in a thousand and one instances has suffered on account of their quarrels. A pamphlet on the subject has just been published by Mr. Raphael Brandon, F.R.I.B.A., having for its object the promulgation of a plan whereby railway shareholders might reap advantages in proportion to those conferred on the public, by the adoption of a better system. This, in Mr. Brandon's opinion, is only to be accomplished by the Government taking up all the railways in the kingdom. The Post Office, the Money-order Office, and the proposed absorption of the Telegraph Companies by the Government, he regards as but partial recognitions of the one great principle, that in matters so virtually interwoven with the well-being of the community as the forwarding of intelligence, and even parcels, it is advantageous that the carrying trade of the country should not be left to the mercy of private speculators, but should be maintained by a well-organized and comprehensive system for the general convenience of the public who pay for it. According to his plan the whole of the railways should be united under one general management, becoming a recognized branch of the public service, available to the whole population; and that passengers should be enabled to travel one journey, of any distance, in one given direction, at a sum little more than nominal. Threepence is the minimum sum upon which his calculations are based—existing fares below the proposed minimum to remain as at present. He supposes that the adoption of this minimum rate would increase sixfold the number of persons who at present travel by rail. We find, from the general summary for the year ending 1865, that 251,959,862 passengers were carried, producing fares to the amount of £14,724,802, giving an average of nearly 21 miles, and 73 passengers for each train—that is about 3½ passengers for each mile, the average fare paid by each passenger being 1s. 2d. Six times the number of passengers, Mr. Brandon says, could be carried for a very small, if any, additional expense; and, if an universal fare of threepence was charged for any distance for each person, six times the number would travel, and would produce £18,896,989, being £4,172,187 in excess of the present receipts. He further divides the passengers into halves, supposing that one-half would travel at single fares, and the other by another arrangement, which forms the second part of his plan. Thus, dividing the first half of 755,879,586 passengers into fair proportions of first, second, and third class travellers, charging 1s. for first class, 6d. for second class, and 3d. for third class, he gets £16,197,419 as the total half receipts. The other half he considers would take yearly tickets, which he proposes to issue at £25 first class, and £15 second class, entitling the holders to travel any distance, any time, in any direction; and the receipts from this source he calculates at £19,031,765, making a gross total of £35,229,184, against the present yearly receipts (1865) of £14,785,802, and giving an increase of £20,443,382—truly a most glorious prospect for railway shareholders!

"There will be, no doubt," says Mr. Brandon, "many persons who will deem the idea of carrying a passenger from London to Edinburgh for threepence preposterous; but let such remember that it was not until Sir Rowland Hill had shown its feasibility that any one thought it reasonable to take a letter from London to Edinburgh at the same charge as from London to Richmond. It may be said that the analogy does not exist, that the half-ounce of a letter is nothing, but that a passenger is really heavy, and makes some difference in the cost of running a train. In reply, I say that the delivery of a letter is the most expensive part of its cost to the Post Office, whereas a passenger takes himself away; that the average of trains that run could each carry six times as many passengers as are now conveyed by them; and, though the expense might be slightly increased, the increase could be but extremely small, while the receipts, as I show, would be enormously augmented." Here, of course, the whole gist of the argument lies, and it is here we think Mr. Brandon's case breaks down. The probability is that, instead of six times the present number of passengers, ten times the number would travel. Is Mr. Brandon prepared to say that this would entail but a very slight additional cost? Would even the present station or iron way accommodation be anything like sufficient? Mr. Brandon seeks to establish an analogy between himself and Sir Rowland Hill, but the latter had the logic of facts on his side, and therefore triumphed. He plainly demonstrated that, with the resources then at his command, a half-ounce letter could be carried 100 miles for a farthing, and thus established a basis from which all his calculations rose. Mr. Brandon, on the contrary, looks solely to his swollen receipts, and gives us the mere assertion, really nothing more than a surmise, that the present expenses will prove very nearly, if not quite sufficient. Upon this uncertain data, without the shadow of a calculation to support it, we cannot rely, and therefore do not expect much from Mr. Brandon's scheme. In fact, we regard it as utterly indefensible. It would be as reasonable to propose that the Government should supply all the ladies of the country with bonnets at a uniform price. Mr. Brandon has written on a subject which he does not understand, and which apparently he has taken no pains to master. Besides, we regard it as one of the saddest signs of the times that so many people call for Government interference to effect any public good. Are the departments so easily and economically administered as to justify their multiplication? Take, for instance, the Admiralty, a pet department of the Government. The waste, the extravagance, the mismanagement, and the political jobbery of this department are notorious. Pretty much may be said of the Ordnance Department. But Mr. Brandon would, without a pang, create a greater department than either, and so increase the system of centralization which is a curse to continental Europe.

ARCHÆOLOGY.

General A. Cunningham (eldest son of the late Allan Cunniugham, and the greatest authority on Indian antiquities, &c.) describes a very valuable ancient gold coin just brought from Bokhara, in India. He terms it the great gold Eucratides. "It is 2½in in diameter, and weighs ten staters, or eleven guineas. It has the helmeted head on one side, with the horsemen and inscription on the reverse. The owner has refused £700 for it. It beats all the Greek coins hitherto discovered."

It may be recollected that the Theatre of Augers was burnt down about two years ago. The *Moniteur* now states that, the municipality having fixed upon the site to be occupied by the new edifice, its foundations have been begun, and advantage has been taken of the circumstance to make some archæological researches. The new ground was formerly the Christian cemetery of the capital of the Counts of Anjou, and at different periods five large collegiate churches were built upon it, the last of which was pulled down in 1793. M. Armand Parrot, secretary to the Société Académique of the department of Maine-et-Loire, and intrusted with the superintendence of the excavations, has had the good fortune to discover the Gallo-Roman chapel in which the first bishops of Anjou used to officiate and preach to the Pagans who had recently embraced the Christian religion. This little temple was, therefore, the cradle of Christianity in that province, and for this reason excites the highest interest. Two other crypts of different periods have likewise been found, which present some curious architectural details. One of them, called after St. Réné, contains a large number of very fine sarcophagi of various shapes; some of them belong to the Mérovingian period, and consist of magnificent monoliths, in the interior of which skeletons in a perfect state of preservation have been discovered. A number of Carlovingian inscriptions, a variety of Roman and Gothic capitals, church utensils, weapons, &c., have gone to enrich the local museum. One of the most interesting articles brought to light is a complete set of female ornaments, including a pair of ear-rings, which have excited great admiration in consequence of their peculiar form. M. Parrot has also, in the course of the diggings, hit upon the well into which the blood of the victims of the guillotine during the Reign of Terror was re-

ceived. The blood is still there in a dry state, and chemical analysis has shown that it is uncontaminated by any other substance.

SCHOOLS OF ART.

Wolverhampton is not in a favourable position, compared with other towns, in regard to its schools of art. In Birmingham there were, we believe, upwards of 1000 students, and the number is continually increasing. Even such places as Stourbridge, Dudley, and Kidderminster have thriving schools, though it cannot be said that in either of these three places there exists anything like the necessity for a school of art as at Wolverhampton. We find, from a report of a public meeting held there last week, that the school of art has for a considerable time past been in a languid condition, and the number of artizan students has now dwindled down to 50. The subscriptions last year amounted to the small sum of £70, and the expenditure for the last four years has exceeded the income by £50. A fresh effort is now to be made with a view of furthering the interests of the school, and making it a means of usefulness to the artizan population of the district.

The Council of the Wakefield School of Art having placed the school in connection with the Science and Art Department at Kensington, have obtained about £300 worth of models, examples, &c., for the use of the students, and have secured the services of Mr. Walter Smith, Head Master of the Leeds School of Art, as manager. The classes commenced on Monday. On Tuesday evening Mr. Smith delivered an address, on "Art Education," in the Music Saloon. A museum and library are shortly to be opened in connection with the institution.

PARLIAMENTARY NOTES.

In the House of Commons on Monday, Lord Eustace Cecil asked the Secretary of State for the Home Department when the report of the Commission on False Weights and Measures, referred to by him at the close of last session, was likely to be issued, and what prospect there was of his being able to introduce a bill upon the subject this session. Mr. Hardy said the report was delayed in consequence of the death of some members of the commission, and at present he was not in a position to say when he should be able to lay it on the table of the house. On the same evening, Lord John Manners, in answer to a question put by Mr. Cowper, intimated that considerable difficulties had arisen in consequence of alleged interference with ancient lights, which had delayed the works at Burlington House, and he was therefore afraid that the works would not have advanced sufficiently to enable the Royal Academy to vacate Trafalgar-square, and hold their next year's exhibition at Burlington House.

Mr. Gregory, on Friday, once more brought forward the "unseemly congestion" of the various collections in the British Museum. He recommended the abolition of the family trustees, and of all the *ex officio* trustees, with the exception of the three principal ones, who might retain the patronage. There would then remain fifteen, and he proposed that they should be divided into three boards, with each of which should be associated one of the heads of the three departments, who should be responsible to the officer who was directly responsible to Parliament. With regard to the drawings, he trusted the moment the National Gallery was in a condition to receive the drawings of the great masters, they would be removed there. As regarded the mediæval collections, the Saxon, Roman, and mediæval British collections ought to be kept intact within the British Museum, but the foreign mediæval collections, such as the majolica, ought to go down to Kensington. Mr. Disraeli lamented that Parliament had not bought, as it might once have done for a comparatively small sum, the Duke of Bedford's park in Bloomsbury. No doubt the present constitution of the Museum was anomalous. The Government had prepared a bill, which had been referred to the trustees, for the separation of the national collection.

It is stated that the bill to authorize the removal of the Natural History Collection from Bloomsbury to South Kensington has already been approved by the trustees, and the scheme may be said to be complete, with the exception of some minor details of administration which still require adjustment.

WATER SUPPLY AND SANITARY MATTERS.

The North Shields Waterworks Company have nearly completed their large pumping establishment beside Preston Whitehouse. There is every prospect, it is said, that, before the summer is over, an ample supply of water at high pressure will be brought into the town.

At the ordinary monthly meeting of the Glasgow Water Committee held on Monday, it was resolved, by a majority of 9 to 2, to proceed with the scheme for supplying public works with water drawn from the Clyde, instead of Loch Katrine. It is proposed by this scheme to draw 15,000,000 gallons a-day from the river, 7,000,000 gallons of which are to be supplied daily to sixteen factories specified in the Act of Parliament. The new water will be supplied considerably below the price of that from Loch Katrine, which latter, it is believed, will in a few years be required for domestic purposes alone.

Large sums are being spent in straightening and improving the old serpentine river Witham, Lincolnshire, erecting bridges, &c. This river for a considerable distance is the receptacle of vast quantities of water. The object of the works now in operation is to prevent the overflowing and bursting of banks which is now constantly occurring. Mr. Neale, of Mansfield, is engineer to the commissioners, and the works are being executed by Messrs. Fast and Co., of Melton Mowbray.

Building Intelligence.

CHURCHES AND CHAPELS.

The restoration of Aveton Gifford Church, near Kingsbridge, is about to be effected. The tender for the work of Mr. Willcocks, Aveton Gifford, at £1,997 has been accepted.

A new Wesleyan chapel was opened last week at York. The building consists of one large room 61ft. 6in. long by 40ft. wide. The materials used are red and black bricks, relieved by arches and strings of white bricks. Mr. Edward Taylor, of York, was the architect.

A new church, to be called the Hamilton English Presbyterian Church, has just been commenced in Laird-street, Birkenhead; it is intended to accommodate 620 persons. The contract is being carried out by Messrs. Anderson and Sons, of Liverpool, for the sum of £2,200. Mr. James N. Crofts, 7, Cook-street, Liverpool, is the architect.

St. Helen's Church, Bishopsgate, was reopened, after restoration, on Tuesday last. The floor has been lowered throughout to its original level, and the chancel paved with tiles by Minton, after pattern of some ancient ones discovered embedded in the floor. The church has been entirely reseated, the fine old carved stalls from the nun's choir forming the present choir. Several handsome windows, filled with stained glass, have been added to the church. Great care has been taken with the collection of monuments, probably the finest in the City of London. The work has been carried out under the superintendence of Messrs. Wadmore and Baker, architects.

On Saturday week the corner-stone of a new Wesleyan chapel was laid at Tom Fowd, near Bolton. The building will be of brick, with stone dressings, and will cost about £800. Mr. John Lord, of Farnworth, is the contractor.

A new church to be built entirely of brick, to hold 750 persons, and to cost £6,400, is to be erected at Blackheath, near Birmingham. The design, which is in the Early Pointed style, is by Mr. W. J. Hopkins, of Worcester. The plan has a clerestoried nave with aisles, a chancel of equal height with the nave, with a transeptal organ chamber on its north side, and a western tower and spire.

The late Mr. James Fallows, of Manchester, has bequeathed £10,000 to the Manchester Diocesan Church Building Society, besides £10,000 each to five of the Manchester charities.

The work of the new Catholic church at Longton has been intrusted to Mr. Heveningham, of Wolverhampton. His tender was £9,150, and there were two lower than his. Mr. Pugin is the architect of this church, which we have previously described.

On Monday, the foundation stone of a new Methodist chapel was laid at Blyth, Newcastle. The edifice, which will seat 750 persons, will be a plain one, without any architectural features about it, and its dimensions are 66ft. long by 51ft. broad, and 30ft. high, with a gallery around the interior. The whole work will be done by Mr. Middleton, contractor, of Blyth.

The church of St. Bartholomew the Great, Smithfield, said to be the oldest in the city of London, was reopened on Sunday by the Bishop of London after restoration. The work has been in hand during the last four years, under the direction of a committee, of whom Mr. Tite, M.P., Mr. Beresford-Hope, M.P., Mr. Hardwick, R.A., and Mr. Foster White, treasurer of St. Bartholomew, were among the principal members. Upon the restoration between £5,000 and £6,000 have been expended. It is said to be unique as an edifice of the Norman style of architecture. Its massive solidity had suffered little from the lapse of time, and its chief features, after so many centuries, remained unimpaired. Hence the work of restoration has been, not so much the repair of the fabric itself, as the removal of a mass of rubbish by which its stately proportions had been, to a great extent, obscured for generations. Rahere, a gentleman of the court of Henry I., and described by a contemporary historian as "a man of singular and pleasant wit, and therefore by many called the King's jester and minstrel," was the founder of the church, the erection of which was begun 1103, and is said to have been finished about 1113. When complete it measured 280ft. in length, and had a nave, which was pulled down at the Reformation, 87ft. long, and 60ft. broad. The building is now about 130ft. by 57ft., and 47ft. high, with an open timber roof, which is supposed to be as old as the fabric itself. At the end of the south aisle is a square brick tower, 75ft. high, containing five bells, and erected in 1628. A fire in 1830 destroyed a beautiful chapel of the time of Edward III., with a large western archway, which stood on the western side of the south wing. Of Rahere, the founder and first prior of the church, an effigy and tomb are still to be seen within its walls, inserted within a screen, and in a good state of preservation. On the south side of the clerestory is an oriel window, built by Prior Bolton early in the sixteenth century, and ornamented by his rebus—an arrow inserted through a tun,—hence, probably, the origin of the sign "Bolt-in-tun." The church contains some very ancient monuments besides that of Rahere; among others the Elizabethan tomb of Sir Walter Mildmay, founder of Emmanuel College, Cambridge, who died in 1589, and of Rycroft, the King's printer of the Polyglott. Among its baptismal records is that of William Hogarth, dated November, 1697.

BUILDINGS.

The old Infirmary at Sunderland has been purchased by the Primitive Methodists, and is being converted into a Theological Institute. The alterations, at a cost of £600, are being carried out in accordance with plans prepared by Messrs. Joseph Potts and Sons, architects, of Sunderland.

There is every probability of Leicester-square and its immediate neighbourhood being turned before long into a theatrical market-place. Negotiations have been for some time in progress for the purchase of the old and now deserted Sablonnière Hotel, which stands at the south-east corner of the square, and was once the residence of the great painter Hogarth. The intending purchasers are a popular dramatist, a popular novelist, and their friends, and the design of the purchasers is to convert it at once into a theatre. If the new street from St. Martin's Church to Oxford-street should be constructed in the line intended by the Metropolitan Board of Works, the Sablonnière will then be left in an advantageous corner position. Simultaneously with these negotiations others are in progress for the purchase of the site of Savile-house, the object being to construct a first-class playhouse on that spot. Shortly after the fire in the spring of 1865 which destroyed that building, the various holders of the property demanded something like £48,000 for the freehold—a price that frightened several theatrical proprietors of that period. It is now confidently stated that a well-known *impresario* and the chairman of a great hall company have almost completed the purchase. A site in Tichborne-street is also spoken of as an "eligible" and probable place for another theatre, and it has been carefully surveyed several times for this purpose during the last four years.

NOTICE.

FRIDAY next being GOOD FRIDAY, the "BUILDING NEWS" will be published on THURSDAY, the 9th inst. Advertisers and others are requested to forward all communications not later than Five p.m. on WEDNESDAY.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—R. V.—S. N.—W. S.—I. M. S.—W. T.—L. L.—C. B.—P. and K.—A. F. K.—I. P. S.—H. H.—C. and B.—A. T. B.—I. P. S.—W. P.—I. H.—H. and N.—W. and C. K.—W. H. W.—L. B. and Co.—I. H.—I. W. T.—E. R. P.—W. R.—L. W. and A.—I. W.—W. L. C.—I. C.—I. H. M.—C. L.

W. P.—Apply to Lockwood and Co., 7, Stationers' Hall-court.

Correspondence.

THE NEW HOUSE OF COMMONS.

To the Editor of the Building News.

Sir,—Severe illness prevents my answering Mr. Talbot Bury's letters in your next impression as fully as I had intended. But time presses, and I wish to say a few words on the New House of Commons. I have not the slightest wish, nor am I at the present moment physically capable of entering into any competition, but I have a fair right to demand that the present or any future Government shall not allow itself to be hoodwinked or cajoled into the perpetration of another job for the new House of Commons, such as that which has just come to maturity in the detestable and useless corridor, and the other works in New Palace-yard. The honour of a nation should be sacred in the hands of its executive, and the interests of art should never be sacrificed to any actual or supposed hereditary claim. Let three architects, who are known to possess some skill in Perpendicular work, be selected. By all means let Mr. E. M. Barry be one of them; and, if he can produce a fitting design, exhibiting the same feeling, character, and finesse as the original building, I should be the last person to oppose his appointment to carry it out. In justice, however, to the cause I maintain, I cannot forbear renewing my testimony to the fact that what he has accomplished is simply an absolute and too costly proof of incompetency, which, by its contrast with the old work, places him in a very much worse position than if he started *de novo*. Should the authorities disregard the successive warnings, which have reached them from all sides from men who are perfectly competent to offer an opinion, they will be condemned by universal opinion. £100,000 is rather too much to pay on the top of £27,000 for a still more extensive fiasco.—I am, &c.,

E. Welby Pugin.

PUGIN *v.* BARRY.

Sir,—The energies of Mr. Clayton—although I do not presume to place myself on a level with such a master of analysis—and the persistent blundering of Mr. Talbot Bury, are totally misapplied and superfluous. I really think that it would be much more to the purpose, if, instead of throwing the dust of their small inferences and inquiries into people's eyes, they would direct their attention to such facts as the following:—

1. Mr. Herbert, without insisting on the identity of every detail, saw with his own eyes Mr. Pugin make the designs for the Throne substantially as it is at present. He remembers all the circumstances connected with it, and has described them, as we all know.

Mr. Edward Pugin saw his father make several different designs, one of which was made on board a Ramsgate steamer.

I, myself, saw three different designs, which I know to have been by Mr. Pugin. They were lost at the railway station at Birmingham, found by me, opened and discussed in my presence as Mr. Pugin's; and I vividly remember Mr. Pugin's complaints of the trouble he had been subjected to, and the labour unnecessarily inflicted on him through Sir C. Barry's perpetual changes.

Mr. Pugin's Diary speaks of a "Throne" drawing made by him at Salisbury, and sent to Mr. Barry on November 12, 1835. Dr. Barry (Notes, p. 6) acknowledges that "a drawing of the Throne, by Mr. Pugin, for the estimate drawings still exists."

Mr. Clayton, last week, in your journal, tells us that, amongst the drawings referring to the Throne exhibited recently at the Arundel Society's rooms, "one of them, a general design of it, was, beyond all possibility of doubt, by Mr. Pugin," which, he adds, "was, no doubt, the one Mr. Herbert saw in progress."

Mr. Wolfe (Dr. Barry's Notes, p. 9) says that "Pugin worked on the Throne, and that the greater part of the ornamental detail of it was his." Mr. Wolfe also informs us that Sir Charles Barry wrote to Pugin, on Sept. 3, 1844, saying "that he had made a new design for the Throne," at which time Mr. Pugin paid Sir Charles, at his own entreaty, a visit of five days to work (as is always impressed on us) on the details. Yet Dr. Barry informs us that the design for the Throne, in his pamphlet, is dated Dec. 17, 1844. In other words, the details were worked out by Mr. Pugin about three months before the design was made by Sir C. Barry.

Now, it is really inconceivable that, with all these indisputable facts before these gentlemen, the sole inference deduced from them is exactly that which is the least probable, viz., that Sir Charles made the design in the photograph himself. And this inference, moreover, is shackled with the monstrous inconsistency, just elicited from Mr. Wolfe's statement—that the details were made by one person three months before the design was made by another.

2. Mr. Talbot Bury asks whether Mr. Pugin's brother-in-law, Mr. J. Powell, has not seen this drawing of the Throne, and has informed him that Mr. Bury is right and Mr. Herbert wrong? I answer that Mr. Powell has made no such unqualified admission. I have before me a letter from him to Mr. Edward Pugin, wherein he admits that "the drawing looks wonderfully like Mr. Pugin's touch," adding, "one thing is *certain*, it never could have existed without his mind." This is, in reality, the pith of the whole matter. Mr. Pugin's mind, manifested in all the other designs he made for the Throne, is manifest in this as well. It flashes out plainly enough, in spite of the "main lines" and "Pugin-like symmetry of square forms," which are assumed so positively to be the attributes of Sir C. Barry's work.

3. It would conduce very materially to a settlement of this question if we were informed whether there are in existence any more drawings of this kind said to be by Sir C. Barry—any of the "general drawings of all the internal fittings of the House of Lords," made during Mr. Pugin's visit to Brighton in 1844.

4. Let me remind Mr. Pugin's antagonists that the general question about the original design is not in the remotest degree settled by this minor discussion about the Throne. The Throne drawing, indeed, makes the "nursery secret office" doubly suspicious, and at the same time calls from Dr. Barry for an explanation of the fact that Sir C. Barry's visit to Mr. Pugin at Salisbury, from Nov. 2 to Nov. 9, 1835, is not entered in Sir C. Barry's Diary.—I am, &c., T. S. Burton.

21, Savile-row.

ORGANS.

Sir,—Schulze's bellows may be old fashioned, but, for all that, they are steadier than Willis's: no one is asked to use Schulze's bellows, but Willis is asked to improve his. Gigantic organs, gigantic architecture, gigantic bands and choruses, are not tests of the artists. There is only a certain quantity of variety of tone possible—it is not necessary to have a gigantic instrument to produce it. We all know that an orchestra beyond a certain size produces no greater effect of tone than one of a sufficient number of players. As to the British public and its capacities, I am sure your correspondent has not seen many of the scores of Covent Garden and Her Majesty's. I do not know any other public that will swallow as much. We make slight alterations in this country when the evening is hot and the singers out of humour, but this is entirely a matter of opinion. As to the emasculate tone of the old instruments, well it is what I admire. I think it mellow, full, round, delicious, refined, free from either thin sharpness or noisy vulgarity, but this is also entirely a matter of opinion. If Willis does not think it necessary to have good metal, why are the 32ft. pipes in the monster organ to be all tin?—I am, &c.,

Warrington Taylor.

190, Euston-road.

Sir,—I am sorry that the interesting controversy on Organs seems drawing to a close, as we sometimes arrive at the truth after wading through much misrepresentation. Your correspondent "J. C. J." can have but very little knowledge of organ pipe metal, when he asks us, why, if metal has so much tin in its composition, it is not spotted? Now, spotted metal is produced by mixing certain quantities of tin with good lead, in proportion varying from one-third to two-thirds of tin. If metal, containing about these proportions, is not spotted, it is because the spot has been planed out. The pipes in the organ at St. Paul's Cathedral are made of metal containing three-fourths of tin to one-fourth of lead, and that composition will not spot on account of its richness. I notice that "J. C. J." calls the Kingston organ "a very large organ," and then says that Mr. Lewes has never built a really large organ. Mr. Lewes is the builder of the celebrated organ in St. Hilda's Church, South Shields, an instrument that for beauty and power of tone far surpasses any instrument of similar size constructed by Mr. Willis; in this (the St. Hilda's) organ the wind reservoirs contain, according to Mr. Rae's published account, 160 cubic feet of air. If "J. C. J." will tell us how much air can be contained in the reservoirs of the Kingston organ, we can then judge for ourselves whether the organ at South Shields entitles Mr. Lewes to be classed with the "great" organ builders or not. I suppose that even Mr. Willis must have had a few "small country church organs" to build in his time, and were they small because he had not then talent enough to build large organs? I should also like to know where Mr. Lewes's unsuccessful specimen of an organ exists? and why Mr. Willis, with all his talent, and an immense sum of money at his disposal, so failed to fill the Liverpool Townhall with his gigantic organ of over 100 stops, that he has lately been obliged to add a number of very powerful reed stops, at (I believe) a pressure of 22in.?—I am, &c.,

Y. Z.

THE BIRMINGHAM SPRING EXHIBITION.

Sir,—Being on a visit to Birmingham (chiefly on account of the Exhibition) I have more than once visited the Architectural Room, making notes respecting the various drawings as I went through. As an architect of some position in London, and consequently having had much experience in designing and carrying out work (chiefly church architecture), I feel convinced you will not refuse to allow me a little space in your valuable paper for their insertion. I am also happy to say Birmingham is considered by London people to possess some of the finest and most imposing buildings in England, and the people are considered art-loving and art-encouraging. Having said this by way of preface, I will commence my criticism.

The Gothic style appears to preponderate over Italian, and the examples of both styles are, on the whole, very good. The designs of Mr. J. G. Bland may be mentioned as very thoughtful studies in Gothic architecture, the views of Stroud and Acock's Green Churches being specially worthy of remark. The etching is beautiful. This gentleman has, I believe, distinguished himself by numerous structures, in which polychromy is used extensively, chiefly in brickwork. Mr. J. A. Chatwin's design for St. Augustine's Church, Edgbaston, and St. Lawrence's Church, Birmingham, shows a deep knowledge of Gothic, and a considerable amount of æsthetic feeling. Mr. G. Holmes's designs are also worthy of remark. Mr. John Davis, jun., sends three elaborate drawings. Assuming that he is a young man, the drawings do him much credit. The two etchings show immense labour and perseverance, and, though abounding in faults, are very promising. The coloured drawing is not so satisfactory, being somewhat crude and approaching to tawdriness. How-

ever, if Mr. Davis perseveres (studying carefully our best ecclesiastical structures, and wedding himself to no particular branch of Gothic), he may in time do something really meritorious. The drawing by Mr. F. Barlow Osborn is a very successful attempt to adapt Gothic to commercial requirements. It has a solid substantial appearance, and its proportions are good and detail elegant. The drawing of Norwich Cathedral by Mr Bakwell is a very interesting and faithful representation of the interior of that noble edifice. Among the other Gothic works must be mentioned those by Messrs. Nichols, Ingall, Veall, &c., many of whose designs are satisfactory. Among the Classic contributors are Messrs. Chatwin, Yeoville Thomason, Holmes, Bateman, and Corser, Phipson, Plevins, &c., most of whose designs are good, but not so interesting to a lover of Gothic architecture as the former.

The collection of photographs is very interesting. Most of them are taken from the works themselves. For sharpness and delicacy, I have never seen them surpassed. I trust I shall have the pleasure of seeing most of the above drawings at the London Architectural Exhibition next year.—I am, &c.,

A London Architect.

Farringdon-street, London.

LOW ESTIMATES.

Sir,—The letter from "Fair Play" in the Building News, March 13, induces me to take up my pen and vindicate myself and others who are not the lowest in these "low tenders," and who wish to see justice done to builder and proprietor, by explaining the unprincipled way in which the work is carried out in a contract now in the course of execution, for which I and a few more were invited to tender. My business calling me to Portsmouth, I thought I would prolong my journey to Hayling Island to see the building I had tendered for, when the highest tender was sent in at £2,054, and the lowest at £845, and which had to be completed by the 25th of March, subject to a penalty of £10 per week after that time until completed. On my arrival I found, a short distance from the railway station, only the carcase of the building that had to be completed by March 25! I asked to see the foreman, but found there was not one, and that there were but five or six men on the job. I was told that the "governor" would be there shortly, and, as he did not arrive, I made a survey in his absence, and I discovered that timber and other materials, far inferior in quality and less in size than those mentioned in the specification, were being used. I much doubt if this can pass. In justice to the proprietors, I can say that the wording of the conditions and specifications for this building is very explicit, but it is far from being carried out.—I am, &c.,

Fair Play's Mate.

THE NEW ISLINGTON WORKHOUSE.

Sir, The statement in last week's number with reference to this building is incorrect. Since the selection and adoption of my design, the compulsory requirements of the Poor Law Board have considerably increased the cost. The infirmary, planned on the Pavilion principle, provides just upon 500, and the "separation wards" 1,300 cubic feet per inmate, as against the 500 cubic feet asked for in the first instance. Central stoves have been preferred for the wards instead of fireplaces in the side walls, as originally intended, with additional kitchen, scullery, and other internal arrangements; also a detached doctor's residence, and a large dispensary. The cubical capacity of the casual ward has been increased. Several improvements, suggested by myself, and not included in their original instructions, have also been adopted by the Guardians. The amount stated in the original instructions issued by the trustees was, including the margin of 10 per cent., about £40,000. The amount of the accepted tender, which, in addition to the Poor Law requirements, &c., above stated, includes "sanitary" fittings of the most approved description, piping for hot and cold water, warming, and gas throughout the entire building; also for all enclosing and other walls, earthwork, drainage, &c., is, on the other hand, under £62,000.

57, Oxford street, W. Robt. Hy. Burden.

Intercommunication.

QUESTIONS.

[789.]—PLATINUM DISCS.—Can any reader inform me where, and at what price, platinum discs for economising gas, as exhibited at the last soirée of the Royal Society, are obtainable? An increase of the quantity and quality of light is much desired by all, and especially by—A Night Worker.

[790.]—QUANTITIES AND PRICES OF TIMBER.—Will some one tell me how to understand the quantities and prices of timber and deals, as advertised in the Building News, and the meaning of duty and drawback, &c? How many lineal yards or feet of 11in. by 3in.; ditto, of 9in. by 3in.; ditto, of 7in. by 3in., or cubic feet, to the load or hundred?—Ignoramus.

[801.]—THE AUTO-PLANOGRAPH.—Can you inform me where I could obtain a sketch and description of the auto-planograph, exhibited by Mr. R. Jahns, at the Liverpool Architectural Society's meeting, mentioned at p. 210 of the Building News; or can you give me Mr Jahn's address? If so, you would oblige a subscriber.—H. Francis Clarke.

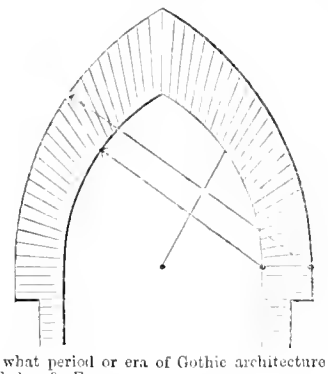
[802.]—A SEA WALL.—Sir,—Please insert the following in your journal as soon as convenient, and oblige:—A sea wall, built in 1866, enclosing a parcel of ground to be used as a promenade, the height of which above the ground was 7ft, and the thickness about 2ft. 6in., about three weeks since succumbed to the force of the sea during a heavy gale, and was a second time destroyed. As it is intended to rebuild it, I should be obliged by yourself or any of your readers giving me any plan by which it might resist the force of the sea. It was built with good heavy stone, laid on edgeways, and cemented with best Portland. I should also think it a favour if you could give me a receipt for making good concrete.—Alexander.

[803.]—MOUNTING DRAWINGS ON CLOTH.—Would "C. E., Tor may," oblige a subscriber by giving a description of his way to mount drawings on cloth? and oblige yours—A Constant Reader.

[804.]—EYESIGHT.—I shall be obliged if I can be informed whether continual working in a shop where all the glass is frosted does not tend to injure the eyesight?—D.

[805.]—DRAWING INK.—Could you, or any of your readers, enlighten me as to the best ink I can use in drawing on a substance very similar to ground glass or slate? It is necessary that the ink should stand the effects of being washed.—S. T. H.

[806.]—ARCHES.—Is this arch constructionally good;



and to what period or era of Gothic architecture does it rightly belong?—F.

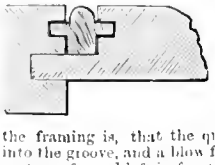
[807.]—TUNBRIDGE WELLS INFIRMARY COMPETITION.—Can any of your readers furnish information respecting the above-named competition? In 1866, an advertisement appeared, inviting architects to send in designs for certain alterations and additions to the infirmary before January 1, 1867. An extension of time was given, and the day finally selected for sending in the designs was April 1 (All Fool's Day, be it observed), a day singularly well chosen, and possibly intended as a dismal joke at the expense of the dupes who responded to the invitation.—An April Fool.

[808.]—MEASURING OLD BUILDINGS.—In measuring old buildings I often have to guess the height of some unaccessible point, from not knowing how to obtain it without a theodolite. Will you readers kindly tell me whether there is any easy method of doing this accurately without instruments?—Ecclesiologist.

[809.]—TENDERING FOR OLD LEAD.—I tendered for the old lead on a church roof at so much per ton, as weighed in the churchyard. Can I claim for a per centage for dross, or must I give exactly what I have offered without making any deduction whatever?—Plummet.

REPLIES.

[767A.]—BEAD AND FLUSH FRAMING.—Seeing your previous correspondents disagree as to the right construction of bead and flush panels, I think the proper construction is an



astragal tongued in dry, as in sketch; but I am afraid that, in these days of cheap foreign joinery, this is too much to expect from builders; though this would be cheaper than the bead on the framing. My objection to the bead on the framing is, that the quirk of the bead nearly cuts into the groove, and a blow from the other side breaks the portion of wood left in front. This is also often effected by dampness causing the tongue of panel to swell, and so bursting the face off. I object to the bead on the panel, because the shrinkage of the panel (generally the widest piece of wood in the framing, and therefore subject to greater expansion and contraction) causes the end bead to slide on the mitre and assume a curved form, finding employment again for the joiner's enemy putty. But, as work is generally executed, I should give the preference of the two plans, except in thick framing, to the bead on the panel.—Robert Phillips, Foreman of Works, Dobroyd Castle, Todmorden.

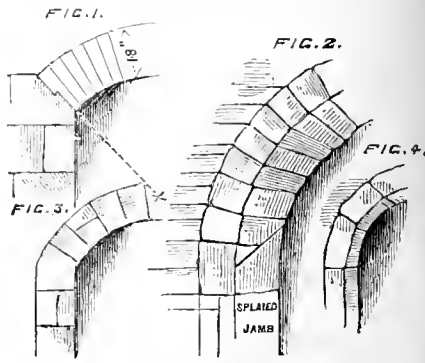
[775.]—COMPETITIONS OF DRAWINGS FROM EXISTING BUILDINGS.—I beg to say that I went and measured an old wood roof to a church some few miles from where I reside, and had no difficulty whatever when I got to understand the sexton; and, further, I intend measuring and drawing the whole church, some parts of which are Fourteenth century.—Another Constant Reader.

[779.]—AGREEMENTS.—If there was a stamped agreement stating the price the builder was to pay the subcontractor, the work must be paid for at the rate mentioned in that agreement, and the builder must supply a copy of it. But if it was not stamped within a month of the date of the signature it will not hold, and the work must be paid for measure and value, at the usual market prices, as determined by a licensed surveyor.—F. T.

[784.]—"PRACTICAL BUILDER" AND TREATISE ON CIRCLES AND RAMPS.—The most practical treatise on circular surfaces and ramps, and oblique arches, and the best and most useful information upon practical building, may be found in "Gwilt's Cyclopædia," published by Longman and Co.—T. T. H.

[790.]—BOOK OF DESIGNS FOR CARVINGS.—If "W. F. H." is in earnest, and wishes to obtain grace and variety in the forms of vases, he cannot do better than study the Etruscan Vases in the British Museum. One day spent in studying and sketching from them would do him more good than any number of books.—W. T. R.

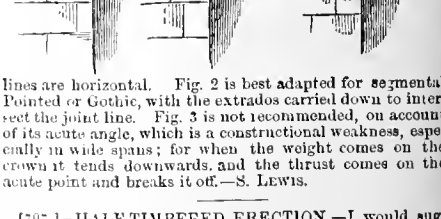
[793.]—SHAPE OF ABUTMENT STONES.—"F." has shown his abutment stones as they are generally formed for



modern works. Fig. 1, in the above sketch, would seem more appropriate and secure than what he has shown; fig. 2 shows an interior abutment stone; and figs. 3 and 4 are exteriors, all of which radiate from different centres. The latter three sketches are from ancient examples.—Clerk of Works.

[793.]—The question of your correspondent amounts to a principle, and is not "purely a matter of taste." It is a matter of pure taste—the maximum amount of beauty for the minimum amount of cost. Referring to the sketches, and remarking that it is highly inexpedient to work a stone at an acute angle, then No. 3 would be objected to on principle, because the projecting beak would crumble away with a very slight knock. And as for No. 2, let one fancy the trouble and expense of cutting out the nasty corner at the bottom, not forgetting the fact that, if the arch stones are, as is generally the case, of a strongly contrasting colour, the arch would appear to be either flying in the air or resting on a pane of glass, ever seeking the opportunity of slipping down, to the discomfiture, at least, of people's minds, if not their bones. I, therefore, prefer No. 1, both constructively and æsthetically, and cannot see the difference whether used in what your correspondent is pleased to call "Classic or Gothic," as being the most common-sense method—a method which, alas, is not apparently so highly developed as the opposite one of "freaks o' fancy." The question recalls to memory those pointed brick arches where the bricks are "rubbed" into all sorts of earthly shapes merely that the joints shall radiate to one common centre instead of to two—not knowing why, unless it be that the cost should be increased five times.—H.

[793.]—There is no general rule for the shape of abutment stones. Some adopt one and some another form; but for strength and repose fig. 1 suggests itself, where the main



lines are horizontal. Fig. 2 is best adapted for segmental Pointed or Gothic, with the extrados carried down to intersect the joint line. Fig. 3 is not recommended, on account of its acute angle, which is a constructional weakness, especially in wide spans; for when the weight comes on the crown it tends downwards, and the thrust comes on the acute point and breaks it off.—S. Lewis.

[797.]—HALF-TIMBERED ERECTION.—I would suggest to "W. W." to line over the inside of his partitions with ½-inch rabbetted boarding, the face of which should be left rough for papering. I would also advise "W. W." to dispense with such flimsy constructions, and adopt the Portland cement concrete walls, which would be durable, and, in a sanitary sense, much more healthful of the two.—F. H. Luscom.

STAINED GLASS.

The church of St. Michael, North Waltham, Hants, rebuilt in 1866, has recently been enriched by the placing of several stained glass windows, by Baillie, in memory of the late Rev. Henry Carey, M.A.

A stained glass window has just been completed and fixed in the north-east side of the chancel of South Molton Church, Devonshire. It has a large four-light window. The subjects in the four top lights are The Blind Receiving Sight, The Lame Walking, The Lepers Cleansed, and The Dead Raised. The subjects of the lower panels are Feed the Hungry, Give Drink to the Thirsty, Clothe the Naked, Visit the Sick. The window is by Messrs. E. and S. Beer, of Exeter.

STATUES, MEMORIALS, ETC.

The model of the statue of President Lincoln, which is to form part of the "Lincoln monument" to be erected by the War Fund Committee, has been completed by the artist, Mr. H. K. Brown. The statue, which will be of bronze, will be 9ft. in height, representing Mr. Lincoln in a standing position, holding in his left hand a copy of the Emancipation Proclamation, with the right hand pointing to the words, "Shall be for ever free," engraved thereon. The statue will rest upon a pedestal 15ft. in height, ornamented with appropriate devices. The total cost of the monument will be 15,000 dols., which amount has been fully subscribed in one dollar subscriptions. The monument will be placed in the Park, near the great fountain.

WAGES MOVEMENT.

It is calculated that at least 1,500 operative builders are on strike at Geneva, and the wages of whom amount to about £240 per day. The master builders have issued an address to the men, in which they say—"With your energetic concurrence, we shall be able to avoid a general strike; learn to unite to resist the tyranny of an association; learn to oppose to it the free expression of your will. Free and independent workmen, make use of your liberty; make known your opinion, and prove that the International Association represents but a small minority, whose violence and threats cannot intimidate you."

Letters from Philadelphia inform us that throughout the United States, at the beginning of the year, the working men submitted to a marked reduction of wages in nearly every branch of labour.

It is stated that, in addition to the numerous dismissals of hired artizans and labourers which have taken place at Portsmouth, and at other yards, a reduction to the extent of 1,200 men will be made at Woolwich yard alone.

LEGAL INTELLIGENCE.

Claim against Chapel Trustees.—Parkes *v.* Mountain and others.—In this case before the Birmingham County Court, Mr. Parkes, tube maker, Birmingham, sued George Mountain, John Palfreyman, Jabez Reynolds, and John Page (trustees of the United Methodist Free Churches Chapel, at Ridding-lane, Wednesbury), to recover £46, being the price of work done in putting a warming apparatus into the chapel. The execution of the work in question was not disputed, but the defendants alleged that the agreement to do it had been made with a Mr. Brotherton, of Wolverhampton, who undertook to execute it for £25. Mr. Brotherton had taken the chair at a tea-meeting of the congregation in December, 1866, and the defendants alleged that Mr. Brotherton on that occasion remarked that the chapel was very cold, and some further conversation taking place, he undertook to get the chapel warmed for £25, and give six months credit. The defendants were willing to pay £25 for that work in the terms of the alleged contract. Mr. Brotherton was called, and denied having made any offer to put a warming apparatus in the chapel for £25, or for any other amount. He denied having alluded to the warming of the chapel in any remarks that he made on the occasion of the tea-meeting. Mr. Parkes, the plaintiff, and his brother, were also called, and deposed to doing the work on instructions received from Mr. Palfreyman, one of the trustees of the chapel. George Mountain and John Page, two of the defendants, were called, and swore to Mr. Brotherton offering to warm the chapel for £25. The judge said that no doubt there had been a misunderstanding on the part of the defendants as to who was to do the work for them, but they were legally liable, and the verdict must be for the plaintiff for the full amount.

NOTICES OF PUBLICATIONS.

"Recollections of the Paris Exhibition of 1867." By Eugene Rimmel: Chapman and Hall, 193, Piccadilly.

M. Rimmel, the well-known perfumer, was an Assistant-Commissioner of the Paris Exhibition, and wrote a description of it in two French newspapers, which he afterwards published in a collected form. He has here given us an English version of that work. Perhaps his attractively got-up little volume has been somewhat late in appearing; still it is interesting enough, without being very original, and will, no doubt, be to many a welcome souvenir of the latest, and in some respects the greatest, of the International Exhibitions. M. Rimmel, it may be stated, joins heartily in the opinion that the jury awards, as a whole, and particularly as regards this country, were open to censure. "Eminent noblemen had to judge manufactures with which they were totally unacquainted, and learned doctors to pronounce on the merits of fancy articles which all their science did not enable them to appreciate." His argument is that the right man was not in the right place. Again, the jurors were originally misinformed as to the time when they would be wanted, and the result was the paucity of rewards obtained by British exhibitors, which gave rise to loud complaints.

"Rating of Railways." By Edward Ryde, Surveyor: Cassell and Co.

In the form of letters, each letter complete in itself, Messrs. Cassell are issuing a series of practical reference books, from the pen of Mr. Ryde, of Parliament-street. The present pamphlet treats of the rating of railways, a subject of special interest to professional men, but one little understood by the public at large. In connection with railway rating, a vast number of questions have to be considered, and Mr. Ryde brings the experience of thirty years to elucidate and explain the general rules and principles to be adopted. In a small shilling *brochure*, of thirty-six pages, this wide subject is necessarily treated very briefly, but this is, perhaps, a merit. In subsequent letters the author will deal with land surveying, compensation cases, timber measuring, light and air questions, dilapidations and nuisances, and other subjects of importance to men in his profession, and not without interest to the general public.

"Manual of Wood Carving, &c." By W. Bemrose, Junr. With an Introduction by Llewellynn Jewitt, F.S.A. Fifth Edition: Bemrose and Sons, 21, Paternoster-row.

We have had recently to notice more than one new manual of Wood Carving, and we are now called upon to notice another which has reached a fifth edition. This may presumably be taken as a proof that the art is being more generally practised than formerly, and that carved furniture, and other objects, are coming into general favour. "Take care of the beautiful," said Goethe, "and the useful will take care of itself." There is truth in the maxim. But wood carving, it may be said, is not more beautiful than useful. As Mr. Jewitt, in an elegant introduction to Mr. Bemrose's work, remarks, "There is scarcely an art to which our English homes are so much indebted for their beauty, their comfort, and their attractiveness, as that of wood carving; and there is none which is capable of more development, or of being practised with more pleasurable results, than it is." Nor is the notion well founded that, because a piece of furniture is carved, it must be costly. In one sense, carved furniture is costly, but there can be no doubt that it is 50 per cent. less expensive than much of the veneered furniture, and more than 500 per cent. better and richer looking. The manual before us, which is chiefly intended for the instruction of learners and amateurs in the art, is superior to most works of the class we have seen, in the number and variety of examples of carving it gives, suitable for general use—*i.e.*, for domestic furniture. Some of the side-board backs and the book-cases are rich and elaborate, and would require very considerable skill on the part of an amateur for their successful execution. Others of the designs are more simple, but equally effective, and in good taste. The church furniture, which includes lecterns, stools, chairs, almsbowls, &c., is good on the whole. Two new features in wood carving are, we observe, introduced in Mr. Bemrose's work. The one he has named "Diaper Carving:" it consists in the groundwork, or parts usually cut away in carving, being punched in patterns, thus throwing up the design with such force that the effect is almost equal to carving itself. This is an improvement on the old method of filling subordinate parts by scribing. Furniture made up entirely on this plan looks remarkably well, says the author, while it can be rapidly executed. The other new feature is the introduction of club nails (known as "cast hobs"), which may be introduced with advantage on various parts of carved work, as shown in several of the plates. These nail-heads may be of various shapes, and when placed at intervals of half-an-inch along the edge of a plain shelf, they produce a very neat appearance. This manual shows great taste in the getting up, and is published at a very low figure, considering the number of plates, and the amount of instruction it contains.

"Workmen and Wages at Home and Abroad." By J. Ward, author of the "World and its Workshops," &c.: Longmans.

The great argument of this work is briefly this:—The workman has no right to insist on his master paying him higher wages, if the master can find a man who can supply his place for lower wages; nor has a workman the right to say to his fellow-workman, that he shall not work for such wages as he likes himself, but at such wages as the other likes. If workmen have a right to demand higher wages, the master has an equal right to refuse them. If the master depends upon the workman's labour, it is equally clear that the workman depends upon the master's capital; and to compel the master to raise wages beyond what he can afford is injustice and tyranny, and must in the end be the ruin of both master and man. Mr. Ward endorses the conclusions that trades'-unions are founded for an unsound purpose, and that, consequently, their moral effects are bad; that society can be best aided by free and open competition; and that education and forethought alone can secure to every one his just reward. He reviews very ably and interestingly the condition of workmen and wages here and on the Continent as well as in America, and his reflections lead the author to this other conclusion, that there is probably no other country on the face of the globe where sober, industrious, young mechanics and labourers can so soon raise themselves to ease, independence, and comparative comfort as here—in no other country in Europe are the working classes so free from enforced taxation as they are in Great Britain. It would be well, thinks Mr. Ward, for the great body of the working classes if they understood, or would even take the trouble to understand, the economic laws by which they are governed, and which are as fixed and enduring as the great laws of the universe. We are afraid that some of the acts which have taken place in connection with recent labour agitations and trades'-unions, as well as not a little of the published evidence before the present Royal Commission, go to prove only too conclusively the soundness of these opinions. On a former occasion we gave some statistics from Mr. Ward's book to show that the general earnings of Paris workmen in the different branches of industry are much below those paid in this country. The work is appropriately dedicated to Mr. Gladstone.

Our Office Table.

The Dublin papers announce the death of Mr. Bernard Mulrenin, a distinguished miniature painter of that city, and president and secretary of the Royal Hibernian Academy.—M. Picot, the veteran historical painter, has just died at Paris, aged 82. He obtained the first prize of L'Ecole des Beaux Arts, with his "Mort de Jacob," so long ago as the year 1813.

Mr. W. Gibbs Rogers, the carver, is about to sell by auction his collection of several hundred specimens of old Italian, Flemish, Venetian, and French works, carvings by Grinling Gibbons and Chippendale, and many of Mr. Rogers's own works of original designs and working drawings.

Although subsequent search at the works of Messrs. Bell and Black, at Bow, has not resulted in any additional "find" of china of any importance, collectors of this ware continue to manifest great interest in the recent discoveries by their attendance in considerable numbers to watch the operations of the excavators. Most of the specimens of Bow china hitherto recovered have unfortunately been broken by the pick-axes of the labourers engaged in cutting the drains.

Among the many marvels of this marvellous age, not the least, thinks the *Leader*, is the conversion of a railway arch into a theatre, with boxes, pit, gallery, and stage, all complete. This, it would seem, is in course of construction near the Elephant and Castle, and immediately contiguous to Mr. Spurgeon's tabernacle.

A meeting of operative house-painters was held on Wednesday evening at Cleveland Hall, Fitzroy-square, to hear a deputation from the Manchester Alliance of Painters, on the necessity of a better organization in the London trade. Several speeches were made, pointing out the advantages of unions, and urging members of local societies to unite themselves to the Manchester Alliance, which was conducted on the federative principle. After some discussion, resolutions were adopted, pledging the members present to co-operate with the Manchester Alliance.

We hear that the town of Willington is to have a public park, through the liberality of Lord Boyne. The ground will shortly be laid out, and a bridge requires to be built, in order to connect the two portions of the estate divided by the river Wear.

The following will act as presidents of the various sections at the Norwich meeting of the British Association for the Advancement of Science:—Professor Tyndall, mathematical section; Mr Frankland, chemical section; the Rev. M. J. Berkeley, biological section; Lord Strangford, geological section; Right Hon. W. E. Gladstone, M.P., statistical section; and Mr. G. P. Bidder, mechanical section. Professors Olley and Huxley, together with Mr. Scott, of the Board of Trade, are also expected to deliver lectures.

The number of women artists in New York has become so large as to justify the formation of a society for the aid of all their sister artists who may be in need. To raise a fond for this purpose it was proposed, at a recent meeting, that each member of the association shall contribute a picture once a year to the exhibition, which shall then be sold for the benefit of the society. Mrs. Pope has been named president, and Mrs. Gray treasurer of the society, a number of gentlemen being appointed "an advisory committee" to counsel and assist the ladies.

Mr. Whitworth, the well-known engineer, has intimated to the Government his readiness to place in the hands of trustees a sum sufficient to provide £100 a year for thirty young men who have passed a satisfactory examination on the subjects of "Technical Education." The details of the scheme, says the *Pall Mall Gazette*, have not yet been arranged.

A new patent feeding holder, applicable to writing and ruling pens, has just been introduced by Messrs. Rowney and Co., of Rathbone-place. The roling pen, which will contain a supply of Indian ink sufficient for several days, appears especially suitable for architects. Mr. Gilbert R. Redgrave has used the pen, and has found it thoroughly to answer his purpose. He says that the ingenious method by which the ink is forced into the nibs seems to him to completely overcome the tendency to blot possessed by all previous self-feeding pens. The construction of the instrument is very simple, and its use easily acquired, and he has no hesitation in stating that it is a valuable acquisition to the architect.

The *Mechanics' Magazine* believes that leaden tobacco-boxes have nearly disappeared in this country, though it sees some occasionally. Dr. Mayer, of Berlin, it is remarked, has traced six cases of lead colic and paralysis to the use of these utensils. M. Chevallier has also found that tobacco, wrapped in lead foil, becomes impregnated in the course of time with acetate of lead.

A large proportion of the lucifer matches used in this country are imported from abroad. The Match-Making Company of Jonkœping, in Sweden, furnishes a large quantity. In 1866 they made 45,693,241 boxes, of which 36,000,000 were sent to this country. They make a considerable number of matches on a plan of their own in which phosphorus is not required.

"A correspondent," says Mr. Vale, "the week before last, gave an account of a building just completed with a smoke tower, and no chimneys. I beg to state that a gentleman in Devon adopted a similar plan some 35 years since. It proved to answer all anticipations, and the draughts from the several fireplaces were perfect. But the idea of making a building without chimney tops! They should be added to a house especially for foul air shafts, for all voids between floors, cellars, basements, and every other room throughout, a matter of vital consequence, but too often little regarded."

By a process which is still a secret, Mr. Adolphe Braun, of Dornach (Haut-Rhin), has produced an immense number of absolute *facsimiles* of the best drawings left by the great masters. These new photographs are superior, it is said, to all former works of the same kind in the ordinary excellencies of detail and surface-quality. They also reproduce exactly the tint of the original neutral, brown, red, or greenish, as the case may be. The new photos are confidently asserted to be absolutely permanent, but this must of course remain to be proved by time.

The will of the late King of Bavaria, which was read at Munich the other day, contains some very interesting bequests. The testator bequeaths the Walhalla, near Ratisboone, to all Germany; the Temple of Glory, near Munich, the Monument of the Deliverance, near Kilheim, and the other buildings which he possessed to King Louis II., to whom he recommends his poor dependants. Prince Leopold receives the Chateau of Leopold, and the marble quarries of Untersberg.

Eastwell Park, Kent, the residence of the Earl of Winchilsea, had a narrow escape of total destruction by fire last week. The flames, however, were subdued, after doing damage to the extent of £12,000.

MEETINGS FOR THE ENSUING WEEK.

Tues.—Institution of Civil Engineers,—"The City Terminus Extension of the Charing Cross Railway," 8. Second, on "The Experimental Determination of the Strains on the Ties of a Bow String Girder," by Wilfred Airey, Assoc. Inst. C.E.

Society of Arts.—"Cantor Lectures," the Conversion of Chloride of Sodium into Carbonate of Soda; the Decomposition of Common Salt into Hydrochloric Acid and Sulphate of Soda; Glauber's Salt; the Transformation of this Compound into Soda Ash, Soda Crystals, and Bicarbonate of Soda, Ballard's Process, and the important and recent Discovery of the Utilization of Soda Waste, &c., Illustrations.

Wed.—Geological Society, 8

Sat.—Associated Arts Institute, Committee Meeting.

Trade News.

TENDERS.

Carshalton, Surrey.—For villa residence, for Mr. W. H. White. Messrs. Goodman and Vinall, architects. Quantities supplied:—

Simpson	£1,042
Shepherd	980
Lathey Brothers	976
Rhodes and Roberts	934
Sharpington and Cole	839
Jarrett	834

Charlton.—For rebuilding Infant School, Charlton, Kent. Mr. W. Wigginton, Cornhill, architect:—

Ennor	£592
Kilby	555
Axford and Whittier	555
Abraham	530
Walker	502

Charlton.—For Almshouses, Charlton, Kent, for the trustees of the Dutch Church, Austin friars, E.C. Mr. W. Wigginton, architect, Cornhill:—

Abrahams	£3174
Kilby	3122
Ager	3117
Ashby and Sons	3038
Macey	2991
Hill and Keddell	2969
Ennor	2865
Axford and Whittier (accepted)	2833

Goldenhill.—For the woodwork of two houses and shops. Mr. R Dain, architect, Burslem:—

Halfpenny	£340 10 0
Wooldridge	325 0 0
Bennet and Cooke	315 0 0

Hanley.—For the erection of six houses on the Grove estate. Quantities supplied. Mr. C. Lynam, architect, Stoke-on-Trent:—

Sutton	£3,900
Matthews	3,737
Collis and Hudson	3,669
Oakley and Minks	3,580
Wooldridge (accepted)	3,562

London.—Rebuilding No. 19 and 20 Walbrook, E.C., for Messrs. Lawson and Sons. Mr. Wimble, architect:—

Myers and Son	£3,560
Piper	3,337
Newman and Mann	3,195
Adamson	3,190
Colls	3,156
Kilby	2,978
Mortar	2,900
Ramsey	2,843

Reading.—For new Lunatic Asylum for the county of Berks and boroughs of Reading and Newbury. Mr. C. H. Howell, architect. Quantities supplied by Mr. J. Scott and Messrs. Widnell and Trollope:—

Foster	£47,250
Lucas	46,978
Brass	46,700
Brown and Robinson	45,126
Webb	44,500
Piper and Wheeler	43,990
Trollope and Sons	43,434
P'Anson	43,280
Dennett and Co.	43,100
Lovatt	42,950
Holland and Hannon	42,870
Perry	42,850
Higgs	42,190
Barnsley and Son	41,960
Mansfield, Price, and Co.	41,618

Teddington.—For building residence and stables at Teddington. H. H. Collins, architect, 5, Queen-street, E.C.:—

Dawes (accepted) house, £1,550; stables, £580

London.—For alterations, additions, and decorative works to house and stables, Stratford-place, exclusive of gas and hot water work. H. H. Collins, architect, 5, Queen-street, E.C.:—

Gillows	£9090
Henshaw	8600
Foxley	7733

Wrexham.—For the erection of four cottages for Mrs. Mulliner. Messrs. H. Davies and Son, architects:—

Rogers	£816
Owen	780
J. Davies	650
Samuels (accepted)	560

PROPERTY SALES.

March 23.

At the Mart.—By Mr. F. D. Tuckett.—Freehold house, shop, and premises, No. 38, St. George street (otherwise Ratcliff Highway), let at £35 per annum—sold for £450.

By Messrs. Foster.—Leasehold residence known as Rosenstead, No. 62, Avenue road, Regent's Park, term 69 years unexpired at £35 per annum—£4,200.

Leasehold residence with grounds, paddock, &c., in all three acres, known as Cypress House, Dulwich Common, term 12 years unexpired at £20 per annum—£1,110.

By Mr. C. Moore.—Freehold two cottages, situate in Edward road, New Barnet, let at £26 per annum—£325.

Freehold residence, situate in Henry road, New Barnet, annual value £30—£385.

Freehold residence, situate in Henry road, New Barnet, annual value £30—£385.

Freehold residence, situate in Henry road, New Barnet, annual value £30—£380.

Freehold residence, situate in Henry road, New Barnet, annual value £30—£380.

Freehold plot of building land, in Henry road, New Barnet—£110.

Freehold two residences, known as Elizabeth villas, Victoria road, New Barnet, producing £52 per annum—£710.

March 24.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer.—Copyhold residence, with stabling and coach house, No. 564, Mile end road, annual value £90—£1,210.

Leasehold two residences, Nos. 25 and 26, Albion square, Dalston, let at £38 per annum each, term 94 years from 1845, at £12 per annum—£800.

Leasehold residence, known as St. Germain's Lodge, St. Germain's road, Forest Hill, let at £60 per annum, term 99 years from 1866, at £6 per annum—£600.

Leasehold improved ground rents, amounting to £240 per annum (for 76 years), secured on nine residences in Highbury grove—£4,490.

Freehold property, known as Holm Elms, Wimbledon, comprising a residence, with stabling, coach house, garden, grounds, and farm yard, with farm buildings, the whole comprising nearly 12 acres—£8,400

By Messrs. Bond and Son.—Leasehold shop and premises, No. 33, Brill place, Skinner street, Somers Town, annual value £28, term 54½ years from 1827, at £3 per annum—£105.

Leasehold residence, No. 40, Bedford row, let on lease at £120 per annum, term 21 years from 1854, at £100 per annum—£65.

March 25.

At the Mart—By Messrs. E. Fox and Bousfield.—Freehold house, No. 20, Clarence street, Rotherhithe street Rotherhithe, let at £14 19s. per annum—£140.

Leasehold two houses and shops, Nos. 7 and 8, Bedford row, Lower road, Rotherhithe, producing £44 per annum, term 32½ years unexpired, at £6 per annum—£360.

Leasehold residence, No. 13, Victoria road, St. John's Wood, annual value £130, term 99 years from 1855, at £18 per annum—£1,550.

By Messrs. Candy and Luckin.—Leasehold residence, No. 43, Jackson road, Holloway road, let at £38 per annum, term 98 years from 1864, at £6 per annum—£375.

Leasehold residence, No. 43, Lowman road, Jackson road, Holloway, let at £40 per annum, term 99 years from 1866, at £6 per annum—£375.

Leasehold house, shop, and premises, No. 1, Roman road, Barnsbury, let at £40 per annum, term 99 years from 1859, at £6 per annum—£400.

Leasehold two houses, Nos. 2 and 3, Roman road, producing £69 16s. per annum, term 99 years from 1859, at £12 per annum—£540.

By Messrs. W. and C. Moore.—Leasehold two houses, Nos. 2 and 3, Montrose terrace, Roman road, producing £60 per annum, term 92 years unexpired, at £12 per annum—£550.

Leasehold business premises, No. 1, Ebury square, Pimlico, let on lease at £24 per annum, term 99 years from 1791 at £1 6s. 3d. per annum—£190.

Leasehold house, No. 55, William street, Regent's Park, let at £61 2s. per annum, term 99 years from 1823, at £7 per annum—£525.

Leasehold residence, No. 40, Hawley Road, Kentish Town Road, let at £44 per annum, term 92 years from 1846, at £6 per annum—£510.

Leasehold residence, No. 21, Crowndale road, Camden Town, let at £44 per annum, term 99 years from 1844, at £6 per annum—£615.

Leasehold residence, No. 25, Ampthill square, Hampstead road, let at £67 10s. per annum, term similar to above at £16 10s. per annum—£905.

Leasehold two residences, Nos. 35 and 36, Harrington square, Hampstead road, producing £142 per annum, term 99 years from 1843, at £22 per annum—£1,980.

Leasehold residence, No. 64, Gloucester crescent, Bishop's road, Bayswater, let at £100 per annum, term 95 years from 1854, at £2 per annum—£1,630.

Leasehold two residences, Nos. 16 and 17, Rutland street, Hampstead road, producing £95 per annum, term 97 years from 1840, at £10 per annum—£1,345.

Leasehold two residences, Nos. 6 and 8, Harringay Street, Rutland Street, Hampstead Road, producing £100 per annum, term 99 years from 1825, at £16 16s. per annum—£1,420.

MARCH 26.

AT THE MART.—By Mr. Newbon.—Policy of Assurance, amounting, with bonuses, to £1,262 10s. 6d., effected with the Norwich Union Office on the life of a gentleman aged 76 years.—£640.

Leasehold improved ground-rents, amounting to £32 per annum, secured on eight houses in Iseldon road, Hornsey road, term 80 years from 1862—£575.

Leasehold improved ground rents, amounting to £13 4s per annum, secured on six houses in Wellington street, Holloway, term 99 years from 1859—£215.

Leasehold improved ground rent of £12 per annum, secured on No. 37, St. George's road, Notting Hill, term 99 years from 1862—£200.

Leasehold residence, No. 3, Whitley villas, Caledonian road, let at £40 per annum, term 90 years from 1852, at £8 per annum—£525.

By Mr. John M. Dean.—Freehold house and premises, known as Perseverence Cottage, Abbey street, Barking road, annual value £15—135.

Freehold ground rent of £18 per annum, secured on six houses in Albert road, Plaistow road—£355.

Freehold ground rent of £6 per annum, arising from two houses in Lower Hamlet's road, Forest lane, Forest Gate, £115.

By Mr. Henry Staines.—Freehold six houses, Nos. 1 to 6, Park place, Sale street, Bethnal Green road, producing £70 4s. per annum—£510.

MARCH 27.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Leasehold house, No, 194, Albany road, Camberwell, term 14¾ years unexpired, free from ground rent—£210.

By Mr Skinner.—Leasehold house, No. 2, Cornwall terrace, Creek Bridge road, Deptford, let at £26 per annum term 76 years unexpired at £3 per annum—£150.

Leasehold collar factory in rear of the above, let at £50 per annum, term similar to above, at £8 per annum—£505.

Leasehold piece of ground, situate in Knott street, Creek Bridge road, term similar to above at £3 per annum—£80.

By Messrs. Broad, Pritchard, and Wiltshire.—Leasehold groundrents of £39 10s. per annum, arising from seven houses in Russell terrace, Holland road, Brixton, term 80 years from 1842—£540.

Leasehold three houses, Nos. 14 to 16, Inkerman road, Kentish Town, producing £74 per annum, term 56 years, unexpired, at £5 per annum—£615.

Leasehold house and shop, No. 108, Euston road, let for three years at £75 per annum, term five years unexpired, at £45 per annum—£50.

Leasehold residence with stabling, known as Bloomfield Lodge, Portsdown road, Maida Hill, let at £72 per annum, term 81¾ years from 1856, at £15 per annum—£840.

Leasehold residence, No. 3, Portsdown road, let at £55 per annum, also the house in the rear, let at £16 per annum, terms similar to above, at £13 per annum—£690.

Leasehold residence, No. 2A, Camden Park road, annual value £45, term 98 years from 1863, at £8 per annum—£400.

Leasehold residence, No. 33, Patshull road, Kentish Town, annual value £45, term 85½ years from 1865, at £6 per annum—£450.

Leasehold residence, No. 12, Church terrace, Kentish Town, let at £25 per annum, term 67 years from Lady-day, 1868, at £5 per annum—£250.

Leasehold residence, No. 15, Church terrace, rent, term, and ground-rent same as above—£235.

Leasehold residence, No. 16, Church terrace, let at £26 per annum, term and ground-rent same as above—£245.

Leasehold residence, No. 21, Church terrace, let at £26 per annum, term and ground-rent same as above—£245.

Leasehold residence, No. 22, Church terrace, let at £26 per annum, term and ground-rent same as above—£245.

Leasehold residence, No. 24, Church terrace, let at £26 per annum, term and ground-rent same as above—£250.

APRIL 1.

AT THE MART.—By Messrs. E. Fox and Bousfield.—Leasehold, 15 houses, three with shops, Nos. 47 to 61, Murray street, Hoxton, producing £522 per annum, term 99 years from 1843, at £82 per annum—£5,150.

Leasehold, two houses and shops, Nos. 175 and 176, Edgware road, producing £125 per annum, term four years unexpired, at £6 12s. per annum—£340.

Leasehold, two houses, Nos. 101 and 102, Lisson grove, North, producing £91 per annum, term 24 years unexpired, at £15 15s. per annum—£705.

Leasehold house, No. 9, Cumberland terrace, Bayswater, let at £42 per annum, term 79 years from 1867, at £7 per annum—£365.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Samuel Edward Marples, Ramsgate, architect, April 15, at 1.—Thomas Livewell Neave, North-square, Mile End, carpenter, April 15, at 2.—Henry Pack, 8, Falmouth-street, Stratford New Town, joiner, April 15.—James Paramor, Margate, builder, April 11, at 12.—Benjamin Ryley, Royal Hill, Greenwich, engineer, April 15, at 1.

TO SURRENDER IN THE COUNTRY.

James Bates, Wolverhampton, brick and tile dealer, April 8, at 12.—Philip Harrel, Ugborough, mason, April 9, at 12.—Thomas Jackson, Pudsey, stonemason, April 7, at 9.15.—Joseph Jefferson, Old Accrington, joiner, April 20, at 1.—George Llewellyn, Pontypool, painter, April 13, at 11.—George Winn, Alfreton, builder, April 15, at 12.—George John Bell, Norwich, builder, April 13, at 11—David Watkin, Coychurch, Glamorganshire, carpenter, April 17.—Frederick Young, Brynmawr, railway contractor, April 12, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

April 23, T. Brading, Ryde, builder.—April 11, G. Hunt, Bury St. Edmunds, plumber.—May 1, G. Lapthorn, High-street, Poplar, master joiner.—May 5, R. C. Rudman, Walmer-road, Notting hill, builder.—May 8, B. Scotting, Shepherd's Bush, builder.—May 1, G. Wood, Mold Green, stonemason.—April 20, T. Eddisford, Heath Charnock, near Chorley, tile manufacturer.—April 22, T. D. Kirkham, Lower Broughton, decorator.—April 14, C. Cotten, Hythe, carpenter.—April 17, J. Scott, Egremont, joiner.

DIVIDENDS.

April 17, J. Taylor, Worsbro' Dale, near Barnsley, builder.

SCOTCH SEQUESTRATION.

Robert and James Carswell Swan, Prospect-hill, near Glasgow, builders.

PARTNERSHIPS DISSOLVED

Birkby and Kelitt, Wike, stonemasons.—Evans and Martin, Penge, builders.—Harrison and D'Hooghe, Darlington, surveyors.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow..	£11	0	£12	0
Quebec, red pine		3	10	4	15	St. Petersburg, yel...	10	10	11	0
,, yellow pine..		2	15	4	5	Finland	7	10	8	10
St. John N.B. yellow		0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..		5	15	6	15	Gothenburg, yellow	8	0	10	0
,, birch.....		3	10	4	10	,, white	8	0	9	0
,, elm		3	10	5	0	Gefle, yellow.....	9	0	10	10
Dantzic oak		4	0	0	0	Soderham	9	0	10	10
,, fir		2	5	3	5	Christiania, per C., 12 ft. by 3 by 8 in.				
Memel fir		3	0	3	15	yellow	12	0	15	0
Riga.....		3	0	3	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	3
,, wedish		2	0	2	9	PUMICE STONE per ton	6	0	8	0
ats, Quebec red pine		6	0	7	0	OILS, &c.				
,, yellow pine..		5	0	6	0	Seal, pale....per tun	38	0	0	0
Lathwood, Dantzic, fm		5	0	7	0	Sperm body	100	0	103	0
,, St. Petersburg		8	10	9	5	Cod	35	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, Sth. Sea, pale	3	6	0	0
Quebec, white spruce		13	0	19	0	Olive, Gallipoli.....	73	0	74	0
St. John, white spruce		13	10	16	10	Cocoanut, Cochin, ton	54	0	55	0
Yellow pine, per reduced C.						Palm, One	40	0	40	0
Canada, 1st quality.		17	0	18	16	Linseed	33	10	34	0
2nd do.....		11	0	12	0	Rapeseed, Eng. pale..	37	10	0	0
						Cottonseed.....	33	10	40	0

METALS.

IRON:—

Welsh Bars in London	per ton	5 10 0	6 0 0		3
Nail Rod	do	7 5 0	7 12 6		
Hoops	do	8 5 0	9 0 0		2½
Hoops, Single	do	8 0 0	9 0 0		
Staffordshire Bars...	do	7 7 6	7 15 0		
Bars, in Wales	do	5 7 6	6 0 0		3
Nailrods	do	7 5 0	7 12 6		2½
Foundry Pigs, at Glasg. No 1 ..	do	2 12 6	2 18 0		net.
Swedish Bars	do	10 0 0	10 10 0		2½

STEEL:—

Swedish Keg, hammered	per ton	15 0 0	15 5 0	2½
Swedish Faggot	do	0 0 0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolts ....per ton		82 0 0	82 0 0		
Hammered Bottoms	do	92 0 0	92 0 0		
Flat Bottoms, not Hammered ..	do	87 0 0	87 0 0		
Cake and Tough Ingot	do	73 10 0	73 10 0		3
Best Selected	do	80 0 0	82 0 0		
Australian	do	82 0 0	82 0 0		
Y. I. Metal Sheathing & Rods ....per lb		0 0 7	0 0 7½		

LEAD:—

Pig, English	per ton	21 5 0	0 0 0		
,, Spanish Soft	do	19 0 0	0 0 0		2½
Shot, Patent	do	22 10 0	0 0 0		
Sheet	do	20 10 0	20 15 0		5
White	do	27 0 0			

TIN:—

English Block	per ton	96 0 0	96 0 0		
do Bar	do	96 0 0	97 0 0		2½
do Refined	do	98 0 0	98 0 0		
Banca	do	95 0 0	0 0 0		nett
Straits	do	92 0 0	0 0 0		

ZINC:—

English Sheet	per ton	26 0 0	26 10 0	2½
Devaux's V. M. Roofing Zinc	do	26 10 0	0 0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20 0 0	0 0	nett
QUICKSILVER	per bll	8 17 0	0 0 0	

REGULUS OF ANTIMONY

French	per ton	44 0	45 0	

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 10, 1868.

MANCHESTER TOWNHALL.

ONCE more we find ourselves in Manchester, and once again in front of a room full of designs for its new Townhall. This time our notice is restricted to the productions of those favoured eight architects who were started as a crew to pull for the prize some six months ago, for our readers will doubtlessly recollect that out of the 136 designs sent in in August last, ten were chosen to compete amongst themselves for the honour and glory of building the municipal palace in Cottonopolis. It was found that amongst these ten were only eight men, two of them having sent in two designs apiece. At present the eight beatitudes don't seem to be much quoted amongst them, and the commination service seems to have prolonged itself from the first day of Lent to this, very nearly the last of it, for the—well—not blessings we hear, are, if not loud, most certainly deep. We wonder if ever there were, or if ever there could be, a satisfactory architectural competition. Architects and committees would both need much alteration before that consummation could be arrived at, and it often occurs to us that the French word *concours* is better fitted to express the fact than our own. They use the same word for horse racing, and there is much the same amount of jockeying and hocussing in the one as in the other, and this does not seem to have been an exception. It may be well just passingly to review what has hitherto taken place before examining in detail the plans before us. Just twelve months ago the corporation advertised for plans, and, as we have said, 136 designs were sent in, some good, some bad, and many indifferent; a professional umpire was called in, and those he delighted to honour were withdrawn from view, and, with the exception of some others, who did not choose to exhibit their designs, the rest were exposed to the public view, and on which we commented at some length. Much dissatisfaction was at the time expressed that all the designs, whether temporarily successful or not, were not treated alike, so that those who were beaten might see that they had fairly been defeated, and the successful architects were then challenged to exhibit their designs in this new competition, in order that it might be seen how far they had pillaged from the industry and invention of others. This they have of course not done, and their original designs are still mysteriously hidden. On Valentine's day last eight sets of drawings were sent in from Messrs. Lee, Brodrick, Wyatt, Speakman, and Charlesworth, Salomans, Waterhouse, Worthington, and Scott, junior, and these comprise 126 drawings, on which Messrs. Street and Donaldson were requested to report. This they did after two days' examination, which would allow them about five minutes per drawing, and as a natural consequence their report was so unsatisfactory that they had to supplement it with another; and now comes the strangest part of this very strange matter. Their second report was "a confidential communication," to be kept strictly private, yet read to a committee of upwards of sixty persons! We all know how very private such a thing must be, and each hearer recollects so well the criticism against his friend; and the discord this has produced and the bitterness of feeling it has caused can easily be imagined. The corporation would do wisely even yet to publish this mysterious document at once, for if it is fair they have nothing to be ashamed of for giving publicity to it, and their withholding it seems to imply that it is not so.

Of course Mr. Waterhouse is successful, though from the evidence of the drawings it seems to us a wonder why. His design is very poor—a flat façade, with a low mean entrance, and a horribly ugly tower in the centre, a tower which seems to have no connection with the building from which it springs, and to have but little between the parts which compose it. The composition of the front itself is very faulty, and the windows are, in some instances, placed in utter disregard to structural requirements, and piers come down over voids, in bold defiance to all laws of gravity or art—in fact, this front of Mr. Waterhouse's design is a failure. The other fronts are more successful, but none of them attain eminence in art, and if we come to analyse the design, we find it is more the handicraft than the architecture which commends it. Some of the sketches are exceedingly beautiful, and the little pen and ink sketch of the perspective view from the point demanded by the committee in their instruction is a charming little drawing and a very artful dodge. Its sketchiness reveals nothing and suggests everything, whilst it enables Mr. Waterhouse to supplement his design by a perspective drawing, taken from a more advantageous point of view. Very exquisite is the drawing of one of the internal circular staircases, which have an open and arcaded well-hole. Very few could draw this in such admirable perspective, and none represent it better. Another staircase is also shown, which is a marvellous illustration of how poor a design may be well represented. In execution it would be positively ugly, but as a picture from this point, with all the adventitious aid of an impossible point of sight and extreme elegance of drawing, it is very pleasing. The main hall has a roof of the Westminster Hall type, but instead of showing the rafters the ceiling is curved, following the main line of the arch rib, a change which is not an improvement on its prototype, and the acoustic effect of which would certainly be bad. It is only when we come to the plan that we find anything commendable, and here Mr. Waterhouse has been very successful. It is exceedingly simple; and when the awkwardness of the site is taken into consideration, our professional readers will know how much thought and trouble must have been bestowed upon it to produce this apparent simplicity. By making his main entrance on the ground-floor Mr. Waterhouse obtains two good things. He gets all his steps under cover, and preserves the whole front to Albert-square on the first floor for reception rooms *en suite*. He has, moreover, shown great skill and wisdom in placing the main hall in the centre of his sill, and not ranging with the centre of his façade, a point not seen by any other of the competitors, and which gives him greater and more equal open space for ventilation; and by raising the ground floor a few steps he maintains a continuous corridor on the ground floor, and yet obtains a cartway and ready means of access to the basement. These corridors form a continuous ambulatory around each floor, and have the circular staircases before alluded to at each angle, giving ready access to all divisions of the buildings. To obtain all this Mr. Waterhouse has encroached somewhat on the space allowed for the buildings, and thus obtains one advantage over those who have complied with the conditions, and at which some of them take what seems to us reasonable exception. Altogether Mr. Waterhouse's design does not please us. It has great merit in parts, but wants much more thought and consideration to make it a perfect whole, and will require quite as much alteration as some of the others would do before it or they could be fitted for its purposes.

[On account of going to press a day earlier than usual this week, the concluding part of this article came to hand only just as we were going to press, and must therefore be postponed till next week.]

RECOLLECTIONS OF THE PARIS EXHIBITION.

IN the statistical introduction to the catalogue of the British section of the Paris Exhibition, a remarkable document, issued from beneath the shadows of the new boilers at Brompton on the 1st of April—(appropriately enough, as some were wicked enough to think)—is a table showing the number of persons engaged in domestic service, and in all the principal industrial operations of the United Kingdom, according to the census of 1861. From this we learn that the fourth great industry of this country is building—standing in that position relatively after "service" (domestic and agricultural), "dress," and "cotton." If we add to these numbers engaged in building operations purely, those set down under the head furniture, without recording the various trades and industries which contribute materials for the builder's use, such as lead, iron, glass, &c. ("stone and clay" alone counting for a very large number), we find that cotton itself must yield its place and give way to the builder, who thus takes rank as third in the list of industrial operators, following only the great staple headed "dress," which ranks next to domestic and agricultural service, the term under which the largest number of all working individuals, men and women, are included. Now, although it is only with the comparatively small proportion of workers in this industry which can be deemed artistic, and the small amount of their work which can be recorded amongst the fine arts, to which we now desire to refer, still, as a little leaven leavens the whole lump, so does the work done by this minority, and in this infinitesimal proportion influence for good or evil, both artistically and constructively, the whole mass of building works carried out in the United Kingdom. Thus the importance of this matter, of the good or bad architecture of the age, shows itself in connection with any comparative exhibition of the arts and the industries of the period. With this point in view it is not unprofitable to enquire before the opening of this year's exhibitions, what results from the great display of last year are evident and patent to all, or what has been lost of opportunity, and how far our coming exhibitions, though on no world-wide competitive scale, may profit by the experience of last year's failures.

Whether South Kensington profited by the statistics gathered by themselves, and gave sufficient prominence to architecture in the Exhibition, and whether it would not have been preferable to have had the architectural drawings properly hung at the opening of the Paris Great Exhibition, instead of devoting so much care to placing prominently in position the case of old newspapers and such like fidfads, let those more directly interested in the matter say; but what we think is that the important series of drawings sent to Paris deserved better treatment at the hands of the authorities, even if the names of those sending them were not sufficient to ensure it. The small space in which these works were huddled together, not in the Fine Art ring at all, was disgraceful to those who had the disposal of the space, and we are informed that a definite application for more was definitely refused.

Whether the combination of the Art Manufactures Court with the exhibition of architects' designs was practically of advantage to architects may be a moot point, but there can be no doubt that it was highly distasteful to the South Kensington authorities, and that it suffered accordingly. At any rate, it seems by the report of the Paris Exhibition Architectural Committee, just issued, that the combination was more or less satisfactory to the promoters, inasmuch as they do not deprecate any similar arrangement at any future time, though bewailing the troubles attending it in this instance. It, however, it was an advantage to the works of art industry to be placed so near the fine arts as to occupy the outer wall

enclosing that ring, it was hardly so for the Fine Art itself, which was placed beside it, when it ought to have been within the proper circle, and, indeed, it was scarcely fair to deny to the architecture of Great Britain alone of all the architecture exhibited a sufficient place in the range of the Fine Arts; but when it is considered that the number of all the drawings and models exhibited through this committee amounted to more than all those exhibited by other countries put together,* France alone excepted, of course, an excuse may perhaps be found in the impossibility of providing adequate space in a proper position for such an important display. At the same time it may be deemed an honour to British architecture to have taken up so determined and definite a position with regard to practical work, and shown more designs for actual buildings, &c., than all the rest of the world, France even included, and altogether to have made a satisfactory show of architectural designs both as exhibited in drawings and in works of a more substantial character. (See the before-mentioned table.)

If we look upon the special style of French drawing in contradistinction to that of our own, we may not find a reason for this curious fact, that the French prefer to show "Projets" and ancient studies rather than executed works, but we may at least ask if the executed works of France do not suffer from the too careful attention to draughtsmanship, the liney elaboration of delicate ornamentation, the monotonous, care-taking symmetry of parts which is the result of paper-planning and drawing-board decoration. On the other hand, is not the vigorous, bold—coarse, perhaps, often wanting in refinement—but strong drawing and colouring of our British delineation better adapted to show the actual form and appearance of the buildings, and to lead the designer himself to approve and provide more variety, light and shade, boldness and vigour in the actual work? And for the purposes of *exhibition* is not the latter style more desirable after all, if the object be to interest the public in the works of architects? for, even to the professional man, it takes some time and imagination (besides the examination of the plan) to understand the effect of an elevation, and to the unprofessional visitor it is almost impossible, while a good perspective drawing properly shaded, and with the materials truthfully coloured, is surely of the highest value as an architectural study. Yet it is the fashion to deprecate such exhibition drawings as if they were never got up except to deceive, and to praise the French style of delineation, and speak of mere elevations and plans as if technical draughtsmanship was the object, and not architectural representation.

Now, for the Royal Academy to exhibit merely such technical drawings would be absurd, and nothing could lead less to popularise architecture. Then who was right as to the kind of drawings exhibited, France or England, in the Paris Exhibition? where all the world was invited to see, amongst other things, the architecture of the period pre-eminently before the draughtsmanship. All this has a bearing upon the daily work of architects, as well as on all exhibitions of architecture, and we commend it to the consideration of all who may have any concern in the matter; but we wish emphatically to assert that to draw—even the figure—is not to design, and to make archæological drawings is not to conceive fit architectural clothing for the every-day building wants of the nineteenth century.

But for the Architectural Exhibition to take up the special line of technical delineation in combination with popular—though not on that account useless—representation of buildings and designs, is perfectly right, and indeed obligatory; for therein consists the life, the *raison d'etre* of the society itself, and a cause for increased opportunities of usefulness, even when the Academy shall be enabled to offer space on its walls for a proper exhibition of architectural works; and if it should unfortunately turn out that the Academy still looks coldly on one of the arts which it is established to foster and encourage, the Architectural Exhibition Society will still remain to shelter and protect, if not to honour and adorn, the neglected sister of the arts. It would then become the pride, as well as the duty, of the managers, to see how far they could extend the popularity as well as the professional usefulness of the extensive collection of drawings and photographs which yearly they offer to the inspection of the public.

We shall look with anxiety at the position which this society will hereafter assume, and we venture to predict for it—if only true to its purpose—a future of extended usefulness, instead of apprehended dissolution. At the same time, if eclipsed in its displays, or deprived of its resources by the all-absorbing power of a regenerated and enlarged academy, we shall not regret its extinction, but remember its period of existence with all gratitude, honour it for its usefulness in the day of its power, and recollect it as having risen up to perform a duty neglected by another to the best of its opportunity and ability.

* Comparative Statement of the Exhibits in Architecture at the Paris Exhibition of 1867.—Under the head of "works" are included all designs actually executed or in execution; while under the other head are included all mere studies; designs only proposed for execution, restorations of buildings not intended to be carried out, &c., &c.

		Exhibitors.	Exhibits.	Works.	Projects, studies, &c.
England ..... Total number of frames, 175	* Drawings	60	83	65	18
	Photographs	14—74	57—140	39	18
				104	36
France ..... Total number of drawings, 351.....	Exposition	34	55		
	Annuel ...	6—40	9—64	16	48
			No. of Drawings.		
Pays Bas.....	....	4	13	7	11
Belgium	....	5	12	3	9
Prussia.....	....	7	33	3	30
Wurtemburg	....	1	5	4	1
Bavaria	....	1	1	—	1
Austria.....	....	19	21	5	16
Switzerland...	....	9	10	1	9
Spain	....	2	2	—	2
Russia	....	4	7	4	3
Italy.....	....	9	9	2	7
Roumania ...	....	5	6	3	3
Turkey..... Egypt	.....	2	13	1	12
United States	None(?)	—	—	—	—
Totals.....		68	137	33	104

Thus it will be seen that Great Britain alone exhibited more than twice the number of works that were exhibited by all the rest of the countries of the world put together, even including France.

To show more clearly the active state of architecture in England, and the unexhaustive character of the contribution to the Paris Exhibition, the number of exhibitors in 1867 in—

The Royal Academy was	35	and	72	exhibits.
The Architectural Exhibition	was 141	"	349	"
Totals...	176 exhibitors.		401	Exhibits in addition to the above.

* A much larger number had to be rejected for want of space.—*See Report.*

THE EARTH SYSTEM.

WHETHER the earth system is destined to be the one generally adopted for sanitary purposes we must wait to see. At all events every day's experience proves that the water system is very far from perfect. It is, in truth, open to objection on many grounds, as its warmest advocates cannot but admit. If it cures certain evils, it creates others which are just as bad in their effects. Four years ago the Committee on the Metropolitan Sewage stated in their report that no efficient artificial method had been discovered to purify, for drinking and culinary purposes, water which had once been infected by town sewage. And this fact remains. By no known mechanical means can such water be more than partially cleansed; it is always liable to putrify again. Processes of filtration and deodorisation cannot, therefore, be relied upon to do more than mitigate the evil. Water which appears perfectly pure to the eye is sufficient, under certain conditions, adds the same report, to breed serious epidemics in the population which drinks it. That the present system of sewage is defective, unsatisfactory, and, in fact, attended with positive injury to the public health, though its primary object is to subserve the ends of health, it need not take long to prove. The evidence at hand is abundant and conclusive. For example, no fewer than 100 cases of fever at Tottenham were distinctly traced to the water from the sewage works that irrigated the fields in the neighbourhood. And the Registrar General has shown that 78 per cent. of the deaths has been due to the use of water rendered impure from the presence of sewage matter. Though irrigation and water-closets are advocated by Mr. Rawlinson, Mr. Latham, and other sanitary engineers, the system is strongly condemned by other authorities, including many eminent medical men. Dr. Hawkesley observes that "the great fault of the irrigation system is, that it leaves unredressed the crying evils of polluted air and water. The drains and sewers remain exactly where they were—an enormous laboratory of pestiferous gas, and the deadly adulterators of our water. Under this system the double and treble mortality must go on—the degeneration of the human constitution—the spoiled homes of our labouring classes." Dr. Macadam says, "The irrigated meadow is not so healthy as ordinary pasture land." Dr. Carpenter, of Croydon, Dr. Buchanan, Dr. Capelli, of Italy, and others, also report against the system. Mr. Thorwirth, of Berlin, though an advocate of irrigation, yet recommends that "the lands to be irrigated should be a mile or so away from any human habitation." More deaths and illness, it is proved, occur along the line of great sewers than elsewhere; and facts also prove that irrigation is really noxious and pestilential. As to sewers, Mr. Bazalgette remarks that they "should have free ventilation into the open air, or the gases generated in them will escape through the untrapped house drains into the houses, where they become dangerous and offensive." Of course they must be ventilated in order to be cleansed and repaired. But the difficulty of trapping sewers is very great. Mr. Hayward, engineer of the City of London, describes the difficulty as "gigantic." In his evidence before the House of Commons he confessed himself unable to suggest any better means of ventilating the sewers than are used at present. "I am afraid," he said, "that we must let out the stink in the middle of the streets." What the effect of this is on the public health need not be told. The epidemic in Washington, in 1857, was clearly traced to the escape of gas from sewers; and so late as last year a sewer in Philadelphia absolutely exploded from the accumulated gas. The case of Croydon is constantly cited as an example of successful irrigation, but though Croydon possesses peculiar advantages as regards the application of the system, the result afforded is after all only partial. The farm at Croydon, it is stated, comprises 312 acres, the crop raised on which brings annually £1,800, but then the value of the sewage passed over it is £17,500; therefore, seven-eighths is wasted, and the air and water are poisoned in that degree. Medical men assert, with regard to water-closets, that since their introduction, owing to the lowering effect of the poisons emanating directly and indirectly from them, the type of disease has been altered, and has become more dangerous. The three great objections to the wet system, then, are, first, its noxious effects on health; second, its expensiveness in the matter of water-works, pumping-engines, straining-tanks, &c.; and, third, its wastefulness. With these facts before us, it is not surprising that we should turn our attention to the earth or dry system, for a remedy for the evils from which

we suffer. The merits of this system have received a great deal of discussion lately, and it must be confessed that the advocates of the plan are able to say much in its favour. A very sensible little pamphlet has just been published by Messrs. Spon and Son, of Charing Cross, on this very important question. The writer strongly advocates the adoption of the earth system, and replies to the objections that have been made to it. There can be no doubt that a dry system is *primâ facie* consistent with nature. The use of earth was under certain conditions commanded in the Scriptures, Deut. xxiii., 12, 14. The power which earth possesses of deodorising fœcal matter is indisputable, while the application of water to human excrement favours its decomposition. "It is proposed in this system," says the writer, "that the soap and household water shall be carried off in ordinary rain drains, to be applied to subsoil irrigation, thus avoiding all the evils of pollution, both of air and of water." Again, "the earth method has this great advantage over the sewage system that, although the liquid must be discharged at all times and seasons when the tanks are full, the earth may have its fertilising property increased to almost any extent, and may be stored dry in sacks, and transported to any part of the country as necessity arises." To the objection that the requisite amount of earth for the effective employment of the earth system is so great as to render its application in large places impossible, it is replied that contractors have offered to supply the quantity that might be requisite for any part of London. It would not be attended with anything like the cost of the present method, and, finally, it has been tried with the most satisfactory results. The earth system has already been adopted in public unions, of which may be mentioned Caister, Bradfield, near Reading, Frome, Bromley, Horsham, &c., in barracks, in the Royal Infirmary, Manchester, and in Broadmere Lunatic Asylum; and of its working in Wakefield Gaol, Captain Armytage, the governor, so late as December 26 last, expressed himself as being "perfectly satisfied." The system has also been tried on Baron Rothschild's estate, in a village containing 800 inhabitants, and the Baron's agent, in a communication (as late as December 20 last) expresses the following opinion:—"In practice, the system is so wholesome, simple, and inexpensive, that no one who tries it properly would ever desert it for the water method." Earth-closets and urinals have likewise been adopted in Dorchester County School, where there are about 80 boys; in Brighton Barracks, for 200 men, besides other places, with like success. Ample testimony to the great value of the system has also been borne by the Government of India, which, as is well known, awarded the Rev. Henry Moule £500 in token of its sense of the benefits conferred upon the inhabitants of that country by his system. These are facts which are simply indisputable, and surely they deserve the careful attention of all sanitary reformers.

CONTINENTAL ART.

MR. J. BEVINGTON ATKINSON, in an article in the *Contemporary Review*, on "Art in the Paris Exhibition," gives an interesting account of the condition and characteristics of modern continental art. At the Exhibition the picture galleries as usual excited most of popular interest. 2,116 representatives of some twenty-six national schools constituted as it were a vast and crowded panorama of the contemporary art of the entire world. Six schools or geographic groups could be distinguished.—1, the French; 2, the Belgian and Dutch; 3, the German; 4, schools of southern nations, including Italy and Spain; 5, schools of northern nations, comprising Norway, Sweden, Denmark, and Russia; 6, the English school. The sketches given of each indicate indirectly the conditions of the respective peoples and the phases of civilization. The arts are essentially representative; they pass easily into manufactures and diffuse themselves willingly over life, and thus in their various manifestations become typical and illustrative of countries, climates, and races.

The French school of painting was again proved to be the first in Europe. According to Mr. Atkinson, the arts in France, in common with governments and dynasties, have undergone changes and revolutions. French artists have passed from classic to romantic styles, and thence downwards into such naturalism, realism, or frivolity as may belong to rustic scenes, or to incidents of the toilette and the boudoir. The school of David and his disciples, co-existent with the First Empire, the abnegation of life and nature, could not withstand the assaults of ardent realists and romancists led on by Gericault. The French school reached its zenith under Delaroche, Delacroix, Ary Scheffer, and Flandrin. The period is best represented by the works of Delaroche. He was the reflection of his age; he responded to the impulses freshly awakened in literature and art. The overthrow of usurped authority, the renunciation of dead tradition, the renewal of national life in Europe, the health and vigour gained by recurrence to nature, made the school of Delaroche a product and necessity of the time. The strength of this school was its truth, its health was in freedom, its productive resource was in nature. According to it high art was nothing else than noble thoughts nobly expressed. This style the French have surrendered for pictures of nudity or costume; this school, honourable to humanity, foreign nations, to the shame of France, are the last to uphold and honour.

French art is described by negations—large pictures do not abound, high art is exceptional, works of noble intent are few. The positive side of the school remains to be illustrated. No nation can beat the French in the painting of a battle. Since the days of Horace Vernet battle-pieces have become specialities in Paris. Our neighbours are just the fellows either for a skirmish in the field or on canvas. An artist is as indispensable to the grand army as a drummer or a chaplain. War in its bravery, carnage, and brutality is celebrated by not a few—among them, Yvon, Pils, Bellangé, Beaucé, Beaumé, Rigo, and Protais. It is surprising what movement, energy, and passion animate these desperate onslaughts. They are clever, realistic, and vivid. They cannot, however, be too strongly reprobated for their inhumanity and barbarity. The French talk of the glory of war, and their painters are glutted in its carnage. The first Napoleon decided for Europe the tactics of a campaign, and Horace Vernet has equally determined for the whole world the style in which battles shall henceforth be painted.

As before said, since the death of Delaroche, Ary Scheffer, and Flandrin, high, historic, and sacred art has been less and less practised. Romance, voluptuousness, elegant trifling, these are now the motives and ends of French art; these the sentiments and desires to which are due the brilliancy and allurement of Parisian picture galleries. In French pictures now the vogue, cleverness takes the place of conscience; the diction, rhetoric, and elocution, so to say, of art, are studied to the disregard of substance and truth. Gérôme is precisely the man to fulfil these conditions, and, consequently, he has become the fashionable artist of the day. The morality of his pictures, "Phryne" and the "Egyptian Dancing Girl," is not the less culpable because, after the manner of the French, passion wears a thin veil of disguise. That it was possible for Gérôme to have walked soberly, to have trodden with honour the highway of history, is indicated by such noble works as the "Dead Gladiators" and "Dead Cæsar." In art treatment, and for mastery over every technical method, it is needless to say, Gérôme has scarcely an equal. His drawing is academic for precision: his touch is only less brilliant than that of Meissonier; the intellectual conception of his subject is clear, wit sparkles on his canvas, indeed the keen edge of satire often bites malignantly. That an artist so singularly gifted should make the outrage of taste and morals his deliberate intent must be taken as a grave comment on the manners of the Second Empire.

The transition from Gérôme to Cabanel is easy. The license of the French stage, the intrigue of Parisian *salons*, the dissoluteness of works of fiction, are inevitably reflected in the pictures of artists meant for better things. The French can paint a woman, but not a goddess; their nymphs are grisettes, their Magdalens repent of repentance. It has long been the creed of the French Academy that the drawing of the nude figure is the acme of art, the last pledge of talent and trained skill. Ingre's "Odalisque" and Flandrin's "Fisher Boy" have been for many a year famous as faultless models of the male and female form. The excuse in justification of such performances is supposed to be in their treatment. And surely minds the most modest cannot be shocked by the Elgin marbles, and modesty herself might take a lesson even in Paris, in the presence of the Venus of Milo. Cabanel and his compeers, however, would scarcely care for anything so quiet. A certain æsthetic sensuousness, which the French affect greatly, seems as it were to reach its quintessence in Cabanel's "Venus," tossed ashore on the top of sea foam.

It must be counted an ill omen when a gallery is conspicuous for "genre,"—a term to designate a nondescript class of pictures. Tableaux de société are sure to be feeling and clever among a people who live less in private life than public places, who make etiquette and deportment parts of scholastic training, who believe that attitude and address are everything, and that manners make the man. Positively there are no more sparkling pictures in the whole world than the small cabinet works of Meissonier, Plassan, Fichel, Vetter, Toulmouche, Duverger, Frère, Hillemacher, and Leleux. Meissonier, like others of his countrymen, by his treatment gives to the most trivial subjects importance. Among the other artists above enumerated Plassan deserves to be singled out as especially French. He is fond of painting a girl at prayer by her bedside, for the sake, it would seem, of the demi toilette, excused by the situation. Toulmouche also bears the unmistakable traits of a Frenchman—address *savoir faire*, polish *aplomb*. It is no disparagement to say that French artists would a thousand times rather be frivolous than heavy and dull. French art, indeed, is too apt to treat life as a jest, society as a comedy—hence pictures too frequently have no more substance than vaudevilles at *Le Theatre des Varietes*.

In what may be called the school of naturalism, Hamon, Breton, Millet, Bonnat, Hèbert, Ribot, and Rosa Bonheur are pre-eminent. Hamon's "Aurua," a graceful figure sipping morning dew from flowers, is well-known. Breton and Millet are rustic and rude; the peasants they paint have never seen a city, they are children of nature. The French are not likely to be outdone in this or any other branch of the art. They lead in battles, are at ease in boudoirs, and at home in the home of the peasant. Rosa Bonheur's fame is well known. It may be observed, however, without detraction, that the more that is known of animal painting in France the more evident it becomes that she does not stand alone.

It only remains to speak of French landscape, to the surprise of the whole world lately strangely exalted by the International Jury. French landscape painters do not show themselves over ambitious in the choice of subjects. They seldom aspire to a mountain; for the most part they rest content with a marsh, a moor, a common, or a wind-stricken tree. Certainly they cannot be said to compass the whole of creation. Rousseau, Daubigny, Francais, Lambinèt, Huet, Combet, Cabat, Carot, are all limited in range and effect. They paint poetry with a heavy brush; pigments they load on thickly with a clumsy hand; light they mingle with over-much shadow; colour is toned down with dirt; so that often the most brilliant of successes is but the solution of the problem how to make the darkness visible. The French figure school is the first in Europe; the same school in landscape receives ample justice by a place in the second rank.

The Belgian Gallery at the Exhibition contained 186 pictures, representing seventy-five painters. Belgian painters are, in more senses than one, national; they give pledge of sincerity and fidelity in the choice of subjects which lie near to the homes of their fathers. Thus there is much circumstantial reality and power of persuasion in Ley's picture of the "Burgomaster Lancelot Van Ursel Haranguing the City Guard for the Defence of the City." The same painter, in works taken from the lives of Luther and

Lucas Cranach, identifies himself with Protestantism. His style, too, is of the period of the German Reformation, and has much in common with the manner of Holbein, Durer, and Cranach.

Holland built to herself a separate gallery, which at once ensured the isolation and prominence of 170 pictures. Modern Dutch art is near akin to its ancestry. Yet it must be admitted that the painters of Holland are within their narrow limits singularly complete. One painter can be named, Alma Tadema, who proves the possession of originating power. His aim is to restore the domestic manners of the ancient Egyptians, Greeks, and Romans. His genius is essentially northern; that it should have been cast as a waif and stray on the shores of Holland, is passing strange. One element he has in common with the Dutch, that of technical excellence and skill.

The German school, which comprises representatives from Austria, Bavaria, Baden, Wurtemberg, Luxemburg, and Hesse, contributed 437 pictures. In Austria art, refusing reform altogether, goes on slumbering still, conservative and stagnant. The Prussian gallery presented a striking contrast. Kiraus is perfect in his way. A broad Hogarth truth which stops just short of caricature, the power to tell facts by a touch, and to clench characters by a stroke have secured to him pre-eminence. Bavarian painting was required to conform to the conditions imposed by architecture, but a change is impending. Piloty, the realist, now rules the young school of Munich. This clever painter has been for some years known to Europe by his "Death of Wallenstein" and "Nero amid the Burning of Rome." He paints for effect. Piloty, the realist, is expressly an artist for the present times. German art has changed its sphere and style, but it cannot cast off its national idiosyncracy. It may cease to be grand, but it still remains ponderous. A German painter elaborates a picture as a professor might propound a problem in "Euclid." Yet the productions of the Teutonic intellect are almost as a matter of course scholarly, academic, and right minded. It is, however, not a little strange that a people with whom æsthetic culture has been a hobby should in the application of the science to actual art want subtlety, sensitiveness, and even an eye for beauty.

The arts in Italy and Spain, Greece and Portugal are but reflections or shadows of the past. Lisbon, with less to lose than Athens, finds herself in like miserable plight, and so Portugal and Greece may be blotted out altogether from the chart of European arts. Among Italian cities Florence, as of yore, takes the lead. Florence lives in the naturalism of Masaccio, Venice dotes on glowing memories of Titian and Veronese; and the reckless Neapolitan of the present day paints with the savage rudeness of Caravaggio and Ribera.

The conditions conducive to high art still subsist in Spain. Her vigour and resource promise the resumption of her ancient position. In the Spanish gallery at the Exhibition were two of the grandest interiors ever painted; the one solemn in that gloom which is the glory of Spanish Gothic, the other the Sistine Chapel. Spanish figure pictures have the dramatic force, breadth, and shadowed solemnity which pronounce with national character the pictures of Herrera and Velasquez.

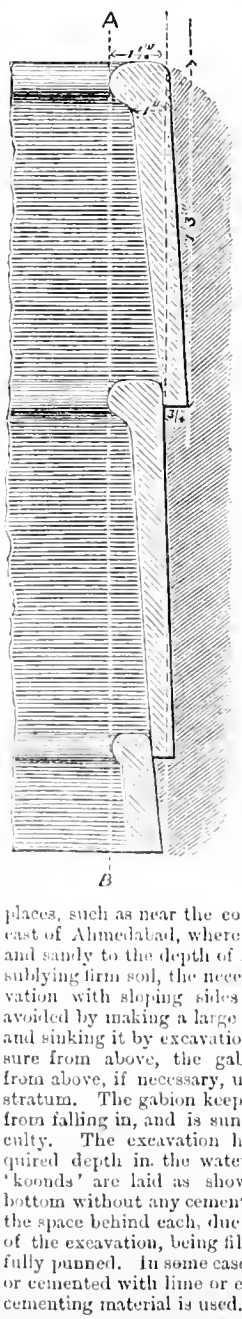
The Latin races that first caught the light of knowledge as it dawned in the east, now dwell in half shadow, and the lands peopled by the Celt, the Saxon, the Gaul, and the Slavonian find that the sun inclines to northern latitudes. The arts have assuredly found their way to the banks of the Neva. Yet Russia has no distinctive art nationality. She does not create, but she borrows wisely: her school, if not a copy, is at least a compilation. Of Denmark it is impossible but to speak disparagingly. The contemporary art of Copenhagen must be pronounced unworthy of the land that gave birth to Thorwaldsen, to Oersted, to Worsae, and to Andersen. The honour of Scandinavia is, however, safe in the keeping of Sweden and Norway. The art products of these sister kingdoms at least inspire respect. The school of Tidemand, who is to Norway what Wilkie Webster and Faed have been to Scotland, makes a faithful chronicle of humble peasant life. There is much that is independent and outspoken in the art language of these peoples espoused to Protestantism. The church as a church seldom makes her presence known; the state collectively in ceremonies or pageants does not intrude; but man, the unit, or rather the master of his house and home, stands upon canvas ready to assert such human rights as belong to honest industry or bravely borne poverty.

We have, in this abstract of Mr. Atkinson's paper, freely used the author's words without qualifying them with any criticism of our own—a task which we may perform ere long.

"KOOND" WELLS.

THE *Bombay Builder* contains the following observations on "Koond" wells, which will be found interesting to English readers:—"It frequently happens that people would be glad to have wells in their compounds, but the cost of a permanent one is beyond their means, and a 'kutcha' one is always more or less unsatisfactory. The object of this article is to explain a simple and very cheap way of sinking wells, of small diameter, it is true, but which will amply suffice for irrigating a good large garden, and for all purposes, except where an exceptionally large supply of water is an object, as in the case of factories, mills, &c. The system is, as will be described, equally applicable to wells of large diameter, but where such are necessary, the funds for their construction with the usual masonry steening are generally forthcoming.

"'Koond' wells will possibly be familiar to some of the readers of the *Bombay Builder*; but the greater proportion will, in all probability, have never heard of them. The method of constructing them is well known in Guzerat, and is one of many wrinkles which engineers will do well not to be too proud to pick up from the natives.



"'Koonds' are cylinders of the usual native pottery, handmade, carefully burnt, and of a rather peculiar shape. The sketch in the margin represents a section through a portion of one side of the lining of a 'koond' well, showing the dimensions and shape of the cylinders (or 'koonds'), and the manner in which they are set one above the other. It will be observed (vide vertical dotted line A B) that, from the taper given to the 'koonds' during the moulding, the full diameter of the well is preserved from top to bottom. In sinking one of these wells in firm soil, and where the greatest depth to be attained is not more than 40ft., the excavation is carried down, with a diameter a few inches greater than that of the 'koonds,' without any lining, the last few feet being in the water-bearing stratum, and the water being kept under by leather baskets plying from a windlass above, or by a 'kos' and pair of bullocks. In some places, such as near the coast, and to the north-east of Ahmedabad, where the soil is often friable and sandy to the depth of from 6ft. to 10ft., with subdying firm soil, the necessity for a larger excavation with sloping sides through the sand is avoided by making a large gabion of cotton twigs, and sinking it by excavation from inside and pressure from above, the gabion being lengthened from above, if necessary, until it reaches the firm stratum. The gabion keeps the sand or loose soil from falling in, and is sunk with very little difficulty. The excavation having reached the required depth in the water-bearing stratum, the 'koonds' are laid as shown above from top to bottom without any cementing material whatever, the space behind each, due to the extra diameter of the excavation, being filled in with earth carefully punned. In some cases the joints are pointed or cemented with lime or clay, but in general no cementing material is used. In this way a neat and useful well is sunk very cheaply, and will last for many years.

"Wells of entire 'koonds' (or cylinders), as described above, are rarely made of a greater diameter than 3½ft., their usual diameter being from 2½ft. to 3ft., which is quite sufficient for the working of the bullock 'kos.' Where wells of a greater diameter are required, the system is somewhat different. It would naturally be a most difficult matter to burn larger cylinders without warping and cracking, and they are therefore, soon after being moulded, cut vertically into a number of vousseirs (as one may say), which are set in rings, from bottom to top, breaking joint, the diameter of the well being, in construction, slightly reduced to ensure the firm wedging in of the last vousseir in each ring, thus obtaining the greatest strength possible to resist the inward pressure of the earth tending to rupture the 'koond' lining."

CATHEDRAL ARRANGEMENTS.

AT the last meeting of the Worcester Diocesan Architectural Society, Mr. Beresford Hope read a paper on Cathedral Arrangements. He said that he would not detain the company by any lengthened prologue, but at once enter on the subject of "Cathedrals and their Arrangements." The fine old cathedral of Worcester was now undergoing restoration, and, various opinions being entertained as to that restoration, he should say as little upon that matter as possible, or else he might put his head into a wasp's nest, and therefore he proposed to speak on the general question. However, if anyone present should put his head into the cap which he (the lecturer) provided, it would not be the lecturer's fault. For himself, he would much rather have been addressing an audience in a town where a cathedral ought to be built—say Birmingham, for instance—and stirring them up to the good work, for we wanted more cathedrals in England. We had been building numerous gaols, but no cathedrals. The popular idea of a cathedral was that it was a large church, with a great deal of carving, and painted glass, and so much space that no one knew how to make use of it; whereas not one of these features was essential to such a building. An *ecclesia cathedralis* was a church in which the bishop's seat was fixed, and that was essential to a cathedral. He was addressing them, of course, as Church people—as an Episcopal community—as members of the Church, in which were the three orders of bishop, priest, and deacon. The cathedral should be regarded as a most perfect and complete building, devoted to the service of God, in which due place and room enough could be provided not only for every order of the clergy to officiate, but for large congregations of the laity. People were too apt to deal with a parish church as if it were a unit in the ecclesiastical system, and to look on a cathedral as a splendid exception, greater and grander than a parish church, and to a certain extent superfluous; but he would start from a different point of view, as the whole history of Christian antiquity ran counter to such a theory. The bishop and his cathedral church was, in truth, the centre of the ecclesiastical system, and the parish churches were, in fact, only offshoots of the cathedral—deputies of that great church—representatives of that building in which Christian truth was first preached, but which building, as Christianity progressed, could not be used as a place of worship for the whole diocese. If they went back to the primitive Church they would see that the centre and moving principle of the system was the bishop and his clergy, acting in and through the cathedral for the worship of God, and the discipline of the people committed to their charge. Parish churches should be imitations of cathedrals as far as they could be, but both should act and react beneficially on each other so far as the conduct of the services was concerned. But a cathedral was greater and better than a mere building—it was an institution. The finest church in the world would not be a cathedral, unless the bishop's chair was there; but the humblest church would become a cathedral with that addition. The bishop and his chapter were necessary to the great idea of a cathedral as an institution; and a cathedral would be untrue to its character and purpose if it did not contain adequate space set apart for its clergy and for the due performance of Divine worship. As to the origin of cathedrals, the records before the time of Constantine were uncertain and scattered; but when, under that

Emperor, Christianity became tolerated, the *basilicæ*, or Roman courts of justice, were used as Christian temples. The heathen temples were not at first used for Christian worship, but were still required for the rites of Paganism, which for some time went on side by side with Christianity. Mr. Hope described the arrangement of these *basilicæ* when converted into Christian temples. There was the apsidal or east end, around which sat the bishop and clergy, with the altar before them. The celebration of the Lord's Supper was the great bond of union to the early Christians, not one of whom would have considered the Lord's Day duly observed without participating in that holy rite. The altar was usually covered with an elaborate architectural canopy, and on the apse behind it was in many cases a mosaic picture representing Our Lord in Judgment, the Lamb of God, or some apostles and saints. The word nave meant a ship, being symbolical of the Church as an ark floating on the troubled waters of this life; and the cross form was observed in the first Christian churches built, and universally recognized as the appropriate symbol of the believer's faith in Christ crucified. At Constantinople other forms also prevailed. The apsidal east end was subsequently abandoned, and the bishop and clergy were seated in the choir, as at the present day. Some still thought the primitive arrangement was best and most solemn, when they sat in the eastern semicircle. Others were of opinion that the bishop and clergy taking up a lower position in the chorus cantorum was a salutary thing; but this and the other usages of the Church we now took as they were handed down to us. The Prayer Book, the liturgy in which had been reformed last in the time of Edward VI., had also been accepted to the present time, and our cathedral arrangements ought to have been reformed as well as the rubric and liturgy, for cathedrals now stood in the same relationship to those of the Middle Ages as the Prayer Book did to the service books before the Reformation. The existing arrangements agreed with the ancient ones so far as having fixed stalls for the clergy, but what they differed in was this: the Roman service was in Latin, and the people could not be expected to follow it. The communion service, or the mass, was the one central thing around which all the other services clustered. These services were called the "hours," because of different services being assigned to various hours of the day and night. Being said in Latin they were sealed to the laity, who usually only attended the mass. There was a multiplication of these masses, for a superstitious veneration of relics had led to the erection of numerous altars. The removal of this superstition and the translation of the services into English was a part of the work of the Reformation. The "hours" were thus converted into short services, which every worshipper was enabled to follow, and thus the Prayer Book was made. Of course there could be now but one altar in a church, except, as at Hereford Cathedral, where the lady chapel was a separate parish church, and had an altar to itself. A cathedral might be considered under two heads—those parts of it which were for use or necessity, and those for dignity or ornament. Gorgeous roofs, pillars, and arches, towers and spires, flying buttresses and pinnacles, and transepts, all these were ornamental, but not essential to a cathedral. The lecturer here referred to a large ground-plan of Worcester Cathedral, pointing out its various parts. The double transepts, he said, originated with the Monastery of Clugny, in France, and took deep root in England, as shown by the many cathedrals in which they existed. A square east end was now much more common than an apse. Triforium meant a gallery, or thoroughfare, above the arches of an aisle; and clerestory meant clear of walls, and capable of being pierced with windows. He next came to consider how a cathedral should be arranged in the most dignified and practical way for the service of Almighty God and the due accommodation of clergy and people. To begin at the east end: in parish churches, where there was not more space than was actually required, the altar was necessarily placed close to the east wall, but there was no necessity for this in a cathedral, which admitted of a chapel or ambulatory behind the altar, putting the latter in a more prominent and elevated position. Indeed, it was necessary that the altar and its approaches should be so raised above the rest of the building, in order to confer on it more dignity, and that what was done there might be seen throughout the choir. To prevent the altar appearing naked and undignified, it should be supported by something architecturally ornamental, and hence the reredos. The Dean of St. Paul's had consented to admit a canopy or lofty structure on marble columns, with a kind of pediment or cupola, over the altar in that cathedral. There should be ample space in the sacrarium for the free action and passage of the bishop and clergy on all occasions, also for communicants: and in all cases the sanctuary should be approached by steps. Sedilia (seats) for the bishop and clergy, and a shelf or bracket for the bread and wine in the early part of the sacramental service, must likewise be provided. And then he came to the clergy, or clerks. Their stalls in the choir were not always filled by them, but frequently might be seen in those stalls a large display of coloured bonnets. Now if the Queen alone had a right to sit on her throne, if strangers in the House of Commons were not permitted to trespass one inch beyond their own boundary, if our Corporations and other bodies observed the same formalities, surely in the House of God everything should be done decently and in order, and the stalls should be preserved rigidly for those for whom they had been intended; and, although there might be more stalls than were required by the clergy on ordinary occasions, it should be remembered that a cathedral was built for the highest purposes, and that there were such occasions as choir festivals, diocesan synods, ordinations, &c., when every seat would be wanted. He was for sending all the coats and bonnets into the nave, and retaining the surplices in the choir. A lectern might be placed just inside or just outside the screen which divided the choir from the nave. From that point the reader would be well heard; but there should certainly be a pulpit in the nave. There were two kinds of sermons, one in which the bishop might have occasion to address his clergy, and this would be in the choir, but the other for general purposes in the nave. King John's tomb, in Worcester Cathedral, he did not consider to be ornamental, but, as it was there, he would not advise its removal. The bishop's throne had always been on the south side of the choir. As to the choir screens, some time ago it was thought that the removal of organs, screens, and everything else, so as to give an uninterrupted view from east to west, and to make a desert in which a coach and six could be driven, was the most desirable thing; but a better taste and a sense of what was right and decidedly more beautiful now prevailed. The screen projected for Worcester Cathedral was beautiful; still he would rather not have servilely imitated the prevailing style of screen, and would have preferred a specimen he had recently seen, which was carried up to and terminated in a gallery, but was of such light and open work that neither sight nor sound was impeded. As to the nave, the question was how best to accommodate the worshippers. They might have either chairs or benches, but if chairs they should be broad, and not fastened together with a strip of wood. Moveable benches, however, were better. The font should be at the west end of one of the aisles, screened off in a kind of baptistry chapel. The lecturer then spoke of the external buildings incidental to a Chapter, and especially commented on the necessity of a Guesten Hall for the entertainment of visitors. (This wicked sally occasioned much laughter.) A great debt of gratitude, however, was due to the Dean and Chapter for the spirited way in which they had taken the cathedral in hand, and he concluded by an earnest appeal to all who heard him to do as much as in them lay for the promotion of this excellent work.

JERUSALEM.

THE latest of the published consular reports to the Foreign Office contains that of Mr. Consul Moore on Jerusalem. From this document some interesting particulars may be gleaned. We learn that the population of the city of Jerusalem is estimated at 18,000, of whom about 5,000 are Mohammedans, 8,000 to 9,000 Jews, and the rest Christians of various denominations. The chief native industry is the manufacture of soap, and what is called "Jerusalem ware," consisting of chaplets, crucifixes, beads, crosses, and the like, made principally of mother-of pearl and olive-wood, and sold to the pilgrims, who annually resort to the Holy City to the number of 6,000 to 8,000. No mines are worked, although it is known that sulphur, bitumen, and rock-salt abound on the shores of the Dead Sea; but security and capital are wanting, and so long as these are absent the probable wealth to be extracted from those regions will remain unavailable. No factories are to be met with. The employment of the people in the rural districts is agriculture, which is carried on in the most primitive mode. It is very satisfactory to be able to report that at length the construction of a carriageable road between Jaffa and Jerusalem has been commenced by the local Turkish administration, a work of primary importance to the material progress of the country, whilst claiming the special interests of Christendom. It is expected that the work will be completed in the spring of this year. It will certainly be an immense improvement on the wretched mule-track that has hitherto done service as the high road to Jerusalem. The value of this improvement would be much enhanced were a harbour to be made at Jaffa. The other roads of the district are of a most wretched description, and, with the want of security, are the main cause of the poverty and general backwardness of the country. Two lines of telegraph, viâ Beyrout and Alexandria respectively, connect Jerusalem with Europe.

THE PRINCIPLE OF CONTRACTS.

A MEETING of the Metropolitan Board of Works was held on Monday, when the tenders were opened for the paving, &c., of the footways, and the erection of fences on the Thames Embankment north, between Westminster Bridge and the Temple. The tenders were divided into A to B, and B to C sections, A to B representing a portion of the western end of the embankment, and B to C the continuation of it to the Temple—viz.:—

	A to B.	B to C.	Total.
From Messrs. Newell and Robson	£7,000 0 0	£2,150 0 0	£9,150 0 0
From Mr. A. S. Gouch	6,960 3 11	...2,160 11 3	... 9,120 15 2
From Mr. E. Thirst	6,729 0 0	...2,290 0 0	... 9,019 0 0
From Mr. T. Turner	7,295 0 0	...2,270 0 0	... 9,565 0 0
From Mr. G. Furness	8,387 0 0	...2,563 0 0	...10,950 0 0
From Messrs. James Knight and Son...	5,742 0 0	...2,193 0 0	... 7,935 0 0
From Mr. A. W. Ritson.....	9,500 0 0	...2,550 0 0	...12,050 0 0
From Messrs. Hill and Keddell.....	6,200 0 0	...1,890 0 0	... 8,090 0 0
From Mr. H. Booth	6,343 0 0	...2,053 0 0	... 8,396 0 0
From Mr. H. Benthall	6,856 0 0	...2,140 0 0	... 8,996 0 0
From Mr. J. Mowlem	6,928 0 0	...1,958 0 0	... 7,986 0 0

The Board then resolved itself into committee, and the public were excluded for the space of half an hour. On their re-entering Mr. Pollard (the chief clerk) read the report of the committee of the whole board, which recommended that the contract should be given to Messrs. James Knight and Son, their tender being the lowest, and only amounting to £7,935. Mr. Freeman moved the adoption of the report, which was seconded by Mr. Fowler. Mr. Savage said that, on principle, he should move as an amendment that, as each contractor had made two separate tenders (A to B and B to C), the lowest one in each case should be taken. For instance, although Messrs. Knight and Son were the lowest by £256 on the A to B tender they were £303 above Messrs. Hill and Keddell on the B to C tender. If the principle of saving the ratepayers' money were strictly adhered to those two contracts would be given to the lowest tenderers in each case. Mr. Legg seconded the amendment, which was put and lost by a large majority.

Mr. Bidgood, on the original motion being put, moved, as an amendment, that Mr. John Mowlem, of Bankside, should have the contract, as his tender was only £51 above the Messrs. Knight's, and he was well known to the Board to be of the highest standing. Dr. Evans followed on the same side, and seconded the amendment.

Mr. Freeman said it was most unfair for Dr. Evans and the other gentlemen who had not spoken in committee to now bring forward such amendments based on such arguments. He said that if the contracts were given in all cases to the largest contractors it would entirely shut out all others from tendering. He was strongly of opinion that the tenders should not be separated. The amendment was then put and lost, and the original motion carried by a large majority.

Mr. Knight was then called in and informed of the Board's choice, after which it adjourned until Friday, the 11th of April.

The death of Herr Vandernnel, architect, Vienna, is announced.

ART EXHIBITION, BOMBAY.

WE have received from the editor of the *Bombay Builder* a catalogue of the Art Exhibition which was opened in Bombay in February last. The idea of this exhibition is due to the Hon. C. J. Erskine, who was president of the Sir Jamsetjee Jejeebhoy School of Art before he left India. It was at first intended to confine the exhibition to the products of the students of that school, but ultimately the doors were opened to contributions from all quarters. On the scheme being definitely drawn out the Government contributed 4,500rs. towards the expenses. It may be said that in 1853 the late Sir Jamsetjee Jejeebhoy offered the Government the magnificent sum of a lakh of rupees as an endowment for the maintenance of art students, provided the Government erected a building and established a school of art. The offer was referred to the Home Government, and after the delays which are usual in such matters, consequent upon the references backwards and forwards, the institution was opened in 1857. From a speech delivered by the Hon. Mr. Ellis, on the occasion of opening the exhibition in February, it appears that this school of art is in a flourishing condition, that it has assisted to foster artistic life, and exercises a civilizing influence over the people of India. If England is destined to hold India, and so become an exception to the rule in the long history of conquests, such means must be used more extensively than hitherto.

The exhibition consists of oil paintings by artists at home and in India, an immense collection of photographs and water colour sketches, including a number of contributions from Major Baigrie, sketched by him in Abyssinia; beautiful specimens of gold-embroidered work from Koolburga; collections of porcelain, and specimens of native art in all its branches. Connoisseurs of jewellery, in particular, have much to feed their eyes upon, for the famous jewel-cloth prepared at the expense of the Gaekwar of Baroda for the tomb of the Prophet at Mecca, and worth it is said about twenty-five lakhs of rupees, is one of the articles exhibited. As another instance, we may mention a magnificent sword and dagger, in sheaths, lavishly mounted with precious stones, and worth, we were told, about three lakhs.

GOTHIC FORMS.

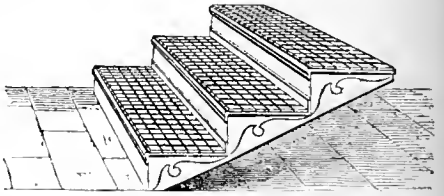
WE have just received the second portion of Mr. Talbert's work on Gothic forms applied to furniture, metal work, &c., for interior purposes. The first portion, consisting of about fifteen plates, was noticed at length in the Building News of July 12th, 1867. The opinion then expressed, that modern Gothic furniture was apt to be overdone, we have seen no reason to modify. The work professes to show how Gothic forms may be adapted to domestic furniture, and it must be allowed that it exhibits considerable skill and much fancy; but that it represents Gothic furniture, such as our ancestors actually used, we may be permitted to doubt. The author observes, "I consider the principal use of the work is, that it may be of a suggestive nature." In this we agree, and cannot but admire the modesty of the remark. Our own opinion regarding Gothic furniture is, that it was very simple: Mr. Talbert's idea is, that it was very florid. The few pieces of ancient furniture which are in existence, such as the cope-chest at Salisbury, the Glastonbury chair, and an aumbry here and there, are exceedingly plain. The very bench-ends in many churches having beautifully carved rood screens are comparatively rough, and it may be fairly inferred that domestic furniture was not more elegant. In the present designs the principal fault appears to be the excessive use of little columns, crockets, trefoils, and quatrefoils, accompanied by too ostentatious a display of construction. In short, all of them would be improved by a little judicious pruning. Plate 17 shows some drawing-room furniture in walnut, ornamented with brass filagree-work, and inlaid with satin wood, all the constructive framing being turned. Mr. Talbert confesses to the difficulty of designing Gothic furniture for a drawing-room, as it is almost impossible to make it sufficiently light, without destroying its Gothic character. Judging from the engraving, the attempt has not been successful. A cabinet of a later period (plate 20) is well worth notice, but the table and stool in the same plate are rather cockneyfied. Plate 21 exhibits a drawing-room, with its furniture complete, and we must confess it does not give us a comfortable impression. From the chimney-piece to the bird-cage it is what the Yankees call too "all-fired" Gothic, and not of a good kind of Gothic; and the same may be said, though in a less degree, of the library interior (plate 22), which recently appeared in the Building News. A writing-table and large book-case (plate 23), and a cupboard, which was exhibited at the Paris Exhibition, are among the best of the designs. A piano (plate 25) is not without grace; and a cabinet (plate 27), for exhibiting objects of *vertu*, will find many admirers. It is, however, in hall furniture that Gothic design tells best. Plate 30 shows a hall table of solid appearance, suited only to a large house. Some designs for tables are also given in plate 28. Here, as in all the other designs, the simplest forms are the best. There is, in this plate, a small folding-table, which is, in our opinion, more truly Gothic than anything in the collection; but the drawing-room table, with columns and carved caps, surmounted by trefoils, is overdone. Mr. Talbert says, "The greatest difficulty to deal with is the drawing-room; there has been little attention paid to the subject, and the requirements are directly opposed to what is generally considered to be in the spirit of Gothic design." And he sums up in these words:—"It is not mediæval furniture confined to the antiquarian knowledge of the past that is wanted, but a recognition of the more honest principles that governed them, substantial work, and ornament, not at war, but having some fellowship with, the Gothic architecture of the present day." These are "brave words" which cannot be gainsaid. Mr. Talbert will in time get over the difficulty.

HONOLULU CATHEDRAL.

ABOUT fifteen months since (Building News, No. 627) we gave an exterior perspective view of Honolulu Cathedral; and we this week give a view of the choir of the same cathedral, the only portion of the work which the architects, Messrs. W. Slater and Mr. R. H. Carpenter, have as yet undertaken, the nave, transepts, and towers being deferred till a future period. The length of the choir from the first step to the outside of the apse columns, we may observe, is 45ft. It has been the object of the architects to convey the cathedral idea more by the general plan and arrangement of the building than by any grandeur of design or physical magnitude. The local deficiency of building materials made it specially necessary to study simplicity in its details, for there were only two courses open—either to send out the masons' work complete from England, or to build the whole of rough stone, plastered inside and out. A design embodying the latter idea was, as will be remembered, at first proposed, highly decorated with colour in the interior; but the other expedient was considered to be the best, and has been acted on. The choir has three bays, with a polygonal apse of five arches, the processional path being continued all round it, with coupled windows in each bay. The columns of the arcade are cylindrical, with carved capitals, and the arches have two orders of simple mouldings. Above them runs a string of ornamental terra cotta under the sills of the clerestory window. In each bay of the clerestory are two lancet lights with coupled shafts; the bays of the apse have one light. The bays are divided by shafts resting on corbels above the arcade caps. These shafts run up to the level of the springing of the clerestory windows, at which level spring also the arched ribs of the roof. The whole of the roof is of timber, and boarded and panelled between the trusses, and is intended to be decorated with colour. For the ordinary walling black basalt and reef-stone (cut from the reefs by the native prisoners) is used. The natives thoroughly understand and can execute this sort of walling satisfactorily; but skilled masons' labour is very expensive, as much as five or six dollars a day being asked. Oregon timber and American pine are used for the roofs, which are covered with tiles. The windows of the clerestory will be filled with coloured glass, but the aisle windows will have movable glazed sashes, and inside Venetian shutters. The stone used for the arcades and windows is Ketton, white Mansfield, and Doulting. There will be two rows of stalls, six in number, on each side, the dean and precentor's stalls being respectively at the west end of the north and south blocks, and the chancellor and treasurer's stalls at the eastern end. The bishop's throne will be on the south side eastward of the stalls. The altar is raised seven steps above the nave level, and will have over it a lofty baldachin of metal work. A low iron screen is to stand in the western arch; and there will also be iron grilles in all the side and apse arches, with gates opening into the processional path.

HAWKSLEY'S PATENT STEPS.

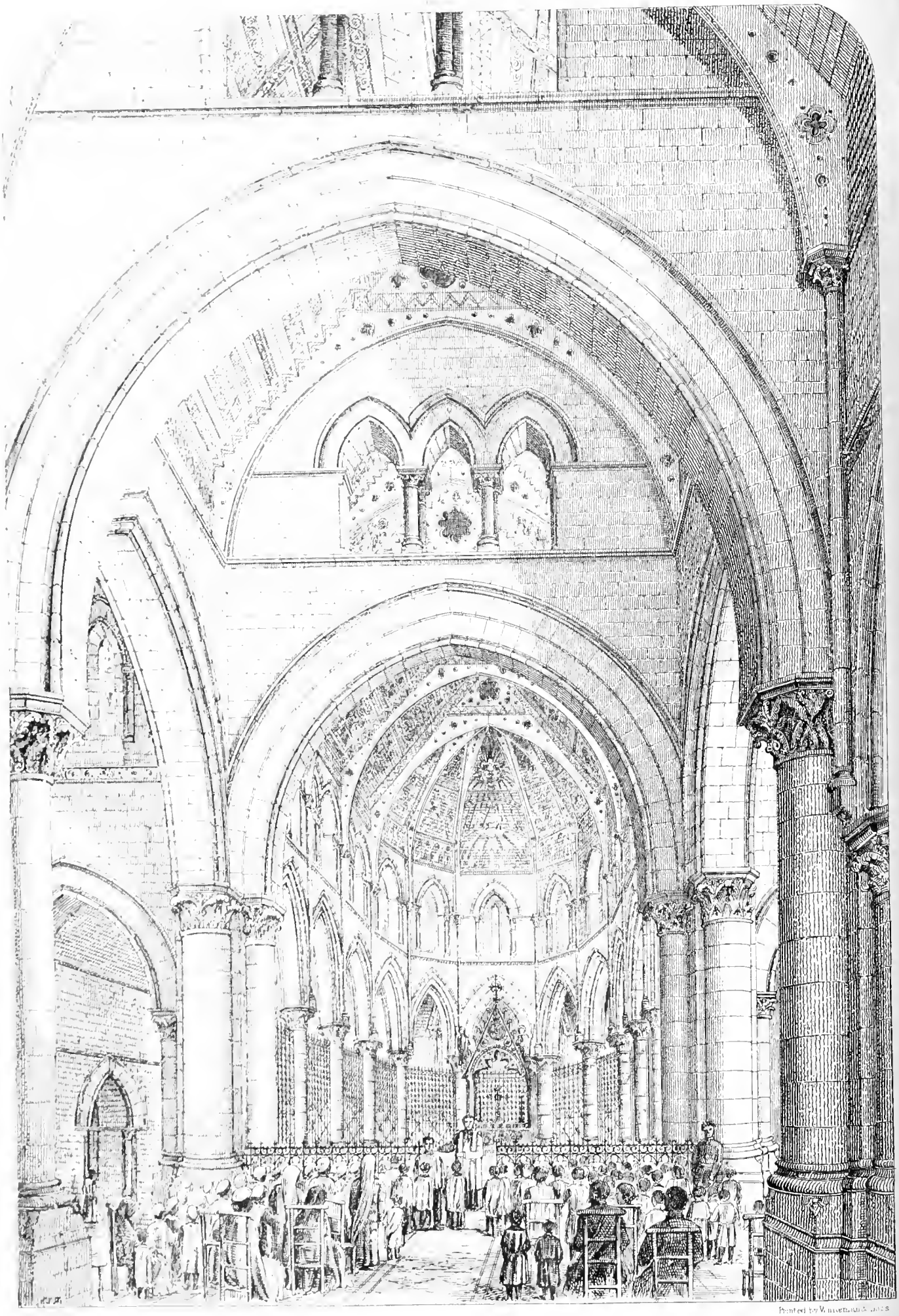
MANY of our readers have no doubt witnessed the rapid wear and tear that stairs and steps are subject to at railway stations and other places where there is an immense traffic. Hence, unprotected wood is but of very little use for such a purpose at such places. Sometimes lead and sometimes brass edging is put on the



nose of each step as a protection. Lead, however, soon wears out, and brass is expensive. To meet this difficulty Mr. George Hawksley has recently patented an invention which is likely to be of much use. The invention consists of a cast-iron frame, having numerous square openings, of the form of the tread of each stair or step. Into each opening is inserted, as seen in the illustration, square pieces of wood, with the grain upwards. Experience has proved that a step so constructed will admit of a vast amount of wear. We are informed that at the Victoria Park Railway Station, through which passes a greater traffic than at any other station in the metropolis, and where lead edging wears through in six or eight months, Hawksley's patent steps have been used for twenty months without perceptible wear. It is used in most of the North London stations, and we can personally testify as to its utility and durability.

SMOKED CEILINGS.

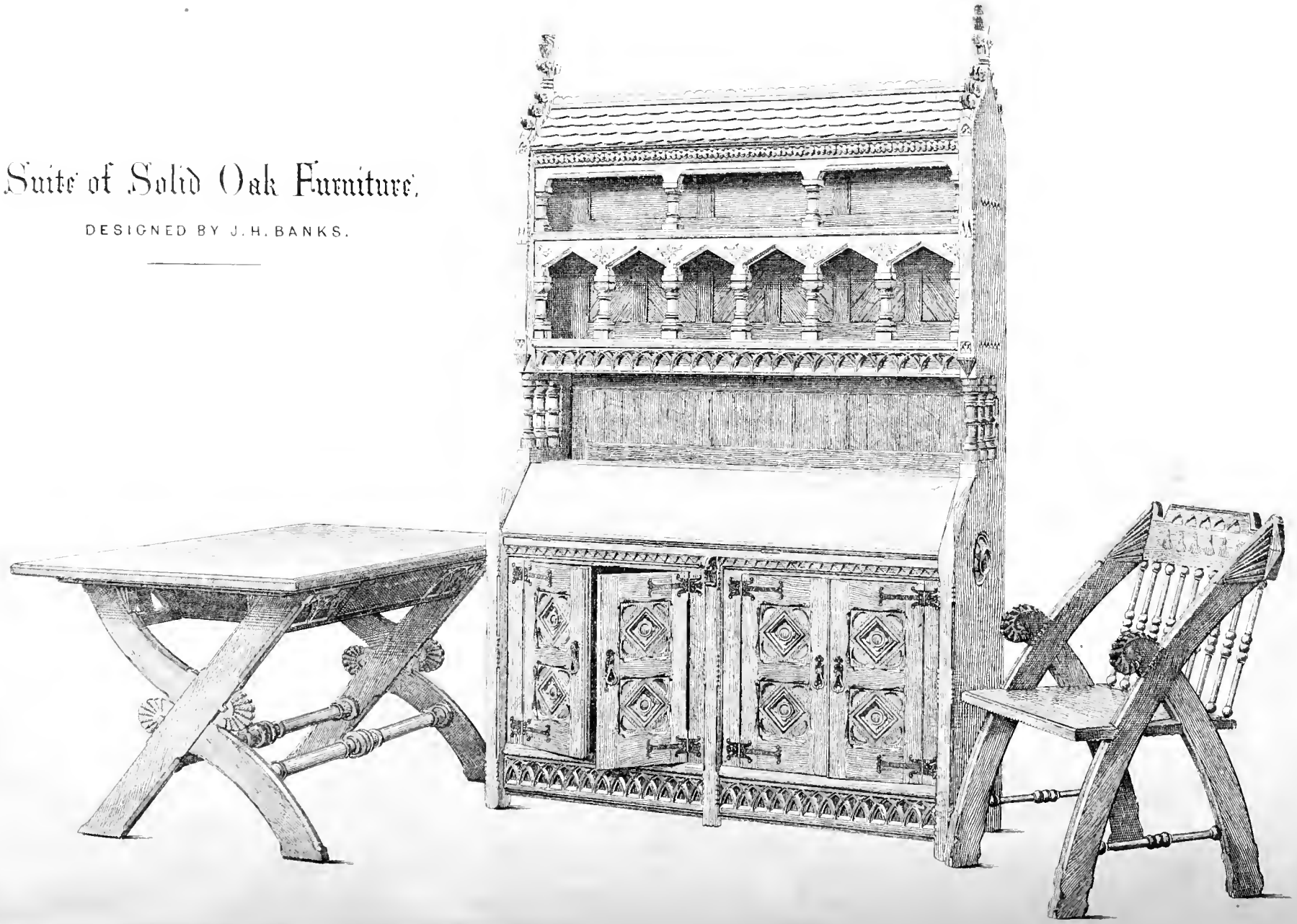
IT is generally supposed that the smoking of ceilings is occasioned by impurity in the gas, whereas, in this case, there is no connection between the deposition of soot and the quality of the gas. The evil arises either from the flame being raised so high that some of its forked points give out smoke, or more frequently from a careless mode of lighting. If, when lighting the lamps, the stop-cock be opened suddenly, and a burst of gas be permitted to escape before the match be applied to light it, then a strong puff follows the lighting of each burner, and a cloud of black smoke rises to the ceiling. This, in many houses and shops, is repeated daily, and the inevitable consequence is a blackened ceiling. Now, if the match be applied to the lip of the burner, and the stop-cock cautiously opened, no more gas escapes than is sufficient to make a ring of blue flame; the cock should then be gently turned on until the flames stand 2in. or 2½in. high. When this is done, few chimney glasses or globes will be broken, and the ceilings will not be blackened for years.



Choir of Honolulu Cathedral. W. SLATER & R. H. CARPENTER, ARCHTS

Suite of Solid Oak Furniture.

DESIGNED BY J. H. BANKS.



THEATRES.*

HASTE in building is an evil which overshadows all others connected with modern theatre construction. The bad arrangements of line and mass, the defects of the pit-extension system, the narrow vomitaries and the wretched exits are but slight inconveniences when compared with all that is involved in this word Haste. Let us see what it is which is involved by haste. It may be premised, as a matter of course, that no one ever builds a theatre for the love of the thing. Whatever force the dramatic art may have once possessed, it is quite clear that here, at any rate, it has no force in these days sufficient to encourage its most devoted patron to enshrine it in a temple worthy of it. The man or men who advance the money for building a theatre do it as a mere matter of money investment. On the other hand, affection for religion and affection for home have not yet altogether disappeared, and men may still be found sufficiently animated by the spirit of love to build church or house with some idea of safety and endurance, and with other wiser thoughts of investment than those which are founded on nothing but an excessive rate of interest. If the drama were all that some say it is, and that others hope it may become, if it were a real teacher and a real refiner, if, as in old time, it were a co-worker with religion, poetry, and philosophy, it would be treated as worthily, and housed in enduring temples as strongly and as nobly built, as cathedral or palace. Instead of this we find it accommodated in what the sad experience of the last few years too plainly proves to be nothing more than the flimsiest of temporary lodgings. But if, as some think, the drama in England is in a moribund condition, then the sooner it is carried out and buried the better. Its habitations might then be swept clear away, and the holocaust, which hangs like the sword of Damocles over every theatre in England, would be averted for ever. Although much —very much—in the present aspect of the stage tends to encourage this hopeless view, although men of a literary or artistic turn of mind rarely come away from the theatre without confessing their fatigue and disappointment, and although the greatest "successes" are for the most part the results of the most unhealthy excitement, still I cannot help thinking that the drama has a work to do, a position to occupy, of which we are as yet but partially conscious. When we have become alive to the importance of the art as a prime instrument in the field of education, when the pictures of the stage shall be as true within the bounds of true conventionalism and the dramatic ideal as nature and museum and book can make them, then we may expect to see theatres built for the honour of the art, instead of for the greatest percentage on the least possible outlay. Meanwhile this, like every other question of reform, must be treated as something to be developed. We are not ripe for sudden and sweeping changes, which only tend to bewilder the public. At the same time it is impossible to rest contented with the present state of things. The primary reason for haste in theatre building is to obtain a quick return for the outlay. For this everything is sacrificed. An architect is selected who shows the proprietor how eminently qualified he is for the work by consenting or offering to get the building ready for use in as many months as ought to be absorbed by the architect in *thinking* out the subject. The first consequence of this weak consenting on the part of the architect is to shelve all idea of "thinking," and merely to adapt from what has already been badly done by himself or his contemporaries. The greater haste the greater success, is the motto alike of proprietor, manager, and architect; and the second consequence of the architect's acceptance of the conditions is insecurity of structure, for as brick walls and vaults take time to build and time to dry, it is manifest that time will be saved wherever wood can be used in place of brick, plaster, or stone. That by the free use of wood framing and thin boarding the interior of a theatre is made as combustible as an ancient pyra, is of slight moment compared with the receipts of a season; and it is very clear that the architect's endeavour to enrich his client (and thus obtain a character for what is called "business-like qualities") should supersede all other considerations, and especially such trifles as the convenience of the public or the safety of the audience. Even in those cases where brickwork has been introduced in a larger degree than usual, haste steps in and compels the builder to carry up the walls with a speed altogether inconsistent with sound construction. Moreover, the mere fact of a brick wall being introduced here and there is worth little or nothing in a conservative or preventative sense unless a fair substance is secured—that is to say, the walls of a building which has always large quantities of combustible material stored in it must not be regulated by the minimum allowance of the Act of Parliament (an Act, by the way, which has done incalculable harm). Haste, again, is the parent of most of the mistakes in what is called the "decoration of the house." We have seen of late years an indication of something better than usual, in the employment of first-rate artists to paint figure subjects. The innovation has been but feebly carried out, and no artist can be said to have had a fair chance; the works have not been painted on the spot, and I believe no encouragement has been given to the painter to re-touch his work. No one, I imagine, can put this down to anything but haste. This it is which compels all the decorations to be executed on canvas during the time the house is actually building, so that experiment is out of the question, and there is no opportunity until too late of seeing the effect of distance or the form of the house on the colours or lines which have been applied on the canvas within the narrow limits of the painter's studio. This same impolitic haste, with all the evil hurry-scurry which invariably accompanies it, prevents also anything like joint action among artists; for, however artistic an architect may be, and however anxious to do well, it is simply physically impossible for him to hold that communion with his co-workers (painters, sculptors, decorators) which is so absolutely necessary to make a building successful; whilst to draw and design any decoration to a large scale with his own hands is equally impossible, even if he has the power to design ornament, a power which is by no means common in any branch of art. This question of rapid building is one of real and serious interest; and it would be well if the legislature could be urged to interfere in this vital question. Parliament has dictated all kinds of things for the encouragement of cheap and nasty building; it has made all sorts of little provisions for all sorts of trivial things; it has placed innumerable restraints upon sound construction; for the security of the outdoor public it has been tenderly anxious; for the passer-by, who has room to come and go, it has enacted no end of safety clauses; but it has done nothing for the indoor public, and has been altogether careless of those masses who are thickly crowded beneath the inflammable roofs and slight construction of our public places of amusement. If the new Parliament would deserve well in this department of domestic affairs, let it look well at the condition of our public buildings, and do something to mitigate the immoderate haste with which so many of them are framed.

EDWARD W. GODWIN.

* Continued from page 207.

THE TERMINUS OF THE MIDLAND RAILWAY, NEAR KING'S CROSS, LONDON.*

I VENTURE to call the attention of the members by a few words to what may be considered one of the most important works now carrying on in our metropolis, vast in extent—for it will cover seven acres—and gigantic in the proportions of its terminus shed. This grand feature is distinguished by a construction which, as to boldness and ingenuity, reflects the highest credit for conception and execution on its eminent engineer, Mr. W. H. Barlow; on Messrs. Waring, the contractors; on Messrs. Ordish and Le Feuvre, who designed the details of the roof; and on Mr. Alleyne, of the Butterfly Iron Works, who arranged the travelling staging and hoisting gear for the purpose of fixing the roofing in its place.

The roof of the terminus shed is 690ft. long, and has a clear span of 240ft. The main ribs, which are 29ft. 4in. apart from centre to centre, are latticed, and 6ft. deep, forming the curve of a four-centred pointed arch, the radii being 57ft. and 163ft. respectively, and rising to the height of 96ft. above the level of the platform. The feet of the ribs cover a remarkably small area, as though they stood on pins; but here at the springing, instead of being latticed, they have plate webs and are let into a shoe, which spreads out on each side to the projection of a buttress, so as to give a firm footing, and these shoes are bolted down to anchor plates at the foundation, built into the wall to ensure further stability. Except the shoes, the whole consists of plate iron, three intermediate ribs between the main ribs being of rolled iron, I section, 10½ inches deep. There are at regular distances on the sweep of the roof trussed purlins to carry the intermediate ribs, and so constructed that they stiffen laterally the lower flanges of the main ribs. In the whole height of the roof there are no ties, the sweep being so adjusted, and the weight so distributed and equipoised, that the series of girders, about 2ft. deep, extending across the station at the level of the floor, are sufficient to retain the feet and resist the tensile strain at that point upon the ribs.

The floor is also designed with considerable ingenuity, and merits our attention. The whole area, 690ft. by 240ft., is upheld by a series of cast columns, 14ft. 8in. apart from centre to centre, and 15ft. high, and on the caps are the transverse girders already mentioned, and a series of longitudinal girders. The vaulting, if it may be so called, of this basement storey or ceiling rests on this net-work of girders, and is formed of Mallet's buckled plates securely fixed to the girders, and thereon comes the floor. Thus it will be perceived that the columns afford clearer space for stowage beneath than piers would have done, and the buckled plates are lighter and more sure in construction than brick vaults.

The ribs and roofing are erected and fixed in place by means of a travelling staging and hoisting gear. The system on which Mr. J. G. N. Alleyne, of the Butterfly Iron Works, has designed the staging is, that the main rib is never lost hold of until all the wind-ties are finally fixed to the walls. The staging is divided into three sections, the centre consisting of six divisions, the side ones of five divisions each, and from front to rear there are four divisions. The standards consist of die-square balks of timber, 12in. square; the horizontal traverse pieces are double, 12in. by 6in. each, except the lower one, which is 12in. square, with iron shoes bolted down to receive the feet of the standards and braces. The cross braces are 12in. by 12in. in the two lower tiers, 10in. by 10in. in the two next tiers, and in the upper ranges 9in. by 9in. The wheels, on which the three sections move are 2ft. 8in. in diameter, and run on a balk of timber, 18in. square; altogether, there are 123 wheels under the staging. Of course, the three divisions of the staging can be moved, and are moved distinctly and separately; but when main ribs are being hoisted and adjusted, they are all three bolted together at each horizontal timber with wrought-iron clamps and bolts, and screwed firmly together against a chock of timber. Each gallery of the stage is fitted with two slides, which are forced outwards against the rib by folding wedges, so that the work can be adjusted to the greatest accuracy.

* Read by PROFESSOR DONALDSON before the Royal Institute of British Architects, March 16, 1868.

For moving the staging the following process is followed. When, in the first instance, two ribs have been fixed and the riveting finished, and everything is properly adjusted, the folding wedges of the two side stages are knocked out. The rib, in taking its proper deflection, rests firmly on the centre compartment; the wedges of this are not disturbed, the whole centre compartment being kept bolted down to the floor. The slides are drawn inwards, and the side divisions of the staging are moved, so that the slides originally opposite to No. 1 rib are brought to be opposite No. 2 rib; they are then wedged out and bold No. 2, and are in turn bolted down to the floor. The wedges of the centre compartment are now removed; it is set free from the floor, moved up to No. 2 rib, and the three compartments or divisions are bolted together as before, and are then ready for No. 3 rib. The sides may be moved in about thirty minutes each, and the centre in ten minutes. These movements may be effected by hand-power of three men with iron bars to each wheel. For hoisting steam power is used. The derrick employed for the purpose is arranged with an universal joint, so that it can be raised, lowered, or twisted round in any direction. The steam crab is furnished with a double warping barrel, so that the rope does not accumulate on it—a system first used, probably, at the Exhibition in London, 1862.

THE NEW UNIVERSITY OF LONDON.

THE Senate of the University of London, at its last meeting, finally decided upon the figures which they believe are most suitable for the ornamentation of the exterior of the new building in course of erection in Burlington Gardens for the purposes of the university, and which is at last making fair progress.

1. It has been thought that the four figures over the four piers of the entrance portico should typify the four faculties of the university as represented by Englishmen illustrious in arts, science, law, and medicine; and those of Bentham, Milton, Newton, and Harvey were happily chosen. The Chief Commissioner of Works at first demurred, we believe, to the position assigned to Bentham, but this must have been in ignorance of the intention and meaning of the Senate. Bentham they believe to be the best representative of jurisprudence and the science of legislation as distinguished from law in the common sense of the term; and a knowledge of his works has always been more or less demanded from candidates seeking the degrees in law. The Chief Commissioner further suggested that Shakspeare should appear amongst the distinguished representatives of modern knowledge, and find a place over the portico. It was at once rejoined that Shakspeare could in no sense be regarded as an example of academic culture, and his statue will, therefore, not displace that of Bentham, but be placed in a prominent position within the building itself.

2. Along the roof-line of the central portion of the building six standing figures in the classical style will represent men of ancient times eminent in various departments of study included in the university course, and Cicero, Galen, Aristotle, Plato, Archimedes, and Tribonian have been selected for this group.

3. In the niches of the ground floor of the wings will be placed six portrait statues of distinguished representatives of modern knowledge; those on the west wing being British, on the east wing foreigners. In the former position will be found Locke, Bacon, Adam Smith; in the latter, Cuvier, Leibnitz, and Linnæus.

4. There will lastly be on the roof-line of the wings six standing figures of representatives of modern knowledge—those on the west British, those on the east foreigners, and these will be supplied by Hume, Hunter, Dalton, Galileo, Laplace, and Goethe. In addition, the statues at the angles of the wings will be grouped with astronomical and chemical accessories, sufficient to give the required mass, instead of being double groups as proposed by Mr. Pennethorne.

Opinions differ as to the probable beauty of the building when erected. Not a few persons regret that the wings are not to be carried up to a level with the central part of the building, and anticipate that it will not be sufficiently imposing for a university. However, whatever may happen outside, it is certain that the doings within its walls will still further increase the brilliant reputation which the young university has already made for itself.

RANSOME'S ARTIFICIAL STONE.

THE highest endorsement of the qualities and capabilities of this remarkable product, says the *Mechanics' Magazine*, is probably its intended introduction, by Mr. Digby Wyatt, in conspicuous positions in the new Government Offices, in Downing-street. It is to be used for a pair of enriched truncated pierced screens, in the Renaissance style, which are to enclose the third-floor galleries of the Indian court. This fine quadrangle was designed to have been left open at the top, but is being covered by an elegant roof of wrought iron, which will be filled in with glass throughout. The inner faces of the quadrangle consist of windows almost entirely, excepting only the spaces taken up by the polished granite columns, and the piers which support the superstructure and spaces at the ends of the quadrangle for eight statues of distinguished Indian governors and heroes, and appropriate historical tableaux in alto-relievo. Three galleries cross each end of the court on a level with the respective floors, the two under galleries having balustrades in front. The upper galleries will have the screens referred to, in addition to the balustrade. They have been designed, with exquisite effect, by Mr. Digby Wyatt, and are each 67ft. long by about 6ft. 8in. high, with a mean thickness of about 6in., and will contain about 340 cubic feet. Had the patent stone been liable to warp or shrink it would, of course, have been totally unsuited for ornamental work of such a high character. But it has been abundantly demonstrated to possess incapability of shrinkage, and the absolute rigid retention in every particular of the form in which it leaves the mould. A convincing test as to shrinkage has repeatedly been applied with success, viz., by casting in a block a piece of plate glass cut to parallel lines to preclude the possibility of dovetailing. On breaking the stone after it is thoroughly hardened it is found impossible to extract the glass by any other process than cutting round it to the bottom, which would not be necessary if even the slightest degree of shrinkage took place.

The patterns—to Mr. Wyatt's drawings—and the moulds from them, have been made by the art workmen at the company's works, East Greenwich, and the screens, which are in a forward state, will be finished and fitted as soon as the roof of the quadrangle is covered in, although that need not hinder their erection, the material being invulnerable to atmospheric influences. Builders and contractors are now getting bound doors, sashes, mouldings, and other carpentry goods from Norway and Sweden; they will never need to go so far afield for capitals, finials, trusses, balustrades, or other ornamental work in stone, while the Patent Concrete Stone Company is able, as now, to compete against all comers.

STREET WATERING.

A CORRESPONDENT says:—Sir,—In looking over *The Engineer* for 1859 I accidentally alighted on the following paragraph, and thinking it may very possibly resemble Mr. Cooper's new patent system, which is making so much stir just now, it is worth re-publishing:—

September 2, 1859.

"*New Process for Watering Streets.*—A curious experiment is now being tried at Lyons for laying the dust in public promenades, and has so far been attended with success. A chemist of that city, having accidentally spilt some hydrochloric acid on a terrace of his, found that it hardened the spot on which it had fallen, and maintained it in a state of permanent moisture. This led him to think that, by watering the streets with this acid, the dust on large macadamized roads might be laid or rather prevented from rising. Experiments were first made on the Cours Napoléon, between the Rhône and the Perrachio Station. The success was complete, and has also proved durable, the carriage way having now been several months free from dust; and another experiment is now being made on the Place Bellecour. During the hottest part of the day, the ground, although dry and gravelly, has the appearance of being as consistent and damp as if it had been watered half an hour before; but as evening approaches, the moisture becomes more and more perceptible. Every morning the ground is stiffer and more comfortable to walk on. This may be easily accounted for: the acid decomposing the gravel or stone, forms one or several deliquescent salts, which therefore attract the moisture of the air. The question as to whether roads thus watered are likely to last as long as they ought, can only be decided by time."

Perhaps you, or one of your correspondents, might be able to tell me whether the system referred to is still continued, or whether it was abandoned as a failure.

SCHOOL OF ARTS IN PARIS.

THE Minister of Agriculture, Commerce, and Public Works has just issued the programme of the conditions of admission to this important school, which is open to foreigners as well as natives of France, and on the same conditions. Diplomas of "Engineer of Arts and Manufactures" are granted annually by the Minister to those pupils who are recommended by the Council of the school as having passed through all the examinations in a satisfactory manner, and certificates of capacity are granted to those who have exhibited sufficient knowledge in the most important departments of instruction. All the pupils are out-of-door scholars, and no uniform, nor any other distinctive mark, is worn by them. The course of study occupies three years, and the fees, including the costs of experiment, are 800 francs (£32) per annum, half the amount being paid on entering, and the remainder, in two equal instalments, in the months of February and May. The only other conditions are—the deposit of a sum of 35f. to defray any losses or injuries done by the pupils' negligence, and the purchase of the necessary books and instruments, which may be had at the school, at rates fixed by the director. In the case of pupils, natives of France, whose families are not in a condition to defray the costs of the school, subventions are granted by the State, under certain conditions, but this, of course, does not apply to foreigners.

All pupils, says the *Society of Arts Journal*, must pass an examination before admission, and these examinations take place twice in the year, namely, in July and October. The programme for admission consists of compositions and oral examination in the following subjects:—French language; arithmetic; elementary geometry; algebra, as far as the general theory of equations exclusively; rectilinear trigonometry; analytical geometry; descriptive geometry; physics; that part of the usual course of the lycées which precedes heat; chemistry; rudiments of metallurgy; natural history; freehand, linear drawing, and tinting. In addition to these, the pupil is examined also in the general subjects, as in other superior schools. Full particulars are to be obtained by application to the secretary of the school. The pupils must have attained the age of seventeen on the first day of the year of application, and must produce testimonials of good conduct and a certificate of vaccination.

WINDOW PANES IN WINTER.

OUR contemporary, *Galignani*, records a very curious discovery recently made by M. Auguste Bertsch, and which has been turned to practical account by M. Kuhlmann, the celebrated chemist. Who is there that has not, during cold winters, stopped to admire the beautifully symmetrical and yet fantastic figures of leaves and flowers depicted on the window panes of a well heated room, the air of which is charged with aqueous particles? M. Bertsch has found that Epsom salts (sulphate of magnesia) dissolved in beer, together with a small quantity of dextrine (artificial gum), and in this state applied to a pane of glass with a sponge or brush, will, on crystallising, produce the identical designs above alluded to, hitherto considered peculiar to water; with this improvement, however, that the liquid may receive any colour whatever, at the option of the operator. The ephemeral productions of frost may thus be easily perpetuated; but M. Kuhlmann, on being apprised of the fact, conceived the idea of going a step further, and transferring those fairy-like creations to stuffs and paper. For this purpose he first got the crystallisations on sheets of iron, on which he afterwards laid one of lead. By means of a powerful hydraulic press the minutest details of the figures in question were durably imprinted on the soft metal, and a copy of them in relief was then obtained by galvanoplastics. But here another difficulty arose. In the impression of cotton stuffs the pattern must be continuous; whereas in M. Kuhlmann's plates the lines at one end would clearly not coincide with those at the other, so that disagree-

able interruptions would be caused in the printed designs. This obstacle, however, has been overcome in a most ingenious manner by effecting the crystallisation on the cylindrical surface of a roller. A slight rotary motion imparted to it will prevent the liquid from accumulating at any particular point before it has evaporated.

COMPETITION.

ST. ANDREW'S CHURCH, HERTFORD.—The committee met in the Shire Hall, Hertford, on March 27, to select a design for the rebuilding of St. Andrew's Church. Five designs were first voted for, viz:—"Well considered," 8; "A device" (a quartrefoil), 7; "All things considered," 7; "Hope and Faith," 1; "£3,000," 6 votes. The competition was at length between "Well considered," 8, and "Quartrefoil," 7. The former was unanimously chosen as being the most worthy to carry out the above object. The architect is Mr. John Johnson, 35, Moorgate-street, E.C., whose estimate is £3,000, exclusive of tower, carving, lighting, or warming. In our observations on the drawings (March 13), we spoke highly of the selected design "Well considered," and also mentioned that the choice was between several of the above-named mottoes. The decision is considered quite impartial.

SCHOOL OF ART.

THE other day deputations waited upon the Duke of Marlborough, as President of the Privy Council, to present memorials praying for a Government grant in aid of the Midland Institute and the Birmiogham School of Art. Mr. Mathews, on behalf of the Birmingham and Midland Institute, referred to the position which they held in the educational work of the town. The Institute cost £23,000, all of which was subscribed in the neighbourhood. Their students were taught at a loss of about £400 a year. It was impossible to make the classes self-supporting, as the cost of teaching would be above the reach of those taught. The prizes, too, which were given, were very insignificant, and ought to be increased in value. At present the students could only earn from the grant £30, which was insufficient. Mr. C. R. Cope, on behalf of the Birmingham School of Art, pressed for assistance, to enable them to erect suitable rooms for imparting instruction. They had about 1,050 pupils now, and were obliged to turn applicants away. At present the school had a suite of rooms at the Midland Institute, which were now wanted for the science scholars. The claims of both institutions having been urged by several other gentlemen present, the Duke of Marlborough promised that Government would give its early attention to the matter.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Methodist Chapel has been completed at Wolstanton, Staffordshire. The building, which is of a plain character, cost £850, and will seat 350 persons. The architect employed was Mr. R. Dain, of Burslem; and the builder, Mr. J. Trevor, of Newcastle-under-Lyne.

The parish church of North Reston has been fully restored, under the direction of Mr. Withers, architect, London. The work was executed by Mr. C. Clarke, of Louth.

A new church is about to be erected in the parish of St. Marylebone, in the immediate neighbourhood of Dorset-square, for a new district, which will bear the name St. Cyprian.

The quarterly meeting of the Salisbury Diocesan Church Building Society was held last week under the presidency of the Lord Bishop. Applications for aid were received from the promoters of works of restoration at Trowbridge, Holy Trinity, Dorchester, and Drimpton, and grants were made in each instance. The usual routine business was transacted, and an earnest appeal for further subscriptions made, it being announced that the grants made at this meeting would nearly exhaust all the Society's available funds for the present year.

BUILDINGS.

The market at Bury having undergone important alterations, under the superintendence of Mr. Green, civil engineer and architect, of Portsmouth, near Todmorden, has just been reopened. The cost of the work has been between £4,000 and £5,000.

The extensive buildings in course of erection by the Middlesborough Exchange Company are rapidly approaching completion. The various offices, nearly sixty in number, will be ready for occupation in May, and the large Exchange Hall is expected to be finished by July, when the whole will be opened with an appropriate demonstration.

The committee appointed by the town to carry out the Redcar Sea Wall and Promenade improvements have contracted with Messrs. Lynas and Middleton for the labour required in the construction of the work for the sum of £1,056, the committee finding materials. The estimated cost of the whole, which forms a substantial roadway and wall of paved slag facing the sea, is £2,400, towards which upwards of £1,900 is already subscribed, of which £1,000 is the contribution of the Earl of Zetland. The work was commenced last week.

The new courts and offices for the Borough of Wigan are nearly completed. The building is in the Italian style, the main façades being faced with Longridge stone up to the first-floor windows, the second storey consisting of pressed red bricks with stone dressings. Messrs. Nuttall and Cook were the architects, their design being chosen from fourteen sets sent in competition. Messrs. Fairclough and Son, of Wigan, are the contractors. The cost of the building is about £17,000.

It is once more positively stated that Her Majesty's Theatre is to be rebuilt. The Prince of Wales, if rumour be true, will lay the foundation stone on his return from Ireland. Mr. Charles Lee is to be the architect, and the cost is put down at £65,000—certainly a very moderate sum. The Bijou Theatre—the theatre within a theatre—will not be rebuilt.

During his recent visit to Australia, H.R.H. the Duke of Edinburgh laid the foundation stone of a fine graving dock, which is in course of construction at Williamstown, Victoria. This dock, which has been named the Alfred Graving Dock, will be 420ft. in length over all, and 400ft. long on the floor within the entrance. It will be 97ft. in width at the top, and the entrance will be 80ft. wide in the clear. At ordinary spring tides there will be a depth of 24ft. 6in. over the sill at low water, and 27ft. at high water. The dock is being built of the basaltic stone of the neighbourhood, known as bluestone, and its cost, complete, with pumping engines, &c., is estimated at £185,000. The dockyard, with which the graving dock will be connected, comprises an area of fifteen acres, and includes a slip capable of raising vessels of 2,000 tons. The new dock was commenced in 1864, and it is expected that it will be completed in 1869.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—O. W. D.—M. and Co., with photographs and samples of paper.—A. H. H.—M. H. and Co.—A. B.—E. C.—I. L.—T. M. S.—C. F. H.—G. S.—A. C.—I. D. W.—I. R., with drawings.—I. H. P.—F. B. and Co.—I. I and Sons.—W. F.—D. O. B.—C. R.—R. S.—G. D. I.—I. L. H. G.—L. and Son.—I. F. and Son.—R. L.—W. H.—I. I. —H. D.—B. J. T.—M. and Co.—I. I. B.

R. W. M.—Your question on brass rubbings was answered in the BUILDING NEWS, No. 657, page 554.

SUBSCRIBER, who deals pretty largely in personalities, takes good care to be safe himself by not even sending his name.

S. L. W. wishes to know whether any decision has been come to on the competition for the church of St. Swithin, Lincoln.

Correspondence.

ORGANS.

To the Editor of the BUILDING NEWS.

SIR,—I will not follow your correspondent "W. T." into the question of Covent Garden scores or the meteorological influences upon the singers, the public, and the orchestra; though, if he is consistent in his ideas of orchestras as compared with organs, I suppose that he would return to the orchestras as they existed in the time of Handel and Purcel, and that he votes Mozart and his successors bores. Nor will I do more than note the audacity of the assertion that "there is only a certain variety of tone possible." Anyone who will assert that all the possible variety of sound is produced by the finest German organ, or by any old organ in existence, merely makes a rash statement utterly incapable of proof.

In the first letter upon this subject that occurred in your columns, "A. B. C." remarked that mechanical power alone would not secure a fine instrument; but that an organ builder, to be a good one, must be an educated man. Now these positions I am certainly not going to controvert. I presume, however, that by education was meant musical education, as, in fact, at the end of the letter it is so limited, and a hard slap is given to the parsons (almost always men of good usual education), who, with their half musical education and various crotchets, will meddle with things they don't understand.

Taking my stand here, then, I would remark that it is rather a curious fact that neither of the trio named as *the* organ builders of the world are educated musicians. I am informed upon authority that I cannot doubt that not one of them is an organ player. Granting, then, that fine mechanism is not the only requisite for producing a fine organ, I still maintain that a great knowledge of mechanism is necessary for its production, and when accompanied with great musical ability, and accurate and intimate acquaintance with music and musical instruments—qualities, I confess, seldom to be found in the organ-building fraternity—I say, that then it can hardly fail to lead to great results. Now, these are the very qualifications of the organ builder whom I singled out as the most advanced example of the advancing school. If Mr. Willis had not been a great organ builder, and so had his time so fully occupied, he would have been a great organ player.

The whole of the question of the production of sound, its variety and proportion, is so open to discussion that it would be impossible to carry it on in a periodical correspondence. This much is certain, that the "leave things as they were" principle is no wiser or more possible in music than in politics. The sound must be proportionate and apportioned to the place in which, and the uses for which, the organ is required. Those who love to listen to the soothing, sleepy tones of their own extempore performances are pretty sure to prefer the old style.

I am asked, if good metal is not necessary, why the great organ at Hyde Park is to have tin pipes? It was said that the advocate of Willis was an advocate of cheap metal. I mentioned this and other instances to show that where there was no lack of funds he preferred good metal. The reason for using pure tin in the present case is simply and solely for the appearance. The tone will be precisely the same, granting the same conditions of scale, wind, voicing, &c., whether produced by tin, spotted, or white metal. This is not a matter of question; it can be tested and has been tested over and over again.

Now for my other opponent. I beg to inform "Y. Z." that one-third of tin produces but a poor spot, hardly worth the name, and that two-thirds, his other limit, does not spot at all; it is here that the metal becomes bright—at two-fifths the spots become confluent, not so pleasant to the sight as one-half, but superior in all other respects. The fact is unfortunately that metal with one-half or less tin has an unhappy quality of getting soft by age, so that it is positively better, unless metal of a fine quality can be afforded, to use an alloy of lead, tin, and antimony than the ordinary and nicest looking spotted metal, especially as the best builders have now ceased to thrash the pipes with tuning cones.

In writing now I feel that I am before the organ-building craft, and I am sure that our old notions about organs improving by age are erroneous. Their alteration, and, as I think, loss of fulness of tone, arises, in my opinion, from the instability of the metal; for in every old organ that I have seen there can be no doubt that the settlement at the mouth and foot has diminished the apparatus for the wind. If this is so, most likely the sounds we are told to deside-

rate were not those which the ancients themselves wished to get.

With regard to the metal in the St. Paul's organ, I have ascertained that they do not reach a spot. They contain, in fact, less than I said—viz., about 20 per cent. of tin, and so "Y. Z.'s" information upon this point is not more accurate than the myth about the Dean and Chapter locking the pipes up in the cupboard for fear of their being hurt. Of the organ at South Shields I have only heard, and so I will not offer an opinion. It is said to be a German organ, something like Schulze's work, certainly not so good as his. I have already said that I consider Willis in every way superior to Schulze.

I see no reason why I should name unsuccessful works of Mr. Lewes. I have no wish whatever to disparage him or do him damage; all I object to is the dictatorial attempt to thrust him down our throats, and to give him a position in the craft which he certainly has no claim to.

Thus, we are told that the organ at Shields "for beauty and power of tone far surpasses any instrument of a similar size constructed by Mr. Willis!" This is a mere assertion, and depends for the little value it may have as "Y. Z.'s" opinion upon whether he has really critically examined all or any of Mr. Willis's organs of a similar size. I cannot help doubting his extensive knowledge with the multitude of organs built by Mr. Willis, because of his remarks upon his Liverpool instrument, with which it is pretty certain he is not acquainted, or he could surely never have said anything so foolish as that it did not fill St. George's Hall. I can from personal knowledge affirm that there never was a more unfounded assertion. In judging of that splendid work we must remember that it was built sixteen or seventeen years ago, and that the most astonishing improvements and inventions, especially in the matter of reeds, have been made since the time of its building. But, before the addition of the great reeds, Mr. Hopkins and Dr. Rimbault, in the work on organ-building, call this an unrivalled instrument. The idea of its not filling the place is simply ridiculous. Ever since its erection, Mr. Willis has been making, and, in fact, is still making, so many improvements that in an instrument such as the Liverpool, which Mr. Willis, as well as all connected with it, would wish to be as perfect as possible, alterations from time to time are certain to take place.

Your correspondent's assertion with respect to *all* Willis's organs reminds me of an incident which happened to me some time ago. A clever amateur extempore player was inveighing in the usual style against the present degradation of the organ, and monsters in general, when some one asked what he thought of the Liverpool organ. "Ah!" he replied, "Abominable—a great, big, coarse thing like that at the Crystal Palace." But, when I quietly asked him if he had ever heard the said instrument, not having the presence of mind or moral opinions of Lord Chesterfield, he replied, no he had not. Can the assertion of "Y. Z." as to "all Mr. Willis's organs of such a size," and as to the unfilling qualities of the Liverpool one (Dr. Rimbault and Mr. Hopkins notwithstanding), be of a very different character to that of my musical friend?—I am, &c., J. C. J.

"NO MORE CHIMNEY TOPS."

Sir,—Your correspondent, who refers to the house which is being erected at Eastbourne, from my designs, without chimneys as ordinarily treated, has evidently not quite understood the whole scheme. The leading idea and the primary one being a flat promenade roof to the house, "chimney pots" in close proximity would, I think he will acknowledge, be objectionable. Your correspondent overlooks the fact that the smoke tower serves to ventilate every room passage, closet, and corner of the house by its superior extracting power. Then, why have "chimney pots?" Does not your correspondent believe in Mechi's "magic touch," which has been lately going the newspaper round? As to priority of invention, I am well aware that it is now too late in the day for anyone to do anything really original respecting chimneys. All I claim is an architectonic result, based upon sound engineering principles. I can refer your correspondent to plenty of single shafts that take several flues into them; but, if he be an architect, he will, I hope, spare me and your readers the pain of dwelling upon such things longer. In a few weeks I shall be able to give my professional brethren the result of my experiment—*i.e.*, as soon as we attach the flues to the smoke tower.—I am, &c., H. H. Vale, F.R.I.B.A.

17, South Castle-street, Liverpool, April 6.

PUGIN *v.* BARRY.

Sir,—Mr. Burton, in a letter last week on the "Throne drawing," quotes a passage from a friendly letter of mine, which might, I fear, accidentally lead to a wrong impression on the minds of your readers, viz., that I had made two criticisms on the same drawing, at variance with each other, to different friends. This apparent inconsistency will be at once explained by your kindly allowing me to state that the expression quoted regarding the touch being so like Mr. Pugin's was made on seeing the reduced photograph from the drawing, and not made as a criticism on the original drawing itself, which I had not seen. As I have no desire to inflict on the public weekly explanations of expressions in my private letters, I shall take it as a kindness if Mr. Burton, in any future correspondence on the subject, will avoid reference to them.—I am, &c.,

John Yardman Powell.

Birmingham, April 7.

Sir,—In a letter signed T. S. Burton, published in your last week's edition, I find that Dr. Barry is called on "for an explanation of the fact of Sir C. Barry's visit to Mr. Pugin at Salisbury from November 2, to November 9, 1835." A similar statement has been made by Mr. E. Pugin, viz., that Sir C. Barry was at Salisbury on that very week unknown to me, and he, Mr. E. Pugin, has put forth extracts from a so called diary of his father to prove it, thus: "Nov. 2, Mr. Barry arrived; Nov. 3, on River front compartments; Nov 9, Mr. Barry left." Now this I affirm is positively untrue. I left town on Sunday, November 1, 1835, for Mr. Pugin's, at Salisbury, and I was engaged with him until the 8th, finishing Mr. Graham's set of drawings for the Parliament houses. We worked together in the chapel of his house for the whole week, I resided at the house, and I know for a certainty that "Mr. Barry" was not at Salisbury during that time, and that Pugin was not engaged on anything for Mr. Barry.—I am, &c.,

Talbot Bury.

50, Welbeck-street, Cavendish-square, April 8.

[We cannot insert any more letters on this controversy.—Ed. B. N.]

Intercommunication.

QUESTIONS.

[810.]—MIXED CEMENT.—Will you, or some of your correspondents, kindly inform me what effect would be produced by using Portland and Roman cement mixed, say half and half; whether so used would be more durable for external cornice work, or separately; and if separately, which is best?—S. W. M

[811.]—MULBERRY WOOD.—Can you tell me where mulberry wood is to be obtained, as I want some to match in an old piece of furniture?—Cabinet Maker.

[812.]—FLAT SOFFIT FLUSHING.—How ought the circular groin line of a flat soffit, finishing upon a splay, be worked in brickwork?—R. X.

[813.]—BULGING WALL.—I have been building a flint wall, 1ft. 6in. thick, and 20ft. long, with good foundation, and 12ft. high, and it shows signs of bulging in the centre; what had I better do to make a sound job of it?—Nip.

[814.]—TO DEADEN RINGING OF AN ANVIL.—Could anyone inform me what will deaden the ringing of an anvil, so as to have the same effect as striking on lead?—A Constant Reader.

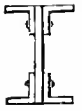
[815.]—TO DEADEN SOUND.—I should feel obliged to any of your readers who could inform me of the best way of preventing sound passing from one room to another. The rooms in question are separated by two 4½in. brick walls with a 3in. cavity between. At present the slightest noise in one room is distinctly audible in the other.—Metropolitan.

[816.]—STAMPED SPECIFICATIONS.—Some little time ago I asked whether it is necessary to have specifications. I received the answer that it is not usual to stamp them, unless they are to be enforced at law. I must confess that this answer does not satisfy me. Let us suppose a specification, with carefully worded general conditions, to be signed but not stamped, and a dispute to arise, can the conditions, &c., be enforced at law? I should be much obliged if some one would kindly give me a clear answer, for I fear that my ignorance of this point may lead me into difficulties.—Quiero Saber.

REPLIES.

[758.]—EGG SHAPED SEWERS.—Will you let me say a word about this question in "Intercommunication" in answer to your correspondent? There must be some mistake either in the original or copy, as it is impossible to work out the formula as given. It is $3 \log A + \log n + 6 s = \log D$; the diameter of the sewer in inches being represented by D. Every mathematician is aware that numbers, and the logarithms of numbers, cannot be manipulated together—they cannot exist in the state represented in the formula. For instance, we can have the expression $24 \times 34 = 816$, or its equivalent $\log 24 + \log 34 = \log 816$. The latter worked out would be $1.38021 + 1.53148 = 2.91169$. This last quantity being the log. of the number 816. We could not, however, work out the expression log. 24 + 34, which is similar to that given.—Algebra.

[774.]—STRENGTH OF WROUGHT-IRON GIRDERS.—In answer to the first part of "J. Walker's" question, the breaking weight at the centre of any girder may be calculated by the well-known formula $\frac{W = A \times d \times c}{l}$.



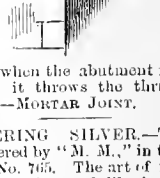
In this equation W is the weight applied at the middle of the span, A is the sectional area of the bottom flange in square inches, d is the depth, and l the length in feet; or both may be put in inches if more convenient. c is a constant, which varies according to the description of girder used. Its value for a girder, as shown in the sketch, may be taken at 75. As an example, suppose the angle irons to be 3in. × 3in. × ½in., with one rivet ¾in. in diameter uniting them to the web or vertical plate; then the value of A becomes equal to $2\left\{(3\text{in.} + 2\tfrac{1}{4}\text{in.}) 0.5\,\tfrac{1}{2}\right\}$ or 5½ square inches. If we suppose the depth to be one foot, and the span ten feet, we have the breaking weight at the centre $= W = \frac{5.25 \times 1 \times 75}{10} = 39.375$ tons. The girder would bear twice this weight uniformly spread or distributed over its surface. To obtain the sectional area necessary for the girder given by "J. Walker," in which the span is forty feet, and the distributed load ten tons, we must assume some depth, which may be taken at one-tenth of the span, or four feet. The expression for the strain at the centre is $S = \frac{W \times l}{8d}$, and in this case is $S = \frac{10 \times 40}{8 \times 4}$ = 12.5 tons. Supposing that we put a strain of four tons per square inch upon the material, we shall require $\frac{12.5}{4}$ or 3.125 square inches of sectional area in the flanges at the centre. This amount may be decreased towards the ends of the girder, where the strain becomes less. L. P. D.

[777.]—ARCHED PRINCIPAL RAFTERS.—The introduction of the laminated timber principle is due to De Lome, who constructed some fine examples of roofs of that description on the continent. The principle is simple, consisting merely in bolting together several thicknesses of inch or inch-and-a-half timber planking, bent to the required curve. A familiar example is to be found in the roof of Charter-house, which is formed of four circular ribs of deal, each one inch and a half in thickness and four inches wide. For some reason or other, saw cuts, nearly three-eighths of an inch deep, were cut in the under side of each rib. Marine glue was used in the putting of the ribs together, which was done upon a cradle centre. The rafters rest partly upon the circular ribs, and partly upon purlins, which are supported by the collar. The dimensions are—One circular rib, consisting of four thicknesses, 6in. by 4in.; purlins, 5in. by 4in.; collars, 6in. by 2in.; rafters, 4in. by 2½in.; ceiling joist, 3in. by 2in.—Architect.

[788.]—WATERWORKS AND RESERVOIRS.—There is no work of the kind "G. H." requires; but in "Weale's Quarterly Papers on Engineering" there is an excellent description of the Bann reservoirs, with plates showing the section and manner of making up the embankment. In your back numbers for last year there is a good deal of information upon retaining walls under the title "Elements of Engineering—Docks."—A Reader.

[792.]—SECTION OF ROADS.—For a road less than 15ft. wide one water table will be sufficient.—W. T.

[793.]—SHAPE OF ABUTMENT STONES.—In Gothic the shape of abutment stones in segmental arches is



usually thus: and when the abutment is small, it is generally advisable, as it throws the thrust more into the centre of the pier.—Mortar Joint.

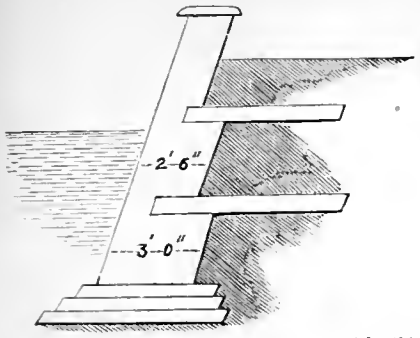
[795.]—LACQUERING SILVER.—The method of lacquering is answered by "M. M.," in the last number of Building News, No. 765. The art of making a perfectly green lacquer is lost. Rea, of Wardour street, sells the nearest approximation to it. A perfectly green tint is found in old Persian examples.

[796.]—MEASURING PROPORTIONS.—The readiest plan to do this in sketching out of doors is, when you have fixed upon your point of station, take a piece of tape tied to your coat button hole, and of such a length that a scale of (say) 12in. long tied at the end may be easily held out at arm's length, then, by carefully holding the arm at the same angle and turning round the scale, a very near approach to the proportion of the object to be sketched may be obtained.—Fred Rogers.

[797.]—HALF TIMBERED ERECTIONS.—This kind of construction may be kept quite air-tight by taking the following precautions. Let your plaster filling in finish about ¾in. behind the face of framing, run a groove in the framing coming flush with the plaster. This groove acting as a key when the timber shrinks there will be less likelihood of there being a chink to allow the weather in from the outside. Roughly plaster the inside of the brick filling in, and nail horizontal strips or battens to the wood framing, upon which the upright battening for plaster laths will come, and thus, by presenting a jacket of air between the outside and inside, you get the advantage of a hollow wall.—F. R.

[798.]—DECAYED STONE.—The plan which was found efficacious at Westminster was to first cleanse the stone from dirt with a light dust brush and then lay on lightly a solution of shellac in spirits of wine. This will prevent decayed stone from becoming worse inside a building.—I. P.

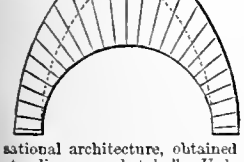
[802.]—A SEA WALL.—I would inform "Alexander" that a strong sea wall may be built, as shown in the accompanying sketch. After putting in a good solid foundation,



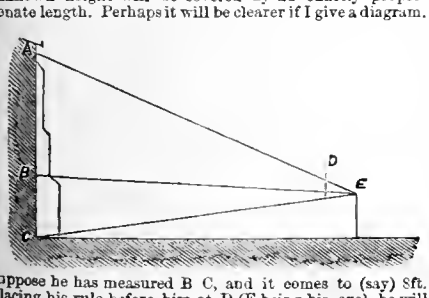
carry up your wall for three feet four or five bricks thick, then lay in a 3in. stone slab to project two feet on to a good bed of earth or concrete; then carry up the wall for four feet more three and a-half bricks thick, when another slab must be laid in, projecting 18in. or 20in. On the top of this last slab you may carry up your wall to the required height. This plan has been adopted in many docks and other sustaining or wing walls with great success, the various sets off at the back forming counterforts, which, by the downright pressure of the earth above them greatly strengthen the wall. Bricks to be laid in best Portland cement.

"Alexander" may have a good concrete by taking fresh burned stone lime, ground to a powder, without slaking, in proportion of five parts of gravel or sand to one of lime. It must be well turned or shovelled together, with a quantity of water added only sufficient to slake the lime into the state of very stiff mortar. After turning the compound over once or twice, throw it quickly (as it very soon sets) into the foundation or trench from a height of eight or ten feet, where, after being slightly rammed, it should not be touched. Be careful in all cases to fill the trench close up to the sides in every part.—W. H. D., Ipswich.

[806.]—ARCHES.—In answer to enquiry last week respecting arch, I would inform your correspondent that it belongs to no period of Gothic architecture, and that, therefore, as a Goth would say, its construction is faulty. Any arch whose voussoirs will not radiate from a point, or points, from which, as a centre or centres, the intrados can be described, must be an imperfect work. The arch of which you gave an illustration should have a semicircular intrados, the pointed extrados being merely ornamental, and so much dead weight, or nearly so. There are many examples of this latter description of arch, and some of the rusticated Renaissance doorways are treated very like it. A moment's consideration will show your correspondent that, by removing the masonry below the dotted line, we cut away the very heart of the arch, and the work must fall at the crown. This way of putting work together may be practised in Victorian times, and with other frivolous means for making a sensational architecture, obtained it the name of "the hair standing on end style." Unless well watched, bricklayers will build pointed arches after this fashion.—O. W. D.



[808.]—MEASURING OLD BUILDINGS.—I can suggest to "Ecclesiologist" a very simple method for obtaining the heights of inaccessible points, which I have often used myself with satisfactory results, though I am not aware that it is generally employed. Suppose he desires to obtain the height of some point from the ground. Having already measured some accessible height, let him stand some distance off, and hold his rule upright, so that the known height shall be covered by a certain length of it; then the unknown height will be covered by an exactly proportionate length. Perhaps it will be clearer if I give a diagram.



Suppose he has measured B C, and it comes to (say) 8ft. Placing his rule before him at D (F being his eye), he will cover the 8ft. with (suppose) 2in. of it. Then, looking up to A, he will find the whole height covered by (say) 6½in., and will, therefore, assume A C = 26ft. This may be very easily proved by the sixth book of Euclid.—A. K. C. L.

STATUES, MEMORIALS, ETC.

Some three years ago a public subscription was set on foot to provide for the execution of a statue of Sir Rowland Hill. A commission was given to Mr. Peter Hollins, of Birmingham, to execute a marble statue at the price of 950 guineas, which has just been completed by him, and is now about to be sent to the approaching exhibition of the Royal Academy. The statue has been cut out of a block (three tons weight) of Carrara marble. The figure is represented in an easy standing posture, the left foot being slightly advanced, and the left hand resting on a low pedestal. In the right hand Sir Rowland holds a roll of penny postage stamps, suggesting the work on which his fame chiefly rests. The figure is 6ft. 8in. in height.

WAGES MOVEMENT.

We stated about a fortnight ago that a dispute between the builders of the Potteries district and the carpenters and joiners, as to the hours of labour, had been referred to Mr. J. E. Davis, the stipendiary magistrate of the Potteries. The masters proposed that the carpenters and joiners, who go to work at 6, and leave off at 5.30, should begin later in the winter time, and leave off at 6 all the year round. The men resisted this proposal, and Mr. Davis has decided in their favour.

The painters and plasterers of Halifax are seeking an advance of wages, and strikes are not improbable. The painters ask to be paid 6d. per hour minimum wage, the present rate being 5½d. The plasterers demand 2s. a week more, and one hour a week less labour. The masters, we believe, are endeavouring to effect a compromise.

LEGAL INTELLIGENCE.

The Chancellor of the diocese of Carlisle, in a judgment delivered in the Consistory Court, has decided that churchwardens have a right to an unrestricted access to the church committed to their care, independent of the minister; whether this should be by the custody of one key themselves, or by one key being provided for each party, he should leave to themselves. Notice of appeal was given against this decision.

ALLEGED FAULTY CONSTRUCTION OF PROPERTY.—Wilkes *v.* Longmore.—In this case, before the Walsall County Court, Wm. Wilkes, gun-lock filer, Cock-street, Darlaston, sought to recover from Isaiah Longmore, miller, of the same street, the sum of £10, for damages alleged to have been sustained by him through the erection of a flue, wilfully and improperly, adjoining the plaintiff's workshop. It was shown that one of the beams which supported the floor of the workshop passed through the wall of the building and projected beyond it to the extent of about a foot, reaching to within about six inches of the defendant's flue. On the 26th November last the projecting end of the beam took fire and smouldered away, until that part which rested on the wall was consumed. The remaining part of the beam then fell down within the building, carrying with it a part of the floor of the workshop, and causing damage to the amount, as the plaintiff estimated, of £5. He also alleged that he sustained a further loss of £5 by loss of time in seeking another place in which to work. Witnesses were called to show that it was exceedingly improbable that the beam took fire from the flue, and that, setting aside a supposition that it was ignited by a fire in a grate in the plaintiff's shop, the mischief must have been caused by some person or other wilfully setting fire to the end of the beam outside the premises. In the end the judge found for the plaintiff in the sum of £2 and costs.

Our Office Table.

The well-known "Tabernacle" in Finsbury, erected by George Whitfield about 100 years ago, is about to be demolished, the lease of the ground having expired.

It is not uncommon in Paris to find the portraits of celebrated men employed to decorate wrapping paper, and common clay pipes carry the features as well as the name of some public character. A manufacturer of porcelain now announces that he is bringing out a complete dinner set with the likenesses of the whole staff of writers of a favourite journal. This will certainly be a change from the time-honoured willow pattern and the droll-looking figures of the celestials.

The foundation stone of the fourth pier of the new Blackfriars Bridge was laid on Friday. The pier has been carried nearly up to the half-tide level, and in the third pier the four principal caissons have been sunk to the bottom and filled in with concrete, and the two end caissons are nearly sunk to the full depth. Two of the arches have also been put together, and are now in position. The bridge will probably be finished in about a year. The new bridge is to cost between £250,000 and £300,000.

A singular calamity has befallen the town of Essen, in Rhenish Prussia. The soil is sinking at several points, a new street, one of the finest in the place, being especially affected. Three houses have already been obliged to be taken down, and a fourth is on the point of disappearing. Twenty-seven others show symptoms of ruin. The cause of the giving way in the ground is unknown.

The purchase of the Gallery in Pall Mall, hitherto used for the exhibition of pictures of the British Institution, has been completed by the Duke of Sutherland and the Earl of Leicester, as trustees of a new athletic club. The sum paid was £18,000.

Some time ago a paragraph appeared in the newspapers respecting the awards of Grand Prizes for Agricultural Machinery at Paris. Messrs. Howard, of Bedford, took exception to it on the ground that the statements were both incorrect and misleading. They also attributed to Messrs. Ransome, of Ipswich, the authorship of the paragraph. A rather angry correspondence ensued, and the dispute was at length referred to arbitration, William Fairbairn, Esq., of Manchester, being chosen the adjudicator. Messrs. Ransome having admitted that the paragraph was supplied by them, Mr. Fairbairn has decided as follows:—"I find, and am of opinion, that the expression in the paragraph, 'First grand prize to Messieurs Ransomes and Sims, of Ipswich, second ditto to Messieurs James and Frederick Howard, of Bedford,' and to which expression Messieurs James and Frederick Howard object, is ambiguous and improper, inasmuch as the words first and second might give to the reader of them an erroneous impression of superiority to Messieurs Ransomes and Sims, whereas both the said firms are on an equality with regard to the grand prizes awarded. I am further of opinion that the words objected to were used inadvertently by Messieurs Ransomes and Sims, and not with any intention to mislead or to claim more than they were entitled to."

Sir J. G. Simpson, the distinguished physician, states that in the old town of Edinburgh there are 13,000 families, consisting of 60,000 individuals, living in one-roomed houses, and that 1,500 rooms are the abodes, day and night, of from 5 to 15 persons. About 120 dwellings have no windows, and 900 of them are cellars.

The conductor of one of the American lines of railway has invented an ingenious contrivance to indicate to railway passengers the station which they are approaching, its distance from the one last passed, and from that point to each terminus of the road. It is placed in the centre of the car and has two arms projecting about two feet from each side of the car, which, coming in contact with posts placed for the purpose, turn the indicator immediately after leaving each station.

Aërodomes is the name given by an architect, M. Jules Borie, to a gigantic project of his, which he states has obtained the approval of the Emperor, and it cannot be denied that it looks plausible enough. The leading idea is that the disastrous agglomeration of numberless small lodgings within a narrow space in the business quarters of large towns may be obviated, without driving the people from the scene of their daily avocations, by, on the one hand, widening the streets, and, on the other, gaining in height what is thereby lost in breadth. For this purpose the houses to be built in the new and spacious thoroughfares which are to replace the existing narrow lanes will be not less than 10 storeys high, access to the upper ones being afforded by lifts, as is already the case in many hotels, both in England and France. Iron is to constitute the framework of these vast edifices, which are to rise to altitudes of from 100 to 120ft. Let us suppose the building to occupy a large rectangle; the fifth storey will be partially surmounted by a terrace, say 10ft. broad. Above this rises what may be called a second set of houses, narrower than the basement part just described, and constituting the aërodome proper, also five storeys high, making ten in all. The basement flats would serve for shops, banking, and other offices, &c.; those above the terrace would be inhabited by the clerks and other people generally connected with the establishments below. Let us now imagine a series of these rectangular constructions, separated from each other by wide avenues; the inhabitants of the aërodomes may communicate with each other by means of bridges thrown across from terrace to terrace, and in this way we get, in fact, two towns, one above the other; a large amount of traffic will be carried on without descending into the streets at all, provisions, fuel, &c., being obtained by means of the lifts. Each aërodome may be inhabited by 1,000 people and more, all enjoying commodious apartments, a pure atmosphere, and abundance of light, while the streets below will be wide and airy.—*Galignani.*

The third meeting of the members of the Architectural Institute of Scotland of the season was held in Edinburgh last week, Mr. J. Dick Peddie in the chair. Mr. Gowans read a paper on "The Education of an Architect," in which he pointed out the subjects that ought to be studied, and advocated the endowment of a chair of architecture in the University of Edinburgh.

The following fact, given on the authority of an eminent French architect, will convey to our readers a curious idea of the value of land in Paris. A plan for a new street, to run in a direct line from the present Italian Opera to the recently-erected Opera-house, has received the sanction of the Municipal Council, and may be inspected at the Hotel de Ville. The street is to be called La Rue de l'Imperatrice. The ground has been purchased at the rate of 1,800frs. to 2,000frs. the square metre—that is from £72 to £80. The greater number of the houses to be built are already let—the lower part as shops at the rate of 20,000frs. to 25,000frs. a year (from £800 to £1,000 a year). It is true that the situation is one of the most central in Paris. The question arises, and it is a grave one, where are men of small income to lodge? As to the poor, Paris has ceased to have homes for them.

A writer in one of the magazines recommends the new metallic compound, aluminium bronze, for household plate. He thinks it rather singular that this metal is not more used in England. We know it best in the cheap pencil cases which come from America, but there is no metal which it is alleged is so well suited for many domestic purposes. "I suppose," says this writer, "that our plate is chiefly of silver, not because it is one of the precious metals, and we wish to make a show of our wealth, but because it is a clean, hard, useful, and beautiful metal, easily kept in order. Its preciousness is a positive disadvantage to it, because it entails upon us some extra trouble in guarding it; and many persons, to save themselves this worry, refuse to have silver, and take to electroplate. Electroplate is certainly as hard, as cleanly, and as beautiful as silver, and it has the advantage of not being tempting enough for thieves; but it is unreal—too much like the thing it imitates, and many people reject it on that account. To all such persons let me say, Try the aluminium bronze. It has all the beauty of gold, without any pretence of imitating it. You know it is not gold by the weight of it; and no one has a word to say against the metals which in tint resemble gold—as brass, because they are not deceptive as the resemblances of silver. For articles in aluminium bronze, however, we should have to go to Paris. They are not made in England. Spoons and forks, cruet-stands, candlesticks, harness, and many other things in this beautiful substance, figured prominently in the Paris Exhibition."

At the quarterly meeting of the Conservative Land Society yesterday, at the Norfolk-street offices, Viscount Ranelagh in the chair, the secretary, Mr. Grunesen, submitted the report of the executive committee, which stated that the receipts for the half-year at Lady-day amounted to £105,217 3s., and the grand total to £1,205,820 10s. 9d. The £50 shares issued were 29,142, being a subscribed capital of £1,457,100; the withdrawals on which had been £316,162. The sale of land to Lady-day, 1868, was £545,777, and the reserve fund was £12,051. The society had acquired three new estates; the first was at Northampton, the second at Holloway, and the third at Red Hill (Surrey). The report stated that the new United Land Company (Limited) had been incorporated to co-operate with the Conservative Land Society, the former under the Joint Stock Companies' Acts, and the latter under the Friendly Societies' Acts as usual, and the shareholders were congratulated on the prospects and position of the new undertaking as an adjunct to the present institution.

We mentioned a week or two back that the lime light was about to be introduced for the purpose of illuminating the soldiers' barracks at Perth. The arrangements are being rapidly proceeded with, the principle adopted being the same as that known as the Drummond light. Various towns in Scotland are adopting the light, and if, as will doubtless be the case, the experiment at Perth proves satisfactory, it is expected that the lime light will gradually supersede the use of gas.

The late Mr. Felix Slade, whose death has just occurred, was well known as a collector of exquisite works of art. It is stated that he owned "the finest private collection of glass in Europe, but that in this respect he had a formidable competitor in Mr. E. W. Cooke, R.A."

According to a return furnished by the engineer of the Metropolitan Board of Works, the average daily quantity of sewage pumped into the River Thames at the Southern Outfall Works, Crossness, during the past week, was 54,563,859 gallons, or 247,909 cubic metres, equivalent to about as many tons by weight.

Mr. John Johnson, the successful competitor for St. Andrew's Church, Hertford, says in a letter to us:—"I am a total stranger to the committee, so that the decision is perfectly impartial. I did not canvass for a vote, although I understand some of the other competitors did."

Mr. Chauncey Hare Townsend, the friend of Southey, and well known as a man of letters and a lover of art, who died recently at his house in Norfolk-street, Park-lane, has by his will made several valuable and interesting bequests for the benefit of the public. He bequeaths to the President of the Council for the time being, for the benefit of the South Kensington Museum, such of his pictures, water-colour drawings, and engravings as the Lord President may select; also his collection of Swiss coins and his boxes of precious stones and cameos, together with the ancient gold watch which, having been stolen by the celebrated Barrington, was the cause of his transportation; also the looking-glass and frame over his drawing-room chimneypiece, carved by Grinling Gibbons. The articles thus bequeathed are said to be of great value. The only conditions that he attaches to this gift are that the articles may not be sold or exchanged, but publicly exhibited. The rest of his pictures, drawings, engravings, books, curiosities, and objects of vertu are given to the Wisbech Museum. The residue of his personal estate is devoted to founding a school in or near London for educational purposes, of the humblest and simplest kind, upon a plan to be settled by the Bishop of London. Besides being an elegant poet, the late Mr. Townsend was an accomplished musician, and sang the songs of his own composition with a high degree of grace and expression. He drew and painted with no mean skill. He was a lover of art, and a collector of rare judgment and exquisite taste. Every house in which he lived had, indeed, the interest of an art museum.

The architect Northoff, of Dresden, has designed a new font and cover for the new church of Oberwiesenthal in Saxony. An engraving is given in the *Christliches Kunstblatt* for December, 1867. The font has an octagonal bowl, very much after a common English type, with octagonal stem and base. The most novel feature is a metal crane, very well designed, which stands close to the font, in order to suspend and swing off the cover.

Arrangements are in progress for giving practical effect to the resolutions of the conference of working men, held on the 14th ult., under the auspices of the Working Men's Club and Institute Union and the presidency of the Earl of Lichfield. The consents of Dr. W. B. Carpenter, F.R.S., and Professor Warrington Smyth to deliver lectures, together with conditional promises of co-operation from several equally distinguished men of science, have been obtained.

The Dead Letter Office at the London Post Office is not the only curious place in the world. The same establishment at Washington would seem to be as great a curiosity shop. A New York paper states that the property clerk of the Dead Letter Office at Washington is now arranging in show cases, for public exhibition, upwards of a thousand articles of value and interest which have from time to time been received, and yet remain unclaimed. Among the articles and fragments is an elaborately wrought collar, evidently the property of a lady, to which is attached a note with the inscription "Burned in the cars between Fort Mayno and Chicago, Feb. 5, 1868." There is also a square of gun caps, found with fifty other squares, quilted in a lady's skirt, on the occasion of Sherman's march to the sea. The cartes de visite and photographs of soldiers in the Dead Letter Office number about 15,000, and they are being placed in portfolios for exhibition and public identification.

The ancient gold work, dating as early as the fifth century, exhibited at Paris, and lent by the Roumanian Government to the South Kensington Museum, will only remain on view for a few days longer before its return to Bucharest.

Earl Grey has given notice of his intention to move, in committee on the "Regulation of Railways Bill," the insertion of clauses imposing penalties for the emission of opaque smoke by railway engines required by the law to consume their own. The station master in the district in which the offence is committed is to be the nominal defendant.

The Rivers Commission, after taking evidence for two years, seems to have been broken up by dissension among its members, or probably owing to a disagreement between Mr. Rawlinson and Mr. Harrison. At all events the commission has been dissolved, and a new one constituted. It includes, we believe, Mr. George Denison, Mr. Norton, and Dr. Frankland. The former commission consisted of Mr. Rawlinson, Mr. Harrison, and Professor Way.

We have received the following letter:—Sir,—I beg to call your attention to the new lights at the Euston Station in the large hall. They are Kidd's patent carburetted gas sunburners. The gas formerly used to light the hall was about 230ft. per hour, the new lights consume under 200 cubic feet per hour, and about one gallon of the carburetting fluid in a week, the cost of which is 7d.—I am, &c., Arthur Barff.

The thirteenth meeting of the session of the Liverpool Architectural Society was held last week, Mr. Kilpin, the president, in the chair. Mr. Shoolbred exhibited several large photographs, principally of buildings in Spain, of great interest. Amongst them were views of Burgos Cathedral, the hospital of Toledo, the Alhambra, the Alcazar at Seville, the cathedral of Salamanca, &c.—Mr. Boult exhibited a photograph of the statue intended to be erected in St. George's Hall of Mr. Joseph Mayer. Mr. Boult said he had received it from Mr. Fontana, the sculptor, and it had been taken from the plaster cast of the statue, which was now being transferred to the marble. Mr. Boult further said he wished to inform the members of the society that contributions for the forthcoming architectural exhibition must be delivered in London on the 8th and 9th of the present month. Mr. Batty, of Manchester, read a paper on Vault Architecture, and received a vote of thanks for the same.

MEETINGS FOR THE ENSUING WEEK.

Wed.—Society of Arts.—"On Liquid Fuel," by Benjamin H. Paul, Esq.
Sat.—Associated Arts Institute, Committee Meeting.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2274 M. JONES. Improvements in Kitchen Ranges. Dated August 6, 1867.

The patentee claims constructing and arranging the flues of the top and bottom ovens of kitchen ranges, and combining the said flues with independent vertical back flues, substantially as described, whereby one or other or both of the ovens may be heated at pleasure, and the quantity of heated air circulating about them regulated.—Patent completed.

2329 J. BADGER. Improvements in Kitchen or Cooking Ranges. Dated August 13, 1867.

The patentee claims, first, constructing and arranging or combining the parts of the fire-grates of kitchen or cooking ranges so that the fire-grate may be raised or lowered in the fire place, and fixed or supported at the required height, in order to increase or diminish at pleasure the depth or fire space of the grate. Second, opening and closing the chimney hole of the range, and forming a draught plate or box at the said chimney hole when the grate is an open one, by means of a door constructed and used substantially in the manner described.—Patent completed.

2332 T. WALKER. Improvements in Machinery for Cutting Grooves in Notchboards of Stairs, Ladder Strings, and in other Articles Requiring such Grooves. Dated August 13, 1867.

Here the patentee employs arms mounted so as to be capable of being turned to any required angle, and connected together by suitable rods, which are carried by sliding pieces mounted on the arms. The material to be grooved is placed upon the rods, and is moved against a revolving cutter situate above, and is traversed along rollers or other guides for successive cuts. The distances apart of the grooves are regulated by a gauge piece which is mounted so as to be capable of being turned upward and downward upon a centre, and is placed in one groove to determine the position of that which is to succeed it. The gauge piece is also capable of being moved horizontally.—Patent completed.

2296 R. HEATHFIELD. IMPROVEMENTS IN MACHINERY FOR THE MANUFACTURE OF CUT NAILS. (A communication.) Dated August 9, 1867.

This invention relates to the "feeder," which consists of a tube slightly inclined, the end nearest the cutter being lower than the other end. Through this tube the strip of metal from which the nails are to be cut is passed, and to the tube an alternating motion of partial rotation is given in the ordinary way. To the end of the tube, and on one side thereof, an arm is fixed, parallel to the axis of the tube. The extreme or free end of this arm is bent at right angles, and as a slot or opening made in it, through which slot or opening the strip of metal passes. The outer end of the tube, or the end most distant from the cutter, is supported in a bearing which allows the tube a slight motion in a vertical plane. The inner end of the tube is pressed upon by a spring, the end of the spring being formed into a clip or bearing. The action of the feeder is as follows:—The strip of metal fed through the tube and slot or opening in the arm, is urged forward towards the cutter in the usual manner; after one nail has been cut from the strip, the tube performs a semi-rotation, the end of the arm bearing on the bed of the machine, and constituting an oscillating centre about which the rotary motion is performed. The inner end of the tube, together with the arm and strip, consequently rise and fall in a vertical plane during the semi-rotation of the tube, the tube and arm being pressed down to the bed plate, and lateral motion in them prevented by the spring described. The action of the feeder is, after each nail has been cut from the end of the strip, to turn the strip at the same time, slightly raising it, and bringing it down again in the same position upon the bed plate, the motions being very similar to those effected by the human hand in hand-fed nail-cutting machines.—Patent completed.

2297 C. HOHGREFE. IMPROVEMENTS IN APPARATUS TO BE APPLIED TO CHIMNEY TOPS. Dated August 9, 1867.

Here the patentee employs a series of funnel-shaped rings having an inner diameter corresponding with the width of the chimney. These rings are fixed horizontally, and one above the other, with their mouths downwards, and with spaces between them. Their surfaces are curved so that the wind blowing against them horizontally becomes deflected upwards in a vertical direction, and the ascending current of air so obtained tends to draw the smoke out of the chimney.—Patent completed.

2351 A. F. BAIRD. AN IMPROVED EARTH CLOSET. Dated August 15, 1867.

Here the patentee places a receptacle beneath the seat for receiving the deposits with which the earth is to be mixed, with a shoot or passage opening into the said receptacle for conveying the earth into the same, and at the other end to that above-mentioned another opening by which the earth is supplied from a hopper to the said shoot; the bottom of this hopper being curved and provided with the last mentioned opening for communication with the shoot, is opened and closed by the action of a sector piece or other valve weighted as a counterbalance, such piece or valve being secured to, and forming part of, a flap or valve hung at the centre, the office of which flap or valve is to close the opening from the shoot into the receptacle first mentioned, the same being effected by means of a projection from the centre of the said flap or valve situate just beneath the seat of the closet, so that, when at rest, the sector valve closes the entrance from the hopper to the shoot, and prevents the discharge of earth into the said shoot; and when the closet is used, the weight of the "sitter" presses the seat on the said projection, and thus gives motion to the valve arrangement and opens the entrance from the hopper to the shoot, shutting the entrance to the receptacle for deposits, thus causing the shoot to be filled up with earth, which is to be discharged therefrom into the receptacle by the removal of pressure of the "sitter" getting up from the seat. The sector valve has a rod or rods attached to it, working in the hopper, to prevent the consolidation of the earth, and cause it to remove as required. —Patent completed.

2437 W. R. LAKE. A NEW GREEN COLOUR. (A communication.) Dated August 26, 1867.

This invention consists, principally, in the employment of linseed oil, acid, and oxide of copper. It is produced by precipitating a neutral soap prepared from linseed oil with a dilute solution of copper, or in letting linseed acid act on oxide of copper, or a combination, consisting partly of oxide of copper. Oleic acids produced from other oils also furnish the said colour in divers shades.—Patent abandoned.

2461 J. DOUGLAS. IMPROVEMENTS IN THE MEANS OF VENTILATING AND REGULATING THE DRAUGHT OF CLOSE FIRE RANGES OR KITCHENERS. Dated August 29, 1867.

Here the patentee makes an aperture at any suitable point in the front or side of the range above the fire, and communicating with the flue. This opening he provides with a door or flap, hinged or otherwise mounted, of a size to fill up the whole area of the flue; this flap is held in any suitable position by a bent arm attached thereto, having teeth or notches catching in a guide fixed at the upper part of the aperture; or it may be otherwise arranged to hold the flap more or less open, as desired. By adjusting the position of the flap, which acts both as a ventdator and damper, the draught in the flue may be regulated according to the requirements.—Patent completed

2464 J. and R. D. PAULIN. IMPROVEMENTS IN APPARATUS FOR FEEDING PAINTS ON THE STONE OR STONES ON WHICH THEY ARE TO BE GROUND. Dated August 29, 1867.

The patentees make a receiver for the paint of any convenient size, form, and material, within which, and at the bottom thereof, is a knife (by preference double curved) revolving on its spindle; at the side of the receiver is an opening with arrangements for closing the same to a greater or less extent, as may be desired. The knife during its revolutions pushes some of the paint through the opening in the side of the receiver into a box. Another knife moved by a crank at the proper time cuts off that portion of the paint which projects from the receiver into the box, and in travelling back to its former position carries such portion of paint to a position immediately over or communicating with the eye of the stone; and provision is made for raising the knife preparatory to its being moved again towards the receiver, so that the paint is dropped which falls or is conveyed into the eye of the stone.—Patent completed

2481 E. K. DUTTON. IMPROVEMENTS IN WINDOW SASH FASTENERS, WHICH ARE ALSO EMPLOYED TO SUSTAIN THE WINDOW SASHES IN ANY DESIRED POSITION WHEN THE WINDOW IS OPENED. (A communication.) Dated September 2, 1867.

Here a lever works in a "frame" or "fixing" of a suitable form and material, the fulcrum of the lever being nearer to one end than the other, the shorter end of the lever having been suitably formed to have attixed thereto a pad of caoutchouc, &c., and the longer end of the lever being suitably shaped to be operated upon by the hand. The frame and lever are affixed to the side of the "sash frame," or so let into the same that the pad of caoutchouc is pressed against the fixed window frame in which the sash slides, a spring operating upon the lever to give the said pressure; when the window is closed, a projecting portion of the lever enters a slot in a metal plate affixed to the window frame and effects the desired fastening.—Patent abandoned.

2485 A. V. NEWTON. AN IMPROVED MANUFACTURE OF TOOL FOR CUTTING STONE. (A communication.) Dated September 2, 1867.

This invention relates to a novel saw or rotary cutting tool. The edge or periphery or perimeter of the cutting tool is studded with small precious stones of great hardness or pieces thereof (diamonds being preferred), the same being so disposed that the stones shall form the cutting edges or points of the saw, some of them projecting on either side of the saw plate to cut a "kerf" sufficiently wide to keep the plate from binding in the kerf.—Patent completed.

2486 H. VALLANCE. IMPROVEMENTS IN FASTENINGS SUITABLE FOR CASEMENT WINDOWS. Dated September 2, 1867.

The patentee claims combining with the latch fastening of a casement window a rod passing along the frame to a pin or bolt locking with a quadrant, in such manner that the movement of the latch handle is communicated to the said locking pin or bolt, as described.—Patent completed.

2494 E. Y. ROBBINS. IMPROVEMENTS IN FIRE-GRATES. Dated September 3, 1867.

This invention consists in forming the front of the grate basket, or part of the grate in which the fuel is held, concave in its horizontal or vertical, or in both its horizontal and vertical sections, so throwing the fuel into such position that there is cross radiation from one part of the front of the fuel upon another part, keeping the entire front surface of the fuel hot and brightly incandescent; also forming a highly heated channel of draught, drawing up smoke and the dust of ashes into the flue, this channel of draught being entirely within the fireplace or stove, and the bars so shaped that any smoke coming from the fuel between the bars is under the arch and within the jambs, and not likely to get into the room.—Patent completed.

2498 G. SMITH. IMPROVEMENTS IN LADDERS SUITABLE FOR FIRE-ESCAPES AND OTHER PURPOSES. Dated September 4, 1867.

According to this invention the inventor combines two or more ladders, according to the amount of extensibility required, disposed one within the other, the inner ones being capable of sliding in the outer ones. The outer ladder of the series is pivoted or carried on hinges or centres at its lower end, such centres being fixed on a carriage mounted on wheels for the facility of transport. There are various other features comprised in the invention. —Patent abandoned.

Trade News.

TENDERS.

BATLEY.—For erecting a warehouse at Batley, near Leeds, for John Blackburn, Esq. Quantities supplied by Mr. Walter Hanstock, architect:—

MASONS AND BRICKLAYERS' WORK.	
W. Atkinson	£565 0 0
J. Hepworth and Sons	528 10 0
James Brier	510 0 0
John Mortimer and Sons	499 12 10
Hart and Brier	480 0 0
James Booth	469 0 0
Charles Chappell	458 18 6
Robinson and Hurst	439 10 0
William Goldthorpe	423 9 11
Preston and Webster	410 0 0
Charles Winsdale	330 0 0
CARPENTERS' AND JOINERS' WORK.	
John Jackson	868 0 0
George Lyles	675 0 0
Robert Ibberson	669 12 0
Petty and North	669 0 0
Joah Williams	620 0 0
William Hodgson	590 0 0
PLUMBERS' AND GLAZIERS' WORK.	
Brumitt	46 10 0
Joseph Firth	37 0 0
Kershaw and Co.	35 0 0
J. H. Senior	32 16 0
Matthew Lobley	31 3 4
SLATERS &C., WORK.	
J. T. Rawsthorne	160 0 0
A. Thompson and Son	142 10 0
J. Thornton	138 0 0
IRONFOUNDERS' WORK.	
Michael Shilito	68 17 0
J. and J. Horsfield	67 0 0
John Bagshaw	65 0 0

CAMBERWELL.—For a villa, Grove Park, Camberwell, for B. Hooper, Esq. Mr. Thomas Nixon, architect. Quantities supplied by Messrs. Mann and Saunders:—

Thompson	£2024
Cooper and Cullum	1970
Henshaw	1878
Nixon and Son	1877
Colls and Co.	1874
Higgs	1813
Gammon and Sons	1777

EPPING.—For five detached villas, near Eppiog. Mr. William Eve, architect:—

Shurnurr	£2498 0 0
Sawyer	2425 0 0
Cuthbert Brothers	2388 16 0
Mundy and Hutchinson	2370 0 0
Nicholls	2294 0 0
Bell and Sons	2279 0 0
White	2196 18 4
Bayes	2196 0 0
Harrison and Edwards	2180 0 0
Neale	2127 0 0
Clarke	2120 0 0
Capps and Ritso	2095 0 0
Turner (accepted.)	1899 15 0
Callen and Co. (too late)	1825 0 0
Teece (withdrawn)	1744 18 7

GODSTONE.—For completing three houses at Godstone. Mr. William Eve, architect:—

Heiser	£650
Sawyer (accepted)	625

GUILDFORD.—For road making and drainage, on the Woodbridge-road estate, Guildford Mr. Henry Peak, architect and surveyor. Quantities not supplied:—

Watkins	£675 0 0
Garnett	609 0 0
Ayers (accepted.)	473 11 0

LONDON.—For alterations at No. 1A, Hyde Park Gate, for J. R. Haigh. Mr. Thomas Hill, architect:—

Mansfield and Price	£740
Patman and Fotheringham	728
Nixon	647
Eboralo	682
Saunders (accepted)	610

LONDON.—Rebuilding No. 29, Mark Lane. Messrs. John Young and Son, architects, 35, King-street:—

Lawrence and Sons	£6320
Ashby and Horner	6170
Hart	5900
Ashby and Sons	5823
Webb and Sons	5743
Brass	5634
Henshaw	5599
Conder	5560
Newman and Mann	5539

LONDON.—New warehouse, No. 34, Gutter Lane. Messrs John Young and Son, architects:—

Lawrence and Sons	£3770
Mansfield and Price	3524
Hart	3498
Patman	3392
Myers and Sons	3358
Brass	3330
Webb and Sons	3330
Newman and Mann	3246
Ashby and Horner	3197
Henshaw	2965

LONDON.—New building, Great Tower street. Messrs John Young and Son, architects:—

Jackson and Shaw	9500
Ashby and Sons	9450
Mansfield and Price	9303
Browne and Robinson	9124
Henshaw	9050
Ashby and Horner	8840
Conder	8475

LONDON.—For rnising warehouse, 107, Leadenhall-street. Mr. Will am Eve, architect:—

King and Son	£658
Greenwood and Son	565
Heiser (accepted.)	510

REIGATE.—For a pair of semi-detached cottages to plans and specification of J. F. Mathews, Reigate. Quantities supplied:—

Mr. Peters	£498 0 0
Scraggs	420 0 0
Holdsworth	392 0 0
Wentworth	339 10 0

SNARESBROOK.—For erecting two cottages in the Sylvan road, Snaresbrook, for Mr. Rowbotham. Mr. F. G. Widdows, architect:—

Hunt and Elkington (accepted)	£1100

STOKE NEWINGTON.—For rebuilding premises, High-street, Stoke Newington, for Mr. S. Brampton. Mr. F. G. Widdows, architect. The quantities supplied by the architect:—

Patrick and Son	£7 119
Rivett	6 993
Cooder	6731
Brass	6643
Ashby and Son	6616
Newman and Mann	6556
Henshaw	6459
Hill and Keddell	6360
Ennor (accepted)	6346

THEYDON BOIS.—For enlarging house at Theydon Bois. Mr. William Eve, architect:—

Turner	£365
Cuthbert Brothers (accepted.)	275

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Bull and Richard Jeffery, Tunbridge Wells, builders, April 20.—Alfred J. Cohen, Gloucester street, Clerkenwell, timber dealer, April 24.—John Davis, Aldershot, contractor, April 28, at 2.—James Price, Barking, bricklayer, April 29, at 11.

TO SURRENDER IN THE COUNTRY.

Thomas, Griffiths Burslem, plasterer, May 9, at 11. —Charles Field, Hereford, bricklayer, April 21, at 10.—John Simpson, Liverpool, builder, April 16, at 3.—James Soper, Plympton Saint Mary, builder, April 18, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

April 20, W. Davies, Lennox road, Islington, builder.—April 22, W. H. James, Warren street, Fitzroy square, builder.—April 27, W. A. Hammon, Howland mews, Howland-street, builder.—April 23, W. Linfott, New Barnet, timber dealer.—April 30, W. J. Burgis, Sutton, stonemason.—May 4, T. Spooner, Burton upon Trent, surveyor. April 14, J. Nutton, Elland, contractor.—May 8, J. Hodgetts, Staplow-wharf, near Ledbury, timber dealer.—April 27, G. G. Hughes, Everton, builder.—April 20, B. Pritchard, Liverpool, builder.—April 28, G. Patchett, Eccleshill, stonemason.

DECLARATION OF DIVIDENDS.

R. Whiston, Wolverhampton, lime merchant, div. 1s. 2½d.—J. Best, Seaforth, builder, div. 1s. 3d.

DIVIDENDS.

April 22, S. Randle, J. Corrie, and G. Penton, Sydenham, builders.—April 21, C. Rooke, Blandford Forum, builder.

SCOTCH SEQUESTRATION.

James Dunbar, Lillierleaf, mason, April 11, at 12.

PARTNERSHIPS DISSOLVED.

Peters and Markham, King William-street, E.C. surveyors.—Garstang and Gornall, Blackburn, house, Morley, stone merchants.—Knight and Gosling, Birmingham, timber merchants.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak ..... load	£11	10	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	10	4	15	St. Petersburg, yel...	10	10	11 0
,, yellow pine..	2	15	4	5	Finland	7	10	8 10
St. John N.B. yellow	0	0	0	0	Memel	0	0	0 0
Quebec Oak, white..	5	15	5	15	Gothenburg, yellow	8	0	10 0
,, birch.....	3	10	4	10	,, white	8	0	9 0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	10 10
Pantzic oak	4	0	6	0	Soderham	9	0	10 10
,, fir	2	5	3	5	Christiania, per C.,			
Memel fir	3	0	3	15	12 ft. by 3 by 9 in.			
Riga	3	0	3	5	yellow	12	0	15 0
edish	2	0	2	9	Deck Plank, Dantzic,			
asts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1 3
,, yellow pine..	5	0	6	0	PUMICE STONE per ton	6	0	8 0
Lathwood, Dantzic, fm	5	0	7	0	OILS, &c.			
,, St. Petersburg	8	10	9	5	Seal, pale....per tun	38	0	0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	100	0	103 0
					Cod	36	0	0 0
					Whale, 8th, Sea, pale	3	0	0 0
Quebec, white spruce	13	0	19	0	Olive, Gallipoli.....	73	0	74 0
St. John, white spruce	12	10	15	10	Cocoanut, Cochin, ton	54	0	55 0
Yellow pine, per reduced C.					Palm, fine	40	0	40 0
					Linseed	33	10	34 0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	37	10	0 0
2nd do.....	11	0	12	0	Cottonseed	33	10	40

METALS.

IRON:—

Welsh Bars in London	per ton	5 10 0	6 0 0		
Nail Rod	do	7 5 0	7 12 8		
Hoops	do	8 5 0	9 0 0		
Hoops, Single	do	8 0 0	9 0 0		2½
Staffordshire Bars...	do	7 5 0	7 15 0		
Bars, in Wales	do	5 7 6	6 0 0		
Nailrods	do	7 5 0	7 12 6		2½
Foundry Pigs, at Glasg. No 1 ..	do	2 12 6	2 14 0	net t.	
Swedish Bars	do	10 0 0	10 10 0		2½

STEEL:—

Swedish Keg, hammered	per ton	15 0 0	15 5 0		2½
Swedish Faggot	do	0 0 0	0 0 0		

COPPER:—

Sheet & Sheathing, & Bolts	per ton	82 0 0	82 0 0		
Hammered Bottoms	do	92 0 0	92 0 0		
Flat Bottoms, not Hammered ..	do	87 0 0	87 0 0		
Cake and Tough Ingot	do	73 10 0	73 15 0		3
Best Selected	do	80 0 0	82 0 0		
Australian	do	82 0 0	82 0 0		
Yellow Metal Sheathing & Rods	per lb	0 0 7	0 0 7½		

LEAD:—

Pig, English	per ton	21 5 0	0 0		
,, Spanish Soft	do	19 0 0	0 0 0		2½
Shot, Patent	do	22 10 0	0 0 0		
Sheet	do	20 10 0	20 15 0		5
White	do	27 0 0			

TIN:—

English Block	per ton	96 0 0	96 0 0		
do Bar	do	96 0 0	97 0 0		2½
do Refined	do	98 0 0	98 0 0		
Penang	do	95 0 0	0 0 0		nett
Straits	do	92 0 0	0 0 0		

ZINC:—

English Sheet	per ton	26 0 0	26 10 0		2½
Prussian V. M. Rooting Zinc	do	26 10 0	0 0		

* And 5 per cent. discount if laid upon the new system

FUEL:—

Coals on the Spot	per ton	20	0	0	0 nett
Coke	per bll	6 17 0	0 0 0		

REGULUS OF ANTIMONY

French	per ton	44 0	45	0

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 17, 1868.

THE NATIONAL PORTRAIT EXHIBITION.

THE Exhibition-road, South Kensington, has once more become a centre of attraction to the public. Favoured by fine weather, thousands of persons are now flocking thither to view the third and concluding Exhibition of National Portraits. And it must be said that the inducements to pay a visit to this well-known spot at present are very great. A splendid collection of portraits has again been brought together, and we may renew our thanks and congratulations to the enlightened nobleman for a happy suggestion, and to the managing committee of the undertaking on account of the immense success which has attended their efforts. The Exhibition was opened to the public on Thursday, and for the next few months the large and externally rather unpromising-looking brick building used for the refreshment rooms of the International Exhibition of 1862 will doubtless prove one of the most fashionable resorts and places of popular attraction in the metropolis. The gardens of the Horticultural Society, being in close proximity, may be supposed to lend an additional attraction to the Exhibition. The National Portrait Exhibition, as most persons are aware, is specially designed to illustrate English history and the progress of art in England. Lord Derby's idea, as he himself expressed it, was "to admit either portraits of eminent men (and women) though by inferior or unknown artists, or portraits by eminent artists, though of obscure or unknown individuals." This idea has been followed out in the series of exhibitions which have been held, and the present collection completes the chronological series suggested by Lord Derby. It consists of celebrated persons who have died since the year 1800, with supplementary portraits of many distinguished individuals not duly represented in the Exhibitions of the two previous years. The collection of modern portraits extends from the commencement of this century to the present time, and includes the last twenty years of the reign of George III., the ten years comprising the reign of George IV., the seven years of the reign of William IV., and the first thirty years of the reign of Queen Victoria. In an introductory note to the catalogue, Mr. Samuel Redgrave informs us that the first year's exhibition was distinguished by the works of the great foreign artists who had followed their profession in this country. The second exhibition contained the portraits of the founders of the English school of painting, culminating with those of Reynolds and Gainsborough. The present largely represents the works of Sir Henry Raeburn, who died in 1823; William Owen, who died in 1824; Sir Thomas Lawrence, who died in 1830; John Jackson, who died in 1831; Thomas Phillips, who died in 1845; Sir Martin Shee, who died in 1850; and Sir J. Watson Gordon, who died in 1864. It also comprises examples of eminent contemporaneous artists, who now sustain the reputation of the existing school of portrait art. In 1866 the number of portraits exhibited was 1,030; in 1867 the number was 866; and this year the collection includes 946. It will thus be seen that no fewer than 2,842 portraits or portrait groups have been exhibited in the three years. This is a splendid result, and the managers of the undertaking may well congratulate themselves on the fact that the known portraits of our most eminent men, with few exceptions, as well as the art of our best portrait painters, have been fairly represented in these exhibitions. But they also state—and we may take hope for the future from the statement—that it must not be assumed that the stores of portrait art possessed in this country have by any means been exhausted. The portraits offered when it was too late and impossible to accept them are mentioned as some proof of this. Indeed, the number, we are told, seems almost without limit. In the meantime, let us be thankful for what has already been accomplished. Never before have so valuable, interesting, and extensive collections of portraits been gathered together for public exhibition. Contributions have come from many sources. Her Majesty has lent her gracious aid; important contributions have been made by the principal families in the kingdom, by our universities, and by other corporate bodies and national institutions.

Among the more interesting features of the present exhibition is the fine series of portraits belonging to the Dilettanti Society. This society was established in 1734 by several noblemen and others (Viscount Harcourt, Lord Middlesex, and the Duke of Dorset being the chief promoters), who were desirous of advancing the fine arts in Great Britain. The society consists of fifty members, and in 1740 it was ordered "that every member do make a present of his picture, in oil colours, done by Mr. George Knapton, a member, to be hung up in the room where the Society meets. Twenty-three portraits were painted by this artist, and others by Reynolds, Lawrence, West, and Shee. These portraits have been appropriately arranged together, and in themselves form a most interesting exhibition. It may also be noted that the specimens of early English art include the celebrated portrait of Richard II., from Westminster Abbey. This portrait, described as the most important contemporary representation of any English sovereign (1366-1400), used to hang in the Abbey above the Lord Chancellor's pew, on the south side of the choir, next to the pulpit. It was removed in 1775 to the Jerusalem Chamber, where it has hung ever since. It is believed to represent the King enthroned, on the Feast of the Translation of King Edward the Confessor. The portrait is large life size, throned, in royal robes, wearing jewelled crown, minever tippet, minever lined purple robe, inner robe diapered with a crowned R., globe in right hand, and sceptre in left—panel 7ft. by 3ft. 7in. It was first exhibited at Kensington in 1866, and has since been cleaned under the superintendence of Mr. George Richmond, R.A. The comparatively modern painting that concealed almost every part of the original portrait has been removed with complete success, and there now remains the genuine contemporary work of the 14th century. It was one Captain Brome, Walpole tells us, who was Goth enough to repaint over the surface of this wonderful picture, somewhere about a century before his day. These galleries contain numerous examples of the elder masters of portraitnre, —a series of works in which the portrait art of this country may be traced from the time of Holbein to the present day, including the works of Antonio More, Vansomer, Jansen, Vandyck, and his followers, as well as those of our own countrymen, Reynolds, Gainsborough, Romney, Lawrence, and Raeburn. The works of these modern masters will doubtless afford the greatest gratification to the general run of visitors to the exhibition. In a very large number of instances they are the portraits of persons more or less known to this generation; not a few of them, as Lord Palmerston, Thackeray, Cobden, Sir Benjamin Brodie, Faraday, Brewster, Whewell, not to mention others, are but recently dead, and the general public will be in no doubt as to their portraits. But, indeed, it may be said of the vast majority of the individuals here represented that engravings have rendered their features familiar to most persons. We have poets, statesmen, actors, painters, sculptors, historians, wits, and beauties without number, and with most of them the visitor will be able to claim at least a historic intimacy.

For the present we pass over the majority of the great men and the distinguished women who are here represented. We notice, however, with pleasure that the Exhibition is enriched with a goodly number of portraits of eminent architects, engineers, and other scientific celebrities. For example, there is a portrait of the elder Pugin, by Mr. Herbert, R.A., in the mediæval style. This is very quaint and curious, and presents a striking contrast to the fine, jovial, eminently English portrait of Sir Charles Barry, his friend and fellow worker, which hangs right opposite—though, we may add, not in opposition. This latter portrait has been lent by Mr. Charles Barry, and the artist is Mr. Bradley. Mr. Sydney Smirke has sent a faithful likeness of his brother Sir Robert Smirke, the work of Mary Smirke. Sir Thomas Lawrence's portrait of Sir Jeffrey Wyatville, R.A., the property of the Queen, graces another wall. Wyatville died in 1840, at the age of 74. He was the son of Joseph Wyatt, of Burton-on-Trent, and at an early age was apprenticed to his uncle, Mr. Samuel Wyatt, the architect of the Trinity House. In 1823 he was made A.R.A., and next year was appointed architect for remodelling Windsor Castle, when he assumed the name of Wyatville. He was made R.A. in 1826, knighted in 1828, and died in the Wykeham Tower of Windsor Castle in 1840. Another distinguished architect, bearing the name of Wyatt, is represented, though the artist of the portrait is apparently not known. This is Mr. James Wyatt, the architect of Fonthill Abbey, and the successor of Sir William Chambers as surveyor-general of the Board of Works. He was born in 1743, and died in 1813. This portrait is lent by the Institute of British Architects, which body also contributes a portrait by Boxall of the late Professor C. R. Cockerell, R.A., who died in 1863. There is a portrait of Joseph Bonomi, the Italian artist, who settled in London about 1767, who became the friend of Reynolds, and built the Duke of Argyll's palace at Roseneath, Scotland. He died in 1808. The painter is J. F. Rigaud, R.A.

Beyond placing the portraits under separate reigns, no regular arrangement has been followed. But the visitor, as he saunters through the rooms, will come upon Pickersgill's portraits of Faraday and Dr. Brande, Sir Watson Gordon's benign-looking portrait of Sir David Brewster, the rugged and determined head of Hugh Miller, by Bonnar, Horsley's portrait of Brunel, and George and Robert Stephenson, by W. Daniels and H. W. Phillips respectively, with many others of lesser note. There is a portrait of Thomas Gray, the "Railway Pioneer," by Richard A. Clack. This interesting character, who was born at Leeds in 1788, conceived the idea of a general iron railway for Great Britain and Ireland, which he developed in his work on "Land Steam Conveyance," and "Observations on a General Iron Railway," published in 1819-20. He was ridiculed by the public press, tried in vain to get employment after the railway system had been introduced, and died forgotten and neglected at Exeter in 1848. Hanging next to it is Boxall's portrait of Aaron Manby, C.E., who planned the first iron ship that ever went to sea, and was the inventor of the oscillating cylinder marine engine. Interesting, also, is a portrait of Charles Lamb and his sister Mary, taken in old age. The figures are full length, small size, and are a little odd-looking. Charles Lamb is seated, and his sister is standing at his right hand; the canvas is signed "F. S. Carey," the picture being the property of Mr. J. Bertrand Payne. No. 802, "Sarah Malcom," by William Hogarth, will attract the attention of every visitor. It is the full-length figure of a woman in prison; she is seated at a table, on which is a rosary, and having her arms crossed. This woman, who here finds herself in such good company, was a notoriously bad

character. On referring to the catalogue, we read that she was born at Durham about the year 1711, of a family possessing some independence, but her father's extravagance left her without the means of support. She became at the age of twenty-two a laundress at some chambers in the Temple, and acted as charwoman to Mrs. Lydia Duncomb, in Tanfield-court. On the morning of Sunday, February 4, 1733, she entered their rooms and murdered Mrs. Duncomb, another elderly woman, her companion, and their servant maid. For these crimes she was executed opposite Mitre-court, Fleet-street, on March 7th following. Sarah Malcom, however, does not find a niche in this collection on account of her character, but because of the famous painter who has given us her portrait. With very different feelings will the visitor contemplate Wilkie's full-length portrait of George the Fourth, dressed in Highland costume. This is the only ludicrous thing in the Exhibition. One gazes at the effigy of the withered and broken-down old king with pity not unmingled with contempt. George the Fourth, at the age of sixty-eight, in the character and costume of a Scottish chieftain, can hardly be regarded as a pleasant object for contemplation. "Full-length heroic size"—the description reads like a satire. At all events this picture hardly adds to the value of the Exhibition, and its loss would never have been felt.

THE AMERICAN INSTITUTE OF ARCHITECTS.

IT will be interesting to the art public in this country to know what architects are doing in the United States of America. Though the citizens of that country are a go-ahead race, though they are equal to us in many things, and superior to us in some, and though they frequently do a thing whilst Englishmen are thinking about it, they are behind us in architecture. We suppose that no people, however energetic they may be, can attend to *all* the great matters which advance and dignify life at the same time. During the palmy days of architecture, science and commerce, colonisation and freedom absorbed but little of the energy of man. There was no House of Commons in those days, or certainly not as it exists now, to fire the ambition and to engage the attention of so many of the greatest men in the country; and science, which at the present time attracts into the studio or the laboratory such a large proportion of the most gifted of our race, was not then born. There are, we suppose, in every age a certain number of men who possess the power to soar above their fellows. No doubt these men multiply as education becomes more universally distributed. But universal education will not indefinitely multiply great men; it will only give those who possess the natural ability a better chance of developing it. If the chief minds of a nation are devoted to literature or science, or politics, or colonization, or government, the art of a nation will be neglected. This has been to a large extent the case in the United States. Inferior to no nation, and, perhaps, on account of their superior privileges, superior to all, they have been too much engaged in rooting up forests and planting corn, in building cities as if by enchantment in places where a short time since the foot of civilization never trod, and in laying the foundations of a commonwealth which is in all probability destined to become the greatest and perhaps the most enduring this world ever saw, to pay much attention to art matters. Their chief men have been law-makers, lawyers, statesmen, orators, preachers, and inventors. Hence architecture has charmed but a few minds of strength and influence. We find, however, from the last report of the American Institute of Architects that this is not likely to be the case in future. Architecture, like other things, is to receive its due share of attention from that active people.

The American Institute of Architects was formed about ten years since. The "Great Rebellion" interfered and sadly deranged for a few years every branch of commercial and professional pursuit. In fact, little or nothing was done towards promoting the interests of the Institute for five years. The last annual convention, which was held in October, 1867, evoked a most encouraging spirit. Besides the "central institute" there are what they term local "chapters" in affiliation with it. These chapters have each a distinct organisation and independent government. We should call them in this country branch societies. The object of the projectors of the society was somewhat different to the object of the Institute in this country. We find, on examination of the articles of its constitution, that it aimed at improvements in planning, constructing, and laying out of cities. It also aimed at effecting a change for the better wherever it was needed—"the overthrow or alteration, as speedily as circumstances or expediency might permit, of every habitation and building that should be found deficient in a sanitary or moral view of the case." A sufficiently great undertaking, we in this country would think. The American Institute is not only desirous of co-operating closely with all societies of a similar nature "on that continent," but they exhibit a strong inclination to fraternize with members of the profession on this side of the Atlantic. We therefore see that the president, in his address at the annual convention, alludes with gratification to the notice taken of their body by the London Institute of Architects; and he expresses himself warmly on the cordial reception which Mr. W. R. Ware, of Boston, received from the British Institute of Architects the latter part of last year, when he presented to that Institute a collection of photographs and other illustrative works of American architects. The president also alludes to an invitation he had received for intercourse and fellowship from the president of the Royal Society of Portuguese Architects. Such intercourse between the architects of different nations must have a beneficial effect. It not only tends to the advancement of architecture, but to the promotion of the arts of peace.

Architects in America have, it appears, similar evils to contend against as in this country, and one of these evils arises from themselves. American architects cannot agree with each other. This, we suppose, is unavoidable, as men will differ in opinion when there is no indisputable standard to test human effort. But it is not absolutely necessary that architects should unceasingly endeavour to disparage each other's works. The president of the American Institute complains of this fatal disposition on the other side of the Atlantic.

Architects complain, and very justly, of the irrelevant and hostile criticism of unprofessional men. Let them pull out the mote from their own eye before they attempt to take away the beam from the eyes of others. It is one of the most amusing things possible to hear architects pass opinions on other architects' works. They snuff out each other without remorse, and they do it with such a completeness and gusto, as if they were infallible. We suppose, however, judging from what the president of the American Institute says on the question, that this is a failing of human nature, as it exists in pretty much the same quantity and quality on both sides of the Atlantic. The evils of competition have, we may suppose, been felt even more poignantly on the other side of the Atlantic than here. The American president is so emphatic in his condemnation of the system that we can come to no other conclusion than that it has been most shamefully abused in the United States. He says:—

> I feel as if I should not fully discharge my duty to my younger professional brethren if, after my extensive opportunities and long experience, I should omit all allusion to a subject the effects of the facts of which have, according to my observation, produced much evil, and only evil, to the profession. I allude to competition—general competition—a sorry subject for architects. It burns the fingers of those who meddle with it; it is a chronic infatuation, a Will-o'-the-Wisp. It leads on the unwary to trust in the necessarily uneducated and uncertain judgment—so far as our speciality is concerned—of committees, the successes in life of whose members have, in nine cases out of ten, been gained in business pursuits, entirely out of the way of art, science, or mechanics. It blinds the competitors to every other work but their own, however weak that may be. Thus rushing pell-mell into the arena to compete for the suspended prize may be very pleasant to the lookers-on, to the committee-men, and to those of the ring, who gather up the profits; but, at the final decision, when judgment has been passed and the prize is awarded, the competitors find themselves as full of aches and sores as a whipped prize-fighter, or a chronic invalid, just breathing and no more. Now, my good friends, this species of infatuation (I can call it by no better name) should be shunned. I pray you to let general competition alone. Avoid it as an unclean thing, which can produce only heart-burning and disappointment; and by abstaining, you will give it its death-blow. But while the public see us eager to give away our wits and culture, it will be a pastime to it to throw out the bait for our anxious souls to nibble it. And we shall get but nibbling, unless it be something worse. Our time and our work are much too precious to be squandered in this manner.

It is interesting to notice that whilst some are questioning the propriety of having a fixed scale of architects' charges amongst ourselves, the American Institute have adopted, almost to the letter, the published scale prepared by the Institute in this country. A writer has recently said with some reason, "I do not pay my doctor by a percentage on my druggist's bill, nor my solicitor on the amount he can spend in retaining counsel. Yet all these things would be just as reasonable as the system of paying architects by a percentage on the builder's bill. So long as this system continues, so long will people avoid employing an architect, if they can possibly help it." This aspect of the question was considered by the Royal Institute of British Architects before they issued their scale of charges, and we now find that the American Institute, after careful consideration, have endorsed the system.

MANCHESTER TOWNHALL.*

NEXT in the race for success to Mr. Waterhouse's comes the design sent in by Messrs. Speakman and Charlesworth, and which from an Art point of view is very decidedly in advance of Mr. Waterhouse's. The style is Gothic, and of the Decorated period, but by no means an archæological transcription of any particular epoch or example. It is freely and artistically treated, and shows much originality, curbed and reined in with firmness, to prevent it running away with its rider, as it so frequently does. The centre of the Albert-square front is occupied by a triplet porch of three arches of unequal width, the central being wider than the lateral ones. These spring from a wide flight of steps, which they partially protect, and behind them rises a lofty gabled centre, having square massive wings, from which issue octagonal turrets, which seem to want a good deal more study. The main wall composition consists of a deeply recessed arcade or detached shaft, almost cloistral in its depth, having simply composed two-light windows in the background of each bay. The effect of light and shade produced by this treatment is very pleasing, and forms the charm of the design. The basement is simply treated, with square-headed windows, and the upper stage is composed of windows arranged as couplets, divided into bays by statues rising from the projecting storey beneath. Octagon angle turrets terminate this façade, and form bay windows to the rooms situated on this portion of the plan. The Princess-street and Lloyd-

* Continued from page 237.

street fronts are simply and well designed, and by their quietness contrast well with the main front, which is rather over-ornamented. The tower is well designed, and is decidedly the best in the room. Internally, the building has many picturesque bits, and the drawings showing the main entrance and mayor's ante-room are very effective compositions. The large hall is a room of noble proportions, so large, in fact, that, judging from the figures, it is a sixpenny cab-drive from one end to the other, and Stentor himself could never be heard all that long length at once. All the interiors belonging to this set of drawings show the same fault, and are rendered perfectly ridiculous by the fictitious scale thus set up, by peopling a Brobdignag building with Liliputians. The hall has a flat ceiling, and has evidently been studied with a view to acoustic effect, and we think is the only Gothic one in the room which would be useful. The planning of this design is not so good as its architectural treatment, too much space being wasted in the main entrance, which, though very grand and noble to look at, would be horribly draughty, and occupies fully one-fourth of the main front in Albert-square, severing the communication between the two wings on the first floor, and entirely suppressing it on the second. The council chamber is placed in immediate contiguity to the main hall and committee room, which treatment has much in its favour, and yet which is only adopted by this plan. This design is as superior to Mr. Waterhouse's as a work of architectnre as it is inferior in plan; and a question arises, whether it would not be better to combine the works of two architects, taking the plan of one and the elevation of another, as has been proposed to be done with the Law Courts.

Mr. Scott, junior, and Mr. Worthington both claim our attention with almost equal force; and as this is Mr. Scott's maiden essay on so large a scale, we are sure Mr. Worthington will yield the *pas* to him. The general effect of Mr. Scott's design is very Scott-ish, and there is a much greater likeness than one usually sees between the works of father and son; indeed, one doesn't quite know which is which. This design for the Townhall is very like much of the Law Courts' designs of Mr. Scott *pere*, and quite as flat. The chief feature in his main front is a very useful and well-designed porchway of two storeys, the lower one serving as a carriage entrance to the main doorway, which is on the ground floor, and the upper one as a sheltered *parvise*, from which an out-door public may be harangued. The treatment of this is very excellent, and the "get-up" of the drawing which shows it simply marvellous, and never have we seen a finer specimen of architectural colouring. The main body of this façade consists of a ground floor, divided into bays by small buttresses reaching to this stage only, and terminated on the next by statues in canopied niches. Above this, on the third storey, comes a framework of panelled marbles, of various colours, carved with ornaments in low relief—one of the most expensive ways of reaching a bad effect we know of. Firstly, our range of marbles capable of standing an ordinary English climate is but few, and fewer still of these could endure in that of Manchester; and to carve a figured marble is to spoil it, and waste both human life and labour. Up above all this runs a continuous arcade, pierced here and there with a loop-hole, which might be useful for a fusilade in the days of some future Peterloo, but for which we cannot divine any other purpose; and higher up still are dormers and a lofty roof, and, still more aspiring, an "awfully high" tower; it dwarfs everything else, and really is not a characteristic, but a caricature of Gothic art. Mr. Scott's plan has many merits; by using his ground floor for his entrance and main approach he, like Mr. Waterhouse, has the full use of the first storey for his reception rooms, which are ranged *en suite* along the Albert-square front. His main hall is different to any of the others submitted, being cruciform on plan, having shallow transepts of three bays, in which side galleries are placed. Two modes of treating this internally are shown, the one domed on pendentives, and lighted by an arcaded tambour, very like, indeed, to his father's central hall in the Law Courts, and another roofed over with timber roofs of three curvatures. The first plan would be utterly useless for the purposes of music or public speaking, the second would be nearly as bad, the length of the room not being sufficiently great in proportion to its height to admit of this treatment. The interior of the Council Chamber is shown in a most wonderful drawing, decorated in the highest style of modern mediævalism, with exaggerated miniatures stuck into the walls, and is as unfitted for the purpose of a municipal chamber in this most modern of cities as the most riotous imagination could conceive. It is a very beautiful mistake. Mr. Scott's central staircase is an admirable composition and drawing, showing an approach having a central flight of steps dividing into two lateral ones, all of rich marble, and surrounded by a cortile of columns and arches most effectively drawn and cleverly designed. As drawings, Mr. Scott's are unrivalled by any in the room; as architectural designs, they show many faults, mostly those inherent to the productions of youth, and which we rather wonder that the more experienced hand of his father has not kept down; but withal, there is so much that is good and thoughtful, so much Aladdin-like splendour, that we hail with sincere pleasure Mr. Scott's debût, and prognosticate for him the graceful bearing of his father's mantle.

Mr. Worthington contributes a very estimable design, possessing the highest merit. Much of it is exquisitely beautiful, and no praise can flatter the admirable manner in which it is "got up." His main front is like this portion of the designs of many of his *confrères*, the worst part of his work being flat and shadowless, and moreover spoiled by an exaggeratedly high plain tower. Greatly as we enjoy a bold plain treatment we find it is possible to make it even ridiculous sometimes, and much ingenuity has in this instance been wasted to achieve such a result, for here the mass is quite out of keeping with the treatment, and, instead of looking strong and dignified, it simply looks lean and hungry. Had Mr. Worthington only given us half as much of it, his designs would have been twice as pleasing, and the tower then would have accentuated his composition instead of crushing it. His treatment of the long flights of steps needed to reach his main entrance, which is placed on the first floor, is, like all else of his design, very picturesque, and instead of the usual long parallel lines at the base, we have two flights at right angles with the main building rising between a boldly treated parapet wall crowned at intervals by statues. Beneath the landing forming the junction of these is a very charmingly designed entrance to the ground floor. Although we object to external steps on principle, as being quite unsuited to an English, and particularly to a Manchester climate, yet if they are a necessity, this is the very best and most architectural way of treating them, and the beauty of it almost steals away our judgment. The treatment of the acute angles of the site is very admirably managed by forming carriage approaches under an arcaded porch-way at this point of the design. We do not know if this was contemplated in Mr. Worthington's original design, but we remarked a singularly similar arrangement in the exquisite design of Mr. Robinson amongst those rejected. Original or not, it is very excellent, and is admirably treated. This portion of Mr. Worthington's design is scenic in the extreme, and is one of the most charming studies of irregular composition we have seen for a long time; it only wants a few old burghers and men-at-arms about it to make us believe it to be a Rhenish study by Lewis Haghe. Its old worldliness may perhaps be deemed a fault, but if so it is far better than many a new-made virtue. The treatment of the narrow façade to Cooper-street is also well and ably managed, and the breadth Mr. Worthington has managed to throw into it is marvellous; in fact, from whatever point we regard this design we see great evidence of artistic skill of an unusually high range—too high indeed when we look at the tower; and Mr. Worthington's drawings exhibit the most power and thought of any in the room. His plan is very well arranged; he has not adopted the continuous corridor system so rigidly as Mr. Waterhouse and some others, but has, as it were, concentrated his offices in departmental buildings having their special entrances and general halls—a method very serviceable, and one which in work would be found to simplify the amount of searching for and running after a particular office. This will inevitably exist in the gaol-like system chosen, where a day's journey in the corridors will be required to find some official, whose oft-condemned cell is always just round the corner, but which the seeker never can get at. The interiors are not equal to the other parts of this excellent design. The main hall is bald, and, with a pointed arched wooden roof, broken only by shallow panellings, and having but few wall projections, would be a bad room for sound. There is, perhaps, a little too much space occupied by cloistral arrangements round the courts; but, taking it all in all, this design is of higher merit than the one chosen, and is one which would require less alteration to make it workable than that of Mr. Waterhouse.

These four designs are decidedly the cream of the mediæval ones sent in, the remaining two falling far indeed beneath them; and we now turn to those of Mr. Salomons and Mr. Wyatt, based upon the Classic mode of treatment. Of these, we are inclined to give the premiership to that of Mr. Salomons. This is inspired by a study of modern French works; and, in fact, is so very like a French *projet*, both in design and technical representation, that we can scarcely realize that we are in Manchester when we find ourselves in front of it. It is very simple in composition, in many respects very good, and in all very refined. The main entrance is on the ground floor, having but few external steps, and a tower, very ably designed, occupies, according to regulation orders, the centre of the Albert-street façade. Of this entrance and tower an enlarged drawing is given, detailing very exquisitely its ornamentation, and to which we would direct attention as an admirable specimen of purely architectural drawing of the French school. It is as exquisite in its way as Mr. Burges's notable drawing of one bay of the Law Courts, than which we cannot accord a higher praise. The angles of this design are rounded and crowned by small domed turrets, of poor and ineffective character, which, by the way, are horribly out of drawing in the perspective, and quite mar the general effect. The windows, also, of the main storey are much too large and crowded together to harmonize well with either those above or those below them, and the general effect is that of a large triangular sandwich. There is also a general absence of strong masses of light and shade, which makes the design at first sight appear common-place. We say at first sight, because, on closer examination, we find such care and grace in all the parts as would redeem it from ever sinking to an ordinary level. But it is chiefly in the plan that Mr. Salomons shines, and here we have evidences of very great ability. The noble range of reception-rooms and the great facilities of access to any part of the building mark this plan out as one of the highest merit, and a special or state corridor is provided in order that the business purposes of the building may not be interfered with by the more festive duties of the Corporation. Good access is obtained to the basement, and the conditions imposed upon competitors

have perhaps been more literally fulfilled by this plan than by any other. Mr. Salomons has been a martyr to the truth; he has spoiled his elevations by restricting himself to the line marked out as the limit of the buildings, and he has in some respects crowded his plan by providing the specific accommodation demanded on each floor, and the moral of all this is, that we should think Mr. Salomons will faithfully promise that he will never do it again.

Mr. Wyatt's design, too, is French in its character, but French of an earlier epoch than that of Mr. Salomons, going back to the style of the Consulate and the Empire. It is very ordinary, and possesses no great originality or merit. The entrance and centre are tolerably good, but the tower is very poor, and has no unity with the building over which it dominates. The only really good bit is the arrangement of the angle buildings. These are formed into quadrants of circles by projecting pavilions, which cut off the circular part from the front and side, and thus mask the awkward junction which would otherwise be caused by the acutely raking lines of the ground plan. These angle-buildings are terminated by domicular roofs, which, like the roofs of the pavilions in the centre of the lateral faces are high mansard-like coverings, ornamented with lead-work, whilst the main body of the design has no visible roof whatever—a solecism which is very marked and very inharmonious. The interior of the main hall is a very close copy of that of St. George's Hall at Liverpool; the other rooms are colonnades, filled in with windows on one side and doors on the other; and we do not think that we ever saw so much beautiful drawing expended on so little invention—there is scarcely one original idea throughout the whole. Mr. Wyatt must certainly have fallen off very much in this second competition, for we saw many better things amongst the rejected. His plan is fairly good, but is not of any eminent merit, and altogether we are disappointed with the fulfilment of the promise implied by Mr. Wyatt in his report, wherein he says he prefers to design his building in the Italian style, "because Manchester does not already possess any buildings of Classic treatment worthy the importance of that city." After looking at Mr. Wyatt's design we certainly find them better than could have been expected, many of them possessing that originality his is so sadly deficient in.

Of Mr. Brodrick's design we are very loth to speak; and the more so because he shows himself so very much moved by criticism. *Punch* stigmatises his perpetual columns as candles, and forthwith he forsakes his wonted chandlery and betakes himself to confectionery, in which art he sends us "the last sweet thing." There are some of the much-wrought stones of Venice, and the apse of a church turned into the entrance for a town-hall, and there is an enormous circular entrance which swallows up all the best room and does nothing else, and there is—a tower?—but we really can't go on. Mr. Brodrick gains his £300, and we think but little else. As for Mr. Lee, he takes in vain the name of a great good man and calls himself "Arnolfo di Lapo," though why, heaven and Mr. Lee only know. The sight of these two designs sets us thinking of those we saw in September last, and of how very many drawings there were in that "exhibition of the rejected," which far surpassed these last two or three now here. We only regret that the challenge we then threw down has not been taken up, and that the selected architects have not now exhibited their original designs; we should then have been able to see why some of them were selected (which at present we certainly do not), and we should then see more distinctly that which we can now but trace—how much has been abstracted from that *olla podrida* of all the other competitors, offered as a dainty dish to set before the lucky eight, and to watch the process of absorption, a process which we are now told is to be continued, for the council at their last meeting distinctly authorised Mr. Waterhouse to find that good in others his own design might lack, and incorporate, or rather conglomerate, it with the best parts of his own.

As for the action of the council themselves, we must certainly give them the credit for fairness throughout. Their first umpire took from them the onus of selecting twelve, which they reduced to eight competitors. Their second ones gave them an ingenious but not ingenuous report, by which one of the two favourites might be selected, and when this was wanted to be further strengthened and a triple shield erected, another report is sent, which is shrouded in impenetrable mystery. A silent awe comes o'er the lot, and from the mayor down to the bellman they are "dumb dogges all." What can this potent spell be? what this wondrous document? Does it, as is reported, find all the good in one design and all the ills in others? does it regard that as a merit for one which in all others it reprobates with horror? and does it claim as a structural truth in one that which in another is deceit? Of course, we cannot tell, but those who have seen and heard it say so, and we bow to their superior knowledge; but far rather would we see the council take the only step which honour leaves them. Let them even now publish fairly and openly the report, which they should never have stooped to receive secretly, and which we are, with sorrow and surprise, compelled to see that Messrs. Street and Donaldson have so far lowered their office and themselves as to make. An umpire should neither fear nor favour, and an award should at all times be open to both sides. Every principle of manly dealing is based on publicity, and that which is secret must, at least so long as it is secret, be wrong. It is our duty to urge that such wrongs be righted, and we never did that duty with more urgency than we now do in thus calling on the Town Council of Manchester to retrace their steps and prevent the initiation of so unfair a precedent.

CITY OF LONDON IMPROVEMENTS.

THE report, for 1867, of Mr. William Haywood, engineer and surveyor to the Commissioners of Sewers for the City of London, has just been published. Among other improvements, negotiations are in progress for setting back a portion of the western railing of St. Paul's Churchyard, and the frontages of Nos. 57 and 59, Ludgate-hill. The Post Office Department having compensated the various owners of property east of Bath-street, the Commission expect shortly to be able to complete the improvement in Newgate-street, between King Edward-street and St. Martin's-le-Grand. The church of St. Benét, Gracechurch-street, is at length being pulled down. During the present year, therefore, the Commission will be able to effect the long-contemplated improvement at that spot. The eastern and western ends of Fenchurch-street, and the eastern end of Lombard-street, are also to be widened during the present year. Referring to the cleansing of the streets Mr. Haywood states that the Commission, dissatisfied with the manner in which the former contractors performed the work, determined to undertake it themselves, and entrusted it to the Streets' Committee. They, accordingly, acquired upon lease an extensive wharf upon the Regent's Canal, near the City-road Basin, and also the use of a wharf on the Thames, adjacent to Whitefriars Dock. They entered into contracts for the supply of horses and implements, engaged a special superintendent and complete staff of foremen and sweepers, and have been since Michaelmas last employed in executing the work. Under the existing system, in addition to the usual daily cleansing, street orderlies are employed upon most of the main thoroughfares to collect the refuse as soon as deposited. This arrangement tends greatly to keep the streets clean during the busy part of the day and to prevent the accumulation of mud after rain. The Committee also offered premiums for the best plans for the speedy removal of heavy falls of snow from the streets, and a large number of plans were sent in in competition. The various suggestions they embody are still under consideration. Regarding the City Cemetery, at Ilford, the report states that it is yearly becoming more used by the citizens, and that a great number of bodies and human remains exhumed from City churches, for the formation of the Holborn Viaduct, the new street to the Mansion House, and other improvements, have been re-interred there during the past year.

THE EARTH SYSTEM.

To the Editor of the Building News.

Sir,—In your last number an article under this head appears, upon which I should like to offer a few remarks. There can be no more important question for public consideration than that involved in the present discussion, but I think there is some unfairness and not much ingenuity in the way the writer of the article has thrown certain allegations together, assuming them to be facts. The author seems to have hastened to conclusions upon very imperfect data. The question before us is, as I take it, this—What is the cheapest and least offensive method of removing from human habitations the waste and refuse matter, and what is the best way of preserving it for application to the land? How can we take it from the dwellings, where it is a nuisance, to the fields, where it becomes aliment for the soil? There is a very serious problem before us, and we shall have to go over much ground before we arrive at a satisfactory solution; but in travelling over it we must take care that we are correct as to our facts, and that we draw the right inferences from them. We have two methods, one that has been adopted for many years, and a new one that is pushed forward with much zeal, and supported by much inconclusive reasoning. The first method is that of making water the medium of conveying away to subterranean drains and sewers the foul matter of our sinks and water-closets. We must look at the advantages of what we will call the *water* system to distinguish it from the *earth* system. When properly constructed, everything committed to the water-closet or sink is at once conveyed away from the dwelling into the main sewer, and nothing left of an offensive kind. This is the method adopted and approved by all our leading engineers, and there need be no smell, no offence of any kind. The fæcal matter is at once removed from sight, and does not remain to offend any other sense. But your author says that "the water system is very far from perfect," and that "if it cures certain evils it creates others just as bad in their effects." Is it the system itself that is so imperfect, or does the imperfection arise from the bungling way in which it has been carried out in some instances? If we take the system I deny that the evidence of failure is "abundant and conclusive;" on the contrary, we have evidence of the most satisfactory kind to show that, when a system of drainage and sewerage has been scientifically carried out in a district, sickness has decreased and mortality has diminished. No doubt there are many instances where the system has been carried out in a bungling manner, from a penny wise and pound foolish policy on the part of its projectors, or from inexperienced men having carried out crude theories. The cases at Tottenham prove nothing. It has been said, but has never been proved, that the cases of fever arose from the irrigation of the fields with sewage water, and if it had been so proved it is not

much to the purpose, for the experiment of irrigating land in that neighbourhood has been carried out in the rudest way. Surely there must be some mistake as to the statement for which the Registrar-General is held responsible—that 78 per cent. of the deaths has been due to the use of water rendered impure from the presence of sewage water! I have not at this moment the means of referring to the Report of the Registrar-General, but must ask you to give us the means of verifying so extraordinary a statement.

I think some confusion has arisen in the mind of the writer of the article referred to, by mixing up two things which have no necessary connection, that of drainage and sewerage with plans of irrigation. Let us not make the former responsible for the errors in carrying out the latter; let us argue the subject philosophically, and then we shall see that much that is imported into it is entirely beside the question. It may be true that the irrigated meadow is not so healthy as ordinary pasture land, but I shall require much more than Dr. Macadam's assertion before I accept it, and everything depends upon the mode of application. But irrigation may be all wrong, and still it may be that the system of carrying the refuse matter through drains and sewers by the means of water, away from human habitations, may be all right. It is possible that one may be the worst and the other the best system that can be devised for the purposes intended.

Reference is made to the report of the Committee on the Metropolitan Sewage. There can be no doubt they were quite correct "that no efficient artificial method had been discovered to purify for drinking and culinary purposes, water which had once been infected by town sewage." But what of that? No one, to my knowledge, has ever proposed that the liquid matter running from our drains and sewers should be purified or deodorised and sent back to our towns as part of a water supply. The constant attention of our engineers has been directed to means of keeping away from rivers and streams the drainage of towns and villages, and to obtain water from other sources. Mr. Bazalgette has carried his main drainage so far down the Thames as to render it impossible that any portion of it can get back again to pollute that part of the river from which some of the London companies obtain their supply. Mr. Bateman went to Loch Katrine and not to the Clyde for his water for the City of Glasgow. What has this to do with the question? If the earth system were adopted, its stoutest advocate does not expect that all the refuse of the house is to be absorbed by earth. He proposes that all slops and all refuse usually sent down the sink—the water from the cook's kitchen, the fluids from the bed-rooms, &c., should still be conveyed into the drains. All he proposes to take up by the earth closet is that which is usually deposited in the water closet. It need scarcely be said that there is very much of the liquid refuse of a house that would become very offensive if kept, and that has a tendency to adhere to the internal surfaces of drains, so that the same kind of drain pipes and traps would have to be used, as a mass of corrupt matter has still to be carried away, and this it is proposed should be used for the purposes of "subsoil irrigation." We will, if you please, look at that hereafter; at present I will only glance at one or two other matters arising in the article before me.

Now, I hold that a perfect water-closet system is the best that has hitherto been devised for the purpose intended,—and that if of proper construction, and properly used, they might be put in a bed-room without any offence to the senses or any injury to health. I will hereafter point to a few essentials in construction. I must guard myself by saying that I do not speak of the wretched contrivances called water-closets, which are put up in thousands by speculating architects and builders, many of which are a disgrace to our age. But we are told that medical men assert, with regard to water-closets, that "since their introduction, owing to the lowering effects of the poisons emanating directly and indirectly from them,—the type of disease has been altered, and has become more dangerous." To what part of the world does this apply? Surely not to London, for since the water system has superseded the cesspools, the health of the London population has improved, and although some forms of disease have become more malignant, and those not such as are affected materially by malaria, many other forms are less malignant. Who are those medical men? Are they not putting down as a consequence, if it really be true, that which may be only a coincidence? At any rate, we have the opinion of medical men, who have the best opportunities of arriving at correct conclusions, that the converse is the truth. Before any of these statements can have the slightest value, we require to know who makes them, and on what they are founded.

There are grave objections to the earth system, especially in towns, and I speak from an experience of some fifteen years, having started so long ago with an ardent desire to make dry-closets succeed. I spent a great deal of time and money upon it. I will not trespass further upon your attention now, but ask permission in another letter to give my views upon earth-closets. I was a little amused to see in the article a reference to Deuteronomy. What next? I am accustomed to see Scripture quoted for every purpose, but scarcely expected to find it cited as an authority as to the kind of closets to be used. Perhaps nothing more was meant by the writer than to call attention to the law laid down for a primitive people. I would remind him that this instruction was given by the Jewish lawgiver as a matter of sanitary economy for a population dwelling in camps, and could have no reference to people living in cities. It enjoined as a matter of decency, that nature should be relieved away from the camp, and the deposits covered up.—I am, &c.,

B.

THE INSTITUTION OF CIVIL ENGINEERS.

ON April 7, a paper was read at the above Institution "On the Experimental Determination of the Strains on the Suspension Ties of a Bow string Girder," by Mr. W. Airy, Assoc. Inst. C.E. Although in this communication the case of a bow-string girder, as ordinarily constructed, only was considered, yet the author believed that the principle on which the strains had been ascertained was equally applicable to all mechanical structures with complex bracing, as, for instance, station roofs, where the labour and uncertainty of a theoretical calculation rendered an experimental investigation exceedingly desirable. The model on which the experiments were made was composed of a bow of steel, and had a span of 6ft. with a rise of one foot; the string being constructed of two slips of oak, and the suspension ties being of steel wire, gauge No. 6 (96ft. to the ounce).

The process by which the tensions were ascertained was the following:—The ties, on being sounded, gave a good resonant musical note, and advantage was taken of this to compare the note of any string with that of a free string suspended in a frame, and cut off by a sliding bridge to the length of the string under comparison. The free string supported a small scale-pan, and this scale-pan was loaded with weights till the note of the free string and that of the string under comparison exactly coincided. This was determined by ear with the greatest accuracy, the effect of ½oz. in 80oz. being clearly perceptible. The tension of the string on the girder was thus measured by the weight in the scale-pan of the free string; and this was done for every string in every case.

The determination of the thrusts was arrived at by a differential process, thus:—A uniformly distributed weight was applied on the girder, and the tension of every string was taken; then a travelling weight was introduced in addition, and hung at any one point, and the tension of every string was again taken, the difference of the tensions in the two cases of each string being regarded as the thrust, or tension, of that string produced by the travelling load.

The reduced results of the experiments, comprising the effect of every possible arrangement of loads that could come on a girder, were given in diagrams. It was verified by experiment: 1 deg., that the tension, or thrust, of every string was proportional to the weight causing it; and 2 deg. that when several weights were applied at the same time, the effect on every string was that due to the sum of the effects which would be produced by each of the weights separately.

The rules by which the strength of ties should be regulated, as deduced from the experiments, were, for an evenly distributed stationary load, that all the bars were in tension, that the end uprights were most strained and the middle ones least, and that, with respect to the diagonals, those were most strained which radiated outwards from the points where they met the string—the strain on each of which might be taken at one-half the load due to a bay—those that radiated inwards from the points where they met the string being strained to the extent of one-fourth the load due to a bay. In the case of a single movable load, the uprights were liable to a tension of from 10-34ths to 1-6th of the weight, as the load advanced from either end towards the middle, and the greatest tension to which the diagonals were liable was one-fourth, and the greatest thrust two-thirteenths of the weight.

SCHOOL OF ART.

Stoke and Fenton School of Art.—The competition drawings of the pupils of this school were exhibited in the Minton Memorial Building, Stoke, on Wednesday week, prior to their being sent to London for the annual competition. Mr. M. D. Hollins had offered £5 in prizes for modellings from nature and original designs, and there were three competitors, whose works were very creditable to them. The Rev. Sir L. T. Stamer, Bart., had also offered £5 in prizes for original designs for plates in earthenware, and there were two competitors. Besides the above, the works of the pupils comprised majolica painting, flower painting on porcelain, painting in monochrome in oil and in water colours, copies after Mulready's life studies, flower painting in water colours, figure light and shade studies from the cast, light and shade studies from flowers, light and shade studies from the cast in chalk and sepia, mechanical and architectural drawings.

BUILDING AND LAND SOCIETIES.

The annual soirée of the Dewsbury and West Riding Building Society was held last week at Dewsbury. At the meeting which followed, the Mayor, Mr. C. R. Scholes, presided. The secretary, Mr. W. Hemingway, read the report, which stated that the society was in a very prosperous position. The directors felt gratified with the steady increase of members and subscriptions. The number of members that had joined the society during the year was 79, and the number of shares 154. Deducting all withdrawals, the present number of shareholders was 200, the number of shares taken up £346 4s. 5d. The past year's subscriptions amounted to £2,220 7s. 6d., the deposits to £1,389. Owing to the bad state of trade the withdrawals had been very heavy. The amount withdrawn by subscribers was £825 14s. 4d., by depositors £465 17s. 6d., making a total of £1,291 11s. 10d. The amount on mortgage during the year was £2,534, making a total of £3,181, of which £192 had been paid off and realised. The profits of the society amounted to £33 2s. 10½d.

The estimates in 1866 and 1867 included votes amounting to £344,000 for the purchase of a site for additional offices in St. Martin's-le-Grand. The estimates now before the House of Commons propose a further vote of £20,000, part of an estimated cost of £150,000 for the erection of the proposed new offices. The estimates before the House propose votes of £6,000 towards £10,000 required for the erection of an embassy house at Therapia; £8,000 towards £20,000, the amount of the estimate for a new house for Her Majesty's Mission at Teheran; a second sum of £40,000 towards £179,382 for the consular buildings in China; and £15,000 for the consular buildings in Japan.

IRON WORK.

In scarcely any other department of art manufacture has the revival of art feeling been more apparent than in that of ornamental metal work. Twenty years ago we were content to take metal work by the weight, while the amount of original art feeling that pervaded it might be described as homœopathic. Now, the art of working ornamentally in metals seems living, healthy, and prosperous, and the vigour, simplicity, and beauty in the mass of contemporary work argues well for the thought and enthusiasm of the designers and the intelligence of the workers. Instead of the lumpish and spiritless cast work rejoicing in fat acanthus, or "Gothic" which attempted to imitate in iron all the details and feeling of stone, we have now work that recognizes suitability of design to material as its first principle, that aims at constructive correctness as its starting point, and which tries to find its variety in conventionalizing the diversity of nature; and I am inclined to think that the work of the present time will bear an honourable comparison with that of any previous era. Allowing that it does not possess the quaint energy of mediæval times, it does possess a refinement which is an honest characteristic of our own day, and which, as it is natural, is to my mind more desirable than any forced imitation of a feeling which was the natural concomitant of a ruder age. To Pugin and his coadjutor, John Hardman, belongs the merit of inducing this revival of true metallic art, and their efforts have been ably backed by our leading Gothic designers and metal workers, who have proved themselves workmen who need not be ashamed. Some of the works within the last ten years (the Hereford and Lichfield screens for instance) are triumphs of metallic art, and if there is a fault to be found with them, it is that they have too much delicacy in the detail, and a degree too little of that strength and muscle which should characterize a metal so essentially masculine as iron.

The examples of metal work which have been publicly exhibited since '62, although generally vigorous and common-sense in character, have not been important in size, nor strikingly original in idea. In Paris last year Mr. Skidmore, who in '62 appeared as the Magnus Apollo of metallic art, was but meagrely represented, the other chief exhibitors being Messrs. Barnard, Bishop, and Barnard, of Norwich, Hart and Son, and Cox and Son. The gates of Messrs. Barnard, and the principal work of Messrs. Hart, from the Paris Exhibition, are now in the Kensington Museum, and are both worthy of study. The first-mentioned is more mediæval in feeling than any modern work I have seen, but though possessing much of the merit of true mediæval work, it in a slight degree copies the blemishes, and though the whole effect is decidedly quaint, crisp, and spirited, the detail of the principal scroll work is a little thin and poor in design; the most perfect parts of the design, to my mind, are the side standards and the stages with the bas-reliefs, which have just enough relief and design to make them interesting without rendering them intrusive. The candelabrum, by Messrs. Hart, also exhibited at South Kensington, is boldly conceived and consistently worked out; the squareness of section in the framework and detail give it a strong masculine character, which is in good keeping with the general idea. The lower stage of the design is well filled up with judicious ornament, although the working out of the grotesque heads which terminate the triangular part show more of the praiseworthy effort than of the deed accomplished; the painted grotesques on the central column, however, are more successful, and are, indeed, all that could be desired. The whole work is more modern in feeling than the gates of Messrs. Barnard, and though less quaint is equally interesting.

Several of the catalogues published by the metal workers contain many valuable designs, and give evidence of careful study and antiquarian knowledge judiciously applied. The best I have seen are those by Hart and Son, Cox and Son, Peard and Jackson, and J. W. Dovey, of Manchester. Messrs. Hart's catalogue, though good, scarcely does justice to its authors, as much of their best work seems to have been omitted. Messrs. Cox and Son, who have executed several important works, have shown themselves desirous of keeping a foremost place, and have got up an improved edition of their catalogue, which contains many new designs of high artistic merit. The catalogue of Messrs. Peard and Jackson is well drawn and engraved, and the designs are, for the most part, judicious and workmanlike. Mr. Dovey's catalogue, though last, is certainly not the least in importance or merit. It contains several hundreds of designs, many of which have a "go" and suitability to material which I have rarely seen equalled.

The accompanying designs do not pretend to any strict mediæval feeling, but rather, believing in the catholic or cosmopolitan tendency of all true art, I have tried in some cases to cull a few of the beauties of Eastern art, which, I think, might fitly be engrafted with our own; and, as the intention of the sketches is that they should rather be suggestions than copies for imitation, variety in detail has been aimed at rather than coherency of design: and this explanation will account for the want of consistency in some of the designs, which would not have occurred had the sketches been intended as examples for actual work. J. Moyr Smith.

PLAIN OAK CABINET.

One of our lithographic sheets represents a cabinet—an oak cabinet—designed by Mr. Charles Bevan. The cabinet is made in wainscot oak, about 3ft. wide and 7ft. high. The lower part has four drawers, and is enclosed with two doors. There is also an enclosed part on the table shelf, fitted with trays or drawers. The shelves above are open to receive ornaments. The object of this design, says the author, is to show simplicity. Inlaying is omitted, and its ornament consists in the arrangements of the framing and moulding, one or two parts only being relieved by the carver. The designer says he has no intention of imitating any period, and has only aimed at a simple piece of furniture of sound construction.

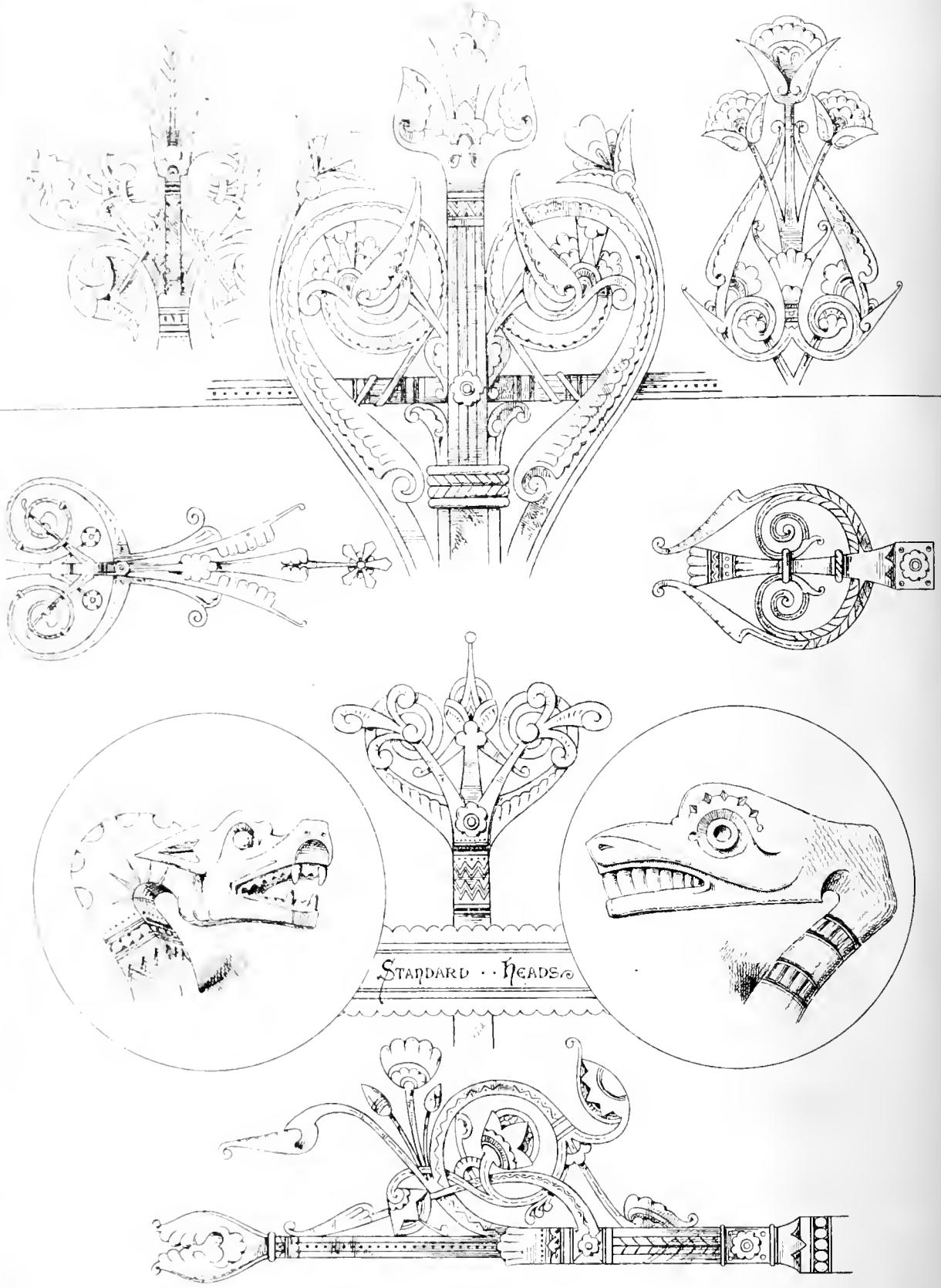
WHITENED SEPULCHRES.

We are too well accustomed to associate in our mind diptheria, fever, and other contagious diseases with the filthy alleys and ill-drained houses inhabited by the poor. Facts, however, prove that in this respect the rich are by no means so secure as is commonly supposed. Dr. Whitmore, medical officer to the parish of St. Marylebone, in his monthly report for March just issued, says:—Deaths from diptheria and other contagious diseases, which occur not unfrequently in some of the best houses in the parish, have induced him to look a little below the surface in order to find, if possible, a cause for their existence in places so apparently protected by the best and most perfect measures of sanitary precaution, and he has discovered enough to satisfy him that many of the finest houses in our most aristocratic streets are but whitened sepulchres. "A few months since," says he, "a gentleman of position, occupying a handsome and luxuriantly furnished dwelling, complained to me of the ill-health of his wife and other members of his family, which he believed was occasioned by some hidden nuisance. Considerable time and trouble were expended in searching for the cause; at length two large cesspools were discovered in the basement of the adjoining house, from which an opening had been made by the rats into the basement of his own, and through which the poisonous gases from the cesspools found free vent. These cesspools were of course abolished, and as a necessary consequence the health of the family was restored. Within the past fortnight one of the sanitary inspectors has been engaged in a house to house inspection in a most respectable street, so respectable, indeed, that it seemed almost an insult to the occupants to investigate their sanitary condition, and yet, strange to say, in the rear of the houses in this street he discovered five cesspools, the existence of which had never been suspected. One of these cesspools I saw; it measured 18ft. in circumference, and in depth 12ft.; it was one-third filled with soil, which, when disturbed and exposed to the air, emitted the most horrible effluvia. With a knowledge of these facts we may cease to wonder that even in our most aristocratic mansions, fatal cases of fever and diptheria will sometimes occur."

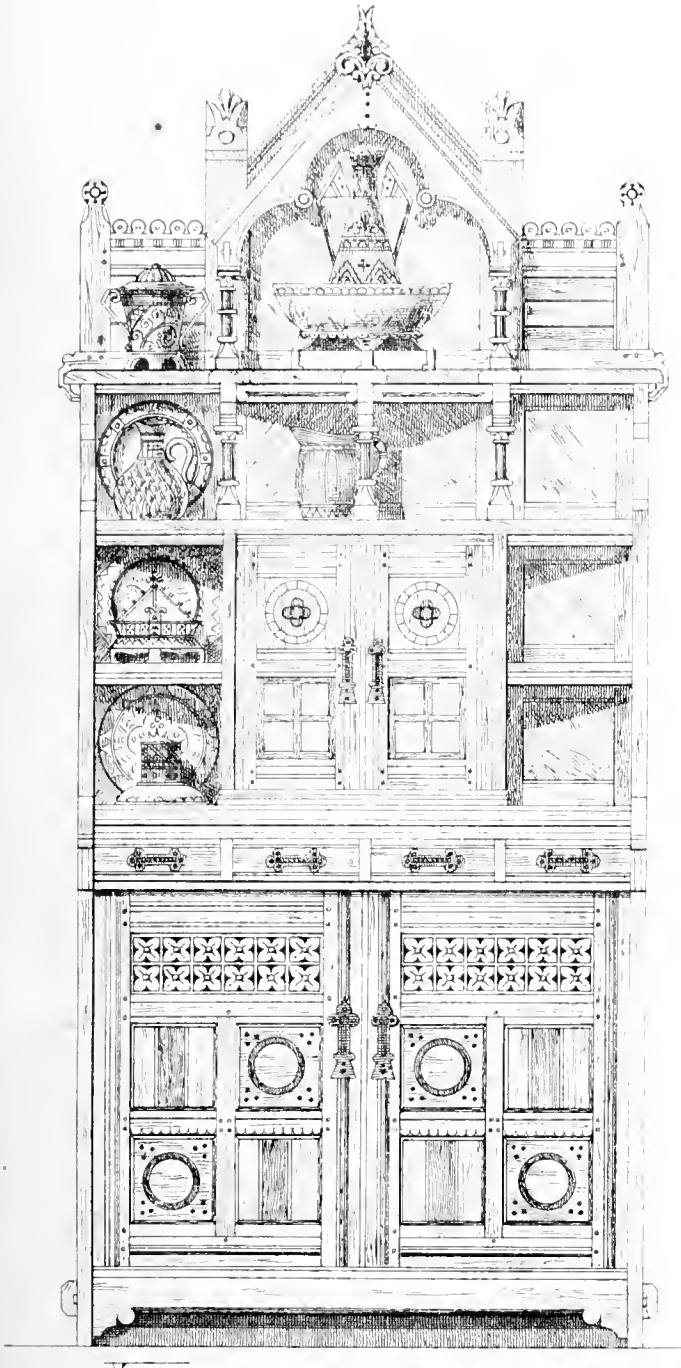
PUBLIC WORKS AND BUILDINGS.

The House of Commons, in proceeding to consider the Civil Service estimates, will probably begin with the department of public works and buildings. The vote for the maintenance and repair of Royal Palaces, varying much of course from year to year, is high this session, amounting to £56,238, an increase of £14,293. There is no very great increase in the charges for palaces not in the occupation of Her Majesty, but there is an item this year of £8,000 for works for diverting the drainage of Windsor Castle from the Thames, and an item of £2,500 for contribution towards the removal of Old Windsor Lock, and the reconstruction of Romney Lock and Weir. The vote for Royal parks and pleasure gardens, £137,524, shows an increase of £12,198; there is a charge of £8,450 for reducing the depth and levelling the bed of the lake in Regent's Park. The vote for the buildings of the Houses of Parliament, £54,937, is slightly below the vote of last session. It includes charges for works in New Palace-yard and Parliament-square, and re-arrangement of the ground occupied by Mr. Canning's statue and the drinking fountain; another vote of £1,000 for Mr. Herbert's "Judgment of Daniel" for the Peers' Robing-room, £1,500 for Mr. Maclise on account of his wall-painting of the meeting of Wellington and Blucher for the Royal Gallery, and a re-vote of £400 for one statue in the chronological series of British Sovereigns in course of execution. The vote for the maintenance of public buildings shows a charge of £31,562, for rent of premises hired for the accommodation of public departments in consequence of the want of public buildings. A vote of £56,000 is proposed for Alderney harbour; up to the end of 1867 the expenditure had amounted to £1,226,861. For Holyhead harbour the vote is £29,429; the total estimate was £1,545,000. The vote proposed for the new Foreign Office is only £22,512 this year; the expenditure to the end of 1867 had reached £240,259. For the new Home and Colonial Offices the vote is to be £10,000; for the public offices' site, £42,760, the total estimate being £104,000. A vote of £24,000 is proposed towards a total of £61,000 for the erection and fitting up of the remaining portion of the east wing of the Public Record Repository. A further sum of £50,000 is required for the acquisition of land on the northern side of the National Gallery, nearly £69,000 having been expended, and £17,000 beyond the present vote will be required for completing the work. £10,000 is to be voted towards £25,000 for the repair and restoration of the Chapter-house at Westminster; £10,000 for the erection of a building to contain the natural history collections of the British Museum; £55,000 towards £160,000 for new buildings at Burlington House, for the occupation of the various learned bodies; £20,000 for a grant in aid of new buildings for the University of Glasgow—a new vote, in part of £120,000 to be spread over six years. The vote for public buildings in Ireland is £149,259, an increase of £32,962. The whole result is that the votes proposed for public works and buildings amount to £1,266,782 an increase of £198,000 over the vote of last session.

The Marquis of Salisbury, who died on Sunday was not only a large landowner, but a great patron of agricultural improvement. His establishment at Hatfield is particularly worthy of notice. Exclusive of agricultural machinery, there are considerable works: brick and tile works for drainage and ornamental pottery for the mansion and houses, drawing office, with clerk of the works, survey office, turbine mill under an engineer, joinery-shop, with planing, sash-making, and other machines moved by water power. The same turbines supply Hatfield House and town with water. The Marquis took a deep personal interest in these affairs, and so far was a considerable manufacturer, and an intelligent employer of capital.



IRON·WORK· · BY · J · MOYR · SMITH·



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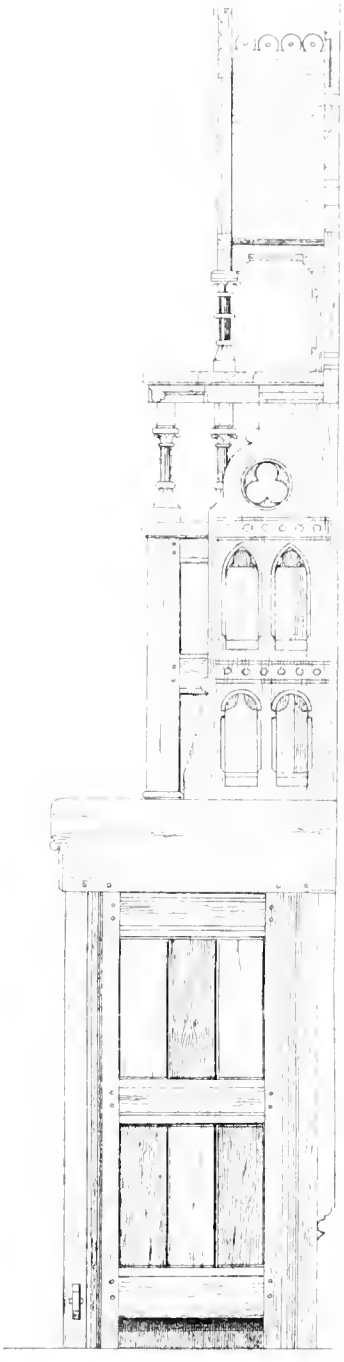

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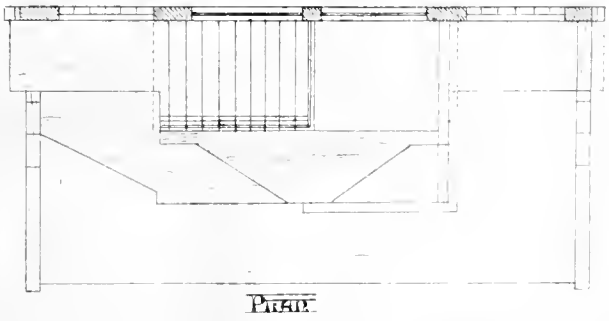


PLAN

PLAIN OAK CABINET DESIGNED BY C BEVAN

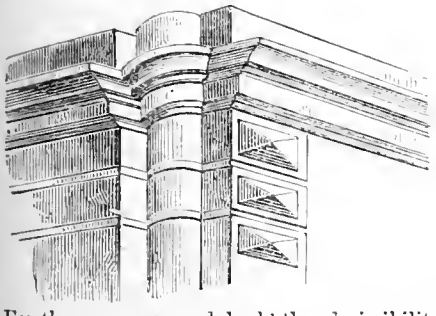
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—NO. XIV.

WE have already spoken of angle pillars or shafts, their too frequent and affected appearance when only employed for ornament, and their legitimate use in relieving the angles of door and window openings. As a rule, such features become meaningless when they depart from their avowed object by assuming functions they do not really possess, as in

FIG. 1.

angles of buildings and chimneystacks, where the idea of their supporting is conveyed by the use of caps, and where the idea is utterly puerile and absurd. In chimney-pieces and decorative details they are admissible as ornamental accessories, but not so when employed in structural situations, where strength and reality of purpose is or should be apparent.

FIG. 2



For the same reason, I doubt the admissibility of crockets and bosses at the corners of buttresses and other exposed positions, where a plain angle or chamfer is far preferable. Some architects are too fond of indulging in an ex-

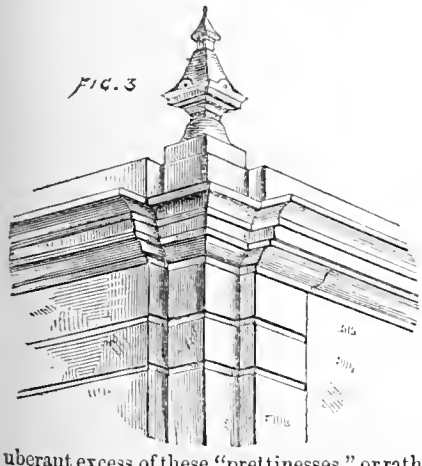


FIG. 3

uberant excess of these "prettinesses," or rather excrescences, wherever they have an angle or chamfered corner, forgetting that in the best periods of Pointed or Mediæval art such effer-

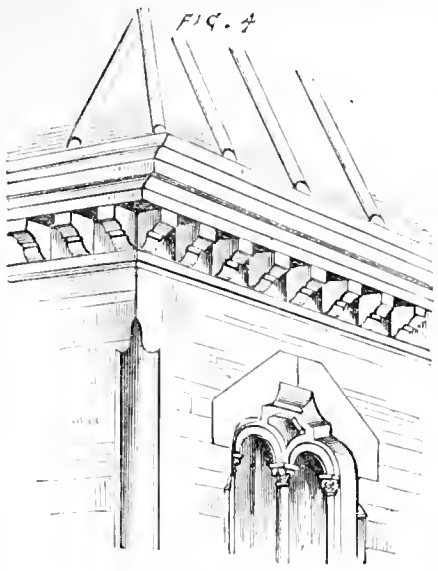


FIG. 4

vescences of the sculptor's art were confined to the interior parts, and to the minor accessories only, as to flying buttresses, pinnacles, spires, the copings of gables, &c., seldom interfering with the structural simplicity and breadth of the edifice, as we find in later examples of the style. The due subordination

FIG. 5.

of sculpture and painting to architecture is a lesson the architectural ornamentalist or milliner no less than the tyro has yet to learn, for we are continually witnessing the pictorial usurping the "architecturesque;" nor can we

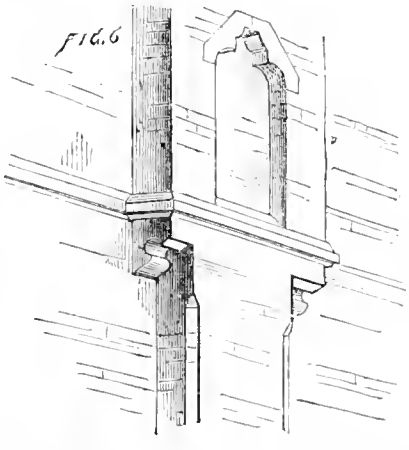


FIG. 6

wonder at it when we find in the progress of art as in religion and science, the objective always taking precedence of the subjective, the literal transcript that of the conventional. The proper sphere of each in the great system or hierarchy of art is only to be found and understood by a wider and more comprehensive study of the fine arts than the modern "pick-up" teaching of our profession inculcates; and generalisation is the crucible through which our fragmentary elements should pass.

As illustrations of the modes by which structural simplicity can be combined with effect both in brick and stone work, we engrave instances of a few important features; and it may be observed that the old Scotch baronial style affords a rich field for the architect in this branch of design. G. H. G.

GROUP OF SOLID OAK FURNITURE.

OUR illustrations of furniture last week were from a group designed by Mr. J. H. Banks, of the firm of Sidebotham, Banks, and Co., church and school furnishers, Manchester, and was executed by them for H. Stubbs, Esq., Woodheys, Ashton-under-Lyne. The cost of the cabinet was fifty guineas, the table eight guineas, and the chairs four guineas each. Messrs. Sidebotham and Banks have bestowed special attention, and with much success, on the production of superior furniture.

WATER SUPPLY AND SANITARY MATTERS.

Sir George Denison, brother of the Speaker of the House of Commons, is to be the Chief Commissioner of the new commission on the pollution of rivers.

In a letter which has been published, Mr. Robert G. Sillar, of 62, Cornhill, says:—With respect to the great sanitary problem of the disposal of the sewage of towns it may be interesting to know that the solid matter can be precipitated from sewage in a few minutes by pouring in a solution of common alum. The muddy waters of the Woosung River in China are always purified in this way for household use, and the same process might advantageously be applied to the sewage of any town, allowing the liquid portion to pass into the river, and the solid to be available for manure.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Wesleyan Chapel was laid on Good Friday at Wall, North Tyne. The building, which, although small, will not be devoid of architectural merit, will seat 140 persons.

The restoration of the nave of Bristol Cathedral is steadily progressing. The portion abutting on the tower is several feet above the ground, and in the cloister yard the foundations are solidly laid. The new cloister door, designed by Mr. Street, is fast approaching completion, and will be used for the first time to-day, on the occasion of laying the corner stone, for which purpose the Earl of Limerick, as Provincial Grand Master of Freemasonry, is expected from Cannes.

The chancel of St. Peter's Church, Wymondham, having been thoroughly restored, under the direction of Messrs. Goddard and Son, architects, of Leicester, will be re-opened to-day. During the progress of the work an ancient hagioscope was discovered roughly walled up and hidden by plaster. It formerly permitted a view of the high altar from the south transept. Another ancient feature of the church, its sacristy, which had been entirely removed, was lately rebuilt on the original foundation, so that the chancel with its appurtenances may now be said to be again complete.

Considerable improvements are being made in St. Hilda's Church, South Shields. Last week Mr. Wailes, of Newcastle, successfully placed a new stained glass window in the chancel. The window represents the Crucifixion, the cross occupying the upper portion, while the lower is filled by the figures of the Virgin, St. John, and the Roman soldiers casting lots for the Saviour's raiment. The other decorations and alterations in the chancel are being executed by Mr. George Cooper, of Newcastle, and will be completed this week. Mr. T. W. Rowe, sculptor, South Shields, is engaged upon an altar-piece representing the Last Supper, which is to form part of the new decorations.

From an extremely interesting account of Shanghai, which appears in the *Scotsman*, we learn that the church in course of erection there, from the designs of Mr. Gilbert Scott, is far advanced. Although only intended to hold about 800 persons, this church is to cost £25,000. In speaking of the architecture generally of this wonderful city, the writer remarks that some of the public buildings, as the English Club and the Masonic Hall, would not be out of place in London. The French settlement has an imposing townhall, and some other fine buildings, as also a magnificent boulevard. The Jesuit cathedral is a building of some pretensions, and is prettily decorated. The walls are painted with the usual scriptural pictures, with this difference, that the principal persons portrayed figure in Chinese costume. Thus, for instance, the women watching at the tomb are represented as fair damsels with their hair combed back and their feet encased in the smallest of shoes. The walls and windows are covered with sentences in gilt Chinese characters. The chief curiosity, however, is an organ, constructed entirely of bamboos, being the handiwork of one of the priests.

A parish church for Ruswarp, a suburb of Whitby, containing 308 sittings, is about to be erected from designs prepared by Mr. Charles Noel Armfield, architect, of Whitby. The plan comprises nave, with south-west porch, two bays of a south aisle, semi-circular apsidal chancel, and vestry under tower, which latter is on the south side, at the junction of nave and chancel. With the exception of the dressings to arches, windows, doors, &c., the whole of the walls will be plastered on the inside with "Martin's fireproof cement," to which it is proposed to apply a considerable amount of coloured decoration. The walls, which are to be built of brown Busca Gill wall stones, hammer dressed, and fine white sandstone from Blue Bank, random tooled, for the dressings, will be 2ft. 3in. thick, 22ft. 6in. high above floor of nave, having buttresses 2ft. square at intervals of 12ft., centre and centre. The tower rises to a height of 64ft., which raises the belfry well above the roof ridges. A spire 46ft. high finishes the tower, making a total height of 110ft. The whole of the works, except decorative painting, have been let to Mr. Robinson, builder, of Whitby, for £1,816 16s. The architect's estimate was £1,871.

On Thursday week the new church of St. John-the-Divine, Brooklands, near Manchester, was consecrated by the Lord Bishop of Chester. The style is Gothic of a simple type, belonging to the earlier period of French work rather than to that of England. The materials of which it is built are Yorkshire shoddies of a warm tint, with dressings of Halifax stone, the walls being lined internally with fire-bricks, cream and brown, in bands and diaper work. The plan is a nave of six bays, 90ft. long by 33ft. wide, without clerestory, roofed in one span, having transepts north and south, taking up the two easternmost bays, divided from the nave by arcades of two arches. The extreme width across the transepts is 68ft. Beneath the eastern rose window is a reredos painted in wax colour, covering a space of 13ft. wide by 5ft. 6in. high; it is divided into three compartments, the central subject being our Lord in glory, with, on either hand, angels in postures of adoration, and at the four corners of the central panel are cherubs apparently full of song; the background of the work is filled in with plants of wheat and vine, conventionally treated. Above the reredos, in the spandrels below the rose window, are two medallions, filled with Caen stone, heads of the Blessed Virgin and St. John, with gilded aureoles. The building is arranged to accommodate at least 500 worshippers, and a large proportion of the seats are free. The general contract for the work has been carried out by Mr. Joseph Robinson, jun., of Hyde, from the designs and under the superintendence of Mr. Alfred Waterhouse, architect, of London and Manchester.

On Good Friday a new Wesleyan Chapel was opened at Hockby Hill, near Birmingham. It is a plain building in the Gothic style, and will cost about £1,000. Messrs. Lewis and Davis, of Birmingham, are the builders.

A church is about to be erected in the St. John-street-road, for the new district of St. Peter, in the parish of St. James, Clerkenwell (to take 8,000 of its population of 25,000), upon the site secured as the nearest available to the scene of the Smithfield martyrdoms. The cost of the Martyrs' Memorial Church, including schools and parsonage, will be about £10,000.

A new Baptist Chapel was opened last week at Kidderminster. The style is Gothic. The walls are of pressed red bricks, relieved with facings of white Bath stone. The area of the building is 72ft. by 40ft., and it will seat about 600 worshippers. The baptistry is lined with encaustic tiles. The total cost will be about £2,400. The work has been executed by Messrs. Scholes and Warrington, from the designs of Mr. G. Bidlake, architect, of Wolverhampton.

On Monday afternoon the foundation stone of a new Wesleyan Chapel was laid at Gosforth, near Newcastle-on-Tyne. The style is Gothic, and the building will be all of stone. Its length will be 51ft., and the width 27ft., and it will seat over 200. Mr. F. R. N. Haswell, of North Shields, is the architect, and Mr. Nesbett and Mr. Robson, of Bulman's Village, are the contractors for the masons' and joiners' work.

On Tuesday afternoon the foundation stone of a new Baptist Chapel was laid at Rodley, Yorks. The building will be in the Italian style. The inside measurement will be 90ft. by 54ft., and 40ft. from the floor to the crown of the segmental ceiling. The walls will be built of Horsforth stone, lined inside with brick. The edifice will seat 1,100 persons, and the total cost will be £3,500. Mr. John Simpson, of Leeds, is the architect.

On Easter Monday, the ceremony of laying the memorial stone of a new district church in course of erection at Shildon, was performed by the rector. It is to be called the "Church of All Saints," and will be built in the Early English style of architecture, to seat 300. The work is being carried out by Mr. Borrowdale, builder, of Darlington, from the designs and under the superintendence of Mr. Pritchard, architect, of the same place.

The foundation stone of a new church, to be dedicated to the Saviour, was laid on Easter Monday, at Everton, near Liverpool. The style is thirteenth century Gothic, and the building will consist of a nave with two aisles, and a chancel with chantries on each side. The length is about 109ft, and the height to the ridge of the roof about 70ft. The walls are of native red sandstone, the pillars supporting the nave of Cefn stone, red Mansfield being used for the smaller shafts. The church will seat 900 persons, and will cost over £4,000. Mr. Gordon M. Hiles is the architect, and Mr. Tomkinson, of Liverpool, the contractor.

The annual meeting of the Chester Diocesan Open Church Association was held on Thursday week. The honorary secretary read the report, which stated that in the previous report they had called attention to the fact that three Liverpool gentlemen had, at their own cost, built, and to a certain extent endowed, three churches, in neighbourhoods where they had long been much required. This year would, it was hoped, witness the completion of four other churches devoted to divine worship in the same noble and generous spirit. Mr. C. H. Horsfall, with the assistance of a grant of £2,500 from the Liverpool Church and School Extension Society, proposed to build a church at a cost of £7,000, for a district in Toxteth Park. His brother, Mr. Robert Horsfall, assisted in the same manner, had secured a site and commenced the erection of a large and handsome church in the Prince's Park-road; the architect is Mr. G. E. Street. The Rev. J. C. Reid and Mrs. Reid were at their sole cost bringing to a speedy completion a very beautiful church in the parish of West Derby; and Mr. William Preston was about to commence the erection of a church on his own estate on the borders of the same parish. A fifth church would soon be provided for another district by a munificent bequest of £10,000. To this list might be added the intention of the Earl of Sefton to build a new church for the chapelry of Kirkby. During the past year various grants had been made by the committee. The usual resolutions were adopted.

BUILDINGS.

The memorial stone of the Walsall Cottage Hospital was laid on Monday last, by the Countess of Bradford. The general external appearance of the building is not pleasing, the architect having evidently had to study utility, convenience, and strict economy. The ventilation and warming arrangements for the two new wards are very satisfactory. The buildings have been carried out from the designs of Mr. G. B. Nichols, architect, of West Bromwich, by Mr. Adkins, builder, of Walsall.

The Paris correspondent of the *Star* says that Baron Haussmann's "building mania" extends to the provinces. Pickaxes and hammers have lately disturbed the echoes of a lovely little valley once dear to the Druids, of whose mysteries its seclusion and ancient woods are eminently suggestive, the result being a temple and statue erected at the sources of the Seine, the chief object thereof, the writer thinks, being the opportunity the said monument affords for an inscription in which the name of M. le Baron Haussemann, Senateur, &c., appears indelibly inscribed on the marble. The Emperor plays a very secondary part in the affair.

New York City is to have a new Post Office. The building will be of white marble, and will cover 2½ acres of ground. In shape the Post Office will be triangular, and will cost not less than 3,500,000 dollars.

The rebuilding of the Medical Hospital of the Royal Infirmary of Edinburgh will be one of the most important works undertaken there for many years. The estimated cost is £100,000.

The dining-room at the side of the refreshment hall, South Kensington Museum, is being decorated by Morris and Company, and is now nearly complete; the panelling, walls, and ceiling have received coloured decoration, stained glass has been inserted in the windows. The room on the other side, entrusted to Mr. Poynter, will shortly be proceeded with.

Workmen are now engaged in making the true levels in the carriage and footways from the top of Fetter-lane to Hatton Garden on the opposite side, so as to meet the newly-formed street from the top of Holborn-hill to Farringdon-road. The new iron viaduct over Shoe-lane has been finished within the last few days, and furnishes a neat specimen of girder bridge building on the buckle-plate system. The whole of the upper surface of the arches over the subways, &c., of the raised way are now in course of being asphalted, prior to the distribution of the broken granite intended as the bed of the new permanent roadway.

Last week the foundation stone of the new National and Sunday Schools to be built in Zetland-street, in connection with the Wakefield parish church, was laid by the Lord Bishop of the diocese. The buildings, which are to be of Gothic design, and are intended to afford accommodation for 500 children, consist of boys' school room, 60ft. by 20ft.; girls' room, 66ft. by 20ft.; infants' room, 52ft. by 21ft.; and two class rooms, each 16ft. by 16ft. The external faces of the walls will be of pitched faced stone from quarries in the neighbourhood, with tooled dressings. The cost of the buildings will be about £1,800. Mr. William Watson, architect.

The proprietor of the *Philadelphia Public Ledger* has erected new premises for that journal. The building contains 64,812 square feet of space, and is lighted by 354 windows. To pass round all the above-ground apartments constitutes a journey of 1,798 yards, or rather more than a mile.

The works for the great dockyard extension at St. Mary's Island, Chatham, have been making good progress during the fine weather which has prevailed. The workmen are actively engaged in constructing the three basins; the brickwork of the third or north basin was recently commenced. The steam brick-making machinery, upon which a large number of convicts are engaged, is in full activity, and it is expected that during this year some twenty million bricks will be made. A large party of convicts are now employed in making a new roadway to the extension works.

New schools in connection with Zion (Congregational) Chapel, Wakefield, are now in course of erection, and on Tuesday the memorial stone was laid. The building will be in the Italian style, and is to cost £2,700.

A volume containing a collection of ancient engravings, of which a large number were by Albert Durer, was recently stolen from the library of the University of Bologna. Those works of art were so rare as to be valued at 70,000f. A small number have just been discovered and seized at Stuttgardt, but the greater part have been so dispersed that their recovery is almost hopeless. Among the number were several prints presented by Pope Benedict XIV., but one of the thieves, who have all been arrested, declared that he had burned them, because they bore a stamp by which they would have been easily identified.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—R. H. I.—S. W., jun.—C. F.—I. C.—I. B. —S. B. and Co.—A. T.—J. S.—A. T.—T. M. S.—G. T. R.— I. P. S.—E. W. P.—A. M.—A. J. M.—B. and M.—H. H. S. —W. B.—A. M. (with MS.)—I. H.—S. B. and Co.—H. C. W. Y.—See BUILDING NEWS for August 16, 1867. A. G. O.—5s.

ERRATA.—ORGANS.—SIR,—Will you kindly correct the two following errors of printing in my last. At page 249, line twenty-one from bottom, for two fifths read three-fifths. This is manifest from the context, but still as it is a matter of some consequence it should be corrected. 2. Second line from the bottom, for "apparatus" read "apertures."— J. C. J.

Correspondence.

COULEUR DE ROSE.

To the Editor of the BUILDING NEWS.

SIR,—A curious contrast is presented by the criticisms in the BUILDING NEWS and *Builder* of this week on the designs for the Manchester Townhall—so curious that those desirous to learn the real state of the case, and who cannot pay a personal visit to Manchester, must be fairly puzzled. Your contemporary, if not of the ostrich nature, too confident of safety with its head in the mud to prevent sight of danger, is, one must allow, by far the pleasanter guide to follow. According to its judgment "the beneficial effect of such an exhibition on the public mind must be considerable." "To the student in architecture a lesson is provided, set forth in its most attractive form." Then "the City Council have shown every desire to free themselves from the trammels of favouritism and 'jobbery,' and this, I think, most will concede at once, however their good intentions may have been frustrated by the evils inherent in the wretched system of competition." And, finally, "the result of this competition must be highly gratifying to the citizens, proving, as it does, that one of their number is able to cope successfully with the best men of the profession. The writer has seen all the drawings, and can confidently say that either for architectural excellence, skill in planning, or artistic and delineative execution displayed in the drawings, no finer collection (not even excepting that for the London 'Law Courts') has ever resulted from one single competition." There is a delightful subject for contemplation. No need to ask the price of a return ticket to Manchester. Without counting the cost, all the profession must go by next train, rejoicing in having lived in a century so prolific of genius. But it is as well, before starting, to see what the BUILDING NEWS says, lest there may have been a slight *couleur de rose* in the glass through which the above view was taken:—"The Commination Service seems to have prolonged itself from the first day of Lent to this, very near the last of it, for the—well—not blessings we hear, are, if not loud, most certainly deep. We wonder if ever there were, or could be, a satisfactory architectural competition."

Stay!—Was this a glass blacked to look at an eclipse through? Let us rub our eyes again and hesitate before incurring so reckless an expenditure as we had contemplated. The BUILDING NEWS gives a detailed criticism of only one—the successful design; while the *Builder* expatiates upon the whole eight "beatitudes," indeed, as it describes them, almost *all* of whom, according to its judgment, are most *honourable men*, whom the profession must forthwith delight to honour.

Points of comparison between the critiques on the individual designs are wanting, except in the case of the successful competitor; so, on the whole, I propose to postpone my contemplated journey till after the Easter holidays, and a careful perusal has satisfied me as to how much is due, in one case, to *couleur de rose*, and in the other, to a colouring of a more sombre character. Oh! that one might hope—but I fear it is too much to hope—that truth may be found clad in the above roseate hues. Will the forthcoming exhibitions resolve the doubts of

A NON-COMPETITOR?

ORGANS.

SIR,—I must request your readers to turn to page 71 of "Hopkins on the Organ." Hopkins is one of "J. C. J.'s" authorities. He distinctly says that the quantity of tin in pipe metal does affect the tone. Is it likely that a genius in his art like Father Smith used 3-4ths tin for any other purpose than sound? I would call attention to Mr. Hopkins's statement about the metal of the pipes at the Temple and St. Paul's, and at the Minoseten Church, Bonn.—I am, &c.,

W. TAYLOR.

SIR,—I have read with much interest the various letters upon organ building that have appeared in your journal, and I think it quite time the public should be made aware of the shocking rubbish now placed in some of our churches, doing far more to irritate than soothe the minds of priest and congregation. The very idea of comparing such a builder as Willis with Schulze and Cavaillé Coll is simply absurd in the extreme. I can easily understand anyone, whose ears will allow them to admire the tone of Willis, being utterly unconscious of any difference in the sound from a pipe of good or bad metal, but more acute ears distinguish in the purer metal a fine singing tone, in the baser compound a dull and heavy tone. Being well acquainted with the instruments of Schulze, Cavaillé, and Willis, I will make some few remarks on the characteristics of each.

First, Schulze, for firm tone, grand mellow diapasons, of about six times the power of those usually found in English organs, fine salicionals, and many other stops of the kind, delicate and beautiful stopped diapasons, differently scaled, and called by various names; open flutes of broad tone. He also makes a very fine Flauto traverso (a wooden harmonic flute peculiar to Germany); the whole of his mixture work has immense power and brilliancy, quite incomparable with anything of the kind.

Schulze's reeds are his weak point—not that they are bad; on the contrary, they are the finest I have heard of the close tight tone, which tone is unfortunately adopted by nearly all the English builders, perhaps to the greatest extent by Willis, the chief difference being that Schulze's are extremely equal throughout the scale; those by Willis are extremely unequal.

The organs of Cavaillé are remarkable for fine workmanship, steady, and firm tone, immense power, and great brilliancy of reed work, fine harmonic flutes, and light stops of great refinement. His general flue work is light and ineffective. If Cavaillé had not done more than his arrangements of wind for the steadying of tone he would be entitled to a very high rank among the organ builders of Europe.

Willis is known chiefly by his rough and ready system of workmanship, small and unsteady bellows, the pump handle having to be worked as vigorously as possible, communicating its vibrations to the whole organ tone. This alone would make Mr. Willis a second-rate organ builder, if he succeeded in all other respects. His diapasons are of a wishy-washy tone, fluty in character, and entirely devoid of the proper harmonics, such as characterise Schulze's diapasons, Erard's grand pianofortes, and all other tone of a good and refined quality. The mixture work by Willis is small, miserable, and screamy, combining in no bearable manner with the rest of his work. His sole point of power is usually gained by tight unpleasant toned reeds upon some great pressure.

It has been said that the pipes in Father Smith's organ in St. Paul's are of common metal. It has also been said, by your same correspondent, that metal composed of half tin or less, in combination with lead only, makes a soft compound that will do its work but for a short time. If this is the case I would ask how it is that the pipes in St. Paul's organ have performed their duty so well for 200 years, if composed of so small a quantity of tin with lead—type was certainly not used in those days. I think I could point to many failures in type metal of less than twenty years' standing. My own opinion of the St. Paul's pipes is that they are of fine metal, and I have often had the handling of them. I will not say that they are for a certainty, nor am I disposed to accept the authority of the very eminent organ builder who has had so little experience in good metal. With regard to the other builder, Lewis, I know but little of his organs beyond the one played upon in his factory at Brixton some few weeks since. It certainly appeared to be a most extraordinary instrument for its size, and very beautifully finished. I am told by many eminent musicians that he will eventually take the lead, at any rate in this country.—I am, &c.,

R. T.

MANCHESTER TOWNHALL.

SIR,—One sentence in your last week's article runs thus:—"To obtain all this Mr. Waterhouse has encroached somewhat on the space allowed for the buildings [areas?], and thus obtains one advantage over those who have complied with the conditions."

As an answer to this, may I be allowed to quote two sentences from the conditions, which seemed to me to give quite as much latitude as I found it desirable to take?

"Architects are to use their own discretion as to the shape and form of the building, and are not obliged to adhere to the boundary line of the land as shown on the plan."

"The lengths of the various projecting portions and areas in Princess-street and Lloyd-street may be altered to suit the design of the competitor."—I am, &c., ALFRED WATERHOUSE.

8, New Cavendish street, Portland-place, W., April 15.

PUGIN *v.* BARRY.

SIR,—I beg to enclose you a copy of a note from Mr. E. M. Barry, together with my reply to it, which must, so far as I am concerned, close this controversy for the present. You will see that my original statement is completely confirmed by the evidence of Mr. Wolfe, as given in Dr. Barry's pamphlet. To vindicate my accuracy in that statement is all that I am now disposed to do. As regards the particular drawing (which in contradistinction to the *design* the Messrs. Barry make so prominent), I do not care to prove who was the draughtsman—whether it was inked in by Sir Charles Barry over Pugin's pencilling, or traced, copied, or in any manner reproduced from Pugin's design; or, on either supposition, whose was the hand that inserted the initials A. W. P., whether they were unthinkingly traced, and by whom; whether Pugin himself inserted them afterwards, to mark the authorship of the design? The initials stand there, however, and every theory of the Messrs. Barry to account for their presence has been hitherto wholly inadmissible.—I am, &c., J. R. HERBERT, R.A.

7, Grove End-place, St. John's Wood-road, April 15.

MY DEAR MR. HERBERT,—Your letter has only just reached me, bearing yesterday's post mark, though dated the 28th inst. It does not answer the request made in my letter to you, but raises instead points of controversy which it will do no good to enter upon.

The *sole question* on which I addressed you was the authorship of the drawing of the throne. I say it is wholly my father's. You have said publicly that you saw Mr. Pugin make it. I have asked you to describe it, as it is very peculiar, and the photograph gives only a part of it, and I have requested you to come and see it. To neither of these requests have you yet replied.

Mr. Powell stated to me exactly what I told you, and has since written to me that he has informed Mr. E. Pugin that, though "very Puginesque in character, it is Sir Charles' own drawing." Whether it is or is not "Puginesque" in character, may be a matter of opinion, but whether it is the drawing of Mr. Pugin or Sir Charles Barry is not a matter of opinion, but of fact; and this I ask you to come and judge for yourself, feeling sure that, professing as you do truth to all other considerations, you will not hesitate to repair any wrong you may be convinced you have done me.

As to any explanation of the initials, that is altogether a secondary question; for if Sir Charles Barry made the drawing, it would be absurd to suppose he would have put Mr. Pugin's initials *as such* upon it.

I will add, in conclusion, that you cannot point to any word of mine which reduces Mr. Pugin to the level of little more than a clerk. I have always admired and fully admitted his rare genius, and the great value of his aid at Westminster. My father, I know, invariably did the same, and spoke of him in the warmest terms. This controversy has been none of my seeking, and I cannot be responsible for its results.—Yours faithfully,

J. R. Herbert, Esq., R.A. ED. M. BARRY.

21, Abingdon-street, Westminster.

MY DEAR MR. BARRY,—The first thing I do after despatching my picture to the Royal Academy is to reply to your letter of the 31st ult.

I must premise that my note to Mr. Edward Pugin of February 24 was hastily written, without any idea of publication, and it was in that note that I said Dr. Barry's photograph was taken from the "actual drawing." All that I then meant was that it was a representation of the actual *design*, as I took the earliest opportunity of explaining in my letter to the *Standard* of February 29, adding

that "I could not of course tell whether the photograph in Dr Barry's pamphlet was taken from the original drawing, or from a very careful reproduction."

Now I have to complain that from that day onward this explanation of mine has been persistently ignored, and my words given above have been more than once garbled, to the perversion of their meaning. Your brothers Charles and Alfred have each quoted part of the above sentence, stopping short in the middle, and placing a full stop where I (with a certain caution) had not used even a comma: that is, they each of them omitted the all important words "or a careful reproduction;" thus leading the public to suppose that I have spoken of one original drawing only.

The repeated challenges therefore from you and your brothers to describe the particular drawing from which the photograph is taken, are wholly beside the mark, and, if I may say so, are not very ingenuous.

But you may say that, in my letter calling attention to the existence of the initials "A. W. P.," I meant to say, it was the actual drawing which I saw Mr Pugin making. The existence of the initials certainly favours the view that the drawing is by Pugin himself, but it does not induce me to change my supposition that it might be a reproduction from a tracing, wholly or in part. If the drawing should be from the *hand* of Sir Charles Barry, it is for you, and not for me, to explain the presence of those letters in the place where they are. Only I must beg leave wholly to reject the explanation hazarded by you and your brothers, that the initials of the Prince of Wales could possibly have been placed by Sir Charles Barry, or any other same man, on the canopy of the Queen's own throne.

Passing now from this entirely secondary question, I return to my original statement, which, deny it or evade it, as your friends may, bears most importantly upon the real question at issue in this matter.

Allow me to remind you that beneath the photograph in Dr Barry's pamphlet is a note I presume by him—in these words:—"It" (*i.e.*, the photograph) "suffices to show how completely Sir Charles Barry's designs prescribed the limits within which Mr. Pugin's assistance was rendered, even as regards the special works of detail entrusted to him."

Now, what did I say? I said that I sat working by the side of A. W. Pugin when the post brought a packet from the then Mr. Barry, containing a drawing, made by Mr. Pugin, of a pointed canopy, for the throne in the House of Lords treated as a shrine, and that in the packet was a small sketch treating the canopy as a baldaquin, square headed, and in very few lines, barely enough to indicate what was meant. Now, what says Mr. Wolfe?—page 67 of Dr. Barry's pamphlet: "The throne was originally designed with a spire-like canopy of tabernacle work, but fearing it would interfere with the frescoes to be placed above, Barry requested Pugin to draw out a throne in harmony with the general style of fittings he had determined to adopt." Here we find Pugin employed not merely to fill in ornaments, as Dr. Barry's note would lead the public to infer, but making a design for the throne from the very beginning, which design, had it not been from its interference with the frescoes above, would have been adopted by Barry as the ostensible architect of the Houses of Parliament. But this object interposing, Mr Barry requests Mr. Pugin to draw out a new design from the beginning, merely giving him the few slight scratches which I saw arrive to Pugin's hands, as described by me in my letters of February 24 and 29 last. In consequence of this Pugin commenced the drawing which I saw, and which Mr Wolfe says he well remembers, and which had, in his opinion, "much the appearance of a heavy half-tester bedstead." Thus Mr. Wolfe completely confirms my original statement. But Mr. Wolfe affirms that Barry so altered the design "that when it was returned to Pugin to prepare the working drawings, little more remained of the original design than the *general form*." I do not accept this statement as it stands, but admitting its correctness for the sake of argument, we have it thus confessed that the general form of the present throne was Pugin's. And it is not only admitted but asserted by you and your friends, that Pugin was employed to fill in the details, and the facts being so, that the general form was Pugin's, the working drawings Pugin's, and the details Pugin's, I am quite content, so far as my testimony is concerned, that Sir Charles Barry shall have the credit of whatever may remain.

You will remember that I said in my letter of February 29 "that I do not affirm that no detail was afterwards changed," for no one would dream of denying that your father's suggestions might have been of great value even to Pugin. I must ask you to forgive me if I express my conviction that what happened in this matter of the throne—which you have selected as a crucial instance in your father's favour—happened also throughout Pugin's connection with the building. I say, therefore, once more that A. W. Pugin is entitled at least to the honour of being the joint architect of the Houses of Parliament, and nothing would more truly rejoice my heart than on this basis to see you shake hands with the son of your father's friend. The time will come when you will look back on this controversy with a more impartial eye, and will admit that Edward Pugin had more justice on his side than you now can perceive. For myself personally, being closely occupied in the fulfilment of important engagements in my art, I must therefore decline to continue this controversy, at least for the present. I do not know what I may think it advisable to do in the future, but at present I am disposed fearlessly to commit the issue to the verdict of all impartial men, on the facts which have been already adduced.

Assuring you once more that there is no ground for your idea that I charged you or your brothers with knowingly stating anything that is inconsistent with the facts, I remain, dear Mr. Barry, faithfully yours,

E. M. Barry, Esq., A.R.A. J. R. Herbert.

7, Grove End place, St. John's Wood road,
Wednesday, April 8.

Breech-loaders, after all, are no novelty. At a recent meeting of the Royal Archæological Institute, Brigadier-General Lefroy exhibited a "curious breech-loading smooth-bored matchlock arquebus," which bore on it the date 1537, and appears to have belonged to Henry VIII.

Intercommunication.

QUESTIONS.

[817.]—MORTAR FROM OLD MATERIAL.—Will you please to inform me whether mortar composed of old bricks and the rubbish arising from pulling down old houses, ground up with fresh stone lime, has the same lasting properties as mortar made with the proper proportion of river sand and stone lime, well mixed by hand or ground in a mill?—Builder.

[818.]—A DAMP SAFE.—I wish to know how to cure dampness in a safe I built a year ago. It is over a cellar and has 12in. freestone walls, 6in. freestone floor, and an iron door of the usual description. Since the safe was built the inside of the door has been covered with moisture, and books placed in it have been much damaged. I have tried a charcoal brazier in the safe for three months, and for the last six months burned gas night and day. I have also made four small holes in one of the walls. None of these efforts to keep down damp is of any avail.—Banker.

[819.]—ROMANESQUE ARCHITECTURE.—Can you, or any of your readers, inform me through "Intercommunication" whether any of the undermentioned examples of Romanesque architecture have been illustrated, and where they are to be found?—Cathedral of Puy-en-Velay (cloister); St. Cuthbert's (apse); Andernach, Bonn, Heisterbach, and Zinzig (the Romanesque portions). A. M. M.

[820.]—ARTESIAN WELLS.—I should feel obliged if any of your readers could inform me whether the machine invented by Dr. Potts (see *Mechanics' Magazine*, Dec., 1859) has been applied in sinking artesian wells, because, in my opinion, it might be so applied with advantage, having been used already several times with great success in sinking iron cylinders for bridges.—J. D. J.

[821.]—GILDING.—Will some reader kindly inform me the difference between the processes of oil and water gilding?—Nap.

[822.]—COMPO ORNAMENTS.—I should be much obliged to any correspondent who would send me a receipt for making compo ornaments, such as are used in picture frames.—Minor.

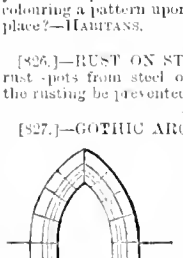
[823.]—CHANGE RINGING.—Is there a practical work upon change ringing from two to eight bells? If so, I should be glad to know the publisher and price.—Changeling.

[824.]—TO MEASURE A DOME.—Will some kind reader give me a rule for measuring the superficies of a semi-circular dome?—Expectans.

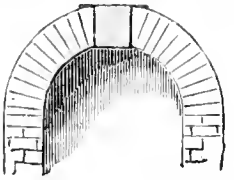
[825.]—PAINTING ON WINDOW-GLASS.—Will one of your correspondents kindly let me know a good plan for colouring a pattern upon window-glass already fixed in its place?—Habitans.

[826.]—RUST ON STEEL.—Is there any way of cleaning rust-spots from steel ornaments; and, if not, how can the rusting be prevented?—J. C.

[827.]—GOTHIC ARCHES.—A friend of mine (an architect) tells me that the straight perpendicular joint in the crown of a Gothic arch, thus, is wrong, being faulty construction. Holding a contrary opinion, and perhaps an erroneous one, I should be glad if any of the numerous readers of the Building News would give me their opinions on the subject? I have consulted "Brandon's Analysis of Gothic Architecture," and I find that out of about seventy-three illustrations where any jointing of voussoirs is shown, seventy-one have the straight perpendicular joint I have described, and which I believe to be perfectly correct and constructional.—Enquirer.



[828.] SUPPORTING A BEAM.—Can any of your correspondents recommend a superior method of supporting a beam under similar circumstances to the one hereunder



depicted; the means of support being a strap of wrought iron, performing double duty as socket for the beam and key to the arch?—F.

[829.]—WROUGHT-IRON ROOFS.—Will E. Swansborough, 6, Great James-street, Bedford-row, be kind enough to show a diagram of the formula for the wrought-iron roofs in Building News of October 18, 1867, and oblige?—Seeker.

[830.]—FLOW OF WATER PIPES.—Will "L. A. B." kindly insert the proof of his formula for flow of water pipes in Building News of January 10, 1868?—Inquirer.

[831.]—WEIGHT OF FALLING BODIES.—Will any of your able correspondents show a formula by which the increasing weight of a block of iron, say 1 cwt., raised to the height (say) of 10ft. or 15ft., more or less, may be ascertained? What would be its weight on the ground, or on any substance by falling?—Ignoramus

REPLIES.

[799.]—PLATINUM DISCS.—Platinum discs may be obtained, 1s. each, at Hodge and Co.'s, Hatton Garden; or any other manufacturing gas engineer would supply them.—F. R.

[800.]—QUANTITIES AND PRICES OF TIMBER.—50ft. cube = one load, *i.e.*, 216ft. 6in. of 9 × 3 = one load, and so on by the usual rule for finding the cube contents of solids.—F. R.

[803.]—MOUNTING DRAWINGS ON CLOTH.—First immerse your cloth in water until wet through, then wring it nearly dry, and nail it tightly upon a board with tacks one inch apart, first nailing down one side, pulling it straight, and then nailing down the opposite side, and so on until the cloth is stretched tight. Place your drawing, face downwards, upon another board, paste it evenly all over, and, the cloth being still wet, lay your drawing upon it, taking care to rub it well down, from the centre outwards, so that no air bubbles be left. A piece of blotting paper must be used over the face of the drawing whilst rubbing, to prevent smearing—F. R.

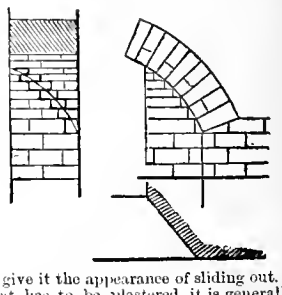
[804.]—EYESIGHT.—If the only light entering an apartment be through a frosted surface, from the extreme whiteness of the light it would very probably in time injure a very delicate eyesight; but the nature of the employment must be taken into account in such cases.—F. R.

[804.]—I have it from reliable authority that working before either frosted or ground glass is injurious to the optics, and can also add my testimony to the truthfulness thereof.—J. Frost.

[805.]—DRAWING INK.—The best medium for drawing upon glass or slate would be Brunswick black. This will stand washing when set, and can be diluted to any extent with spirits of turpentine.—F. R.

[809.]—TENDERING FOR OLD LEAD.—It is usual to allow 5 per cent for dross in weighing old lead; but, to prevent disputes, all contractors should take care that such allowance be mentioned in their agreements.—F. R.

[812.]—FLAT SOFFIT FLUSHING.—In clean brickwork it should not be flushed, but wrought out of the solid, as shown in sketch. To show a joint along the curved



angle would give it the appearance of sliding out. In inferior work that has to be plastered, it is generally flushed up after the centre is taken out, but the arch must run through square on the springing line.—S. Lewis.

WAGES MOVEMENT.

The strike at Newcastle among the bricklayers terminated last week, the men resuming work on the condition of working ten hours per day, except Saturday, and receiving 31s. 6d. per week.

A few days ago a number of workmen on strike made a demonstration at Barcelona, and endeavoured to force their fellow workmen to follow their example. The demonstration alarmed the Government, and they took the unusual course of declaring the whole of Catalonia in a state of siege.

The journeymen painters now on strike in Bradford state that sixpence per hour was promised to them by the employers in 1866, and they were told that it was a reasonable demand, but the employers said they were not prepared to give the proposed advance all at once, and the men did not strike, but accepted ½d. per hour advance for that year, and the same last year. This year, they say, the employers decline to fulfil the agreement, declare they will not meet the men, and decline arbitration. They emphatically deny that the society men have used unfair means towards those out of the society, and assert that most of the latter have come forward voluntarily, asking to be accepted as members, and had left their shops. The men say that all they require is fair play and a truthful statement of the case between them and their employers.

A movement is on foot among the operatives employed in the building trades at Market Drayton for obtaining a reduction in their hours and an increase in wages of 2d. per day. A respectful memorial embodying these requisitions has been presented to the masters. The alterations, if agreed to, are to commence on June 1.

The strike of the workmen at Geneva, stated to have been instigated from London, has terminated. The hours of work are reduced to eleven per diem, and the wages are increased 10 per cent. The men were to resume work on Easter Monday.

A general meeting of the Yorkshire branch of the Master Builders' Association was held at Wakefield, on Monday. After certain formal business had been transacted, the consideration of payment of men by the hour was discussed. It was agreed by the meeting that the principle was just, fair, and reasonable, and that information should be obtained on the subject, in order that the matter might be fully discussed at the annual meeting to be held at Hull, in August next.

The carpenters and joiners of Bradford have made arrangements for the formation of a Board of Arbitration, with the proviso that the present working rules and customs of the trade shall not be jeopardised thereby.

A provisional committee appointed to draw up a code of rules for a proposed Board of Arbitration and Conciliation at Derby, met on Tuesday evening. The meeting, which was attended by employers and operatives representing various trades, was unanimous in a desire to establish such a board and at a late hour was adjourned for a fortnight.

STATUES, MEMORIALS, ETC.

Foley's statue of Burke is to be inaugurated by the Prince of Wales during his stay in Dublin.

The Dean of Salisbury has received a cheque for £500 from the Rev. C. B. Bicknell, rector of Stourton, for the purpose of placing twelve statues in the west front of Salisbury Cathedral, in addition to the forty which have been ordered by the Dean and Chapter. Besides the "Majesty" in the gable of the west front, fourteen statues have already been placed in niches. They are in the style of the thirteenth century, and in point of execution bear a close resemblance to the figures which still exist in the west front of Wells, the execution of which is pronounced, on good authority, to be one of the finest achievements of sculptural art executed during the middle ages.

The unlucky statue of Sir Robert Peel, says a London correspondent, is once more condemned to the obscurity wherein it lay so many years. A sum of £4,000 originally subscribed was offered to the late Baron Marochetti for an effigy of colossal dimensions of the great statesman. When finished, it so utterly disappointed the committee that a suggestion was made that he should attempt one more nearly approaching the size of life. But when finished this in its turn was felt to be so little suited to kindle anything like enthusiasm that it was suffered to rest in the shade of oblivion until the beginning of the present year. A unanimous expression of disappointment swelled in waves of murmur from all who were permitted to see it uncovered while it remained against the new railings at Palace-yard, and accordingly it has been judiciously made away with, at least for the present.

The Dean of Canterbury has published a report on the progress of the statues with which the cathedral is being embellished. The Queen has signified her intention of presenting figures of herself and the late Prince Consort, and a hope is expressed that this example will induce others to take part in the work. Since 1862, when the scheme was originated, thirty-one out of the fifty-six figures contemplated have been erected. Among them are Christ as the Good Shepherd, St. Augustine, St. Anselm, Archbishop Cranmer, St. Gregory the Great, King Alfred, King Canute, Archbishop Becket, King Edward III. and the Black Prince, King Henry VIII., Archbishop Laud, and King Charles I. The figures given, and in course of erection, are Queen Victoria and the late Prince Consort, Bishop Ridley, and Dean Stanhope. Those required and not yet given include King Henry II., King William III., Queen Elizabeth, Mary II. Archbishops Parker, Tillotson, and Richard Hooker.

A monument has just been placed in the churchyard of Madresfield, over the grave of the late Earl of Beauchamp. It is designed by Mr. Preedy, architect, and consists of four panels of grey stone, surmounted with a massive slab of the same, the whole crowned with a cope of highly polished Aberdeen granite, taking the form known as *en dos d'one*.

LEGAL INTELLIGENCE.

Brick Burning.—In a case which came before Sir W. P. Wood, as Vice-Chancellor, it was held that where a nuisance had been of more than twenty years' standing, but with temporary interruptions, the party asserting the right to continue it was bound to show that it had been exercised at least in the first and last year of the period of twenty years, in order to preserve it from being lost. It was not necessary, the Vice-Chancellor said, to prove that any special sickness had resulted to plaintiff or his family from the effluvia arising from the brick-burning, nor that the vapour was more than usually injurious or offensive. It had been held at law that brick-burning carried on in the ordinary way was a nuisance to the persons living within the limit affected by it; and it was such a nuisance as the Court of Chancery would restrain by injunction.

Trade Unionism.—At the Manchester County Court last week before the Judge (Mr. E. Ovens), the case of Walker *v.* Williams was heard. The action was brought to recover £10 upon an I. O. U., the money having been advanced under the following circumstances. Plaintiff and defendant had entered into a contract under which the latter had agreed to build and finish the brickwork for the completion of eleven houses at Collyhurst for the sum of £70, £10 to be paid when the first floor was on, £20 when up to the square, and the remainder when the work was completed. After the work had been proceeded with two days the defendant's men struck, in consequence of some trade union differences; but, as the first floor had been put down, Williams applied for £10, in accordance with the terms of the agreement. Plaintiff declined to pay him anything on account, but consented to advance him £10 upon his I. O. U., and that was the sum now claimed.—The defence was conducted by Mr. Stoney on behalf of Williams, and he stated that the work had satisfactorily progressed for two days, when some labourers out of employment went to the building and said that the defendant was employing one labourer too few. Williams then had in his employment five bricklayers and five labourers, in addition to which he was working himself, and had a boy assisting. He declined therefore to employ another labourer, as requested. A delegate from the union was threatened to be sent for, of which, however, the defendant took no notice; and on the following day the delegate arrived, stating that unless another labourer was employed, he would stop the work. Williams still refused to submit to this dictation, and the consequence was that the work was suspended. The union men further said that they would prevent defendant from working in Manchester, and he had since ceased to carry on business, but had obtained a situation. As a set-off against the plaintiff, he put in a claim for £10, for wages paid to the men.—The Judge said that, although the defendant had been subjected to great hardship, yet he could not admit the set-off, inasmuch as he had not performed the contract. He held a strong opinion as to trade unions, but that court was not the place to express his opinion. He must deal with the case as it was presented to him, and must hold that the defendant could not sustain the set-off. He should, therefore, give judgment for plaintiff.—A number of trade union men were in court during the hearing of the case, and left in a body as soon as the decision was given.

Our Office Table.

According to a communication recently made by Herr Keim to the Polytechnic Society of Berlin, a permanent oil colour can be laid upon cement, and will be found durable if care is taken to rub the surface of the cement three or four times over with acetic acid or vinegar before applying the oil colour.

The frescoes, by C. W. Cope, R.A., in the Peers' Lobby leading to the House of Lords, are now undergoing a new process. A solution of parafine in benzole is being applied to them which, it is anticipated, will make the colouring of them quite secure and prevent any peeling off, and also will enable these paintings to be cleaned without injuring them.

A railroad bridge at Burlington, Iowa (U. S.), now nearly completed, has required over 3,000 piles, and 1,000,000ft. of pine lumber. The bridge is 2,237ft. long, and 7,500 cubic yards of stone have been laid.

"Every person," thinks the *American Inventor*, "who has had any experience with lamp chimneys is aware of the seemingly singular want of uniformity in the length of time they will stand use. Some will last for months, while others, apparently as sound and good, will break after a short use, without any apparent cause. The great cause of their being brittle and breaking so easily lies in the material they are made from. There is 'sheddy' in glass as well as in cloth. Cheapness being the order of the day, a great many manufacturers make chimneys from silicate of lime instead of silicate of lead. The glass made from the silicate of lime has about the following proportions:—Sand, 100; soda, 45; lime, 20 to 25; nitre, 7 to 10. Lime being a non-conductor of heat, the chimney will not bear the expansion caused by the heat; and if, by gradual heating, the chimney does not break on the lamp, a few times heating makes it so brittle that it breaks with the least effort at cleaning it, no matter how much care is used. The silicate of lead has about the following proportions:—Sand, 100; lead, 40 to 50; soda, 20 to 25; nitre, 10 to 15. Lead being very ductile and a good conductor of heat, a chimney made from this formula will almost melt before it will crack with the heat. The uninitiated may tell the difference of the chimneys made of these different qualities of glass by ringing them; the vibration from the lead-glass chimney has a sweet, bell-like sound, whilst the lime-glass has a short, harsh sound. The difference of the cost of manufacture is only, in material, about 8d. per dozen. Another point is in annealing; chimneys as a general rule are not annealed; under a powerful microscope the difference can be seen in the glass; the particles in the annealed glass lie close and compact, while the unannealed seem ready to diverge."

In consequence of the immense number of visitors on Easter Monday and Easter Tuesday, who viewed the Houses of Parliament, far exceeding in number those in the Exhibition year, it is understood that the Lord Great Chamberlain has decided that the "Houses" shall be open to the public on Whit Monday and Tuesday.

The proposal for a new park and public pleasure grounds for Tooting has at last been brought to a successful issue, and this large piece of barren waste land will be devoted to a useful purpose. The common, which has been used for gravel digging, &c., is situated in one of the most picturesque parts of Surrey, and extends over a large breadth of furze and heath lying between Streatham and Tooting, and is in close proximity with Clapham Park.

It is said that some legal difficulties which have only recently been discovered threaten to interfere with the immediate clearing of the ground which is the site of the new Law Courts. Some property which has for a long period been always treated as freehold has, it is stated, been found to be only leasehold, held upon unexpired leases of 300 years, and the legal advisers of the Government have not in all cases been able to trace the individuals who are the real freeholders, and whose interests must be considered before the land is taken possession of by the Crown.

The eastern portion of the Southern Thames Embankment—that between Lambeth Church and Westminster Bridge, will be opened for the public use on the 1st of May next.

The Joan of Arc tower, at Compiegne, fell down the other day, the crash causing great terror in the quarter of the Rue Jeanne d'Arc. Fortunately there was no loss of life.

On Wednesday and Thursday, the 8th and 9th inst., a court was held before the Under Sheriff of the county and a special jury, to assess the amount to be paid by the Great Grimsby Gas Company to the Corporation, for six acres of land, outside the town, required for the enlargement of their works. Mr. Lloyd, Q.C., appeared on behalf of the Corporation, and Mr. Lloyd, jun., Q.C., on behalf of the Gas Company. For the claimants the following gentlemen were called, and the result of their valuations was as under: Mr. P. Bellamy (Lincoln), £6,534; Mr. Maughan (Grimsby), £5,687; Mr. T. S. Woolley (Collingham), £5,400; Mr. Huskisson (Epperstone), £5,066. And on behalf of the Gas Company, the following professional evidence was offered: —Mr. F. Fowler (Sheffield), £1,584; Mr. S. F. Holmes (Sheffield), £1,584; Mr. H. Goddard (Lincoln), £1,515; Mr. J. Brown (Grimsby), £1,380. The jury ultimately awarded the sum of £2,277.

One of the latest instances of American go-a-headism is to be found in Elgin, a town of 5,000 people, on the Fox River, Illinois. Here there is a watch manufactory which sends out 60 watches a day. The machinery was all constructed in Illinois by the persons owning the manufactory, and the speculation was not thought of until 1864.

There is a hitch, it would appear, in the negotiations for the purchase of the Exhibition Palace as a site for the Irish Art Institute. The Government have offered £45,000 for it, after having it valued by an English and Scotch valuator. It was offered by the directors for £60,000, and the Chancellor of the Exchequer declined it upon the terms. A meeting of the proprietors was held at Dublin on Monday to discuss the subject, and after a long conversation it was ultimately moved that a committee, consisting of Sir Benjamin Lee Guinness, Bart., Alderman Manning, Alderman Campbell, Messrs. Arthur Guinness, Switzer, Smith, Clay, Hudson, and Allen be formed, for the purpose of devising the best means of discharging the liabilities of the company, and preserving the building for the citizens of Dublin. The motion was carried unanimously. It was stated during the discussion that the liabilities of the company amounted to £48,000 or £50,000.

Apparently, they have a curious way in Russia of testing a bridge. A communication from Moscow gives an account of the trial of the Borodino Bridge, just terminated over the Moskowa River. The water butts of the fire brigade, all filled, and 60 carts laden with sand, weighing together about 100 tons, were brought on the structure, after which the people who had assembled on the banks were naïvely invited to stand also in the centre. The bridge was fortunately proof against this foolish experiment, for had any accident occurred the consequences would have been terrible. A Te Deum was performed at the cathedral on the occasion, after which the work was blessed by the Bishop Mgr. Leonide, who came in procession with all the clergy of the neighbourhood.

At the monthly ballot of the Institution of Civil Engineers, the following candidates were balloted for and duly elected:—As Members: Messrs. Walthew Clarence Barton, James Bower, William Welham Clarke, Richard Smith Clayton, Francis Jellaius Dennys, James Mathias, John Patou, George Lowe Reid, and David Richmond; and as Associates: Messrs. Herbert Goulburn Anderson, Frederick Cadogan Barron, William Thomas Blacklock, Walter Raleigh Browne, Richard Henry Brunton, Charles Townshend Casebourne, Robert George Clutton, Charles Hutton Croudace, Henry Algernon Shrapnel Fenner, William Randolph Innes Hopkins, William Stuart Howard, Alfred Longsdon, Robert Reynolds, Francis William Robinson, Robert Brough Smyth, William Sykes, James John Wallis, and David William Young; and Sir Arthur William Maekworth, Bart., R.E. It was announced that the Council, acting under the provisions of section 4 of the bye laws, had recently admitted as Students of the institution. Messrs. James Alston Carfrae, John Malcolm Gibson, Charles Selwyn Harris, George Edward Page, and Frank George Wynne.

MEETINGS FOR THE ENSUING WEEK.

Mon.—Society of Engineers,—Discussion on the Sewerage works at Rellhill, read on 6th inst., by Sidney A. Reade, M.A.

Tues.—Institute of Civil Engineers,—1. "Irrigation in India," by Mr. Allan Wilson, M. Inst. C.E. 2. "On the Benefits of Irrigation in India, and on the Proper Construction of Irrigating Canals," by Mr. Thomas Login. 3. "Irrigation in Spain; chiefly in Reference to the Construction of the Henares and the Esla Canals in that Country," by Mr. George Higgin, M. Inst. C.E.

Wed.—Society of Arts.—"On the Cultivation of Beet root, and its Manufacture into Sugar," by W. A. Gibbs, Esq.

Fri.—Architectural Association,—"Hospitals," by T. Roger Smith, F.R.I.B.A.

Sat.—Associated Arts Institute,—Exhibition of Sketches, Subjects, "The River," and "Death."

Trade News.

TENDERS.

Abingdon.—For the erection of a Grammar school for 120 boys, head master's house, and offices, on the Albert Park Estate, Abingdon. Edwin Dolby, architect. Quantities by Mr. J. Crawley:—

Nightingale (too late)	£5363 0 0
Dover	5250 0 0
Cowland	5150 0 0
Thomas and Dicks	5115 0 0
King	5032 13 6
Trow and Sons (too late)	5000 0 0
Selby	4998 0 0
Bull and Sons	4883 0 0
Claridge	4610 0 0

Bexley.—For building a chapel at Bexley. Messrs. Habershon and Pite, architects:—

Butler	£1595
Patman and Co.	1490
Nightingale	1463
Lonagon	1450
Falkner	1159
Paugh	1375
Dabs	1365
Watts	1277
Pearce and Booth	1154

Bexley.—For completing erection of a villa for W. Hall, Esq. Mr. Danby, architect:—

Willes	£1913
Parkes	1876
King and Sons	1665
Nightingale	1653
Regis	1591
Garrud	1560
Rogers and Richards	1196

Derby.—For residence for Frank Campion, Esq., at Derby. Messrs. Thompson and Young, architects. Quantities supplied by Messrs. Waite and Jones:—

Bridgart	£2400
Fryer	2279
Gadsby (accepted)	2174

Gloucester.—For two houses, Spa road, Gloucester, for Mr. Waters. Mr. H. James, architect, Gloucester. Quantities supplied:—

Cullis	£1118
Fream	1090
Meredith	1090
Clutterbuck (accepted)	1050

Guildford.—For alterations and additions to the Old Congregational Chapel, Guildford. Mr. Henry Peak, architect and surveyor:—

	Alterations.	Additions.	Total.
Garnett	£275 0 0	£257 8 0	£532 8 0
Swayne & Sons	206 2 2	262 2 5	468 4 7
Smith	238 0 0	228 0 0	466 0 0
Beagley	214 3 6	246 5 0	460 8 6
Mason	209 14 0	240 6 0	450 0 0
Foster	244 0 0	172 0 0	416 0 0

Staffordshire.—For Inck Hill Church:—

Higham	£2722
Lovatt	2350
Estcourt	2225

Hanley.—For the erection of five houses for Mr. Smith, in Glaistone-street. Messrs. W. and C. Palmer, architects, Hanley:—

Matthews	£1277 0
Ogden	1140 0
Turner and Ward	1030 0
Bennett and Cooke	1030 0
Ellis (accepted)	1063 10

London.—For rebuilding No. 1, St. Ann's-lane, E.C. Mr. Herbert Ford, architect:—

Brass	£1775
Piper and Wheeler	1750
Browne and Robinson	1698
Henshaw	1688
Pritchard	1672
Turner and Sons	1599
Webb and Son	1585
Mann	1512
Crabb and Vaughan	1468

London.—For new building, and raising storey, Featherstone street, City-road. Mr. H. J. Hammond, architect:—

King and Sons	£2053
Eaton and Chapman	2011
Henshaw	1985
Perry and Co.	1985
Macey	1943
Preedy and Son	1710

London.—For three houses and shops in Old-street, St Luke's, Middlesex, for Frederick Ingoldby, Esq. Quantities supplied by Mr. J. W. Forge:—

Turrell Brothers	£2367
Hobson	2537
Porter	2082

London.—For the erection of schools and class rooms, Drummond-street, Hampstead road. Mr. John Tarring, architect, 60, Basinghall-street, E.C.:—

Shurmur	£2,294
Shepherd	2,120
Richards	2,008
Saunders	1,983
R. Mann	1,973
Hill and Sons	1,925

London.—For building Finsbury chambers, Luke street, Finsbury, for F. S. Foster, Esq. H. I. Hammon, architect, 7, Finsbury-square, E.C.:—

Bishop	£30,155
Thorn and Co.	29,000
Moreland and Burton	28 950
Myers	28,565
Brass	27,750
Browne and Robinson	27,720
Eaton and Chapman	26,500
Macey	26,160
Hodgson and Porter	24,779
Henshaw	24,491
Webb and Sons	24,480

Newcastle-under-Lyme.—For laying out and draining street for Mr. R. Slaney. Mr. C. Lynam, architect, Stoke-on-Trent:—

Broomhall	£743
Bryan	589
Parton	472
Edwards	430
Pearce	392
Smith (accepted)	234

Nottingham.—For the enlargement and partial rebuilding of Trinity Free Church, Nottingham. Messrs. Thomas C. Hine and Son, architects:—

Barker	£1260
Wright	1244
Rushworth	1214
Stevenson and Weston	1202
Simpson and Lynam	1179
Marriott, Wartnaby, and Scott	1174
Bell and Wood	1149
Vickers	1143
Booker	1140
Dennett and Co.	1095
Wood and Slight	1075
Blundell	1064
Moore	1030
White (accepted)	1018

Stoke-on Trent.—For the erection of a mill and engine house for Mr. M. D. Hollins. Mr. C. Lynam, architect, Stoke-on-Trent:—

Bradbury	£4370
Oakley and Minks	4190
Wooldridge	4178
Collis and Hudson	4118
Barlow	3750
Sutton (accepted)	3750
Matthews (withdrawn)	3187

Sydenham.—For enlarging Sydenham house, Sydenham, exclusive of shop fronts and fittings. Mr. J. W. Dennison, architect:—

Tully	£1230
Woodward (accepted)	£1090

Taunton.—For a villa residence at Mountlands, Taunton, for Mr. Peter Taylor. Mr. S. Shewbrooks, architect:—

Spiller	£1075
Smith	799
Fox	785
Aplin	745
Shewbrooks	730

Teddington.—For residence at Teddington. Mr. Chas. Aldridge, architect. Quantities supplied by Mr. L. C. Riddett:—

Warne	£2090
Anson	1894
Gammon	1661
J. and W. Sanders	1618
Capps and Ritso	1598

PROPERTY SALES.

April 7.

At the Mart.—By Messrs. Driver and Co.—Leasehold town residence, No. 8, Cavendish-place, near Regent's Park, term 53 years unexpired at £25 per annum—Sold for £5,900.

Leasehold stabling and coach house, premises, No. 15, Queen Anne's-mews, adjoining above, term 14 years unexpired, at £36 per annum—£5.

Freehold four houses and shops, Nos. 51 to 54, Millbank-street, Westminster—£4,500.

Leasehold house, No. 13, Church street, Westminster, let at £65 per annum, term 16 years unexpired at £32 per annum—£325.

By Messrs. Debenham, Tewson, and Farmer.—Freehold two houses, Nos. 30 and 31, Crimscott street, Bermondsey, annual value £56—£350.

Freehold nine acres of building land in Acton-lane, and two copyhold houses, let at £20 per annum, facing Acton-green—£5,860

Freehold residence, No. 2, Ebor-terrace, Albion-road, Stoke Newington, let at £46 per annum—£650.

Freehold residence, No. 7, Ebor-terrace, let at £48 per annum—£610.

By Mr. George Prickett.—Leasehold six houses and premises, Nos. 61 to 66, Upper Ground-street, Blackfriars-road, producing £69 10s. per annum, term 96 years from 1800, at £20 5s. per annum—£360.

Leasehold house, No. 5, West square, St. George's-road, Southwark, let at £30 per annum, term 37½ years from 1794, at £10 10s. per annum—£125.

Leasehold house, premises, and piece of land in Great Dover-street, Borough, producing £81 per annum, term 61 years from 1824, at £25 per annum—£430.

Leasehold sixteen houses, premises, and stabling in Ann's-place and Lant-street, Borough, producing £369 per annum, term 97 years from 1840, at £70 per annum—£1,690.

Leasehold two houses, Nos. 298 and 300, East-street, Old Kent-road, producing £52 per annum, term 69½ years from 1814, at £5 per annum—£355.

A renter's share and free admission to the Theatre Royal, Drury-lane, held for 75½ years from 1819—£65.

April 8.

At the Mart.—By Mr. F. Lewis.—Leasehold three houses (one with shop), Nos. 1 to 3, Collier-street, Pentonville, producing £77 1s. per annum, term expiring in 1884, at £3 13s. 6d. per annum—£485.

By Mr. Newbon.—Leasehold residence, No. 4, Compton-terrace, Upper-street, Islington, annual value £100, term 96 years from 1821, at £10 per annum—£1,120.

Leasehold two houses and shops, Nos. 297 and 299, Holloway-road, producing £125 per annum, term 98 years from 1862, at a peppercorn—£1,400.

Leasehold five houses, Nos. 9, 10, 60, 62, and 63, Belmont-street, Chalk Farm-road, Kentish Town, producing £19 4s. per annum, term 99 years from 1864, at £6 6s. each per annum—£1,870.

By Messrs. C. C. and T. Moore.—Freehold two houses, Nos. 25 and 26, Regent-street, Brunswick-street, Poplar, producing £31 4s. per annum—£170.

Freehold two houses, Nos. 5 and 6, North-street, Limehouse, producing £21 9s. per annum—£220.

Leasehold two houses, Nos. 176 and 177, Eastfield-street, Limehouse, producing £29 18s. per annum, term 53 years unexpired, at £4 4s. per annum—£160.

Leasehold eight houses, Nos. 17 to 24, Silver-street, Stepney green, and a shed adjoining, producing £63 per annum, term 4 years unexpired, at £5 5s. per annum—£95.

Freehold two houses, Nos. 1 and 2, Oriental-villas, Goldsmith's road, Low Leyton, annual value £46—£480.

Freehold house, No. 1, Prospect-villas, Church-road, Low Leyton, annual value £30—£290.

Freehold five houses, Nos. 1, 3, 5, 7, and 9, Cullum-street, Martin-street, Stratford, producing £111 16s. per annum—£1,150.

Leasehold four houses, Nos. 7 to 10, Suffolk-street, Rotherhithe, let at £18 4s. per annum, term 90 years from 1860, at £2 5s. per annum—£600.

Leasehold eight houses, Nos. 3 to 10, Essex place, Old Bethnal-green road, producing £130 per annum, term 31 years unexpired, at £3 5s. per annum each—£765.

By Messrs. Fuller and Marr.—Freehold three houses, Nos. 13, 12, and 7, Mortimer terrace, Kentish Town-road, producing £89 12s. per annum—£1,170.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry Barfoot, Princess road, Notting Hill, slater, April 22, at 1.—Charles Goodman, Bow, Middlesex, builder, April 22, at 1.—William Warne, Parker street, Drury lane, builder, May 1, at 12.—Samuel Dolman, Victoria grove, South Hornsey, bricklayer, May 1, at 2.—John James Keys, Hammersmith, builder, April 29, at 1.

TO SURRENDER IN THE COUNTRY.

Thomas Walter, Bristol, carpenter, April 24, at 12.—Job Crossley, Barnsley, plumber, April 28, at 11.—Thomas Hughes, Penmaenmawr, mason, April 28, at 12.—Charles Whitworth Morris, Dewsbury, painter, April 30, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

April 30, G. Basset, Rochester, builder.—April 30, J. F. Field, Wood street, Upper Clapton, builder.—May 1, P. R. Hodge, Adam street, Adelphi, civil engineer.—May 1, E. J. Wallis, Golborne-road, Paddington, builder.—May 4, A. G. Bowe and J. Eccleston, Clarendon-street, Harrow-road, plumbers.—May 4, E. Herbert, Mardon-road, Bermondsey, plasterer.—May 5, T. Smith, Pickering place, Bayswater, builder.—April 24, T. Jackson, Pudsey, stonemason.—May 5, W. H. Green, Glastonbury, carpenter.—April 25, T. Shepherd, Worksop, builder.—April 24, W. Belt, Hull, plumber.—April 22, T. L. Ball, Merthyr Tydfil, painter—May 4, J. W. Liddell, Bromley, Kent, builder.—May 6, R. Grant, Croydon, stonemason.—May 6, T. Ginger, New Barnet, carpenter.—May 4, J. Oldham, Barrow-in Furness, builder.—May 4, E. P. Nicholson, Shaw house, near Alston, joiner.

SCOTCH SEQUESTRATION.

Hugh and Colin Murray, Bishopmill, near Elgin, builders, April 26, at 1.

DIVIDENDS.

April 27, B. Ord, Middlesborough, slater.—April 24, C. Moyse, Farnham, All Saints, Suffolk, carpenter.—April 25, J. Fryer, Bidford, timber merchant.

PARTNERSHIPS DISSOLVED.

Hiller and Leslie, Isle of Thanet, brickmakers.—Stead and Co, Hillhouse, near Huddersfield, builders.—Sanders and Hindley, Manchester, stonemasons.—Thomsett and Parsons, Sussex road, Brixton, bricklayers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£11	10	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	10	4	15	St. Petersburg, yel...	10	10	11 0
,, yellow pine..	2	15	4	5	Finland	7	10	8 10
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0 0
Quebec Oak, white..	5	15	5	15	Gothenburg, yellow	8	0	10 0
,, birch.....	3	10	4	10	,, white	8	0	8 0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	10 10
Dantzic oak	4	0	6	0	Soderham	9	0	10 10
,, fir	2	5	3	5	Christiania, per C.,			
Memel fir	3	0	3	15	12 ft. by 3 by 9 in.			
Riga.....	3	0	3	5	yellow	12	0	15 0
edish	2	0	2	9	Deck Plank, Dantzic,			
asts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1 3
,, yellow pine..	6	0	6	0	PUMICE STONE pr ton	6	0	8 0
Lathwood, Dantzic, fin	5	0	7	0	Oils, &c.			
,, St. Petersburg	8	10	9	5	Seal, pale....per tun	38	0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body 100	0	103	0
					Cod	35	0	0 0
					Whale, Sth. Sea, pale	3	0	0 0
Quebec, white spruce	13	0	19	0	Olive, Gallipoli.....	73	0	74 0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	54	0	55 0
Yellow pine, per reduced C.					Palm, fine	40	0	40 0
					Linseed	33	10	34 0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	37	10	0 0
2nd do.....	11	0	12	0	Cottonseed	33	10	40 0

METALS.

IRON:—

Welsh Bars in London .....per ton	6	10	0	6 10 0	3
Nail Rod ..... do	7	5	0	7 12 6	
Hoops, ... do	8	5	0	9 0 0	2½
Hoops, Single ..... do	8	0	0	9 0 0	
Staffordshire Bars... ..... do	7	5	0	7 15 0	
Bars, in Wales .... do	5	7	5	6 0 0	3
Railroads ..... do	7	5	0	7 12 6	2½
Foundry Pigs, at Glasg. No 1 .. do	2	12	6	2 18 0	net.
Swedish Bars ..... do	10	0	0	10 10 0	2½

STEEL:—

Swedish Keg, hammered .....per ton	15	0	0	15 5 0	2½
Swedish Faggot ..... do	0	0	0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolts ....per ton	£5	0	0	£7 0 0	
Hammered Bottoms ..... do	95	0	0	0 0 0	
Flat Bottoms, not Hammered .. do	90	0	0	0 0 0	
Cake and Tough Ingot ..... do	80	0	0	83 10 0	3
Best Selected ..... do	82	0	0	85 0 0	
Australian ..... do	82	10	0	85 0 0	
Y. l. Metal Sheathing & Rods ....per lb	0	0	7½	0 0 7½	

LEAD:—

Pig, English .....per ton	21	5	0	0 0 0	
,, Spanish Soft ..... do	19	0	0	0 0 0	2½
Shot, Patent ..... do	22	10	0	0 0 0	
Sheet ..... do	20	10	0	20 15 0	5
White ..... do	27	0	0	30 0 0	

TIN:—

English Block .....per ton	96	0	0	96 0 0	
do Bar ..... do	99	0	0	97 0 0	2½
do Refined ..... do	101	0	0	0 0 0	
Banca ..... do	96	10	0	97 0 0	net
Straits ..... do	93	10	0	0 0 0	

REGULUS OF ANTIMONY

French .....per ton	44	0		45 0	

ZINC:—

English Sheet .....per ton	26	0	0	26 10 0	2½
Devaux's V. M. Roofing Zinc .... do	26	10	0	0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot .....per ton	20	0	0	0	nett
QUICKSILVER .....per btl	6	17	0	0 0 0	

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 24, 1868.

NATIONAL PORTRAIT EXHIBITION.

[Second Notice.]

In our former notice of these portraits, it was remarked that of a large majority of them even the general public will have no doubt as to the individuals whom they represent. Where the portraits themselves may not be familiar, engravings have given them popularity. It may be said that nearly every very celebrated Englishman and Scotchman who has lived and died since the year 1800 is here. Several of the notabilities are, indeed, largely represented. There are five portraits of Nelson, taken at different periods of the great captain's life, by Devis, Rigaud, Guzzardi, Gainsborough, and Abbot. Of Canning there are five portraits, all by Lawrence, besides an early portrait by Hoppner; while Sir Walter Scott is likewise drawn by five different pencils—those of Saxon, Raeburn, Grant, Faed, and Leslie, the last a cabinet likeness, which seems perfect. No other poet, statesman, or warrior has received the like honour, though the instances are by no means few where there are two and three portraits of the same individual. As a rule, a man's popularity measures the number of his portraits, and if these are not always the best they will at all events attract the most attention. But there are many portraits in the exhibition which, though not belonging to the most prominent of great men, nevertheless deserve a more than passing glance from the visitor—for the sake of the man, or the art, or both. Of the many thousands of persons who have visited South Kensington during the last ten days, only an infinitesimal number, we dare say, has stood a single minute before the portrait of William Blake, probably the most unpopular of men, artist or poet, yet certainly one of the most noteworthy characters in the exhibition. He is here limned by Thomas Phillips, seated, pencil in hand, and looking up as if for a vision. The descriptive note in the catalogue says, of the engraver, painter, and poet, that he was distinguished by a grand, wild visionary genius. It informs us, further, that he was born in London, 28th November, 1757; apprenticed to an engraver, for whom he made drawings from the monuments in Westminster Abbey, and afterwards studied at the Royal Academy; that he published "Songs of Innocence" in 1789, and "Songs of Experience" in 1794, besides other effusions; and that he illustrated Mary Wolstoncroft's "Tales for Children," Young's "Night Thonghts," the "Book of Job," &c. But those who would learn his wonderful story must read elsewhere. It is curious to notice the great diversity of opinion that exists with regard to Blake. The *Edinburgh Review*, thirty years ago, thought he could scarcely be considered a painter at all, while Fuseli, with characteristic candour as Mr. Gilchrist says, used to declare, "Blake is d——d good to steal from." Flaxman said that his poems were as grand as his pictures—poems which Wordsworth only looked upon as the productions of insane genius. The merits of "this most supersensuous of the sons of art," as David Scott, a kindred genius, calls Blake, have become better known and appreciated of late, particularly since the appearance of Mr. Gilchrist's life of the painter, published five years ago by Messrs. Macmillan and Company. This work consists of two handsome volumes, and is illustrated from Blake's own works by Linton, and has the fac-simile of a portrait on ivory, painted from the life by John Linnell in 1827—the year of Blake's death—very interesting. The author of the life of Etty succeeded in giving us something like a just conception of the character of Blake, and the biography is one of the most curious and interesting in the language. Then, the other month, Mr. Swinburne, the poet, favoured us with "A Critical Essay" on the painter. This book is very long, often confused and conceited, and seldom coherent. It is dedicated to Wm. Michael Rossetti, one of Blake's most ardent admirers, and is only valuable for the fact that its author is able, on the good authority of Mr. Linnell, to contradict the story about Blake and his wife sitting as Adam and Eve in their garden in Hercules-buildings, Lambeth. Blake did many a queer thing, but we are now assured that he never did anything so repulsive and absurd as that. In spite of the obscurity which has hitherto surrounded the painter's name, his drawings and prints now fetch prices, which, as Mr. Gilchrist says, would have solaced a life of penury had their producer received them. So much for William Blake. In another room may be seen the honest, good-natured countenance of Thomas Bewick, the engraver (by Nicholson), who was in all respects the very antithesis of the other, and died the year after him. Not far distant is Lonsdale's portrait of William Sharp, another distinguished master of engraving, who died in 1824. In addition to the pictures formerly mentioned, the Institute of British Architects contribute a good portrait of Thomas Philip, Earl de Grey, one of their presidents, painted by John Wood, as also portraits of Nicholas Revett (1721—1804), and Sir Robert Taylor (1714—1788). Neither canvas has got the artist's name. Revett, a Suffolk man, was an extensive traveller and writer on architecture. He went to Italy and Greece with "Athenian" Stuart, and assisted in editing the latter's "Antiquities of Athens." In 1766, he accompanied Chandler to Asia Minor, and edited with him the "Ionian Antiquities." Revett was also the architect of the Church of Ayott St. Lawrence, Herts. Taylor was sculptor as well as architect. Guest's monument in Westminster Abbey, and the figure of Britannia at the Bank of England, were from his chisel. Originally the son of a London stonemason, he lived to be knighted, and to amass a large fortune, part of which he left for the foundation of the Taylorian Institution for the study of modern languages at Oxford. Near the Smirke portrait is that of George Dance, R.A., Professor of Architecture to the Royal Academy, and son of the architect of the Mansion House. It is a successful work by Jackson, whose portrait of Sir John Soane, the property of the National Gallery, also finds a place in the exhibition. It has been suggested that the collection is too large, and there can be no doubt that a little weeding would improve the exhibition. Perhaps, too, some of the five portraits of George Canning might have given place to some others rejected for want of room (this being a regret of the committee), the more so as all these portraits are by one artist. At the same time every visitor will admit that out of these nine hundred portraits very few are wholly uninteresting or out of place in an exhibition of this kind. The interest differs just as the features of the individuals represented differ, and some of the portraits will of course strike one and please one more than others. We have already glanced at some of the more noticeable and generally interesting portraits—the *chef d'œuvres* of the exhibition; let us indicate one or two more. A picture of Raffaelle, it has been said, teaches virtue, and the saying might be applied to some of the treasures at South Kensington. Nobody, we fancy, can look upon the portrait of William Wilberforce, by Richmond, without being the better for it. The little man sits in a big chair the "very picture" of bright intelligence, contentment, benignity, and all that is good in human nature. There is a charm and fascination in the face of Wilberforce far more attractive than the bewitching smile of Lady Hamilton as a *bacchante*, which critics have described in such glowing terms. This is a picture at which we linger, and come away satisfied. Hanging by its side is Lane's fine portrait of Clarkson, the vigorous advocate of the abolition of slavery, and the friend of Wilberforce. There is a good portrait of Pitt, by Gainsborough, and a more striking likeness by Hoppner. Gainsborough's wizard like countenance of Erskine is also here, and we have Fox and Sheridan from the pencil of Reynolds. Lords Eldon and Stowell, by Owen, and a second and better portrait of Eldon, by Lawrence, hang close by. Turner's well-known portrait by himself has been contributed by the trustees of the National Gallery, and grouped not far apart from each other are Sir Astley Cooper, Sir H. Halford, Sir Matthew Wood, Sir James Mackintosh, Dr. Abernethy, Jeremy Bentham, Dalton (the author of the Atomic Theory), and Sir H. Davy — a glorious galaxy of intellect. Cobbett and Giffard, of the *Quarterly*, are represented, with a whole host of contemporary poets and writers to keep them company. The Lake school is particularly well represented. Byron, Shelley, Keats, Kirk White have not been overlooked, while the portraits of Christopher North, Lockhart, Crabbe, Southey, Leigh Hunt, and Samuel and Hartley Coleridge are among the best in the exhibition. There is a very fine portrait of John Constable, R.A., which is hung very high, and not seen to advantage. Edward Dayes's portrait, by himself, shares the same fate—a clerical-looking gentleman who was a water-colour painter, and the teacher of Girtin. He died in 1805. There is more than one portrait of Macaulay and Thackeray, each being represented in his study; and everybody will delight to look upon the sharp, keen, and sensitive face of Hood, and that of Rogers, with its serene and benevolent expression. The portraits of Sydney Smith, Theodore Hook, Hookham, Frere, and Douglas Jerrold will recall many pleasant thoughts and diverting reminiscences. The portion of the gallery which is allotted to the portraits of those eminent men in arts, in arms, and in politics who have adorned the Victorian era is crowded with master-pieces of portraiture. There are portraits of Peel, Palmerston, Daniel O'Connell, Lord Lyndhurst, Sir G. C. Lewis, Sir F. Buxton, the Duke of Newcastle, Cobden, Lord Aberdeen, Lord Herbert, and Lord George Bentinck, Lord Campbell, Sir W. Molesworth, Macaulay, Hallam, Lord Rosse, Faraday, Sir W. Peel, Lord Clyde, and General Sir C. Napier, and other great names which have passed into history. The portraits of distinguished women which grace the galleries, and of which there is a large number, give a special attraction to them. There is a full-length portrait of the Queen, by Winterhalter; a second likeness of Her Majesty as the Princess Victoria is very charming. There are two portraits of the Princess Charlotte—one representing her as an interesting child of four or five years old holding up some music to her mother, who is supposed to be playing upon the harp—a rather fanciful picture this; and another as a young woman, it must be owned, somewhat coarse and vulgar-looking. Mrs. Robinson, as "Perdita," is represented by more than one portrait by Reynolds and Romney, as is also Lady Hamilton, and both ladies will attract many admirers. Reynolds's Jane, Duchess of Gordon, Mrs. Opie's portrait, by her husband, and the Countess of Mansfield, by Romney, also deserve notice. But one of the most charming of the modern pictures is the group of Henrietta, Countess of Warwick, with her two children. The face of the little girl is angelic, and the little boy her brother is a perfect study. The

whole picture is very cleverly painted, and exceedingly happy in conception. Romney's own portrait, and that of his blind father, is another striking picture, drawn with great force. But our space is exhausted, and we conclude by advising everybody who has not yet done so to go and spend a day at the National Portrait Exhibition. A more delightful and instructive place it would be impossible to name. It has been happily said of this exhibition that it "concludes that pictorial history of England in three volumes of which the pages are the faces of illustrious men and women and the authors are the great artists of many centuries."

THE PRACTICE OF ENGINEERING FIELD WORK.*

THE connection between the title of the present volume and its contents is not by any means apparent. In fact, it is of a character so slight as to cause the former to be a complete misnomer. By the term "Engineering Field-work" is usually understood by the profession that knowledge, both theoretical and practical, of the several operations required for transferring the plans of any undertaking from the paper to the ground. In this sense, which is alone the correct one, it includes the calculations necessary for using both the level and theodolite, with the information requisite for laying out curves, surveying, setting out bridges and other foundations. The reader will be rather surprised to find that, under the above title, the whole volume is simply a compilation of reports, specifications, and descriptions of works and processes that have been all previously treated of, and which might have been compiled by anyone possessing no professional qualifications whatever. The author, in the preface, by a direct *petitio principii*, assumes what every engineer knows to be still a completely unsolved problem, that is, the economical utilisation of sewage. That it has been successful in a few, a very few exceptional instances, there is no question; but it is equally irrefutable that it has miserably failed in the majority of cases, and the bare fact that it is almost impossible to raise capital in its behalf is the best proof of the distrust in which it is held. We do not for a moment deny the ultimate success of the utilisation of sewage, but we do emphatically maintain that it has at present not arrived at that stage which can, in an honest sense, be termed a success.

In the first chapter, which treats of the different qualities of water and their various impurities, due force is attached to the present inadequate character of the London water supply, and it is justly observed that it will probably require a metropolitan epidemic before the necessity is perceived for adopting one of the great and comprehensive schemes now some time before the public and the Government. Chapter II. deals with the water supplies of various towns, including Brighton, Manchester, Edinburgh, Cambridge, Bristol, and others, and investigates the relative advantages and disadvantages of the different methods of ensuring either a constant or intermittent supply. The difficulty to be overcome with respect to a constant supply is the exercise of such a control and surveillance as will prevent waste upon the one hand, and yet at the same time not partake of too stringent or inquisitorial a character. The invariable occurrence of an enormous waste of water has always been the objection urged against the adoption of a constant supply, but there is no actual necessity for any waste to take place if proper powers of inspection and supervision are granted by the Waterworks Act to the company, together with authority to prescribe the best description of taps and plugs, and, if necessary, to enforce their use to the exclusion of all others. The consumption at Edinburgh, owing to the company not having authority of this nature, averages about 35 gallons per head, whereas by taking the proper precautions to obviate intentional waste and accidental leakage, the rate might be reduced to 20 gallons at the outside. So far as its waterworks are concerned, Edinburgh is particularly fortunate. It is supplied upon the principle of gravitation, and no pumping is required, since the greatest height at which the water can be delivered is 450 feet above the level of high-water mark. As an instance of the magnitude to which waste sometimes attains, it may be mentioned that at Cambridge, upon one occasion when the ball-cock of a water-closet cistern was out of order, the water ran away at the rate of 10,000 gallons per diem, and in consequence of the waste pipe being improperly connected with the drain, there was no suspicion that so enormous an amount of leakage was taking place.

As a contrast to Edinburgh and Cambridge, we find Bristol supplied with water upon the intermittent system, in which it also appears a large amount of waste takes place. The source of the loss lies in the water-closets, which, when constructed upon the old principle, allowed of the valves being propped up, so as to remain open all night, and during the whole period of the delivery of the water. This habit, which was very prevalent, has been checked by the introduction of a new description of closet, which does not allow of any such tampering. In balancing up the comparative merits of the two systems, it may be stated that, by using suitable valves, taps, and cocks, waste may be equally prevented in both methods of supply. There is no need of cisterns, save for water-closets, in the one method, but as they occupy no particular space exclusively, their presence is scarcely perceived. Where the cistern is nothing better than an old water butt or dirty tub, no doubt a considerable degree of fouling takes place; but if a cistern be covered over, and the water be tolerably pure, it will remain free from sediment for a long while.

The dispute that was carried on respecting the relative merits of sewers and pipe drains may be possibly yet fresh in the recollection of our readers. Some advocated large brick sewers, others smaller sized pipes. The Parisians have committed themselves to the former, their principal sewers being sufficiently capacious to admit of men walking upright in them; it has, however, been supposed upon good authority that these large underground thoroughfares were constructed quite as much with a strategic intention as with that of carrying away the storm water and the surface drainage. There is at present no sewage by water carriage, strictly speaking, in Paris. The fourth chapter of Mr. Haskoll's book treats of the subject of sewers and pipes. A wide difference in opinion has existed with regard to the limit at which it is more economical to employ brick than pipe drains. At first sight it would appear that it would be cheaper and less laborious to simply lay and joint a series of lengths of pipes than to build a sewer, but practice has demonstrated that where the diameter of the drain exceeds eighteen inches, the brick sewer is to be preferred in every way. With earthenware pipes exceeding certain dimensions, the risk of breakage is very much increased, and the joints moreover require particular care and attention in laying. At page 77 there is a palpable typographical error, where agricultural land is spoken of as worth £100 and £200 per acre, instead of from £10 to £20. Respecting the best form of sewer, the proper rate of inclination, and other details in connection with them, some useful information is given in the chapter under consideration, and the author's views are sound and clear upon the matter. We would recommend the beginner and the pupil to draw to a scale of about half an inch to a foot the various sections mentioned by Hawksley, Neville, and other eminent hydraulic engineers, as those most suitable for sewers, and then to carefully compare their different capacities and advantages. The eye, although not always an infallible guide, will nevertheless readily perceive those instances in which the correct principle has been departed from. There is a great deal of truth in the remarks relating to clay puddle, but it must not be forgotten that the substitution of concrete would be attended upon a large scale with a commensurate degree of additional expenditure. The real difficulty in puddling any bank, arch, or wall, is not so much in obtaining suitable material as in ensuring it being thoroughly consolidated and beaten up, so as to become completely incorporated throughout the entire mass. In Eastern countries, where the mode of constructing reservoir and water embankments is of a very primitive character, the operation consists of the successive addition of small portions of earth tipped from baskets carried upon the heads of the labourers, and trodden in and amalgamated by the pressure of innumerable feet, the whole mass becoming by these means so effectually incorporated as to be altogether impervious to water. That the material, which is always that obtained upon the spot, has little or nothing to do with the success of the work, is abundantly proved by the fact that it is frequently not possessed of any other qualities which would render it suitable for ordinary puddling. The case of the Vartry embankment has demonstrated how little puddling is to be relied upon as a means of making a watertight joint over the extrados of an arch, and the citizens of Dublin are paying a severe penalty for the blunders of those who had official charge of the works.

In the last chapter the question of sewage is gone into. We differ *in toto* from the author when he states that the present water-closet system is doomed, and are of opinion that no system of sewage can ever be so effectual, so cleanly, so wholesome, and so much in consonance with English tastes and ideas as that at present adopted in London, which for its population is the most healthy city in the world. The argument put forward respecting the pollution of streams is shallow, as there is not the slightest necessity that the employment of the water carriage principle should contaminate rivers and streams to the extent of a single grain. Manchester is not a very felicitous example to quote with regard to the cesspool system, since it costs the corporation £10,000 per annum to empty them. We would take this opportunity of warning those who are in favour of the cesspool principle, whether fixed or portable, not to be beguiled by such terms as ashpits and reservoirs, which to all intents and purposes are cesspools, the difference being simply one of degree, not of kind. All deodorisers have utterly failed to ensure, what is the real point, a sale of the substance so deodorised as manure. The farmers will have nothing to do with it at any price, and will hardly cart it away when they may do so gratis. Neither can we agree with the author that "the conveyance and distribution of sewage may also be a great nuisance," nor do we comprehend how such a statement can be put forward when the conveyance and distribution of sewage may be witnessed daily both at Croydon and Barking, and visitors can easily satisfy themselves, as we have done, of the complete absence of all smell or escape of noxious gases. The advocates of the cesspool system forget that in a dry summer, the water with which the sewage is diluted would be of more value than the sewage itself. Drought is one of the most fruitful sources of an infecundity of soil. That the water carriage principle is in every sense the best mode of getting the sewage away from human dwellings, there is no doubt, but there is also no doubt that the

* 'Waterworks, or the Distribution of Water in Towns under the Constant and Intermittent Systems; Gauging Streams, Sewers, Sewage, and Irrigation. By W. Davis Haskoll, Civil Engineer, author of "Railway Construction," 4 vols., £5 5s., and "Engineering Field Work." First Volume, 20s. Vol. II. London: Atchley and Co., Engineering and Architectural Publishers, 166, Great u sell street, Bedford-square 1868.

DESIGN FOR A LYING-IN HOSPITAL.—GROUND PLAN.

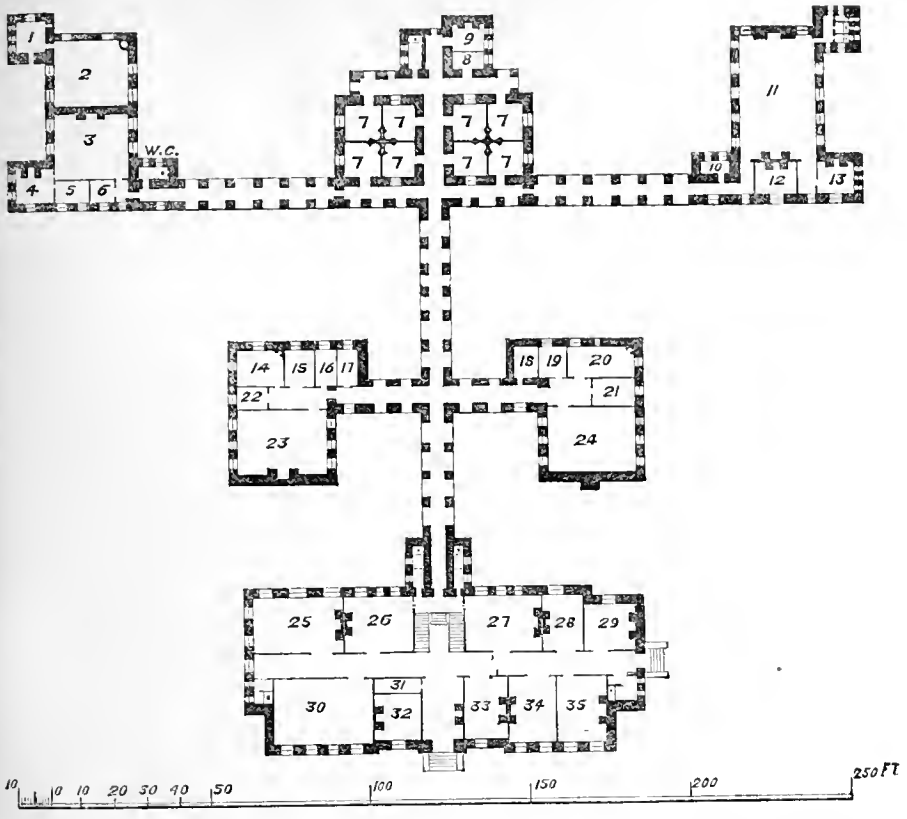


Table.

1. Laundry.
2. Washhouse.
3. Ward for puerperal fever.
4. Nurse.
5. Scullery.
6. Storeroom.
7. Cells.
8. Scullery.
9. Nurse.
10. Scullery.
11. Convalescents.
12. Nurse.
13. Bath Lavatories.
14. Ward (separation).
15. Scullery.
16. Bath.
17. W.C.
18. W.C.
19. Pantry.
20. Common Dining room.
21. Scullery.
22. Nurse.
23. Infirmary.
24. Kitchen.
25. Pupil's Waiting room, and for examinations.
26. Labour room.
27. Waiting room and Board room—Secretary.
28. Medical director's Bed room.
29. Ditto.
30. Lecture room.
31. Ambulance.
32. Porter.
33. Waiting-room.
34. Medical director's sitting room.
35. Ditto.

best means of utilising it has yet to be determined.

A short chapter on traverse surveying—a subject utterly irrelevant to the rest of the book, although the only portion bearing out the title—concludes the volume, which, as a compilation for the purpose of reference, possesses a certain amount of value, but yields in this respect to M. Krepp's book, although the latter is nothing more than an unmitigated puff of Liernenr's cesspool system. "Engineering Field-work" is well printed and got up, but the price is beyond all reason for the value of the contents. A third of the sum would have been nearer the mark, especially since there is not a single plate attached to the book.

MATERNITIES, WITH A DESIGN FOR A LYING-IN HOSPITAL AND MIDWIFERY COLLEGE.

By F. Oppert, M.D., M.R.C.P., London.

THE question as to whether we should have lying-in hospitals at all has lately been again brought before the public, and the total abolition of them proposed on account of the alleged higher rate of mortality in these institutions compared with that of women confined at their homes. Statistics have been adduced to prove that domiciliary maternities are far more preferable, and it may not be out of place to consider to what extent they may be relied upon. The records of hospital cases are usually exact, especially of State hospitals as they exist on the continent, and no death is likely to be omitted, whereas many difficulties exist preventing the reports of domiciliary maternities being equally correct. Though some—not all—of these institutions make it a rule for the midwives to report on the cases, this is not always done properly. Many of the midwives are bad reporters, ignorant, and too much occupied with the care of their precarious existence to attend to this matter. Where the medical officers of the institution are called in when the case takes a bad turn, the fatal issue is recorded; but sometimes the advice of other practitioners is sought, according to the whim of the patient or her relations. Also cases are reported as having ended favourably, which afterwards end fatally. If of a number of one hundred cases treated at the homes of the patients one death is omitted in the report, the death-rate is evidently stated one per cent. too low. A low death-rate is thus obtained, which, by adding the omitted cases—say one per hundred—makes a higher rate than that of hospitals.

Those who base their calculations on the reports of the Registrar-General, comparing the number of births with that of deaths in child-bed, omit all the cases of lingering disease which yet end fatally. Again, hospital cases are of a graver nature, as those are often sent to the institutions, where irregularities occur. But, though the statistics may be fallacious, still the broad fact remains that puerperal fever, the greatest scourge of lying-in, frequently breaks out in hospitals administered and constructed as they are at the present time. It is the writer's conviction that much can be done to prevent this, and before such an experiment has been tried the hospitals should not be condemned. Moreover, they are not likely to be suppressed, for two reasons. Firstly, we want them for certain classes of the population who cannot be confined at home, and, secondly, they are required for clinical instruction of midwives and medical pupils.

The education and training of midwives should be improved in connection with the hospitals. Honorary medical officers should not be expected to work gratuitously, as the duties are too onerous. No midwife should practise without supervision unless licensed, and none should obtain the licence without having passed a course of lectures on a uniform plan, and they should have a popular manual for their use.

The plan of construction of a lying-in hospital should unite the advantages of the hospital system with those of a domiciliary maternity. The principal feature of the appended design is that the lying-in women are confined in cells, enjoying almost the same isolation as at home. The cells should be large, and exposed to the free circulation of air, as the gallery in front and behind is intended to be open the greater part of the year. The passages have four feet less elevation than the cells, by which means it is possible to place separate top windows above them.

The separate blocks are one floor high, except the front building, which may have three storeys, basement, and attics, by carrying the centre part one floor higher. This building contains the rooms of the director and other officials, a large and light lecture room, store and sleeping rooms, as also accommodation for females awaiting their delivery. The labour room is on the ground-floor, and contains three beds, a desk for the medical men on duty, lavatory, screens, &c. The patients are removed to the cells in an ambulance—a carriage on three wheels properly constructed.

The kitchen and infirmary are in separate buildings, and a separation room belongs to the latter. Cases of puerperal fever are removed to a separate ward, with nurse's room and scullery attached to it. All the blocks are connected by galleries, intersected at some parts with open spaces as far as practicable. The convalescents are accommodated in the convalescent ward, and, when needed, temporarily, in the front building.

ADMINISTRATION.

As it is of the utmost importance that the institution is administered on sound sanitary principles, the highest authority lies with the medical director. He has to watch that every room and ward are in a healthy condition, that they be kept empty and cleansed when advisable, that the furniture, especially beds, are disinfected whenever a suspicious case has been in the ward, that the patients are properly transferred from one part to the other. The usual time patients stay in the cells is eight or nine days. They may stay a fortnight longer in the convalescent ward. The medical director is appointed by a government board or by the minister of the interior for a period of (say) ten years. He superintends the college and the pupils, and gives lectures at stated times. He visits most of the patients daily, and receives reports on everything of importance. He is assisted in his duties by

the head midwife and the resident medical officers. The senior physician accoucheur takes his place in his absence. The medical director publishes correct annual reports, he presides unless prevented at the sittings of the economical committee, and plans the lectures for students and midwifery pupils.

The hospital is principally supported by Government grants, but also by voluntary contributions and fees from pupils. The economical committee (consisting of gentlemen who consent to sacrifice some of their time to the interests of an important charity) superintend the matron, and provide the establishment with victuals and necessaries; it settles tradesmen's accounts and enters into contracts, &c. Whenever the director and committee disagree the arbitration rests with the Government board. The head midwife gives lectures to the midwifery pupils, the senior and junior physicians to the students, and these officers also superintend the domiciliary confinements, which the pupils attend to and visit the females in common with them. Special care should always be bestowed on cleanliness, lavatories, hot water supply, towels, &c.

It might be objected to the design that the expense would be too heavy, that the buildings occupy a large piece of ground, and that the costs of maintenance, nursing, salaries, &c., come to a high figure. But the evident advantages overbalance these objections. Unless all our present ideas of sanitary arrangements are erroneous the plan offers the best conditions of having a healthy hospital, free from puerperal fever. The advantages of emptying for a time, and transferring patients from one building to another, are combined with the isolation obtained by the peculiar cottage-like arrangement of the cells; and the advantages of the pavilion system are enhanced by having open or intersected galleries. The benefits derived from domiciliary assistance are included in the plan, and the college supplies a want by educating a numerous class of useful pupils. The grounds are partly to be used as kitchen gardens. Lastly, so much of the plan may be adopted as seems useful, and an extension is not difficult.

THE EARTH SYSTEM.

To the Editor of the Building News.

Sir,—The evils of our present system of house drainage are acknowledged. We carry away by very imperfect contrivances the refuse of our dwellings into the rivers and streams, thus polluting the waters and wasting a product that would be highly useful as manure. The remedies for such an evil will cover a wide field of investigation, and in pursuing it we must be careful of loose generalities, and exceedingly cautious in the acceptance of statements made by the promoters of pet schemes or the inventors of patented apparatus. They may be made with all sincerity, but, founded on isolated facts or unscientific data, they will be of little or no value. Our object is not to establish a theory nor to attack or defend a system, but to ascertain the truth; and in this spirit I hope to discuss the question of earth-closets.

These closets challenge public notice as a substitute for the ordinary water-closet, and are simple enough in construction. An earth-closet has a hopper behind, in which a quantity of dry loose earth is placed, and beneath the seat is a movable vessel to receive the deposits, and it is so arranged that on closing the fall-down flap to the seat sufficient of the earth passes down to cover the deposits made, and no further action is required on the part of the person using it than to open and shut the fall-down flap. The principle has been known for about a quarter of a century, and the first that was brought under my notice was the invention of Mr. Ruddick, of Reading, and this comprised all the advantages of the present construction. I tried it for several months, using peat charcoal, as the best deodoriser known to us, and nothing could be more successful so far as its working powers went. I make no exception, therefore, that it will not answer the purpose so far, but that goes a very small way towards making it an article suitable for common use, and in a much more limited degree towards mitigating the evils of bad drainage and imperfect methods of irrigation. Let us follow with patience the inquiry how far the general adoption of earth-closets would remedy the defects of our present system, and, even suppose it to be an improvement, whether it is really the best method within our reach.

First, it is generally conceded, except by its most sanguine promoters, that its use is not applicable to cities, and for this reason, that the earth to supply it would have to be carted in from the country, and the accumulated refuse taken away by the same means. What would this involve as a mere matter of expense, supposing that it was done upon a system similar to that which the vestries and local boards of the metropolis adopt for collecting dust and other refuse? It would always have to be kept apart from the other dry refuse of a dwelling, and, therefore, an independent machinery would be necessary for this purpose. Suppose this machinery to exist and that we have carried out to the suburbs this refuse, what have we then got to repay us for the outlay? We have simply got the human excreta solid and fluid, the least valuable of the refuse of a dwelling for agricultural purposes. There is no intention that such a closet should do more than substitute the water-closet; thus the valuable liquid refuse, containing the alkalies and salts which are the true fertilisers, are left to run away as now into the drains and main sewers. It saves us nothing in the way of expense, and leaves us after all a very doubtful article—one that I am sure no experienced or scientific farmer or gardener would think it worth the labour of fetching from the common depôt. We are left in the same difficulty as to our rivers and streams, for means will still have to be devised of saving them from the masses of putrifying and decomposing matter which would be carried from the kitchens and bed-rooms of a city along with the rain-waters. It follows, therefore, that the system would do very little towards saving our rivers from pollution or saving the manure that runs into and pollutes them.

We must look at the manipulation required. Whether in town or country, whether it be a house in Pall Mall or a house twenty miles away, the earth for the use of the closet will have to be brought in, and the deposits mixed with earth will have to be taken away. This may appear a slight matter to a gentleman who is intently anxious to carry out a favourite experiment, and who may superintend the matter himself; but we have to deal with a mixed population, whose attention is absorbed by other pursuits, who know nothing of these matters, and who do not expect to be troubled with them. Anyone who has been much engaged in sanitary pursuits will well understand the immense difficulty of getting any proper supervision of appliances in a house. Things are left to all the chances of misuse, neglect, and accident; and when any derangement becomes offensive or inconvenient, then the plumber is sent for, he is scolded for bad work, but employed to put all right, and the matter is forgotten until some other derangement takes place. This ought not to be so, but so it is, and, therefore, the men who have given the most study to the subject of sanitary appliances pay particular attention to the simplicity of construction, to protection from chances of injury or accident, and, above all, to leave the persons using them as little to do as possible. From the very nature of the thing, labour about water-closets is the most offensive and the most difficult to be procured from attendants. An earth-closet in itself may be made as little liable to derangement as a water-closet; but what would happen in the majority of households if the water to supply them had to be placed in a receptacle and the contents had to be emptied every day? It would be impossible to avoid very much annoyance and discomfort, to say nothing of greater evils. And yet we are asked to sanction a system equivalent to this—that of placing dried earth in the hopper and removing the receptacle that receives it, and this daily, for it must not be told to us that the contents might remain longer without becoming offensive. If allowed to remain until decomposition sets in, which would be within twenty hours—and very often decomposition of solid matter has taken place before it leaves the human body—then no kind or amount of earth would prevent the escape of effluvia.

I do not say that if great advantages can be shown as the probable result of the introduction of a new system that this ought to be an objection. We must balance the disadvantages and accept that plan which embraces the fewer; but I hold that there has been nothing offered to us, either in theory or practice, to induce us to exchange the *water* for the *earth* system in closets. I am taking it for granted that our first object ought to be to remove from human habitations, with the least delay, everything of an offensive kind; the next in importance is that of making the refuse of animal life available, as nature intended, for the sustenance of vegetable life.

Is there not a mistake as to the deodorising properties of earth? Properly speaking, what is meant is that it possesses great powers of absorption. When we apply the soil from an earth-closet to newly-dug ground we find no effluvia, but then the action of the sun and air assists the work of assimilation; but when we have this refuse packed up in a box or in a sack ready for transit to a distant place, we have no external agents to act upon it. There has been a theory propounded that the work of assimilation at once begins; but this is not the case, as anyone may prove by placing upon the fire a shovel-full of the mixed excreta and earth. The sense of smell will soon inform him that the foul gases are only held by absorption in the earth. Besides this, urine contains a large amount of ammonia, and no agent is as yet known to science that will fasten this volatile gas. This gas would be gradually escaping and contaminating the atmosphere. If these things be so, what do we gain by using earth? Do we obtain an immunity from foul smells or malaria? I say not.

I have far exceeded my limits. There are many other considerations which, if space can be allowed me, I will embody in another letter.—I am, &c.,

B.

GOSSIP FROM GLASGOW.

(From our Correspondent.)

Nice customs curt'sey to great kings. You and I cannot be confined within the weak list of a country's fashion: we are the makers of manners.—Henry V.

While the beauty of Grecian architecture cannot well be questioned, the apologists of other and more meretricious styles have often argued that it is so fenced about with minutes and modules, intercolumniations and diameters, that it is wholly unsuited for general purposes; that it is too severe and reserved for any liberties to be taken with it, if, indeed, not too pure and good for human nature's daily food; and that in an age of "progress," elasticity, and utilitarianism, it is too retrospective, inflexible, and ideal. Hitherto the Gothic has been deemed the most subservient style, adapting itself with the flexibility of a prime minister to every known and unknown modern purpose, want, and exigency; but it is quite possible to ride a hobby to death, and age seems to be rather withering and custom staling its infinite variety. The great resource of Gothic has been its careless freedom and adaptability, but in at least Glasgow—of all places in the world—there is given to Grecian architecture a no less comprehensive plasticity,

and so the boasted stronghold of its rival has been at last invaded and reduced. It may be said that when Grecian architecture becomes thus mobile it ceases to be Grecian. As well say that English literature ceased to be English when Samuel Johnson or Charles Dickens varied the manner of its composition, or that Shakspeare's "Henry V." cannot be called a "drama," because that the first scene is in England and the last in France, and that the events of weeks and months are represented in as many hours. The criticism that can find Grecian architecture in only such precedents as the Parthenon or the Erectheon is about as petty as that which would circumscribe the English drama by the paltry pedantry of "the unities." If, despite the matter-of-factism of science, there is beauty inherent and associative in the commonest thing in nature, why should there not be also in the commonest thing in art? If in Greek literature there are the odes of Anacreon as well as the epic of Homer, why should Greek architecture so resolutely refuse to be dissociated from the temples of the Acropolis? "As circumstances alter, things themselves must alter," and the question seems to be, If the Greeks had had to design for such multifarious society as is ours—to clothe our naked and barefaced utilities with the true and the beautiful—in what spirit would they have done it? Would the grace of the Corinthian column not be thrown over the factory stalk? would not the leaf of the acanthus lead to the flowered muslin of the warehouse? It may be pleaded, perhaps, that Greek art is "dead," as is the language. Latin is also dead, yet Roman eloquence was revived by Shakspeare's Marc Antony. I suspect that those who argue thus of Greek art are those who do not know how to revive it, who have merely looked at the letter, not drunk in the spirit—made rhetoricians not born poets, and whose first care in "poetry" would be a foot-rule of trochees and dactyles. But the dramatic Samson was not to be bound by the withes of "the unities," nor is genius to be tied up and trammelled with red tape, measuring ditto, precedents, and glossaries. While it has all due respect for laws and canons, it knows also the when and the wherefore to cast them behind it. Gothic is free as the wild Indian is free; but Greek is free under order and government—order and government founded not upon laws, which are mere arbitrary contrivances, but upon principles which are innate, unvarying, and eternal. Whatever modification it assumes there must reign over all, proportion, symmetry, breadth, and unity; and to restrain new forms within these old conditions requires a no less severe judgment than fertile fancy—two qualities that do not always dwell in the same house.

I have hinted that in commercial Glasgow (as a "modern Athens"), Grecian architecture has been showing new forms in the old spirit, putting, as it were, new wine into old bottles; and I need scarcely say now, in even a London publication, that the author of this peculiar modification is Alexander Thomson. The latest instance of Mr. Thomson's adaptation of Greek to modern purposes is a building intended for a warehouse erected in one of our most fashionable and withal most varied thoroughfares, Sauchiehall-street, and having a return elevation to Scott-street. Of the shop storey little can be either made or said; suffice it, that it has been treated with that simplicity which, where a paramount condition is the greatest amount of void and the least of solid, can alone give "architecturesqueness." The central doorway leading to the premises above is, however, an imposing feature, and brings down to the simplicity of this storey something of the character and expression of the upper and more original parts of the building. Towards Sauchiehall-street, above the shop storey, is a range of thirteen windows, each having a broad architrave relieved by only a single fillet, and a cornice like to the curved cornice of the Egyptians, enriched with an incised honeysuckle-and-lotus. The upper part of this cornice is weathered as a sort of roof, and on the apex is a plinth pedestal supporting an acroterion. Beyond these windows is, at each end, a more solid piece of masonry pierced by only a two-light window having the same architrave as the others, a mullion with moulded base, and an ornamental capital, a dwarf frieze with incised ornamentation, trusses, and a remarkably severe and simple cornice. Upon the plane of these more massive ends, carried along the building, the thirteen windows seem to be superimposed; and at the level of the plinth of the acroteria, this plane is receded or stepped back, and the upper storey is thence resolved into a colonnade. The lowest third of the column is bevelled out of the square into the octagon; this again graduates into the circular, and the shaft, which has an unusually great inclination, terminates in a wide-spreading circular capital. Almost the whole of the column, from the square to the abacus, is covered with incised ornamentation. At the line where the circular part of the column grows out of the octagonal is a moulded dado abutting against the shaft, and upon this rests the sashing of the upper windows, which is so contrived as to give the effect of full relief to the colonnade. The putting in of these sashes—trifling as it may seem—gave to the building throughout a new expression, as if by a touch of magic. There is a great deal of subtle ingenuity in the way in which the colonnade rises from out of the solids between the lower windows—an idea which Mr. Thomson has before realised in his own and brother's magnificent property in Gordon-street, and in a building in Bath-street, and which I regret, however much I may appreciate, I cannot describe. The upper storey of the ends is pierced by three distinct windows, the piers dividing and enclosing them being on the same plane as the general masonry, and having simply outlined but enriched capitals. Stretching over all—these piers and the colonnade—is a grand unbroken entablature of such an original composition that to describe it would require a new nomenclature. Above this is a blocking, which, over the ends, is resolved into a sort of attic of two dwarf piers, and an entablature with raking cornice crowned with an acroterion. Towards Scott-street the storey above shops is composed of five windows with architraves, frieze, trusses, and cornice, and very considerable solids between them; and the upper storey of a colonnade of twelve square piers treated in the same manner as those of ends in the front elevation. The blocking over the entablature is broken up into eight square plinths or dies, on each of which is a chimney having something of the effect of a dwarf column. Throughout this remarkable building is that exquisite beauty of detail in alike ornamentation and contour of mouldings in which, in at least Scotland, Thomson is wholly unrivalled. Grecian architecture rejoices in the sunshine, and this building fortunately faces the south.

WHAT IS AN ARCHITECT?*

In Doctor Johnson's somewhat ponderous romance "Rasselas" it is related how the unhappy prince in the happy valley, in the course of his inquiries into all things human and divine, "foregathered," as our Scotch friends would phrase it, with one Imlac, who had at one time taken up the trade of poetry, and in the course of conversation proceeded to enumerate all the qualifications necessary for the office. "To a poet," he said, "nothing can be useless. Whatever is beautiful and whatever is dreadful must be familiar to his imagination; he must be conversant with all that is awfully vast or elegantly little. . . . But the knowledge of nature is only half the task of the poet; he must be acquainted likewise with all the modes of life. His character requires that he estimate the happiness and misery of every condition, and observe the power of all the passions in all their combinations. . . . He must divest himself of the prejudices of his age and country; he must consider right and wrong in their abstracted and invariable state; . . . he must write as the interpreter of nature and the legislator of mankind. . . . His labour is not yet at an end; he must know many languages and many sciences, and, that his style may be worthy of his thoughts, must, by incessant practice, familiarize to himself every delicacy of speech and grace of harmony." "Enough!" said the prince, interrupting him; "thou hast convinced me that no human being can ever be a poet." "To be a poet," said Imlac, "is indeed very difficult." "So difficult," returned the prince, "that I will at present hear no more of his labours."

With the alteration of a word or two here and there, the above passage would stand pretty well for a general description of what is expected nowadays of persons calling themselves architects. He who has taken upon him this calling will find that nothing is too high or too low for his consideration. He must be acquainted with the history and characteristics of all previous styles, and have a certain amount of ethnological knowledge, combined with an insight into the details of joinery and plastering, and an acquaintance with the various tricks of the building trades; he must be able to design a group of sculpture and to pronounce on the causes of a smell coming from the scullery sink; he may be called upon to raise a church spire or to descend into the uttermost parts of the kitchen boiler; he should be acquainted with the prices and quality of bricks and the principles of geology; a knowledge of mechanical statics and dynamics seems indispensable, as also a familiarity with the requirements of a greenhouse; he will of course be an expert water-colour artist, as well as an adept at making a survey of dilapidations, and he will with equal facility design a stained glass window or give instructions for the amelioration of a smoky chimney. In short, if it were possible to enumerate in one paper all the various subjects upon which architects are constantly consulted, and with which they are expected to be perfectly conversant, it would indeed appear that no human being could possibly be an architect.

Not of course that it is intended to assert that any one man in the profession is sufficiently insane either to think that he understands all these various subjects himself, or to endeavour to persuade his clients that he does. There is a limit both to human self-conceit and to human credulity. But the fact that such an impossible number of subjects may be supposed to come under the head of one profession, and that there is no fixed standard or boundary of architectural knowledge and practice, naturally leads to a great variety of opinions as to what is the real primary and essential element of the profession—the only rule of conduct being that each person generally thinks that the essential branch in which he is himself the most proficient, or for which he has the greatest natural inclination. This is a weakness inherent in human nature, and must be looked upon tenderly, though its results are, it must be confessed, somewhat puzzling; and it may be worth while to glance at some of the principal shades of opinion current as to what constitutes an architect, if, peradventure, by clearing some of them out of the way, we may be able to get a better view of the actual essence of an architect, and see wherein his calling consists.

An opinion which was formerly almost universal, and which still lingers amongst us, is that an architect is a man who draws plans of houses suited to the wants and purse of his client, looks after the interest of said client, keeps an eye on the doings of the joiners and plumbers, goes through the accounts and cuts down the extra bills, and in short acts generally as a sort of bridge over the great gulf which is fixed between the refined and aristocratic client and the gross building element, and for these good services pockets five per cent., besides pickings. It is matter for congratulation that this specimen is likely soon to vanish, like the dodo, into the limbo of forgotten things; indeed, it is known that even in the instances in which it is still to be found, it has generally been thought necessary to import a little fine art into the outer office, in the shape of a draftsman, who may be cunning to devise ornaments and elevations, while his employer, in the *sanctum sanctorum*, improves the shining hour in the more congenial occupation of letter-writing and arbitration, or administering soft soap to his clients. But although this type is passing away, "the evil that men do lives after them," and it is probably mainly owing to the long prevalence of the above-named view of the profession that the architect who takes a higher view thereof is so constantly exposed to the attacks of respectable people, who wish him to look at their ovens, to poke his nose into their drains, and to tell them why the shower bath does not act properly, in all confidence that this is his proper duty and calling. What that calling really is I have to consider presently, but at least it has not necessarily to do with such things as these; for does it not stand to reason that the manufacturers of grates and cisterns and shower-baths, who are constantly engaged practically about them, must know more of them than a man who lives outside of trade and manufacturing operations, and only knows partially by theory what they are practising every day of their lives? The fact is, that this notion of an architect's business proceeds from the idea that tradesmen will always deal unfairly unless there is an architect to check and oversee them. Now the fact is that the architect cannot check them efficiently, for the simple reason that, in nineteen cases out of twenty, they know much

* Portion of a paper read by H. H. Statham, Jun., before the Liverpool Architectural Society.

rule about the matter than he does; and if there be a foundation for the idea that such a check is necessary, I believe it arises from the fact that as long as you will not trust men they are not likely to be worth trusting, and that contractors and workmen who find a man pretending to overlook and find fault with them about things with which they are much more conversant than he is, are likely to be tempted, out of a mere spirit of retribution, to "chisel" the architect in some way or other. And I really cannot see why such a strong line should be drawn between the honesty of the professional man and the tradesman or labourer, or why it should be supposed that a good workman, if treated honourably, would be any more likely to shuffle over his work or to make a job for himself than the architect. Are "jobs" entirely unknown in our profession?

To go to another extreme, there is a class of architects and art-critics, including some of our cleverest men, who very constantly affirm that the only business worthy of an architect is to design sculpture, and that the building is only a frame to contain sculpture, and is without it perfectly lifeless and expressionless, and unworthy to be classed as a work of art. At first sight it would appear that this amounted merely to a reduction of the number of artistic professions by one, that of architecture being simply merged in sculpture, and disappearing gracefully from the scene, as a superannuated myth. But those who have taken stock at all of the sculptured works from the designs of architects will see that there generally is a difference between these and what passes for sculpture with the leading professors of that art; and that architects' sculpture generally shows remarkably stiff figures and expressionless faces with very large heads, and legs and arms "of the period," before *biceps* and *gastrocnemius* muscles were invented. The simple fact is that to be a good sculptor or designer of the figure on a large scale is of itself an aim which will demand all a man's time, energy, and study, unless he be one of those exceptional geniuses who appear once in three or four centuries; and as some one must contrive and draw the buildings that must be erected to receive the statuary, it is clear that the architect cannot successfully combine the ordinary business of his profession with the acquirement of a really high power of design in sculpture or painting. He who would succeed in this path must give himself entirely to it. Then there is another theory, tending in quite a different direction, but which is gaining ground a good deal in certain quarters, that an architect is in fact only a constructor; or, in other words, that an engineer and an architect are very much the same thing—especially an engineer. That the professions of architect and engineer might be much more closely assimilated than they generally are is probable enough, but what is required is rather that the engineers should know more of architecture than that the architects should be better engineers. The structures erected under the superintendence of architects are generally stable enough; at least, failures are not more common in them than in engineering works, though it may be admitted that the engineers have tougher constructional problems to grapple with. But what are we to say of the engineering structures of the day considered from an artistic point of view? With regard to most if not all of them it must, I fear, be said, that they show either an utter disregard to anything like beauty of appearance or decoration, or else the decoration is attempted in such a manner that it had better have been let alone altogether. The usual engineer's notion of bringing a work under the denomination of "architecture" consists not in emphasizing and ornamenting the various parts of the construction, so as to render the aspect of the work pleasing while not concealing its strength, but rather in masking the whole construction behind a screen of what is supposed to be architectural design, that is to say, an imitation of some features which have belonged to some period of architecture, and are readily laid hold of and copied. Thus an ordinary brick or stone bridge for carrying a railway over a road or brook, which, if simply built in the strongest possible manner, with a pointed arch and deeper ribs of masonry where the principal lines of pressure act upon it, would be a really pleasing object, is turned into a kind of quasi-architectural sham, with pilasters affixed, and a weak and purposeless-looking blocking and cornice on the top. There is, indeed, a kind of engineer's style, unlike anything that was ever seen in architecture, which is most commonly developed in buildings devoted to the purposes of waterworks; it is not easily describable, but once seen can never be forgotten. Then there is again another theory to the effect that all architectural beauty consists in polychromatic decoration, about which some very fine things have been and frequently are written concerning walls "glowing with colour," "suffused with all the tints of the rainbow" ("*throbbing* with colour" is an expression I have seen used), and the advocates of this theory would have us believe, on the evidence of some nearly obliterated appearances of colour on the stones of some of the Greek temples, that the Greeks, after selecting the whitest marble from the quarries of Pentelicus, were at the pains to daub it all over with colour, an opinion which, I think, with Mr. Garbett, is against all common sense, and not to be believed on any amount of circumstantial evidence; indeed, if the most indubitable evidence were produced, it would seem far more probable that the buildings were painted over at a later period of debased taste, just as our own Gothic cathedrals were daubed with whitewash; a circumstance which Macaulay's New Zealander, in writing his history of the architecture of ancient England, might adduce to prove that the mediæval architects abhorred colour and invariably whitewashed their buildings to bring them to a uniform tint.

The first time that my attention was drawn to what I venture to think the exaggerated importance attached to coloured decoration by some of its adherents was on the occasion of the reading of a long and valuable paper on the subject by Mr. Audsley in this room, in 1860. In the course of that paper, after remarking on the singular absence of coloured decoration in the interior of our buildings, and the bad taste which ordinary house decorators generally showed in such things, when they were attempted, he continued, "Why, may I ask, are the architects employed upon what is often the mere shell or foundation for artistic display, and the work taken from their hands when (if they are worthy of their profession) their real office begins? An architect is not a constructionist alone, and more, an architect need not trouble his head about it at all, beyond the dictates of common sense."

I have always borne Mr. Audsley a grudge for that sentence, and determined to have it out with him some time or other; for I think that if the building itself is left to be the mere shell for artistic display, that then in that case the architect certainly has not been "worthy of his profession:" and this brings me to the real point, *what*, after all, is his profession. If we deny that he is a mere housebuilder and inspector of workmen; if we will not allow him to be merely a decorator; if he is not, as Mr. Audsley truly said, a constructionist alone, and if we cannot admit him to be a designer of sculpture, what ground is there left for him? Simply this—he is a *Building Artist*. It is his office to use stone, brick, and timber, as the painter uses colour and the musician uses sounds; though the analogy with music is the truer one, because both the arts are alike in having no definite expression, or, as it is the fashion to call it, no *phonetic* power—they can appeal to the imagination or feeling, but not to the reason. And if this view of architecture seems at first sight a dry and uninteresting one, after so many writers in the present day have been endeavouring to impress upon us that we are (or ought to be) painters, sculptors, and what not that is grand and exciting to our imaginations, I think a little consideration will show that architecture pure, as the art simply of building well, has high claims enough upon our interest. For it is the special privilege of the architect to turn that which would be a mere utilitarian necessity into a source of pleasure, by, in the first place, arranging the plan of his building so as not merely to afford convenience and economy of space, but to be effective in its disposition and arrangement, and in the second place, by the arrangement and grouping of the windows and of the various masses of building, and by the effects of shadow carefully studied and considered, to see that the building gives some positive pleasure and interest to those who behold it, in recompense for the amount of light and air that it shuts out, so that, instead of being a mere nuisance and excrescence, it should be an object conveying a definite meaning and expression; and, finally, by the judicious application of well-studied ornamental detail where it may help to emphasize and bring out the expression of the building without being too obtrusively prominent, to give the last touch of refinement and point to the design. And I cannot but think that this treatment of a building in the mass is as much entitled to be called a separate art as that of painting, sculpture, or music, though under somewhat different conditions: I believe it is a source of beauty quite complete in itself, and whose place cannot be filled or supplied by anything else, and that we are therefore fully justified in thinking that the architecturesque employment (to use Professor Kerr's new word) of the ordinary durable building materials of stone and timber is the real duty of the architect, and is to be regarded as of more importance than the designing of coloured detail in more fleeting and perishable material for the decoration of the interior. If the architect tries to be a sculptor, the sculptor can beat him; if he would shine as a constructor the engineers can commonly beat him; but in his own line as indicated above, he is doing what no artist of any other profession can do for us, and furnishing an important link in the chain of art. And it is certainly desirable at present that we should insist upon this view of the building art as a thing existing distinct from and in addition to the other generally recognised branches of art, for it is only thus that we can rebut the theory which has been of late years so noisily propounded in certain quarters, that there is really no defined profession or art of architecture, and that anyone who knows how to construct a building has a right to call himself an architect.

SCARISBRICK HALL, LANCASHIRE.

A FEW weeks since (Building News, No. 683), when speaking of what Mr. Gladstone said of this tower, we promised to give an illustration of it, a promise we now perform. It will be remembered that Mr. Gladstone said that he thought it impossible not to recognise the Scarisbrick tower and the clock tower of the Houses of Parliament, only he thought that Scarisbrick tower was the most beautiful and living work. It certainly does not require a very powerful imagination to trace the origin of the two towers to the same author. Scarisbrick Hall is the seat of Lady Scarisbrick, and was commenced in 1837 from the design of the late A. Welby Pugin. The late possessor, Mr. Charles Scarisbrick, insisted upon retaining some portion of the original house and the whole of the old foundations—the confined limits of which have necessitated the erection of a north-eastern wing, 170ft. in length, which is entirely hidden in the south-west view which we give to-day.

The main building is erected of Lonridge and Scarisbrick stone, which has preserved its arris as sharp as the day the mouldings were cut, thirty years ago, not the least sign of decay having appeared in any part. The fittings are of a very splendid and costly description, the doors, shutters, &c., being richly inlaid with monograms, arms, and other decorations. The ceilings are also worthy of especial notice. The arches and jambs are executed in Carrara statuary and Derbyshire black marble.

The great hall is entirely lined with ancient Belgian carvings of the fifteenth century; and, although only a remnant of those left by Mr. Charles Scarisbrick, forms still one of the finest collections of the kind in the country. The whole of the interior has been executed since Lady Scarisbrick came into possession of the property, and has been carried out under Mr. E. Welby Pugin's direction by Messrs. Hardman, Crace, Farmer, &c., and local workmen. The cost of the entire work, including the offices, which are on an extensive scale, amounts to about £85,000.

NEW FONTS.

WE give this week engravings of two fonts executed by R. L. Boulton, Cheltenham. The first is placed in the Catholic Church, Jarrett-street (not Lamb-street, as written by the engraver), Hull. The second is for Cleanwell Church, Gloucester. The last-mentioned is in Caen stone, with granite shafts, having the eight panels carved in bold relief, from the designs of Mr. J. Middleton, Cheltenham, the architect of the church. It was erected at the expense of the Countess of Dunraven.

The voluntary examination of students by the Institute of British Architects will take place in the third week of next month.

Scarisbrick Hall, Lancashire.

AUGUSTUS W. PUGIN, ARCHT

H. Abbott Lith.

Printed by Whiteman & Bass

FONTS

CHVRCH JAMES ST HVLL

NEW CHVRCH CLEANWELL GLOVCESTER

PROGRESS IN PERSIA.

THE ferment for progress has spread from Turkey to Persia, and will very likely make greater way in the latter country. A short line of suburban railway from Teheran, as a trial, has been conceded, and the arrangements are being made by a few Englishmen and Germans. The most striking event, however, is the decision of the Shah to enlarge Teheran, the capital, which has hitherto been remarkable for narrow, ill-paved, and unhealthy streets, shut in by the ramparts. The contrast is the more striking because Rhai and the villages in the neighbourhood are laid out with wide streets, planted with trees, and irrigated. The approach to Teheran is very good, and the palace of the Shahs, belted in with sycamore, produces a fine effect. The Shah has given orders to pull down the present ramparts, and that the new walls shall be a mile and a half distant. Thus the circuit of the city will be greatly enlarged. As in Vienna, under like circumstances, a circular street or boulevard, a Ring strasse, will be formed on the site of the old fortifications, and be a great ornament to the city. As far as possible the old streets will be enlarged, so as to let light and air into the unseemly city, but the best relief will be given by building fresh quarters within the new bounds, the streets of which are to be laid out on the same principles as those of Constantinople, straight, wide, and paved, so as to obtain better security against fire. As Teheran is situated in a plain, the enterprise can be the more readily carried out. Its execution has been entrusted to M. Buhler, a French officer, who has been fifteen years in the Shah's employment, and who is said to have all the qualifications for the task. The plans were put in hand at once.

SCHOOLS OF ART OF EPHESUS.

ON Thursday, the 16th, Mr. Hyde Clarke read before the Society for the Encouragement of the Fine Arts, at Conduit-street, a paper on "The Schools of Art at Ephesus."

Mr. Clarke stated that in his opinion the neighbourhood of Ephesus presented the appearances of pre-historic occupation. Graves and remains had been found on the railway below the recent formations, but had not been properly examined. The cliffs west of Ephesus are particularly deserving of investigation, as they are of the class in which rock-cut pictures are found, as in the case of the Lydo-Assyrian figure of the pseudo-Sesostris at Nymphi. Although he had never discovered anything satisfactory in this way near Ephesus, he did not consider the subject exhausted, for though he was more inclined to look for the other pseudo-Sesostris nearer Smyrna, yet it might have been placed nearer Ephesus, as Herodotus spoke of it as being on the road from Ephesus to Phocæa. He had discovered a curious rock-cut watching place and cistern on the ridge of Messogis, going from Chirkinjee towards the village he founded at Azizieh. He likewise called attention to the numerous caves, as that called of St. John, found in 1863, and the cave church on the road to Chirkinjee, which he regarded as having been formerly a temple or oracle. The floors of these caves, if properly examined, will most likely be found rich in pre-historic remains, throwing great light on the early condition of this part of the world.

With regard to the origin of Ephesus, he saw no ground for adopting any of the theories usually formed in books. He was much inclined to think from frequent observation that Ephesus was formed like some other ancient cities from the amalgamation of three villages or towns founded on neighbouring hills, and which may account for the quarters and names of quarters afterwards found. As to the name of Ephesus he noted it as abnormal, and he did not accept the favourite etymologies. It did not appear to belong to the class of Iberian names which he had discovered in Western Asia Minor, showing an Iberian population conformable to that of Spain, and anterior to the Hellenic. Ephesus and the names of the other Amazonian cities were abnormal from both classes, and he was, therefore, inclined at present to consider them as belonging either to the period of alleged nomad invasion, or perhaps to the Lydo-Assyrian period of the rock-cut monuments. The explanation of this was, perhaps, to be sought not in any Semitic influence, but in a dynasty preceding the Semitic invasion of Mesopotamia, and referable possibly to that period indicated as Turanian by the present connection of the Georgian and Tibetan languages, first proposed by Bryan Hodgson, and confirmed by himself.

As yet Ephesus had not been explored or described, notwithstanding the extent of that valuable monograph, the "Ephesus" of Edward Falkener, the architect, who, like Professor Donaldson, was only a few days on the spot. It requires for its due examination the long-continued labours of men of trained ability in explorations, like C. T. Newton or George Dennis. At present the monuments are being destroyed rather than examined.

The neighbourhood of Ephesus, which he had partially explored, and part of which had been examined by Texier, required systematic investigation. Ephesus was evidently surrounded by summer suburbs, or places for villeggiatura, like all these Ionian cities. He had been on most of these sites. That at Eski Azizieh must have had a population of 20,000; but he did not expect any monuments would be found there, at Chirkinji, or at Azizieh, but he thought that below Azizieh, at Boorgas, and in the mountains on that side there was from the existing fragments some promise. Ortygia, Latorea, and the other old names of villages have yet to be identified.

Referring the oldest known period of art to the Lydo-Assyrian, he said that Ephesus in its most flourishing period had been the seat of great schools of architecture, sculpture, painting, and medalling. It was formerly situated in the neighbourhood of two other rich temple cities, Samos and Magnesia-ad-Maandrum, and of Miletus and Tralles. Ephesus had been the birthplace and the residence of many of the most distinguished artists of classic times. According to Pliny, of the sacred buildings enriched with sculpture and ornament of such a description as entitled them to be called most famous, the first was the Temple of Diana at Ephesus, the second the neighbouring Temple of Apollo at Miletus, the third the Temple of Eleusis, and the fourth the Temple of Jupiter Olympius at Athens.

Of the school of architecture least is known—only this, that its great buildings in the Ionic style gave employment to many of the greatest men, and particularly in the several reconstructions of the Great Temple of Diana. Pæonius is by Falkener placed as the architect of the sixth temple. He was architect of the Temple of Apollo at Miletus. The seventh temple is by him assigned to Ktesiphon, of Cnossus, and his son Metagenes. The latter was employed by Pericles on the Temple of Ceres at Elensis. The architect of the eighth temple was Dinocrates, an architect frequently employed by Alexander. He laid out the city of Alexandria, and his projects included one for converting Mount Athos into a statue of Alexander, and another for suspending the statue of Arsinoe in a temple of loadstone. The name of Dinocrates is variously given. Rhœkus was a sculptor and architect, and father of Theodorus the architect.

Demokritus, Ktesiphon, and Metagenes wrote on architecture. Falkener, "Ephesus," p. 132, quotes the following curious and ancient Ephesian law as to architects: When an architect received the care of a public work, he assured what would be the future cost, and was obliged to deliver up his property to a magistrate as a security till the work should be completed. If the expense then corresponded to the estimate, he was rewarded with decrees and honours, and if it did not exceed one-fourth part in addition, it was defrayed by the public, and no punishment inflicted; but if it exceeded that sum, his property was made use of to complete the works. Twenty-five per cent. was assuredly a liberal margin.

The school of sculpture embraced the greatest names. Rhœkus, and two or three sculptors named Hegesias, are known to have been natives of Ephesus. The most ancient work of art that bears the artist's name engraved on it, is the Gladiator, by Hegesias, in the Borghese collection. Among those recorded as having practised there, are Phidias, Praxiteles, Polyclytus, Skopas, Thrason, Myron, Ktesilaus, Kydon, Heraklides, Mentor, Pharax, Phradmon, Menestratus, Euphranor, Klesis, Posidonius, Strongylion, and Messalinus.

A celebrated select competition was for the statues of the Amazons for the Great Temple. The artists themselves were made judges, "when it appeared that he was the best whom everyone esteemed next to himself." The best then was Polycletus, whose Amazon is supposed to have been holding a bow, from the many copies of it which are now found. The next to him was Phidias, whose statue stood leaning on a lance; the third, Ktesiphon; the fourth, Kydon; the fifth, Phradmon; and the sixth, Strongylion, whose statue was celebrated for the beauty of the legs.

Rhœkus executed, for the Great Temple, an image of a female, called by the Ephesians "Night."

Theodorus, the son of Rhœkus, is said to have carved half a statue of Apollo at Ephesus, the other half of which was executed at Samos by his brother (Pausanias, x. 38), Telekles, who was the father of another Theodorus.

There were works of Skopas in the temples at Ortygia, among others Latona with a sceptre, and Ortygia near her bearing the two children. (Strabo, p. 639).

Among the public statues were those of the Lacedemonian Commanders Lysander, Etronikus, and Pharax, and of the Athenians, Konon and Timotheus.

The Temple of Apollo contained a colossal statue of the god, supposed to be by Myron. This is thought to have been the statue of Apollo which was taken away by Antony and restored by Augustus, who was warned to do so in a dream (Falkener, 110).

Behind the Temple of Hekate stood a famous statue of the goddess Hekate of Ephesus, the patroness of the magicians of the city. It was by Menestratus, and of such splendour that the priests had to warn those who entered to shield their eyes from being injured by it.

One of the last works mentioned is of the Roman time, when the citizens of Ephesus erected a golden statue in the Temple of Diana, in honour of Artemidorus, who obtained the restoration of some of the domains of the temple (Strabo, p. 642).

The Temple of Diana, according to Pliny, was full of sculpture, almost all by Praxiteles. He was also shown some works by Thrason, and said that the statues alone of the temple would afford materials for many volumes.

Thrason likewise executed the Hekatesium, the Fountain Penelope, and the old Eurykleа.

Mentor executed the statue of Diana Ephesia, the tools for working which were hung up in her temple. The same compliment was paid to him in the Temple of Jupiter Capitolinus. He executed also silver vases.

In the Temple of Diana was a statue of Philip of Macedon, destroyed by the mob in the time of Alexander.

An iron Cupid was dedicated in the temple, and appeared suspended, as if without any other support than magnetism.

Hipponax was a distinguished poet of Ephesus, of such strong satire that he was obliged to flee from his native town; whereupon two sculptors set up an image of him, in which they overdid his naturally deformed appearance, but they were so severely satirised by the poet that they hanged themselves in despair.

Trajan presented doors to the temple, which exhibited the Battles of the Giants—Jupiter with his thunderbolts, Neptune with his trident, Apollo with his arrows, and in the lower part the giants fighting with dragons, throwing rocks with their hands, and looking up with maddened eyes.

Of the school of painting more is known. Evenor, called the Prince of Painters, flourished here. He was succeeded by his son and pupil, Parrhasius, who styled himself the King of Painters, and wore a crown of gold and robe of purple. Apelles was also a native of Ephesus. Among the artists connected with the school of Ephesus were Zeuxis, Idæus, Ephorus, the master of Apelles, Theodorus, Ktesikles, Timarete, a female artist, Timanthes, Nikias, Euphranor, Kalliphon, of Samos. Parrhasius and Apelles wrote on painting, so that, with their own and other writings on architecture, Ephesus had a library of art.

Zeuxis and Parrhasius had here their famous contest, in which the grapes of Zeuxis were plucked at by a bird, but, as Zeuxis owned, Parrhasius went beyond, for, as he said, "Zeuxis has beguiled birds, but Parrhasius, Zeuxis." Zeuxis is said to have died from having painted the portrait of a funny old woman, the look of

which was so laughable that he laughed himself to death. Parrhasius greatly contributed to the Temple.

Apelles, who flourished in the next generation, was much more modest, and he would only put his name to three pictures. He painted the portrait of Alexander the Great holding a thunderbolt in the Temple of Diana, for which he received twenty talents, or £3,875. The fingers seemed to stand out, and the thunderbolt to be outside the painting. All these works were executed in four colours only. It was said of this picture that there were two Alexanders—the one begotten of Philip, and he was invincible, and the other painted by Apelles, and he was inimitable.

Arrian says that when Alexander had this portrait taken by Apelles, and came to look at it, he did not praise it so much as the picture deserved, but on his horse being brought in, it began to neigh at the horse represented in the painting as if it also was a real one: "It is clear, O King!" said Apelles, "your horse is a better judge of painting than you are." Cicero speaks of the painting as the most valuable object in the Temple, from which it was stolen by the infamous Verres. Apelles painted Diana in the midst of a choir of virgins; Megabyzus, the high priest of Diana Ephesia, in his state robes; and Klitus on horseback, equipped for war, and asking for his helmet, presented to him by an attendant. It was at Ephesus the incident of "Ne sutor ultra crepidam" took place.

Nikias, pupil of Antidotus, executed the painting of the Sepulchre of Megabyzus.

Timarete, the daughter of Nikon, painted a Diana for the Temple, which in the time of Pliny was one of the oldest panel paintings known.

Kalliphon, of Samos, had two fine paintings in the Temple, one described as Discord raising the battle at the ships of the Greeks, and the other supposed to be women binding on the armour of Patrocles.

Ktesikles, a painter, not receiving from Queen Stratonike such a reception as he considered himself entitled to, painted her romping with a fisherman, for whom, according to common report, she had a strong liking. After showing this picture in the harbour of Ephesus, he at once set sail and got off. The queen would not, however, allow the removal of the painting, the likeness of the two figures being admirably done. (Pliny, Nat. Hist., xxxv., 40.)

There were likewise at Ephesus schools of medalling, which produced the coins of Ephesus and the neighbouring cities; of silversmiths' work connected with the shrine of Diana, and of which Mentor was a famous master; and of pottery. A large collection of framed photographs of Ephesus and the Seven Churches, contributed by Mr. Alexander Svoboda, reached round the room.

A discussion ensued, in which Mr. Hurlstone, President of the Society of British Architects; the Chairman; Mr. A. A. Fry; and the Rev. H. J. Knapp took part.

CURE FOR CHOLERA.

A NEW remedy for cholera, diarrhœa, and other diseases has been introduced by Dr. Chapman, and is at present attracting the attention of the medical world. It consists in the application of ice in varied quantities to different parts of the spine. On the 1st inst. the *Medical Press and Circular* published a case sent by Dr. Fitzgibbon of choleraic diarrhœa, which, after resisting other treatment, was checked by the application of Chapman's ice bag. Dr. Hackett, physician to the Colonial Hospital at Berbice, British Guiana, has also tested it with good results. At a recent meeting of the Surgical Society of Ireland fresh facts were brought forward, which seemed to prove that the new remedy does really exert an appreciable, physiological, and therapeutical action. Dr. J. H. Benson stated that it proved successful in a case of obstinate suppression of the menses, and had greatly benefited a patient suffering from partial hemiplegia. Dr. Hewitt informed the Society that he had also used it in a case of delirium tremens, and found that it cured the tremors, and produced sleep almost immediately. It is chiefly, however, in its efficacy as a cure for cholera and diarrhœa that we feel interested, and we hope soon to hear of further happy results. The *Medical Press* earnestly advises the profession to test the ice bag as a remedy for diarrhœa, so that if happily a large and varied experience should prove that it is really remedial of this disease, it may afford strong hope that we may find in it a most potent remedy for cholera itself.

SCIENTIFIC LECTURES FOR THE PEOPLE.

A SERIES of lectures in connection with Mr. Twining's Economic Museum at Twickenham, for the instruction of the poorer working classes in elementary science, and its applications to health and every day life, has been in course of delivery in various parts of London during the autumn and winter, the last for the season having been given at the Mayfair Literary Institute, Hertford-street, Mayfair, on Tuesday evening last. The course consisted of eight lectures, the first being a description of the most elementary notions of matter; the second of the laws of gravitation, and the most elementary principles of mechanics; the third described the phenomena connected with the pressure of air and water (aërostatics and hydrostatics), and of the production and transmission of sound (acoustics); the fourth contained some general considerations concerning light, heat, electricity, and magnetism (chemical physics); the fifth was upon elementary chemistry; and the sixth, seventh, and eighth were upon the elementary outlines of natural history, human anatomy, and physiology. Scientific lectures, except in the classes of elementary schools, generally presuppose some slight acquaintance on the part of the audience with the fundamental principles involved, or, at least, with the usual nomenclature. It being, however, Mr. Twining's aim to bring a certain amount of this knowledge within the reach of those who are perfectly uninstructed in the matter, he has prepared his lectures in the clearest and most simple language, taking care to define and illustrate every technical term, however common it may be, before using it. The illustrations, consisting of diagrams, specimens, models, and experiments, are all likewise of the simplest kind. The lectures are provided gratuitously in all respects by Mr. Twining, and have been delivered two or three times every week (holiday times excepted) to audiences varying from one or two hundred up to about a thousand persons, at school-rooms, literary institutions, workmen's clubs, mission rooms, and at the Lambeth Baths. They have been clearly and effectively read by Mr. William Freeman, curator of the Twickenham Economic Museum, the experiments being performed and the illustrations exhibited accurately and satisfactorily by Mr. George Whipple, of the Royal Kew Observatory. This attempt to bring elementary science within the reach of the poorest and most uninstructed will be highly appreciated by all sanitary reformers, who find their greatest obstacle in dealing with the poor themselves to be their complete ignorance of the most elementary laws of science and health.

ARCHÆOLOGY.

From Rome we have an account of some very valuable art discoveries that have recently been made there. The excavations in progress are producing the most interesting historical results, and bringing to light a large number of the ancient masterpieces of art with which the holy city was formerly embellished. Two flights of steps which led from the river have been cleared, and two passages have been discovered which gave direct access to the interior of the adjoining market. At the depôt of marbles on the banks of the Tiber was also found a large staircase with sculptured ornaments, in a position exactly corresponding with the previsions of the learned director of the works. Up to the present time there have been found 111 blocks of African marble, 240 of antique yellow, and as many of serpentine. Other varieties are met with in smaller quantities, such as antique red and green, breccio, and even Chalcedonian. At Ostia, where the researches are being made by a commission of antiquarians, some remarkable monuments have been found throwing a new light on the worship of Cybele in that place. Among other things there is a series of votive offerings in the ground consecrated to that goddess. In the same place was discovered the remains of a temple, destined for initiatory ceremonies, and which forms an edifice quite unique of its kind; also a house very elegantly decorated, and on the walls of which was a fresco representing a festival sacred to Diana. This painting is of extreme delicacy of execution.

About 100 old coins of the coinage of the reigns of Elizabeth, James, and Charles I., were discovered recently in connection with certain extensive building operations on the south side of Trongate, near Glasgow. Some of the coins were English and the remainder Scotch.

An interesting discovery has been made at Berwick within the last few days, while trenching ground for a garden at a recently-erected villa, on the Corporation property. The gardener, being compelled to go deep, came upon the skeletons of several human beings. They were in different parts of the ground. On each side of three of the bodies were slabs of undressed stone, with rude stone coverings. On one was an incised cross, with a rose in the centre; and on another, the cist of a child, was a Latin cross. At another part of the ground there was discovered a tower-like structure, in front of which is a wall 4ft. thick, and running in a transverse direction into a portion of the adjoining land. Permission was obtained to trace the wall into the adjoining land, and it has been ascertained that the wall is 94ft. long, by 43ft. in width; the solid masonry is 23ft. square, and between the wall and the building is a space of 20ft. From a small piece of architectural moulding which was found, it is presumed that the building belonged to the Norman period.

There has just been discovered at Pompeii the impression of a papyrus, the characters of which are perfectly legible. This result is of importance, from the fact that no traces of any had been hitherto found in the excavations near Naples, although many were discovered at Herculaneum.

At a recent meeting of the Archæological Institute, Mr. E. Smirke in the chair, Mr. Tregellas gave a short account of "Simpson's Moat," a fortified house of the fifteenth century, near Bromley, Kent, about to be destroyed under the operations of a building society. The house had been acquired by Nicholas Simpson, barber to Henry the Eighth, and by him much improved. From him also it took the name by which it has ever since been known. It since came into the possession of the Langley family, who held it down to modern times; but it had been unoccupied for half a century. A slight sketch of the principal existing remains, together with a ground plan, were shown.

A discovery, which a Scotch paper thinks will give rise to much speculation and investigation among antiquarians, has just been made on the property of Mr. Cadell, of Grange, Edinburgh. In the course of some improvements in the garden, the workmen turned up a large stone, which at first was thrown aside as an ordinary boulder, and for a time was allowed to lie on the surface. An examination afterwards made, however, showed that the reverse of the stone contained an inscription which seemed to identify it with the wall of Antonius (commonly known in that quarter as "Graham's Dyke"), built during the Roman occupation of Lollius Urbicus, for the purpose of shutting off the wild tribes to the north, and which was supposed to extend from the Forth to the Clyde. From the inscription it is conjectured that this stone was intended to commemorate the finishing of the wall; and, if so, it will prove a valuable aid to antiquarian research, as showing how far the work actually did extend eastward.

WATER SUPPLY AND SANITARY MATTERS.

The first section of the new sewerage works at Dartmouth has been commenced, though slow progress for the present is being made, as the men are only able to work "tide work," owing to the water at high tides filling the cutting in Duke-street. The contractors for the work are Messrs. Call and Pethick, Plymouth. The Town Council has decided on using culvert instead of stave pipes as at first proposed.

Mr. J. Bailey Denton says that those who have observed the character and amount of the rainfall of the past winter, and are watching its effect upon our rivers and springs, will feel themselves justified in predicting a reduced summer supply of water for domestic use. As this occurrence may be adduced as proof of the insufficiency of the Thames and its tributaries as sources of supply to the metropolis, and may, when discovered, hasten the issue of the report of the Water Supply Commission, he desires to anticipate both circumstances by again urging the storage of surplus water.

The sanitary condition of Manchester has long been a matter of anxiety to the local authorities. At a meeting of the sanitary association, held on Friday, the mayor remarked that among the causes which contribute to produce this unsatisfactory state of things, not the least serious was the want of proper hospital accommodation for patients suffering from fever and other infectious diseases. In the opinion of the newly-appointed officer of health, this was a want which must be supplied before they could hope to make any impression of consequence upon the death rate. What is proposed, therefore, is that immediate steps should be taken for the establishment of hospitals, where persons labouring under infectious diseases might be placed under more favourable hygienic conditions. It is hoped that the scheme may be carried out by voluntary subscriptions.

The opening of the Liberton Waterworks for the use of the inhabitants of the villages of Liberton and Greenend, N.B., took place on Wednesday. They were commenced on the 15th of January last, and a supply of 30,000 gallons daily is now available. The supply bids fair to be both abundant and permanent. The works have been completed within the stipulated time, under the superintendence of Mr. A. D. Stewart, C.E.; the contractors being Messrs. Chalmers and Mackenzie, of Dunfermline. Mr. Kay, Loanhead, executed the plumber work.

Building Intelligence.

CHURCHES AND CHAPELS.

St. Mark's Church, North Audley-street, which was built forty years ago by Mr. Gandy (Deering), and has been pronounced by high authority to be one of the best specimens we have of pure Greek architecture, has lately been "re-cast," and is a good example of what may be done to improve a galleried church of the kind. Desk obstructions have been removed, so as to open the holy table to the view of the whole congregation.

On Easter Tuesday the parish church of All Saints, Legbourne, Lincolnshire, was reopened after restoration. The church is of the Early Decorated style, and is built partly of sandstone and partly of the chalk of the county. The whole cost of the restoration has been about £2,000. The chancel has been entirely rebuilt. The architects of the church were Messrs. Rogers and Marsden, of Louth.

On Easter Tuesday a new church was opened by the Bishop of Worcester, at Dordon, in the parish of Polesworth. It consists of a nave and chancel with an octagonal bell turret at the west end, and is built of brick with stone dressings. Mr. G. E. Street, A.R.A., is the architect.

The new church of St. Catherine, Gloucester, was consecrated by the Bishop of the diocese on Easter Monday. The style of the building is Early French, and it consists of nave, transepts, and chancel, with circular apse. The nave is 68ft. long and 28ft. wide, the transepts are each 20ft. by 13ft., and the chancel is 22ft. square. The church is built chiefly of Severn-side bricks, relieved outside by bands of black and white Staffordshire bricks, and stone dressings. The church has been erected by Messrs. King and Godwin, builders, from the designs of Mr. H. Medland, architect, of Gloucester.

On Saturday the foundation stone was laid of the new church of St. Peter the Apostle, Swinton. The plans and designs are by Mr. Street. The contract price is £10,000, but before the church is finished, it is expected that half as much more as that sum will be required.

A new Congregational Church at Dalkeith, Scotland, was opened on Sunday. It is from the designs of Mr. J. W. Smith, architect, Edinburgh, and has seat room for 430 persons.

The foundation stone of a new parish church at Kilmoil, County Down, was recently laid by Colonel Forde, M.P. The style is Early French Gothic, and the cost will be £3,000. Mr. Thomas Drew, F.R.I.A.I., is the architect, and Mr. John Murphy, Belfast, the contractor.

The Congregational Church at Bowdon Downs, Lancashire, was reopened on Sunday last after enlargement. The work has been carried out at a cost of about £3,000 from the designs of Mr. Ernest Bates, architect, Manchester.

On Thursday week the corner stone of a new Wesleyan Chapel was laid at St. Helen's, Liverpool. The style of the building is Italian, and it will be in the form of a parallelogram. It will be 95ft. long by 65ft. 9in. wide, and 38ft. 9in. high from the floor to the ceiling. It will be built of Stourton stone and pressed bricks, and will hold 1,200 people. Mr. George Harris, jun., of St. Helen's, is the architect, and Messrs. Harris and Son have taken the contract, for £6,000.

The memorial stone of a new Wesleyan Chapel was laid on Friday week, at Gainsboro'. The building is being built entirely of concrete, and when finished will have the appearance of stone.

The English residents have laid the foundation stone of an English church in Dresden.

On Easter Tuesday, St. Michael's Church, Rushall, was reopened after restoration. The additions include a lengthening of the nave to the extent of 33ft, and the erection of a spire. The work has been done by Mr. Highway, of Rushall, at a cost of £2,000, from the designs of Mr. Cranston, architect, Birmingham.

Wilcote Church, Oxfordshire, was reopened on Easter Day after restoration. The restoration comprises besides a new porch, new roofs, floors, doors, windows, and fittings. The east window has been made somewhat larger and filled with stained glass by Heaton, Butler, and Bayne, the subject being the parable of the good seed. The architect was Mr. A. W. Blomfield.

On Friday last the parish church of St. Lawrence, Snaith, Yorkshire, was reopened after thorough restoration. The church is a large one containing a nave with clerestory and aisles, measuring 94ft. by 60ft., chancel 54ft. by 21ft., and tower 30ft. square outside. The whole church, excepting the tower, has been re-roofed, and the battlements have been rebuilt. The whole cost of the restoration will probably amount to £3,500. The works have been carried out from the designs of B. and William Atkinson, architects, York.

St. James's Church, East Cowes, was reopened on Sunday last after restoration. With the exception of the tower the church is entirely rebuilt from designs furnished by Mr. T. Hellyer, architect, of Ryde.

On Wednesday week the Duchess of Marlborough laid the chief stone of the new church of St. John the Evangelist, at Hailey, in the county of Oxford. The new church will be erected in the early thirteenth century Gothic style, from the designs of Mr. Clapton Rolfe, architect. It will contain 250 sittings, and the estimated cost of the work, including boundaries, is about £2,000.

The parish church of Alton, Hants, was reopened on Thursday week after restoration. The building, which is a good specimen of Norman work, had been sadly neglected. It has been entirely re-pewed, the roof has been stripped of accumulated coats of whitewash, and the timbers varnished. The tower has been utilised as a baptistry. Mr. Christian, of Whitehall-place, was the architect who superintended the work, which was carried out by Mr. Dyer, of Alton.

A small mission school church is shortly to be erected at Sandsend, near Whitby, from designs by Mr. C. Noel Armfield, architect, of Whitby. It will be of middle thirteenth century Gothic of a rural type with low walls and high-pitched roof, and will contain 156 sittings, exclusive of choir and clergy. It will consist of a building of one uniform height, the chancel being defined on the exterior by ridge cresting and wall treatment slightly differing from that of the nave. In the interior the chancel will be strongly marked by a screen, by the arched principal of the roof, and by a polygonal boarded ceiling.

BUILDINGS.

The guardians of the parish of Marylebone have been building some new wards for the aged and infirm inmates of the workhouse; they were opened on Thursday week for a private view. The front faces the quadrangle of what was the able-bodied women's ward. The entire cost has been under £6,400. Mr. Saxon Snell, of Chancery-lane, was the architect. The whole accommodation is for 240 inmates, which gives the rate at a fraction under £27 a bed. The brickwork is all best London stacks, with the old lakehouse and laundry walls used up as fillings, inside courses and partitions.

St. Augustine's Schools, Halifax, erected at a cost of £4,000, were opened on Easter Tuesday.

The foundation stone of the first of the four large new graving docks at Chatham was laid on Tuesday. The new dock is expected to be completed in about two years, by which period the first of the three large basins will likewise be finished.

The subway for water and gas pipes to pass through beneath the new street in course of formation from the corner of Hatton-garden and Holborn-hill, crossing Ely-place, Saffron hill, and Farringdon-road to West Smithfield, near the dead meat and poultry market, is completed, as also the main sewer passing into the Fleet-ditch, and the paving has been commenced. The exterior of the dead meat and poultry market is completed, and workmen are engaged in fitting up the interior.

The Albert Memorial Museum, Exeter, which has been erected at a cost of £12,000, was opened on Monday. In the interior the main architectural feature is the staircase leading from the ground floor. The stairs commence in the centre of the floor, and at the top of the first flight is a niche filled by a statue of Prince Albert, which has been executed by Mr. Stephens, a local sculptor.

The installation of a Poor Classes Convent, which has been erected at Longsight, Lancashire, took place on Thursday week. The building is of the French Gothic style, and has been erected by Mr. Joseph Thompson, of Hulme, from the plans of Mr. W. Nicholson, architect, of this city. Internally, it is in the form of a square, cloisters extending along each side, and apartments—or cells, as they are called—have been erected for the reception of twenty-four nuns and nine lay sisters.

It is now decided that Her Majesty will lay the foundation stone of the new St. Thomas's Hospital on Wednesday, the 13th of May, at half-past eleven o'clock.

On Thursday week the House of Mercy at Great Maplestead, instituted under the management of an Anglican Sisterhood for the Recovery of Fallen Women, was inaugurated by the principal visitor, the Lord Bishop of Rochester. The buildings are from the designs of Mr. Woodyer. The form is a quadrangle. On one side are the dining-hall, class-rooms, kitchen, &c.; and above, dormitories for the penitents and small bedrooms for Sisters overlooking them. On another side are the chapel and infirmary. Round the whole quadrangle runs a covered way or cloister, giving access to the different apartments and affording communication with the whole under shelter. The material is red brick with stone facings and mullions, and all is substantial and solidly executed. The chief attraction is the chapel. Its style is Early English or First Pointed.

MEETINGS FOR THE ENSUING WEEK.

Tues.—Institute of Civil Engineers.—Discussion upon the papers on Irrigation in India and in Spain, 8.

Wed.—Society of Arts.—"On Progress in Oyster Culture," by Harry Lobb, Esq.

Sat.—Associated Arts Institute.—"Notes on Animal Painters," by Frank N. Prince, Esq.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—H. A.—W. R. H.—T. W—S. and C.—F. G. T. R.—A. W.—J. C. J.—A. L.—T. F. M.—R. K.—R. W.—C. B. A.—S. and Co.—J. R.—I. T. R.—H. S.—W. M. E. W. P.—G. W.—W. S.—E. H. L. B.—J. C. J.—W. S.—I. M. S.—I. S. L.—Captain S.—Rev. E. H.—R. R. W.—A. E. T.—F. T.—T. A.—B and D.—H. G.—A. A. A.—P. and Son.—G. R. G.—A. R. T.—W. B.—S. H.—N. N.

The Pugin v. Barry Controversy.—We have received a long letter from Mr. E. M. Barry on this controversy, and did the letter contain any new point or throw an additional light on the points hitherto advanced we would insert it *in extenso* but it does not. For a similar reason we must decline to insert letters on the same subject from Mr. E. W. Pugin, Mr. Burton, and Mr. Wm. Young.

M.—Consult a dictionary on the pronunciation of the word vase.

B. E. N.—Consult a lawyer.

Correspondence.

ORGANS.

To the Editor of the Building News.

Sir,—I am perfectly aware that Mr. Hopkins in common with many others has expressed his opinion that the quantity of tin in a pipe influences the tone, but I am not aware how far he has practically tested the alleged fact. I have done so, and know it to be merely a vulgar error. It is not long since that all authorities upon bell metal accounted for the silvery ring of old bells by the fact of there being a great deal of silver actually mixed with the bronze, till direct analysis proved the contrary, and that the old stories of Russian nobles and others throwing in their plate as the metal was melting were merely myths. That the old organs differed in quality and quantity of sound from the modern is not to be accounted for by the metal used, for, as I have shown, Father Smith's organ metal at St. Paul's *upon real experiment required more tin to be added before it would spot*, and some of Mr. Schultze's work at Doncaster, which most resembles the old in quality of sound, is of zinc—a metal which on many accounts I should be sorry to see extensively used. All the larger pipes in the Doncaster organ are of that metal.

I really will not waste your space by controverting so absurd a proposition as that Willis's diapasons are wishy-washy. Your correspondent might with just as good sense have said that they were green or salt. If they had been described as heavy, coarse, or noisy, I could have understood the objection, though I should entirely have differed from the verdict. Any other epithet in the whole English vocabulary would have as truly described the tone of Mr. Willis's superb diapasons, which are marvellous for purity and roundness of tone. Mr. "R. T."—which I suppose I am not wrong in translating Richard Tamplin—has given us his opinion that Cavaillé's flue work is light and ineffective. I believe he is quite as wrong in this as in his personal remarks upon Mr. Willis. It is quite true, on the other hand, that Cavaillé has made great improvements in arrangements for steadying the wind. But these improvements are adopted by all respectable builders, most certainly by Willis, who uses his system in all its entirety.

If there is one point more than another characteristic of old diapasons it is their flutiness of tone, and now this very quality is alleged as an imperfection in Willis's As for his pipes being devoid of their proper harmonics, why, it is this very feature of making the harmonics ring out that has been his especial study and has made his reputation—one which, in my opinion, "R. T." is quite incapable of shaking.

In reeds, again, close tight tone is objected to It is, however, the very finest tone that one can desire, only enhanced by Cavaillé's magnificent discovery of the harmonic trumpet. We all know the difference of the ordinary street clarionet and that of one played by such a man as Lazarus. This latter is the quality aimed at. It would be a bad day if we were to give up these "tight unpleasant (?) toned reeds" for such as "R. T." would bring us back to if he could. That Willis's reeds are unequal is not a fact.

If metal composed of half tin or less has a knack of becoming soft, "how is it," says "H. T.," "that the St Paul's pipes have lasted for two hundred years?" The answer to this is plain enough—on account of their immense thickness. Father Smith knew the importance of *weight* over quality.

Mr. "W. T." says "is it likely that such a genius in his art as Father Smith should have used three-fourths of tin for any purpose than sound?" Why not? *If he ever did so*, which was certainly not the case with St. Paul's, he might have done it quite as probably for the sake of greater durability or even for appearance: though whatever may have been his idea, it cannot now alter the well-ascertained fact that the quality of metal does not affect tone—that, in fact, given the same scale, thickness, voicing, &c., a stop might be made of alternate fine metal and type without the keenest ear being able to detect the difference.

But as the value of a judgment upon such matters as the quality of musical sound depends so much upon the capability of and absence of bias in the judge, I refer your readers, in addition to the great names I have already adduced as bearing witness to the excellence of Willis's organs, to the reports of the jurors of the 1851 and 1862 Exhibitions, but more especially to the able criticism of H. J. Oakeley in the *Guardian* in the summer of 1862—H. J. Oakeley being Professor of the University of Edinburgh, and one of the greatest musicians of the present day.—I am, &c, J. C. J.

MANCHESTER TOWNHALL.

Sir,—I quite agree with Mr. Waterhouse in his answer to your article of the 10th inst., that the "one sentence" and "part of another" which he has quoted from the instructions (in the absence of the previous portion of the paragraph) would appear to allow the latitude he has taken in the arrangement of his admirable plan. Yet is it fair to omit quoting the governing portion of the paragraph, which reads thus?—"The townhall is to be built upon the land included within the building lines shown on the plan, beyond which no part of the building, except the grand entrance and steps to the main floor in Albert-square, is to project."

Either the above does not allow Mr. Waterhouse the liberty he has taken, or the committee in its insertion did not know their own intention. For myself, I think the paragraph, which I enclose *in extenso*, is sufficiently free from ambiguity, and its meaning I take for this:—A building line is given, beyond which nothing is to be built. The form of the building inside the building line can be altered to suit the designer's own taste and convenience, as can also the various projecting portions both in Cooper-street and Princess-street, still bearing in mind the original boundary or building line is not to be exceeded. In conclusion, I would say that I have good authority for stating that in the preliminary competition the then professional adjudicator, along with the committee, rejected several designs exhibiting excellent specimens of scientific planning as well as architectural compositions, solely on the ground of their authors having exceeded the instructions. —I am, &c., John Charlesworth.

3, Princess-street, Manchester, April 21.

(Paragraph alluded to)

"*The townhall is to be built upon the land included within the building lines shown on the plan, beyond which no part of the building, except the grand entrance and steps to the main floor in Albert-square, is to project.* Architects are to use their own discretion as to the shape or form of the building, and are not obliged to adhere to the boundary line of the land as shown on the plan. At the same time it must be borne in mind that the extent of accommodation afforded will be an important element in the final decision. The building must occupy the full extent of the frontage in Cooper-street, but the lengths of the various projecting portions and areas in Princess-street and Lloyd street may be altered to suit the design of the competitor."

Sir,—Mr. Waterhouse's letter in your impression last week affords another instance of the elastic manner in which conditions to competitors, drawn up with the intention of being precise and exact, may be interpreted by those who wish to make them serve a particular purpose. Mr. Waterhouse quotes the following sentences:—

"Architects are to use their own discretion as to the shape and form of the building, and are not obliged to adhere to the boundary line of the land as shown on the plan." "The lengths of the various projecting portions and areas in Princess-street and Lloyd-street may be altered to suit the design of the competitor." Why did he not give your readers the sentence which precedes these two, and which runs as follows?—

"The townhall is to be built upon the land included within the building lines shown on the plan, beyond which no part of the building, except the grand entrance and steps to the main floor in Albert square, is to project."

This sentence is the text to the two that follow it, and the whole, when put together, means, if it means anything, that the lines of building marked out on the lithographed plan must not be transgressed or built beyond, and that architects are at liberty to alter the building lines only so long as they keep within them. This is the way in which I construed the paragraph, and it is the only acceptation it will bear when taken altogether. I am further supported in my reading of it by another portion of a sentence which Mr. Waterhouse also omits, where it says that "the building must occupy the full extent of the frontage in Cooper-street.—I am, &c.,

A Competing Architect.

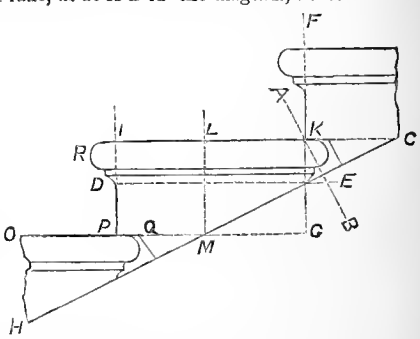
COTTAGE HOSPITAL, VENTNOR.

Sir,—I think those of your readers who intend competing for the proposed National Cottage Hospital for Consumption, Ventnor, ought to be informed that the committee have already their architect, who it is intended shall carry out the successful design whosever it may be; so that the £10 and £5 are all the competitors will probably get for their trouble in furnishing a design.—I am, &c., W. Bosworth.

PROPORTIONS OF STONE SPANDREL STEPS.

Sir,—Those who have had occasion to prepare drawings for stone spandrel steps have doubtless noticed the absence of any definite rule by which to ascertain their thickness in the works of architectural writers on the subject. In default of such a rule I have recently been endeavouring, by the measurement of executed examples, to discover some general standard on which to found a theory of proportion.

By so doing I have obtained the following limitations:—The width across the thinnest part of the step, measured at right angles to the line of rake, as at A B in the diagram, must never be



less than $2\frac{3}{8}$in. or more than 3in. When this width is exceeded there is, I find, a look of clumsiness; and as surveyors measure the step to the extremity of the acute angle, as at C, all unnecessary thickness adds considerably to the cost. Again, it is evident that a thickness of less than $2\frac{3}{8}$in. would be detrimental, not only to the strength, but also to the appearance of the step, for with a nosing of the customary size this dimension is the smallest in which a proper return can be worked clear of the rake.

In trying to found on these measurements a rule for the sizes of steps I was first led, from seeing the important part the return nosing plays, to make the nosing fix the width, *i.e.*, the position of the raking line H C. Thus the intersection of the bottom line of the nosing D E, with the face line of the riser F G, would give the point through which to draw the raking line H C. I abandoned this method, however, as (although otherwise very satisfactory in its results) it depends upon the width of the nosing, which has also not been settled by law. While trying next to get some solution from a subdivision of the riser and tread, I came upon the following construction, which seems to satisfy the conditions for steps of every proportion. Bisect the solid portion of the step I K in L, and from L let fall a perpendicular L M to the face line of the lower tread O P produced towards G. The intersection of these two lines in M gives the point through which to draw the raking line H C.

While on the subject of proportion, I think that it is impossible to have anything better for the relation that the riser should bear to the tread than the well-known rule, that their product, when multiplied together, should be equal to 66. I am not aware that any proportion has been laid down for the nosing. From the examples that I have measured we may assume that its projection R I should be one eighth of the width of the tread I K, and its total depth I D about twice its projection.

The horizontal bearing of one step on the other, as at P Q, should be equal to the projection of the nosing, the raking joint K E being of course at right angles to the line of rake H C.

I should be glad to learn how far the rules thus given agree with the practice of those of your readers who have considered the question.—I am, &c., Gilbert R. Redgrave.

Intercommunication.

QUESTIONS.

[832.]—PAPER-HANGINGS.—Can any of your readers tell me what material is used for the production of the raised, soft-feeling flowers on paper hangings, and how it is applied?—J. GOLD.

[833.]—BUILDING CHIMNEYS.—Will you be so kind as to tell me what you consider the best way to build a chimney about 150ft. high? Should it be a tapering flue, wide at the base and narrow at the top; or should the flue be of one uniform width; or should it be widest at the top? Perhaps you can refer me to some source of information on the point.—EDWIN HALE.

[834.]—DRAWING SCHOOL.—Will you inform me where I can attend (in the evening) a good architectural drawing school, not far away from Kings's Cross?—A STONEMASON.

[We know of none nearer than the Architectural Association, 9, Conduit-street.]

[835.]—GAS-MAKING.—There is an invention by some person now in use for making gas by a small affair, for any house, from a cottage upwards. It is, I believe, self-working. I should be glad if you or any of your correspondents can inform me where it can be had, or who are the inventors and makers of the same. An early reply would confer a favour upon—A. C. E.

[836.]—NEW CEMENT.—Will you, or some of your readers, kindly inform me what mode of mixing should be adopted to form solid masses from sand or other particles mixed with magnesia, slaked with a solution of chloride of magnesium, as mentioned in an article in the BUILDING NEWS, No. 662, page 637, entitled "New Cement and Building Material."—BONA FIDES.

[837.]—WEIGHT OF WATER.—Can any of your readers oblige by informing me what is really the weight of a gallon of water, as I find opinions differ greatly?—CISTERN.

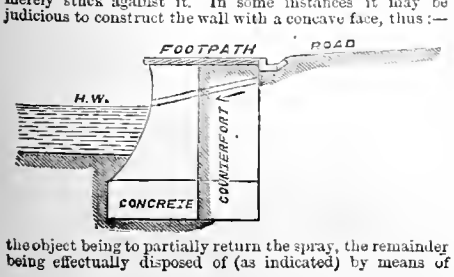
[If "Cistern" wishes to obtain very accurate information upon the subject, let him first weigh an empty imperial gallon measure, then fill it with water, and subtract the weight of the measure from the last. We answer his question by telling him to obtain what he wants, because, if he cannot believe the printed authorities he has seen, why should he believe any fresh ones that he may see in our columns? Besides this, we are putting him in the way of being a practical philosopher. "Cistern" will also find, if he continues his experiments, that the weight alters according to the temperature.]

[838.]—RESPONSIBILITY OF AN ARCHITECT.—If an architect prepares the plans of a building without a specification or any written contract whatever, and his client employs the workmen and supplies all the materials, and verbally engages the architect to superintend the works (there being no specification or written contract), if there should be any fault in the building occasioned through the workmen not doing their work properly, is the architect legally responsible, and can his client compel him to make good the said faults at his own cost?—T. G.

REPLIES.

[800.]—QUANTITIES AND PRICES OF TIMBER.—One part of the queries by "Ignoramus" was not answered last week, *i.e.*, the meaning of duty and drawback. The duty is the amount paid to the Customs when the timber is taken from the docks; and the drawback is the amount allowed and returned by Government if the timber has been used in public works or churches. To obtain the drawback, after the work is finished a form must be obtained from the officer of Inland Revenue acting in the district where the work is fixed, which must be filled in and sent in to the Custom House. The amount of red tape required will be fully shown in the form supplied.—F. R.

[802.]—A SEA WALL.—"Alexander" may glean useful and reliable information on the subject from "Dobson's Art of Building," and "Foundations, &c.," both of Weale's series. The formula laid down for the thickness and batter of retaining walls generally is one fourth of the length for thickness, and one-sixth of ditto for batter; but this rule is, and oft times must be, deviated from, allowance having to be made for the nature of the soil to be supported, and other contingencies. It is a *sine qua non* that the foundation and footings should be level, and the back of the wall perpendicular. A sea wall, if of masonry, should be faced and snugly pointed, thus preventing interstices or irregularities being acted upon by the waves; the coping should be rounded from the face of the wall, and should on no account project beyond. Concrete is often used for sea walls, built up in layers between boards, and finished with a semicircular (self-coped) top. This method has the recommendation of strength if properly constructed, and presents the smooth frontage for tidal action. The foundation in either instance should be placed sufficiently deep to escape being undermined even if the beach should be shifted or washed away: and the wall should be strengthened by counterforts or internal buttresses, at frequent intervals, firmly bonded to as part of the wall, and on no account merely stuck against it. In some instances it may be judicious to construct the wall with a concave face, thus:—



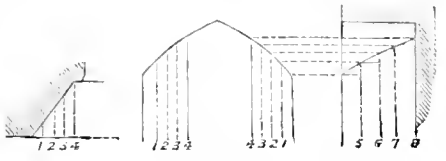
the object being to partially return the spray, the remainder being effectually disposed of (as indicated) by means of surface drainage from the road and sloping footpath, by means of an ordinary channel with frequent outlets. The wall may be protected, and the force of the waves partially destroyed, by the placing of breakers, consisting of piles driven into the beach and connected by planking, at right angles to the wall at convenient intervals; and the immediate foundation of the wall may be further strengthened by rows of sheet piling on the outer face. The proportions of concrete vary from six to three of gravel to one of lime, owing to the difference in quality of the material. Some authorities advocate its being thrown into the trenches from a considerable height whilst hot, and well rammed; whilst others consider these operations to be of very little import.—F.

[810.]—MIXED CEMENT.—In answer to "S. W. M.," good Portland cement used with washed road grit will never separate. It possesses angle binding and strengthening powers for paving steps or blocks. I have proved it to a great extent.—JAMES SAXBY, Guildford Lawn, Ramsgate.

[810.]—Roman and Portland cement should never be mixed, as they do not set with the same rapidity. For external work, Portland cement, with a proper proportion of sand, is by far the most durable material.—F. R.

[811.]—MULBERRY WOOD.—If the mulberry wood is required to match an old piece of furniture it must itself be old and seasoned; and there would be great difficulty in obtaining it. The best plan would be to use a veneer, which could be polished and stained to the colour and face of the old work.—F. R.

[812.]—FLAT SOFFIT FINISHING.—The best way to finish a flat soffit against a splay is to carry up the splay to the highest point of the contact with the soffit, then form the centreing of the soffit against the splay. The exact curve may be found by ordinates, thus:—Set off four equal



Plan of Jamb. Elevation of Jamb and Arch. Section of Soffit.

divisions, 1, 2, 3, 4, in the plan of jamb and elevation of jamb, then set off other four equal divisions, 5, 6, 7, 8, in the section of soffit. The ordinates, 1, 2, 3, 4, being carried across to the section, the junction of 4 with 8, 3 with 7, 2 with 6, and 1 with 5, will give points through which the curve may be drawn.—FOREMAN.

[813.]—BULGING WALL.—To prevent flint walls bulging, and being built without brick piers, they should diminish one-half their thickness from base to top, as there are very little absorbing properties in flint. The stretching courses should be bedded in blue ashes and lime, which will form strong drying mortar for hard bricks; the coping bricks should be bedded in good Portland cement and washed road grit as headers. This is the Flemish bond we seldom practice upon.—JAMES SAXBY, Ramsgate.

[813.]—A flint wall, 20ft. long and 12ft. high, without buttresses or bonding, is not likely to keep straight. The best way to make a sound job of it will be to take down to the level of the bulge and rebuild with brick bonding courses, two bricks high, and 3ft. apart; these bonders need not come to the face of the wall, but if they do will much improve the appearance. If it is not convenient to take down the wall, build a buttress in the centre of the length, the foundations being of equal depth to the wall foundations. Work it well into the wall, and build with brick bonding courses as before described. If there be any thrust upon the top this buttress will be required in any case; but if there be no thrust the buttress may be very well dispensed with.—F. R.

[814.]—TO DEADEN RINGING OF AN ANVIL.—The usual plan to deaden the sound of an anvil is to set it in coal ashes, which reduces the ringing considerably.—F. R.

[815.]—TO DEADEN SOUND.—Let the 3in. cavity between the 4½in walls be filled with cork shavings, which can be obtained at any cork-cutter's; this will entirely prevent sound from passing through the walls.—J. P. E.

[816.]—STAMPED SPECIFICATIONS.—It is not necessary to stamp the specification or drawings if they are numbered and referred to in the stamped agreement; but each drawing and each page of the specification must be signed by one of the parties to the contract, and the first page of the specification must contain the following, written in the margin:—

"This is the specification referred to in the contract signed by me this 20th day of April, 1868.

"(Contractor's Signature) JOHN THOMAS.

"(Witness) George Williams."

Each contract plan must also bear the same clause:—

"This is one of the drawings referred to, &c."—W. W.

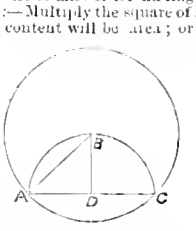
[817.]—MORTAR FROM OLD MATERIAL.—The following pertinent remarks are to be found in a work on cottage building, by W. Wilds, published by Weale:—"A London house is the real phœnix of the fabulist; for whenever a house is burnt down there, the sifted brick and mortar rubbish is made a component of the mortar with which it is rebuilt, and thus the new structure proudly rises from the ashes of its predecessor. This practice, however, is a little excusable, as it is more than probable that the sittings thus obtained will contain more grit, and consequently make better mortar, than some of the road dirt, which is frequently employed for a like purpose, containing, as it does, a large proportion of vegetable and earthy matter, with which it is impossible to make good mortar."—J. W.

[818.]—A DAMP SAFE.—Does the stone act as a vehicle for the moisture? Would it not be best so to isolate the safe as to have an air space round it, closed by metal or wrought-iron grating where abutting on the room? Or if the walling were built close towards the room the air space might have openings for obtaining circulation elsewhere, according to circumstances? Might not the lining be cemented or covered with slate bedded in cement? Without circulation of air to imbibe and carry off moisture no light or fire will avail.—G. M., Seaton Carew.

[818.]—My remarks of yesterday were made on the supposition of the safe being a portable one, with metallic casing complete. On reading the paragraph over again I see the safe to be probably a small room, in which case my former proposals would not be completely applicable. It should be ascertained whence the damp arises, whether from the cellar or through the comparatively porous stone walls. How would it do, as an experiment, to line the walls with glazed tiles, bedded in cement, or have a slate floor, ditto, or both? If practicable, a stream of dry air (warmed or otherwise) might be made to pass through the safe, entering (say) through the floor or side walls near the floor, and carried off at or near the ceiling; the opening for admission being towards one end of the chamber, and that for egress towards the other. Much, however, will depend on the special circumstances of the case.—G. M.

[818.]—A "Banker" is informed that I dried two new strong rooms, the walls, roof, and floor of which were constructed of freestone, somewhat damp (each room being larger, and the walls thicker than those of the one he describes), in the following manner:—I kept in each room for three or four weeks a strong gaslight burning day and night, with the door closed. The heat from the gas extracted the damp, and the rooms were, in the course of a few days, full of moist vapour; this was condensed on the back of the iron door, and on two 4in. iron pipes, which formed a branch of the heating apparatus of the building. Several times each day during the above period the door and pipes were well wiped with a dry cloth, and this process was continued until the vapour disappeared, and until none was formed on a piece of plate glass, which I took with me into the room as a test. The strong rooms were then quite dry.—J. W., Bufurt.

[824.]—TO MEASURE A DOME.—"Expectans" will find the following rule to answer for finding the superficies of domes spherical:—Multiply the square of sec ondal radius by the 3.1416, and content will be area; or multiply the



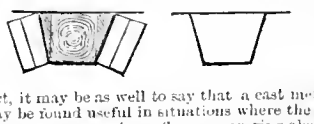
square of diameter of circle whose radius is equal to the sectorial radius by .7854. N.B.—As a circle whose radius is equal to sectorial radius is equal to area of dome, as per sketch.—L. SPONER.

[824.]—To measure the superficies of a semi-circular dome, multiply the square of the diameter of the base by 1.5708; this will give the superficies of any dome that is circular, and the height equal to the radius of its base.—W. R. ATKINSON, Uckfield, Sussex.

[827.]—GOTHIC ARCHES.—"Enquirer" is right as to the almost universal use of a perpendicular joint at the apex of Gothic arches in old examples. I may add that where they are not met with the stone is almost invariably broken.—RAPHAEL BRANDON, the Hall, St. Clement's Inn, Strand, W.C.

[827.]—In this instance "Enquirer," I imagine, has the best of the argument with his architectural friend. I have overhauled all the books on the subject ometattable, and find that they yield a majority of 3½ to 1 in favour of the perpendicular joint or "faulty construction" arch. I found more than one instance of semi-circular arches with a perpendicular joint. A keystone, or crown stone, would oftimes be very large and of awkward shape; and the perpendicular joint, if set in cement, would be even stronger than the brick or stone itself, as experience teaches there is no more danger of fracture of that joint than of any other. The greatest objection to the joint is in the case of visible brick arches, on account of the unsightly pieces at the crown; and the obviation of this is the greatest argument in favour of the pointed arch with one centre for the joints, as shown some weeks since. Amongst others, Mr. Burges, in the detail of his design for the law courts, uses the joint in question. In spite of the contingency of "Enquirer's" mistaking the mitre line of the mouldings for a perpendicular joint in some examples, a sufficient margin is left for his gaining a numerical victory, judging from archæology.—F.

[828.]—SUPPORTING A BEAM.—Ought not the sides of the wrought-iron strap to radiate in a line drawn from the centre of the arch? The triangular spaces left between the said sides and the beam should be filled in with chocks of hard wood or other suitable material. While on



this subject, it may be as well to say that a cast metal key to arch may be found useful in situations where the arched opening approaches a floor or covering above, and an aperture is needed for ventilation or other purpose. This last should have an internal rib or feather, for strength, and probably in many cases would not require the projecting flanges at top.—G.M.

[829.]—WROUGHT-IRON ROOFS.—If "Seeker" refers to page 220 of the last volume of the BUILDING NEWS, he will find a diagram to which the formulæ at page 750 are applicable.—E. S.

WAGES MOVEMENT.

The London painters are endeavouring to make arrangements to amalgamate into one great association. It is thought that the small feelings among the different societies will either prevent the formation of the project or its being carried out.

The Wapping painters' strike on the 6½d. or 5d. an hour still continues. Messrs. Jackson and Rolls offer 6½d., but the men stand out for 7d., and so there is little or no work doing for them. The affair has been made a trade strike.

The Liverpool master builders and the bricklayers in their employ have just taken a step which will prevent in future any resort to lockouts or strikes to enforce changes in the rules of the trade. Both sides have agreed to a series of regulations—to come into operation next month—which place all questions relating to overtime, country work, travelling expenses, payment of wages, &c., upon a basis satisfactory to all concerned; and they have also agreed that in the event of any dispute arising, it shall be referred to a court of arbitration composed of equal numbers of employers and workmen, with a final reference, if necessary, to an umpire, whose decision shall be binding upon both parties.

On the 1st of January last the labourers employed in the building trade in Derby addressed a letter to all their employers in that town asking for an advance of 2s. per week in their wages, namely from 18s. to £1, giving as their reasons for the demand the advance of rent and the high price of provisions. The masters, however, refused. The labourers' deputation then expressed their determination to have £1 per week or nothing, and although considerable correspondence ensued, no agreement was arrived at, but an immediate strike threatened. Upon this the masters, at a meeting held on Monday last, decided to resist the demand to the utmost, and a strike is, therefore, imminent.

STAINED GLASS.

The large window over the high altar in St. Teresa's Church, Dublin, has been filled with stained glass by Messrs. Earley and Powell, of that city. It consists of three large lights. The centre subject is St. Simon Stock receiving the scapular from the Blessed Virgin. The side lights contain the figures of SS. Elias and John of the Cross. The same artists have also just completed another window in St. Michan's Church, Dublin, the subject of which is the Mysteries of the Rosary.

The east window of St Silas's Church, Lozells, which consists of three lancet lights, has been filled with stained glass to the memory of the Rev. M. Walton, the first incumbent of the parish. The subjects illustrated are St. Silas and St. Paul preaching and being delivered from prison. The work has been designed and drawn in accordance with the early period of the architecture of the church—the thirteenth century, and has been carried out by Messrs. Hardman and Co.

The Marquis of Bute has placed a memorial window in Buccleuch-street church. It has been executed from sketches by the young Marquis, which sketches we are told "show great mastery of handling, and a thorough acquaintance with the history of Christian art."

STATUES, MEMORIALS, ETC.

The inauguration of a statue of Bernard Palissy is to take place at Saintes, where the famous potter was born, on the 3rd of the coming month of May. The fete to be given on the occasion will recall one of the most interesting events in the history of the town, namely, the entry of Charles IX and Catherine de Medicis, and their visit to Palissy, whom they took with them to Paris, where he was installed in the old Louvre, and executed some remarkable works; and where the remains of his kiln and a number of his moulds were discovered last year.

A site having at length been procured at the south-east corner of Woodhouse-square, looking down Clarendon-road towards St. George's Church, Manchester, it is intended to inaugurate the statue of Sir Peter Fairbairn on Thursday, May 14.

The committee entrusted with the erection of the Palmerston memorials at Romsey state that they will be ready for inauguration about the latter end of June or the beginning of July.

An additional statue has now been placed at the principal entrance to the members' private arcade in New Palace-yard—viz., one of King John. There are now three statues placed in the front of this arcade viz., Alfred the Great, William the Conqueror, and King John. The remaining three vacant niches will shortly have statues placed in them. These statues are of Portland stone, and stand 6ft. 6in. high. The bronze statue of the late Sir Robert Peel, which stood for some time uncovered at the central entrance to New Palace-yard, having been removed on account of the ineligibility of the site, will shortly be placed on a granite pedestal at the entrance to New Palace-yard fronting Parliament-street and Great George-street. The companion statue of the late Lord Palmerston will not be erected for some time.

Mr. Norman Macbath has been commissioned by the Council of the Edinburgh Royal Society to execute a portrait of the late Sir David Brewster. The painting will be hung in the Society's Hall.

LEGAL INTELLIGENCE.

An action was brought by the Duke of Buccleuch against the Metropolitan Board of Works to recover the amount awarded to him by Mr. Charles Pollock, Q.C., acting in the capacity of umpire, as compensation for having been deprived of the use of a pier or jetty running down from his grace's residence, Montagu House, Whitehall, to low water-mark, and for the mansion and lands having been depreciated and otherwise injuriously affected by the works carried on by the defendants under the Thames Embankment Act. The trial took place before the Lord Chief Baron on the 8th February last, when a verdict was returned for the plaintiff for the full amount claimed, £8,325 and interest. Mr. Hawkins, Q.C., now moved, pursuant to leave reserved, to set aside the verdict, and enter a verdict for the defendants or for a new trial, on the ground of misdirection, and that the verdict was against the evidence. His grace and his ancestors had been lessees of the property for upwards of two centuries. There was an old lease from the Crown, which expired in 1868, but some years prior to that period a fresh lease was granted to the duke for 99 years on consideration of his laying out £20,000 in the erection of a new mansion. He had actually expended between £80,000 and £100,000 in building the existing Montagu House. Mr. Hawkins submitted that there was no grant of the jetty to the duke under either of the leases, that the jetty was really public property, and that therefore he was not entitled to compensation in respect of it. Mr. Baron Martin said it appeared that the jetty had existed from the time of Charles II. There could be no doubt the stairs belonged to the old Palace of Whitehall, and the Crown could make a grant of them to anyone. The Lord Chief Baron concurred. The court granted a rule generally.

Liabilities of Architects.—Swatridge *v.* Colson. This was a case tried at Sherborne, in which the plaintiff, a marble mason, of Yeovil, sought to recover £16 13s. 8d. for two stone chimneypieces. The defendant, who is an architect residing at Sherborne, had been engaged in erecting a rectory at Sandford, and in accordance with his instructions, the plaintiff had made the two chimneypieces, for the value of which he now sued. The defendant, on being sworn, said that Swatridge called at his office early in 1867, requesting that he might supply some of the chimneypieces at the rectory, and after some delay he obtained the consent of Mr. Gale, the contractor, that Swatridge should be employed. The chimneypieces were accordingly executed under his instructions, and the plaintiff's account was passed by him, and sent in to the contractor, who had since become bankrupt. The other tradesmen, however, who had attended at the settlement, had been paid, and if Swatridge had attended his claim would in all probability have been settled. He contended that the order had been given by him in the ordinary way of business, and that as an architect he could not be held personally liable. The judge said there was no doubt that Gale was the contractor for the works. It must be very strong evidence that would make him believe that the case was one out of the ordinary run of business by which an architect made himself personally liable, instead of merely giving directions. They had been told that before the work was done the plaintiff was informed of the name of the rector and the contractor, and that he offered 5 per cent. on any commissions defendant could obtain for him; if that was so it was conclusive, and it had not been contradicted; and it seemed that plaintiff had also inquired as to the means of Gale, in reply to which the defendant had read several letters as to his character, and had informed him of his sureties. All that was perfectly inconsistent with the supposition that he looked upon the defendant as making himself personally liable, and nothing having been made out to his satisfaction that the verdict should be against the defendant, he should give it for him, with his personal expenses.

Our Office Table.

A new popular dictionary of Ecclesiastical Art and Institutions, from primitive to modern times, entitled "Sacred Archæology," by the Rev. Mackenzie E. C. Walcott, Precentor of Chichester Cathedral, is announced for publication. A work of the kind is a great want in the literature of the day, and we know of few so well fitted for its preparation as Mr. Walcott.

The witty art critic of the *Bombay Gazette* gives an anecdote of the Viceroy. Sir John Lawrence, it appears, finding the other day that the cost of a building had already exceeded the estimate before the second storey had been commenced, he at once ordered it to be roofed. "There is a stern morality and Cromwellian ruthlessness about this," says the *Bombay Gazette*, "which profoundly excites my admiration—the savage Gaul flinging his sword into the scale against Art! But necessarily art cannot spring up and flower under such a barbarian."

A new field for building operations has just been opened out. The Metropolitan Board have purchased Tooting Common in order to convert it into a public park like that at Kennington. Tooting has long been a favourite district, on account of its rural beauty; it will now become much more so, and villa building will probably soon be very brisk all round the locality. The sum to be paid for the common is £10,200.

The Earl of Dudley, Lord S. Cecil, Mr. Gladstone, and Messrs. D. Hanbury, G. Moffat, R. Redgrave, and J. Tyndall are noted in the list of persons employed by the South Kensington Department of Art and Science, in connection with the Paris Exhibition, as having declined to receive any remuneration for their services as jurors. Other noblemen and gentlemen have not been so squeamish, the usual fee accepted by each of them for travelling and personal expenses being £52 10s. It is hardly necessary to state that Mr. H. Cole, C.B., comes in for the lion's share of the remuneration. In fact, his services have been rewarded and gratituded in the most handsome manner.

On the 8th inst. the employés of Messrs. Pictor and Sons, of Box, Wilts, stone merchants, were entertained, to the number of 300, at dinner in the new workshops, to celebrate the coming of age of Mr. W. S. Pictor, and his accession to the business. The festivities were continued till a late hour, and the men retired thoroughly pleased with their entertainment, notwithstanding the arrangements had been conducted on strict total abstinence principles, which are energetically advocated by the firm. The workmen employed at Messrs. Pictor and Son's London depôt at Paddington also participated in the general rejoicings, and were invited to a good supper.

Last year the cathedral authorities set a good example by laying down gravel walks and planting out shrubs and flowers in St. Paul's churchyard. Although only done to a very limited extent, it considerably improved the place, and we hoped to have seen a little more attempted this year. Nothing, however, appears yet to have been done, and the churchyard is relapsing into its old neglected state. If it is to be done this year "t'were well it were done quickly."

The late Mr. Felix Slade has bequeathed to the British Museum his collection of glass, consisting of vases and other objects illustrative of the art of glassmaking from the earliest period to the end of the seventeenth century. He has bequeathed £45,000 to be applied to the endowment of fine arts professorships at Oxford and Cambridge, and at University College, London, where some exhibitions also are to be founded.

The Demidoff Gallery in Paris was sold last week, and produced the magnificent sum of upwards of £55,000. The whole gallery consisted of twenty-three pictures. One Ostade fetched £1,300; a Paul Potter, £4,400; a forest scene, Hobbema, £4,400; and a Cuyp, £5,600. Lerburg's, "The Congress of Munster," was bought, as is supposed, for Baron Rothschild, for the large sum of £7,280.

This year's estimates present a vote of £15,000, which will be required for the supply and repair of furniture in the Government offices. It appears always to cost upwards of £12,000 a year to keep the Government offices supplied with furniture! Query, Does this gigantic sum mean wear and tear of desks and stools from enormous use, or does it mean excessive breakage?

The value of old paintings exported from Rome in 1867 was 50,541f.; that of modern paintings, 778,246f.; ancient sculpture, 16,359f. modern sculpture, 1,778,162f. Total value of works of art exported in 1867, 2,623,310f., being an increase of 99,715f. on those exported in 1866.

Last week, a plumber in the employ of Mr. Howard, builder, was sentenced to four months' imprisonment, with hard labour, for stealing lead, the property of his employer. It appeared from the evidence that the prisoner was employed at an hotel being built at Eltham; lead had been missed from the works, and the prisoner was suspected and watched, and was seen to leave the works with lead in his possession, and take the train to London. The foreman immediately telegraphed to his employer's office, and the prisoner was met at the station and 36½lb. of new sheet lead was found concealed about his person.

From the report of the Minister of Public Works in Italy for 1869, we learn that, on the 31st December, 1868, the sum of 48,200,000f. will have been expended on the Mont Cenis tunnel. Eight millions more are to be spent next year. If the expenses continue at the same rate, and if the tunnel be completed, as is hoped, in 1871, its entire cost (exclusive of the two bits of railway that are to connect it with Susa and St. Michael, and which will be enormously costly) will not fall short of three millions sterling. A portion of this will, however, be borne by France.

The Florence correspondent of the *Times* says that Colonel Avet, of the Italian Staff Corps, has for years busied himself in seeking means for transforming a photographic impression into an engraving otherwise than by the ordinary tedious manual labour. He has at last perfectly succeeded. In twenty-four hours, says this correspondent, Colonel Avet can copy a large topographic drawing, reproducing it, beautifully printed, on either a reduced or an enlarged scale. Some of his reproductions are so small that they can be made out only by the help of a strong magnifying-glass. The result of his most valuable invention will be to save the immense amount of labour and loss of time hitherto indispensable to the multiplication of topographic drawings. The invention may be applied to all kinds of drawings without distinction of subject.

The vestry of St. George's, Southwark, contemplate laying down a tramway in the centre of the London-road, for the use of all kinds of vehicles. If successful, similar trams will be adopted on other roads in the parish.

Four new pictures have been lately added to the collection of the National Gallery, viz :—"The Madonna, Infant Jesus, and St. John," by Morando; Venetian School, two portraits by A. Borgognone, and "Tobias and the Angel," by Pollajuolo.

The Vieille Montagne Zinc Company has decided to appropriate the prize of 10,000f., gained at the Paris Exhibition, for the benefit of their workmen. The money is to be invested in Belgian Stock, and the annual dividend of 450f. is to be awarded yearly to such workman or workmen as shall be deemed most deserving.

The Paris correspondent of the *Morning Post* says that one of the first questions a stranger asks a Parisian is, "where does the money come from for building these magnificent boulevards and streets, which are to be found in the course of construction in nearly every quarter of the metropolis?" If he goes a little into the financial question of the building of new Paris, he is sure to get into a bewilderment and mystification which no one is able to clear up, because financially there are no means of arriving at a conclusion as to whether the expenditure of so many hundred millions sterling on churches, theatres, public offices, and private dwellings, will ever give anything like remunerative percentage on the capital employed. The City of Paris, or rather Baron Haussman, appropriates and commands a new line of buildings, and then seeks funds in all directions, at home and abroad, for substituting a class of handsome houses which naturally can be only occupied by a wealthy class of tenants. The Prefect of the Seine publishes an annual budget, which, oddly enough, is made every year to show, as far as figures are concerned, an equilibrium.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2522 F. VERSMANN. Improvements in the Manufacture of Varnishes. Dated September 5, 1867.

This invention relates to the use of certain solvents for the gums, resins, or gum resins employed in the manufacture of varnishes, and it is particularly applicable to obtaining solvents of copal for that purpose. The solvents employed are these:—Alcohols of the series represented by the formula $C_n H_{2n+2} O$ (C = 12), containing more than two equivalents of carbon, beginning therefore with propylic alcohol = $C_3 H_8 O$. The mixture of some of these alcohols known as fusel oil, which contains chiefly anylic alcohol, answers the purpose very well.—Patent completed.

2579 W. E. NEWTON. Improvements in Saws. (A communication.) Dated September 11, 1867.

The patentee claims, first, perforating saw blades with a number of holes in rear of the teeth, as set forth, for the purpose of admitting of the lengthening of the teeth when the latter are worn away by use, without the process of "gumming" or re-cutting the throats or spaces between the teeth. Second, the use of male and female dies constructed and arranged, as shown and described for the purpose of cutting out the teeth or the throats, or spaces between the same, and also the holes in rear of the teeth, at one operation, and admitting of the adjustment of the parts which cut out these holes in such a manner that the latter may be cut or punched in straight or curved lines, as may be required. Third, securing the angle sockets to the saw blade by rectangular slots in the ends of the saw blade and the screw bolts provided with the taper portion, as set forth.—Patent completed.

2580 W. F. COOKE. Improvements in Tunnelling and Quarrying Slate and other Minerals, and in Machinery used for these Purposes. Dated September 11, 1867.

The patentee claims, first, tunnelling or quarrying slate and other minerals with a tunnelling machine working in combination with a traversing machine to cut parallel tunnels into the slate or mineral, as described. Second, tunnelling or quarrying slate and other minerals with a tunnelling machine cutting into the slate or mineral parallel tunnels intersecting one another, as described. Third, the quarrying by cutting into the slate two parallel rows of tunnels, one above the other, or at a distance from one another, and afterwards sawing or cutting away the block of mineral between the two rows of tunnels, as described. Last, constructing tools in the manner described or cutting away at the back of a circular block of slate or mineral which has had a groove cut around it by a tunnelling machine.—Patent completed.

2612 W. LE DUC. Improvements in the Mode of Covering Roofs with Slate or other Materials, which Improvements are Applicable also to the Covering or Forming of Walls. Dated September 17, 1867.

Here the pieces of slate, &c., are made in the form of squares, having two of their corners situated diagonally opposite to each other cut off or removed, so that the piece of slate when prepared for use presents the form of a six-sided figure. In laying the pieces of slate they are arranged in horizontal rows, with their shorter sides in juxtaposition, the lower rows being first laid, and each succeeding row above so placed that its lower corners overlap and cover the joints or intervals between the shorter sides of the pieces of the lower row.—Patent completed.

2621 A. M. CLARK. Improvements in Valve Closet Apparatus, part of which is Applicable for Regulating the Flow of Water in other cases. A communication.) Dated September 17, 1867.

This invention consists, first, in the application to such apparatus of an elastic valve of peculiar construction as a substitute for the arrangement now in use. Second, in means of regulating the pressure of the water in the pipes, which is also applicable for regulating the flow of water in other cases. Third, in the application to water-closets generally of means of separating the solid and liquid matters in the basin itself. Fourth, in the application of a cock for regulating the pressure of the water from the mains, which also regulates the supply to the basin.—Patent completed.

2641 W. POTTS. Improvements in Apparatus for Ventilating Rooms and Buildings. Dated September 20, 1867.

The patentee claims constructing and arranging in the cornices of rooms and buildings, or at the highest convenient part of the room or building, two independent or separate channels, situated at different levels, the upper one serving to collect and remove the hot and vitiated air from the room or building, and the lower one serving to introduce cool and pure air into the room or building, the hot and vitiated air entering its channel, and the cool and pure air passing from its channel through ornamental or other perforations or wire gauze, as described.—Patent completed.

2665 A. MACKENSIE and S. ROBINSON. Improvements in Apparatus to be Applied to Cisterns for Preventing Waste of Water. Dated September 21, 1867.

In applying this invention to water-closet cisterns, for example, the patentees construct inside the cistern, at the lowest part thereof, a gauge chamber of sufficient capacity to contain the requisite amount of water for one flushing of the closet. A small aperture is made in the side of this chamber at the bottom for filling the same from the surrounding water in the cistern, such aperture being opened by the act of closing the principal valve of the cistern, and closed when such valve is opened, a small inlet valve being employed for that purpose adapted to the aperture referred to. At the bottom of the gauge chamber there is fitted the valve-seat and valve, opening either into the old service box, or into a supply pipe leading direct to the basin. This valve is provided with a tubular spindle, having a piston, being connected to a float inside the closed chamber before referred to, and on the lower part of the piston is formed a valve cap, and on the upper part of the tubular spindle through which the piston works there is formed a valve-seat, so that when the piston is raised by the float to a given height, the second passage for water (namely, the passage through the tubular spindle) is closed, and remains closed until, by the opening of the principal valve, the chamber is emptied. This piston is further coupled by a wire to the usual overhead weighted lever which is connected to the "pull" or handle of the closet. The object of the entire arrangement is, first, to admit the full complement of water in the closed chamber to pass down through the principal valve when opened; and, second, to permit of a certain gauged or regulated quantity of water sufficient to fill the pan of the closet to descend through the tubular spindle of the main valve after it has been closed. This latter is the result of the quantity of water admitted to flow through the small open aperture being in a certain proportion in excess of the quantity which can pass down through the tubular spindle or piston valve, and, consequently, the chamber will in a short time become nearly full, and the float raised so as to close the inner valve. This float, however, is not sufficiently buoyant to open the principal valve.—Patent completed.

2677. W. COOKE. Improvements in Apparatus for the Regulation of Up and Down Currents of Air. Dated September 23, 1867.

This invention consists of an apparatus that effectually regulates the up and prevents the down draught in shafts or chimneys by the application of outer flanges or breaks to an upright tube or shaft open at both ends, having angular or other shaped openings in the sides, with inner tubes perpendicularly arranged, so as to direct the upward current of the air or smoke, permitting it freely to ascend, the whole apparatus acting as an exhauster of the air, facilitating the upward current, the openings at the sides serving as escapes for the downward current.—Patent abandoned.

Trade News.

TENDERS

Bristol.—For new district church, Upper Easton. Mr Joseph Neale, architect:—

Davis and Son	£2395
Sanders	2284
Joseph Stephens	2370
Humphries	2326
Beaven and Son	2310
Summerville	2284
Challenger	2150
Webley	2140
J. P. Stephens (accepted)	2127

Devonshire.—For the erection of a Congregational Church at Moretonhampstead, Devonshire. Mr. John Tarring, architect:—

Bragg	£1325 0 0
Bragg and Dyer	1128 6 9
Piller	1091 0 0
Bearne and Marvin	1068 0 8
Tarring and Avrey	1029 9 4
Luscombe	891 10 0

Hemel Hempstead.—For erecting church at Hemel Hempstead, Messrs. Drury and Lovejoy, architects. Quantities supplied by Messrs. Curtis and Son, and Rake and Ramwell:—

	A seats	B seats
Cook	£3752 0 0	£3705 0 0
Humphrey	3325 0 0	3325 0
Chappel	3176 13 0	3289 3 0
Sear	3170 0 0	3240 0 0
Nightingale	3138 0 0	3178 0 0
Harris	3025 0 0	3050 0 0
Webb	2925 0 0	2965 0 0
Wilkins	2902 0 0	2882 0 0
Gibson (accepted)	2800 0 0	2861 0 0

Holkham (Norfolk).—For restoration of the church Mr. J. K. Colling, architect:—

Myers and Son	£6550
Spaur	4171
Skipper	4090
Brown	4086
Cornish	4076

London.—For alterations at Messrs Coates and Co.'s, Whitechapel. Mr. James Harrison, architect. Quantities supplied by Messrs. Leaning and Nicoll and Mr. C. A. Gould:—

Browne and Robinson	£819
Webb and Sons	815
Ashby and Sons	810
Ashby and Horner	798
Hill and Keddell	787
Little (accepted)	783

London.—For the erection of warehouses, Pudding, lane, City, for Mr. J. Sheppard Scott. Messrs. Meeson and Boys, architects:—

King and Sons (accepted)	£5120

London.—For rebuilding wharf and warehouse for Messrs. Nash, Hicks, and Nash, at Pickle Herring Lower Wharf, exclusive of river wall and foundation. S. Brookes, architect. Quantities by R. L. Curtis and Son:—

Piper and Wheeler	£6350
Perry and Co.	6005
J. D. Cowland	5980
Gillet and Wisbey	5800
R. Wells	5467
W. Wills	5409
Newman and Mann	5396
J. and T. Coleman	5333
W. Henshaw	5325

London.—For rebuilding warehouse, No. 22, Crutched Friars, for Messrs. H. Bucknall and Sons. Mr. Arthur E. Taylor, architect. Quantities supplied by Mr Joseph Clever:—

Thompson	£3223
Higgs	31 4
Rider and Son	2 83
Kilby	2769
Browne and Robinson	2720
Emor	2708
Conder	2570
Heushawe	2575
Morter (accepted)	2513

Norfolk.—For a chapel at the Gressenhall Union, Norfolk, exclusive of stone. Mr. R. M. Phipson, architect:—

Harrold	£627 10 0
Skipper	564 0 0
Perkins	530 0 0
Jackson	547 0 0
Larner (accepted)	478 0 0
Nelson	425 0 0

Norwich.—For alterations and additions to Thorpe Rectory, near Norwich, exclusive of old materials. Mr. R. M. Phipson, architect:—

Hood	£2326
Brookes	2310
Lacey	2299
Balls	2270
Downing	22 9
Newell (accepted)	1851

Steeple Morden (Cambridgeshire).—For restoration of church, new tower, and spire. Messrs. Elmslie and Franey, architects:—

Brown	£3065
Whitehead	2980
Mason and Green	2960
Lacey	2150

Suffolk.—For restoring Stoke Ash Church, Suffolk, exclusive of old materials. Mr. R. M. Phipson, architect:—

Burrell	£887 15 0
Rednall and Vine	594 12 6
Bishop	575 0 0
Cornish (accepted)	568 0 0

Sherborne.—For new Hotel. Messrs Slater and Carpenter, architects. Quantities by Messrs Pain and Clark :—

Gale	£16,800
Tr[illegible]	16,073
S[illegible]	15,988
Rogers and Booth	15,910
Dawn	15,766
Pollard	15,260
Mills	15,086
Futcher	14,987
Brown and Sons	14,934
Palmer	14,852
Wellspring and Sons	14,831
Chapman and Track	14,544
Manley and Rogers	14,377
Bartlett and Sons	14,110
Estcourt	13,600
Bull and Sons	13,236

No tender accepted : the drawings to be reduced.

BATH STONE OF BEST QUALITY.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry Botsford, South Norwood, builder, May 5, at 12.—James Costin, High street, Hoxton, plumber, May 5, at 12—David Fox, Ramsgate, builder, May 6, at 1.—John Stephens, Hammersmith, builder, May 6, at 11.

TO SURRENDER IN THE COUNTRY.

Hillman Fenner, St. Lawrence, Isle of Thanet, carpenter, April 29, at 12.—James Pattinson, Carlisle, joiner, April 28, at 11.—William Bainton, Hull, bricklayer, May, 4, at 11.—George Chapman, New Duston, near Northampton, carpenter, May 2.—William Curtis, Sen, Docking, Norfolk, bricklayer, May 7, at 3.—Henry Hodgson, Liverpool, assistant surveyor, May 4, at 3.—Joseph Lovell, Weston-super-Mare, painter, May 4, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

May 22, W Ranger, Lewes, builder —May 22, H. Morris, Newbury, builder —April 30, J. Robbins, Liverpool, tiler.—May 6, S. Phillips, Swansea, mason —May 19, G. Llewellyn, Pontypool, painter. May 12, W. Nicolls, Robertsbridge, carpenter.—May 29, G. J. Bell, Norwich, builder.—May 29, J. R. Stephenson, Monkwearmouth Shore, painter and glazier.

BANKRUPTCY ANNULLED.

Uriah Halsall Jones, Farraday street, builder, April 8.

DIVIDENDS.

May 6, G. Green, Greenwich, builder —May 2, R Pawley, St. Mary Church, Devon, mason —May 7, R. Sherlod, Darlington, builder.—May 7, R. Coates, Hurworth-upon-Tees, brickmaker.—May 8, W. Palmer, Middleton one-row, joiner.

PARTNERSHIPS DISSOLVED.

Frith and Co., Sheffield, surveyors.—J. and G. Willis, Gravesend, timber merchants.—Spargo and Richards, Truro, stonemasons.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak ....load	£11 10	12 10	Archangel, yellow ..	£11 0	£12 0
Quebec, red pine	3 10	4 15	St. Petersburg, yel...	10 10	11 0
,, yellow pine..	2 15	4 5	Finland	7 10	8 10
St. John N.B. yellow	0 0	0 0	Memel...............	0 0	0 0
Quebec Oak, white..	5 15	5 15	Gothenburg, yellow	8 0	10 0
,, birch........	3 10	4 10	,, white	8 0	9 0
,, elm	3 10	5 0	Gefle yellow........	9 0	10 10
Dantzic oak	4 0	6 0	Soderham	9 0	10 10
,, fir	2 5	3 5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	12 0	15 0
Memel fir	3 0	3 15			
Riga..............	3 0	3 5			
Swedish	2 2	2 9	Deck Plank, Dantzic, per 40 ft. 3 in.	0 13	1 3
Masts, Quebec red pine	6 0	7 0			
,, yellow pine..	5 0	6 0	Pumice Stone per ton	6 0	8 0
Lathwood, Dantzic, fm	5 0	7 0	Oils, &c.		
,, St. Petersburg	8 10	9 5	Seal, pale....per tun	38 0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Sperm body	98 0	100 0
			Cod	35 0	0 0
			Whale, Sth. Sea, pale	33 0	0 0
Quebec, white spruce	13 0	19 0	Olive, Gallipoli......	73 0	71 0
St John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	54 0	55 0
Yellow pine, per reduced C.			Palm, fine	40 0	40 0
			Linseed	33 10	34 0
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	37 10	0 0
2nd do......	11 0	12 0	Cottonseed	33 0	40 0

Metals.

Iron :—

Welsh Bars in London	per ton	6 5 0	6 10 0	3
Nail Rod	do	7 5 0	7 12 6	2½
Hoops.	do	8 5 0	9 0 0	2½
Hoops, Single	do	8 0 0	9 0 0	2½
Staffordshire Bars..........	do	7 5 0	7 15 0	2½
Bars, in Wales	do	5 7 6	6 0 0	3
Nailrods	do	7 5 0	7 12 6	2½
Foundry Pigs, at Glasg. No 1 ..	do	2 12 6	2 1[illegible] 0	ne t.
Swedish Bars	do	10 0 0	10 10 0	2½

Steel :—

Swedish Keg, hammered	per ton	15 0 0	15 5 0	2½
Swedish Faggot	do	0 0 0	0 0 0	

Copper :—

Sheet & Sheathing, & Bolts	per ton	85 0 0	87 0 0	3
Hammered Bottoms	do	95 0 0	0 0 0	3
Flat Bottoms, not Hammered ..	do	90 0 0	0 0 0	3
Cake and Tough Ingot	do	80 0 0	83 0 0	3
Best Selected	do	82 0 0	85 0 0	3
Australian	do	82 10 0	90 0 0	3
Y l. Metal Sheathing & Rods	per lb	0 0 7¼	0 0 7½	3

Lead :—

Pig, English	per ton	21 5 0	0 0 0	2½
,, Spanish Soft	do	19 0 0	0 0 0	2½
Shot, Patent	do	22 10 0	0 0 0	2½
Sheet	do	20 10 0	20 15 0	5
White	do	27 0 0	30 0 0	

Regulus of Antimony

French	per ton	44 0	45 0	

Zinc :—

English Sheet	per ton	26 10 0	27 10 0	2½
Devaux's V. M. Roofing Zinc	do	26 10 0	0 0	

* And 5 per cent. discount if laid upon the new system

Spelter :—

On the Spot	per ton	20 0	0 0	nett
Quicksilver	per btl	6 17 0	0 0 0	

Tin :—

English Block	per ton	98 0 0	0 0 0	2½
do Bar	do	99 0 0	0 0 0	2½
do Refined	do	101 0 0	0 0 0	2½
Banca	do	96 0 0	97 0 0	nett
Straits	do	93 0 0	0 0 0	nett

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 1, 1868.

THE ARCHITECTURAL EXHIBITION.

WE heartily recommend every reader of the title of this article to visit the galleries at No. 9, Conduit-street. There are amongst our readers many to whom we would add, let this visit be a long one, a whole day, or, if you cannot manage to give a working day, give its equivalent of time in evenings. Do not suppose that we are asking you to indulge in amusements, and to spend your money on a society whose interests we desire to uphold. If it should so turn out that you are amused as well as instructed, and the society benefited as well as yourself, these are merely subsidiary parts of the great outcome we desire. To the architectural pupil or young assistant who has so much to meet out of a very limited income, the admission shillings to the many art exhibitions which crop up between January 1 and December 31 make up a sum quite worth considering, and the chief consideration is, or ought to be, how to make the expenditure profitable.

There are, we take it, four drawbacks to the educating power of the Architectural Exhibition. There is the *conversazione*, where you lounge about gabbling or drawling out passing criticisms for the edification of the ladies. You affect to look down upon all the exhibitors and all their works; you say what you think to be a clever thing about A, and you have your shallow laugh at B, and so your friends, filled with your trivial chat and overflowing with professional scandal, vow they never had such a delightful evening, and never come again. The second drawback is the extra use to which the rooms are put during the exhibition. For instance, in the first room, where the Manchester Townhall drawings are hung, the Architectural Association hold their meetings. It needs no words to show the sort of value we put on that which costs us nothing. The members of the association are just as human as the rest of us, and as they become familiar for hours together with the designs in the chief competition of the year, familiarity brings forth its natural product, and it would not be surprising if the members of the association neglected to use the exhibition for their good, or in any sense to study therein what to do or what not to do. What we say emphatically of the younger men in the profession may be reechoed up to the very steps of the throne of the Institute. If we all used the exhibition as we ought to do, and if we all had as much simplicity and humility as our old friend Wilars when he lauded the architects of Laon and Rheims, and sketched with a view to development the architectural forms of his immediate predecessors and contemporaries, the galleries at Conduit-street would be visited by every one interested in architecture. A would learn how to arrange sculpture from B, and B would learn how to group his voids and masses from A, whilst both A and B might turn to the French drawings, and learn many a lesson in common. And this reminds us that the feature which distinguishes the present from all past exhibitions is the presence of some of the finest works of our contemporaries at Paris. The greater part of one side of the large gallery is occupied by French works. We have six coloured drawings of Prince Napoleon's house—no pretty tricky views, but genuine architectural drawings, elevations, sections, and details; one or two public buildings; and a magnificent set of drawings by M. C. Lameir, illustrating in plans, sections, details, and perspectives the most complete schemes of painted decoration we have ever seen. We shall have much to say on this work in a future article; meanwhile we commend it to the closest study our readers can give it, feeling satisfied that no one with *seeing* eyes can fail to derive much profit from this grand monumental *projet*, which so nobly illustrates the mighty vision of St. John in Patmos. It must not, however, be thought that we give unqualified praise to M. Lameir. With one or two exceptions the drawing and design or arrangement are of the very highest class, but when we come to consider the question of colour, our verdict is by no means so favourable. This is, however, one of the questions we propose to discuss in a second article.

After the French drawings, which ought by themselves to make the treasury overflow with shillings, the most interesting designs are the competition drawings for Manchester Townhall, the three premiated designs in the first competition for the Bristol Assize Courts, and the competition designs for the Churches at Great Yarmouth and Lincoln. It is very unfortunate for the sake of criticism that the *selected* architects in the Manchester competition should have sent their last drawings instead of their first sketches, for the unfortunate men who exhibit their "sketches" are manifestly at a disadvantage in measuring with those who exhibit richly coloured perspectives in frames 6ft. or 7ft. long. Of those who were placed by the adjudicator in the first competition five exhibit not their original designs, but their finished drawings—Messrs. Waterhouse, T. H. Wyatt, Scott, Worthington, and Speakman and Charlesworth. Amongst those who were never, so to speak, in the running, we have the designs of Messrs. Godwin (E. W.) and Crisp, Prichard, Roger Smith (scratched), Lamb, Ridge, Talbert, Rogers and Codd, and Dunk. The influence which the designs for the Law Courts has had upon some of these designs is very remarkable, notably so in the cases of Mr. Worthington and Messrs. Speakman and Charlesworth, who have helped themselves bountifully from Mr. Burges and Mr. Scott. Indeed, Mr. Burges's thirteenth century translation of the dormer windows of the Hotel de Cluny and the Château de Josselin has been hailed as a discovery, and must be regarded as a great success.

In ecclesiastical work the most important contributions are from Messrs. Wilson and Nichol, Hadfield and Son, Street, W. White, Seddon, and Giles and Robinson. In domestic work we recognise some new views of old friends. Amongst the Gothic work, Messrs. Godwin and Crisp, and Mr. W. White; in Italian work, Mr. Cockerell and Mr. Edis; for smaller works, Messrs. Curzon, Watson, Seddon, Chancellor, and W. Parnell deserve notice. We have this year but one warehouse of importance illustrated in a very large drawing by Mr. Rowland Plumb. The very bad works are not by any means so numerous as in past years. Of "successful men" Mr. Truefitt and Mr. Lamb are certainly not up to the mark. Mr. Lamb is more fanciful and transformationesque than ever, and Mr. Truefitt is trying to be original by the weakest of all contrivances, viz., the conjunction of different styles; his bank at Manchester will not do as a guide to the architecture of the future. Mr. Wimble exhibits something in Southwark-street, and helps thereby to keep the tradition of the Strand Music Hall before us. Designs for decorations and furniture are still few and far between. We are glad to see Mr. Albert Moore's design for the decorations of the Queen's Theatre, Long Acre. It is a pity the drawing should have been so badly mounted and the figure subject omitted. The architects who favour strong colours and violent contrasts, whose eyes can rest well pleased on vermilion furniture and yellow walls, will very naturally oppose Mr. Moore's scheme and call it weak and washy; and we must give such people full credit—to them it is weak; but the degree of sight power is very various, extremes should be avoided, and the strong grasping vision of the clear-sighted man should no more be permitted to force an over-tenderness of colour than the dulled eye should be allowed to have its way and force its hard colour and violent contrasts on unwilling eyes. The mass of people are neither acutely sensible to colour nor are they altogether lower than the dull, and what they want, and what will do them good, is neither higher tone nor lower tone, but purer tone. We do not want you to play a fantasia until you have tuned the piano. Mr. Burges exhibits photographs of some of his very masculine designs, as executed in the shape of furniture, cups, flagons, inkstands, &c.

It remains for us to direct attention to three important features of the exhibition. Two screens are covered with the original studies made by the late Sir C. Barry, for the Houses of Parliament. These are in every way interesting; how the interest would swell if we had two more screens covered with the original studies made by the late Mr. Pugin! The Architectural Association have put forth great strength this year, and the works of Messrs. Lonsdale, Lee, and Vialls are in every way vigorous and careful. Messrs. Evill, Davie, Jones, and Spiers also exhibit good promising work. We have one word to say to these gentlemen: think out for yourselves the problem you have set yourselves to solve, and do not begin by asking yourselves the questions, has this been done before, and by whom. We think, too, that it would be a far more satisfactory and helpful test if the members of the class of design would consent to set aside longer evenings and work out a design at one sitting in the association rooms without reference to books, and well separated from one another, the subject not to be known beforehand. We might not have such careful and effective drawings, but then we should have more of the man; Mr. Spiers would give us more of himself and less of the fountain designed years since for Gloucester; Mr. Jones would not have time to deck up his railway station like a Viollet le Duc etching; and Mr. Vialls would not take so much inspiration from designs made eight years ago. The work of the Association is so good that it would be insulting to make any apology for these few words of suggestion and criticism.

We have now arrived at the last, or, as it stands in the catalogue, the first portion of the exhibition. The original drawings of old works are not much, if anything, in advance of last year. The most careful works are those by Messrs. Cole, Wheeler, Cockerell, and Spiers. Amongst the group of sketches Messrs. Seddon, Watson, and Lonsdale may be noted, especially the latter. At the top of the large room Mr. Cockerell exhibits his father's drawing for the Royal Exchange, and Mr. Childs has a careful oil painting of the Rathhaus, Cologne. We had almost forgotten to mention Mr. W. B. Scott's coloured cartoons for wall paintings hung at the top of the room. We can only wish, for Mr. Scott's sake, that the room had been three times as high.

THE ROYAL ACADEMY.

THIS year the Royal Academy of England celebrates its centenary. One hundred years ago this society was established for the encouragement and support of the three sister arts, Architecture, Painting, and Sculpture, the encouragement and support taking the form of (1) a training school, and (2) admission to membership in the society. Of the school, we do not intend to say anything just now, although we are quite conscious of what may be said of it. At the foundation of the Academy the number of members was limited to sixty, independently of the two or three engravers who were thought worthy of the honour. Of these sixty, forty were considered full members and enjoyed the highest art privileges England had to offer, and were permitted to subscribe themselves R.A.; the remaining twenty, or the novices of the society, from whom alone the R.A.'s were recruited, being dignified by the title of Asso-

ciates and allowed to subscribe themselves A.R.A. Passing by the apparent anomaly that the higher degree should out-number the lower, from which it was recruited, we have to face a still more remarkable anomaly, viz., that during the past century no provision has been made by the society to meet the growth of art and the increase of the art population, or, to put it another way, in 1868 there are only sixty honours to be won by a band of artists who muster in six times the force that they did one hundred years ago, when the same number of honours were to be won. The architectural profession, which has increased during that period in a far greater ratio than its sister professions, is thus considerably worse off in all its relations, so far as honour is concerned, than it was before the foundation of that society which professes to be its foster nurse. Not only is this limit of the eighteenth century rightly felt to be an injustice in the nineteenth century, but a further injustice naturally hinges upon this increase of artists, inasmuch as the wall space which might have been abundant a few years ago is now absurdly inadequate. This latter drawback promises, however, to be very soon a thing of the past, as the new building at Burlington House is now so far advanced that we can see no reason why the next Royal Academy Exhibition should not be held within the new walls. That the illiberal inaction above mentioned could have ever been presented to the minds of such men as Messrs. Richmond, Millais, Frith, Leighton, Calderon, and other members of the Academy, is a thought almost too preposterous to entertain, and yet they are placed on the horns of a dilemma, inasmuch as it is almost equally preposterous to suppose that such men could exist so ignorant of the times in which they live, so unconscious alike of the stagnation of the Academy and the rapid strong growth of the art population around them; for had they been conscious of the latter it is hardly conceivable that they would have sent such a large number of their works, for the good hanging of which they have a right by virtue of membership, to the manifest exclusion (so long as walls are not elastic) of hundreds of worthy pictures. Mr. Richmond, for instance, has on the line this year at least seven portraits. Now, it may be very gratifying to my lord bishop and Mr. Dean and to all their friends to see their portraits placed side by side with Millais's lovely Rosalind, or shoving this great painter's Stella above the line; but is it a particularly pleasant thing for Mr. Richmond and these worthy divines to contemplate the suffering and the broken hopes of many a young and earnest worker, who, from this trifling pride of place, is forced to eat his bread unbuttered for the next twelve months? Would it have made any difference to the bread-and-butter of the R.A. had he been content to have been represented by two instead of half a dozen pictures?

The first glance at this year's exhibition is sufficient to show us that it is not up to the mark of past years. From what we have already said it will be inferred that the members exhibit a great number of canvasses. This at no time in our memory was ever a necessary element of a good exhibition; but this year, from some cause or other, whether owing to the panic, or whether, as the man who stole the pocket-book says, something has disagreed with them, certain it is that even those from whom we used to get fair average painting are this year far below their standard. Mr. Frith, a young—comparatively speaking, quite a boy—R.A., appears suddenly to have fallen into the sere and yellow leaf. Mr. Horsley, R.A., in his "Rent-day at Haddon Hall," is equally retrogressive. Going higher in the scale, we cannot understand how the painter of such a picture as "Whither?" (Mr. Calderon, R.A.) could have wrought such works as the "Œnone" and "Hamlet." There are few pictures better than "Whither?" which is his diploma picture, and, we understand, was painted a year or so back; but between this and the others the artist has chosen to place a great gulf. Messrs. Faed, Nicol, Pettie, Ansdell, Lee, Thorburn, Ward, Richmond, Knight, Leighton, Elmore, Goodall, O'Niel, and Armitage, members of the Academy, are all more or less below what they have at times led us to expect of them. Of course there are R.A.'s who, like curious old port, have lost their body and colour, remaining as we have always known them, and thus, for obvious reasons, are not worse than usual. Among the painters who have distinguished themselves and made their mark deeper we may mention Mr. Poole, R.A. His "Drifting Boat in the Moonlight" is a poem to be remembered, and *will* be remembered, for it gains much of its power from its simplicity. Sir Edwin Landseer, R.A., in his "Dead Deer and Dog," shows, too, that he has not lost his cunning. Mr. Millais, R.A., exhibits in his "Stella" that he has powers in reserve. His four other works more or less maintain his justly earned fame. Mr. Frederick Walker, in his "Vagrants," takes rank with the best, and has painted a picture that the rising English school may well be proud of. Following these we have Mr. Orchardson, A.R.A., who makes us long for more of his work; Mr. Marcus Stone, whose "Interrupted Duel" is far in advance of his last year's production; Mr. Storey; Mr. Yeames, A.R.A.; Mr. Hodgson, who contributes a Chinese interior and a Roman galley "Off the Downs in the Year One"; Mrs. Ward, who takes the lead of the lady exhibitors in her "Lady Jane Grey Refusing the Crown"; Mr. Marks, who is comic as usual, in his "Experimental Gunnery"; and Mr. G. D. Leslie, A.R.A., who is always refined. For portraits commend us to Mr. G. F. Watts, R.A., and Mr. Wells, A.R.A. In landscapes, the veteran Linnell leads; Mr. Hook, R.A., is as strong and as faithful as ever; Mr. Brett has drawn the sea, and Mr. Henry Moore has two capital studies.

A new element in this year's exhibition is the presence of two distinguished foreign artists—Baron Leys, with one of his faithful representations of late mediæval subject; and Edouard Frere, who gives us a picture embodying, as do all his paintings, his fine sense of child-life.

The only decorative painting is a large life-size figure, by Mr. Albert Moore, which ought to have been hung with the architectural drawings. The architects who exhibit this year belong essentially to the modern school. Mr. E. M. Barry, A.R.A., and Mr. Street, A.R.A., have sent drawings, but where are the R.A.'s? and why should we have three drawings of Crewe Hall? It is true they are not all on the line, but it would have been more satisfactory to have had some other works represented. Mr. E. W. Godwin exhibits one of the premiated designs in the second competition for the Bristol Assize Courts. He has also a view of Glenbegh Towers, and two small pen-and-ink drawings of lodges at Castle Ashby. Mr. Waterhouse shows in his view of Manchester Townhall a very marked improvement on his Law Courts' design. Mr. Digby Wyatt sends a view of the Court of the India Office, and Mr. Burges reappears with Cork Cathedral. Of these and other works we shall have more to say in a future number.

THEORY OF PUMPS.

MANY of our readers doubtless remember the time when all supplies of water in the metropolis were obtained through the instrumentality of the traditional pump. Happily the *ancienne régime* has passed away, so far as London is concerned, but, in the majority of our towns, it is still in full vigour. The well and the cesspool are sunk in as close proximity as ever, and the one continues to supply the other with the seeds of fever, cholera, and death. In all country districts, isolated villages, and outlying localities, the pump must long remain as the only means of obtaining from a water-bearing stratum a sufficient quantity of that indispensable fluid. The term "the pump" is, in fact, almost synonomous with that of water, and we remember an amusing anecdote of our younger days in connection therewith. Having occasion to get a prescription made up at a country apothecary's, we proceeded to his compounding apartment, and awaited, with the usual curiosity, the filling of his medicinal "bottle." After duly measuring and pouring in the prescribed tinctures, decoctions, and infusions, which occupied about three-fourths of the bottle, it became necessary to "fill up" with water. The son of Galen, not willing to betray to uninitiated ears the mysteries of his art, and ignorant, also, of our acquaintance with the dead languages, turned to his apprentice and demanded of him, in a pompous tone and in execrable Latinity, some "*aqua pompaginis.*" In addition to the common pump, employed solely for drawing water from a well, another familiar example is that by the aid of which the fluid is driven or forced to a higher situation, such as the cistern or reservoir for supplying water-closets, bath-rooms, and other premises placed nearer the top storey of a dwelling house. Although numbers use these and another description of pump daily, yet few understand either their mechanism or the principle upon which they act. Both are simple, and we trust will be easily comprehended after the perusal of the following description. A knowledge, also, of the nature of their construction, and the theory of their action, is of great value to all those who may have to rely upon their resources, more especially when, as frequently happens, there is no extraneous assistance to be obtained for putting them in order, or getting repairs done, when some of their parts become deranged from bad usage or carelessness.

All pumps may be classed under three heads—namely, the suction, the forcing, and the compound suction, or suction and lifting pump. The first of these, as its name implies, draws up the water by actual suction, that is, by exhaustion of the air in the pipe and barrel, or body of the pump, and will be easily understood from an inspection of fig. 1. At the top of the suction pipe, the bottom of which dips into the water in the well, is fixed a valve A opening upwards, and the piston B, which works air-tight in the pump, is furnished with a similar valve, also opening upwards. The piston rod C is moved by a handle in the usual manner. Before proceeding to state the theoretical conditions attendant upon its action, we will first practically investigate the subject. Let us suppose the whole apparatus to be in its normal condition, in which the valve A will be closed, and the piston B, with its valve also shut, resting close down upon A. Under these circumstances, the pressure above and below the piston and the two valves being equal, there will be general equilibrium, and no motion in any direction will ensue. If the piston B be now raised, the small quantity of air or clearance existing between it and the valve A when it was resting upon it becomes expanded in volume, and consequently the downward pressure it exerts upon A is now no longer equal to that which it exercised previously to the raising of the piston. Equality of the two pressures upon the upper and lower surfaces of the valve A being destroyed, motion takes place in the direction of the lesser, and the valve A opens, allowing, first, the air in the suction pipe, and, subsequently, the water from the well, to pass up into the pump. A few more strokes of the piston and the downward pressure is still further diminished, permitting more water to flow up the pipe. Upon the descent of the piston B it now enters the water, and the valve in it opens, allowing the water to escape through it and fill the barrel of the

pump. When the piston B descends, the valve A remains shut, owing to the downward pressure upon it, and when the pistou rises it opens. The water once being admitted through the valve B, the piston at the next ascent lifts the water to the spout, from which it is discharged. From the above description it is manifest that the water is raised from the well by the establishment of a vacuum in the barrel of the pump, the real agent being the atmospheric pressure existing upon the surface of the water in the well, and which, in obedience to the laws of hydrostatics, forces the water up the suctiou pipe.

By the aid of a few simple equations, the theory of the operations we have just described will be perfectly apparent. If P represent the pressure of the atmosphere, which in round numbers is equal to 15lb. upon the square inch, and P' that in the interior of the pump, we have in the normal condition of equilibrium $P = P^1$. But directly the piston commences its stroke, and is lifted from the valve A, this equality is destroyed, and the pressure upon the surface of the water in the well exceeds that in the interior of the well, that is $P < P^1$. This equation determines the opening of the valve A, and may be correctly termed the limiting equation of the working of the pump. The upward force with which the flow of water takes place in the pump is equal to $P - P^1$, the value of P^1 becoming nearer to zero as the body of the pump becomes filled with water. Theoretically P^1 may be assumed equal to zero, and we should in this instance have the water forced upwards with a pressure equal to 15lb. per square inch. But, in practice, this limit is never reached, and the equation $P - P^1$ will always be less than the above amount. So soon as the water has filled the body of the pump, and the piston B upon its ascent lifts it a short distance to the discharging spout, the pressure undergoes an alteration in value. Although the principle of the lifting pump is involved in the action alluded to, yet the pump itself must not be confounded with that of a compound nature to be described presently. Assuming, therefore, the pump to be full of water, and the piston to be at about half stroke, the pressure upon its upper surface will be as follows :—Putting P, as before, for the atmospheric pressure, and W for the weight in pounds of the column of water lifted by it, then the pressure upon it equals $P^1 = (P + W)$. If we make the diameter of the piston in square inches equal to d, we may write $P^1 = \left(\frac{\pi d^2}{4} \times P\right) + W$. Substituting for P its numerical value, and for $\frac{\pi d^2}{4}$ its equivalent of $d^2 \times 0{\cdot}7854$, and bearing in mind that W equals the area of the piston in square inches, multiplied by the height in inches of the column of water, multiplied by the weight of a cubic inch of water, we have, making H equal to the height of the column, $P^1 = d^2 \times 0{\cdot}7854\ (15 + 0{\cdot}0361 \times H)$.

The practical question presenting itself is, to what height can we raise water by the suction pump? It has already been demonstrated that the upward flow of the water in the suction pipe and pump is due to the formation of a partial vacuum in the body of the pump, which destroys the equilibrium existing upon the free surface of the water in the well. The water, therefore, will rise so long as the vacuum is maintained, until its weight equals that of the force urging it upwards. In fig. 2 is represented a pipe dipping into water, in the upper portion of which a vacuum has been formed, and into which the water has risen as high as C, but no higher. By the formation of the vacuum the atmospheric pressure is taken off the surface of the water at the bottom of the pipe, and, consequently, as that pressure still exists at the upper surface, the fluid is forced up the pipe in the direction of the arm B, until the downward pressure, shown by the arm A, is equal to that exerted in the contrary direction. When this limit is reached the column will not rise any higher. This limiting height evidently depends upon the specific gravity of the fluid, and may easily be determined for water. There is also another circumstance affecting the height, and that is the actual pressure of the atmosphere, which varies, in

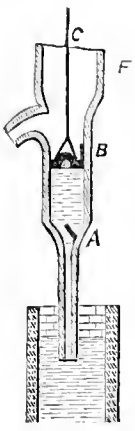


FIG. 1.

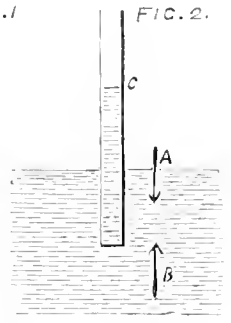


FIG. 2.

the extreme, between 29in. and 31in. of mercury in the barometer. It is, however, usually assumed to stand at 30in., and may be taken at 15lbs. per square inch of surface exposed to its action. The force urging the fluid—when it is water, whose specific gravity is unity—up the pipe is equal to the area of the pipe in square inches multiplied by 15lbs., or more correctly 14·75lbs. When the weight of the column of water standing in the tube above the level of that in the well or reservoir is equal to this force the maximum height will be attained, and no more will flow upwards. If H be this height in feet, the weight of the column will be the area of the pipe multiplied by $H \times 12 \times 0{\cdot}0361$, and the equations become $A \times 14{\cdot}75 = H \times A \times 12 \times 0{\cdot}0361$. Solving for H, we have $H = \frac{14.75}{0.4332} = 34.5$ ft., which is the greatest height to which water can be raised by the ordinary suction pump. It must, however, be remembered that this represents the theoretical value of H, or that which would be attained provided the valves, pistons, and other parts of the mechanism fitted perfectly tight, and that not the slightest leakage took place. Such perfection cannot be ensured in even the best mechanical agents, much less in machines so roughly and carelessly constructed as common pumps. Practically, the greatest height to which water can be raised by the application of this principle, is about 27ft. We must reserve for a future occasion an explanation of the action of the other descriptions of pumps.

GOSSIP FROM GLASGOW.

(From our Correspondent.)

In Glasgow, where everything else has its money value, architecture must be thought to be practised by its professors for its own sake, purely and simply, and not as a means towards such a prosaic end as bread-and-butter, for in a church competition presently in progress not only is no premium offered, but neither does the committee bind itself to accept any of the designs. When the clergyman preaches from the text, "The labourer is worthy of his hire," I shall certainly go to hear him.

Recent experiments with the "lime light" have failed to set the Clyde on fire. It is, however, expected that some difficulties will be shortly overcome, and then that this mode of illumination will be generally used in our large public places, such as Glasgow Green and the squares. Of the lime light a local newspaper, *The North British Daily Mail*, says "that although it is sometimes called 'the Drummond Light,' from Lieutenant Drummond, who in 1826 is said to have been the first who used it, it was really the invention, or rather a discovery, of a citizen of Glasgow—the late Mr. John Hart—a man whose merits the citizens never sufficiently appreciated."

The Portrait Exhibition has, at least as regards attendance, been anything but a success. In the first place, its interest is far from general; it commends itself chiefly to those of old Glasgow "family," and that very limited few who can compare Reynolds with Raeburn, and Gainsborough with Graham Gilbert; and, in the second place, as the price of admission was something like a prohibitory tariff, and as the hours were from nine till six, a suspicion arose that the Portrait Exhibition was not for the many, but that a gallery built expressly for the public's pictures was being usurped by a collection for solely the "upper ten." A more liberal scale is now being tried, but the effervescence having been taken off by "the quality," what remains for the people is found to be "stale, flat," and, I fear, "unprofitable."

The Improvement Act has progressed a stage, six "leading architects" having been invited by the Trust to plan the laying-out of the ground affected by the scheme. It is open to question whether for this special work the "leading" architects, those whose practice has been chiefly among churches, banks, and mansion-houses, are the right men in the right place, and whether the desiderated acquaintance with the wants and habits of the labourer and the artisan might not be more readily found in some humbler grade of the profession. It will be remembered that some of the "leading" architects expressed themselves in no very friendly way towards the Improvement Act, and if these be among the invited, it would be curious to know how they will dispose of the subject. I must mention that each is to receive fifty guineas for his services.

The Glasgow architects having failed to get a charter of incorporation, now propose some sort of local institute of ten pounds apiece and a guinea yearly subscription, one of its objects being the same as was intended by the charter—the raising the status of the profession. For this there is certainly ample room and verge enough.

We are now in daily expectation of the arrival of Foley's statue of Lord Clyde. The statue of the hero of Corunna, after having been upon its pedestal for forty-nine years, has been removed, and the foundations for that of the hero of the Crimea and India are being rapidly prepared. "Peace hath its victories no less renowned than war," and now that Glasgow has discharged a debt due to the memory of its two greatest soldiers, it may, perhaps, at least think of the claims of Thomas Campbell the poet, and Archibald Alison the historian. There is still a vacant corner or two in George-square.

The Corporation has taken the manure of the city into its own hands, and has consequently appointed an Inspector of Cleansing at a salary of £100 per annum to begin with. Apropos of cleansing, there was tried the other day a patented invention of Mr. Sim, late of Furnace Granite Quarries, by which it is proposed to cleanse and water the streets more efficaciously than is done at present, and also to save to the Corporation several thousand pounds a year. Mr. Sim's invention is a very simple one. He lays iron piping of about 3in. in diameter, and closely perforated, alongside the kerb of the footpath, and through these perforations water by gravitation pressure discharges a copious shower across the surface of the carriage-way. I do not know whether the piping is to be fixed or movable; but there seems to be no practical difficulty in the way of it being the former. What with an Improvement Act that straightens old streets and forms new thoroughfares, that sweeps out the birthplace of disease and crushes the cradle of crime, with a water supply unequalled in quantity and quality, a fortnightly new scheme for a system of sewage, new causey for its carriage-ways, and new pavement for its footpaths, lime-lighting for its lamps, and patent showers for its streets, Glasgow, despite a few slanders about habitual drunkenness and hypocritical Sabbatarianism, appears as if about to set up for a model city, and, with some present grumbling, to earn much future gratitude.

HOSPITALS.

At the last meeting of the Architectural Association the president, Mr. R. Phenè Spiers, in the chair, a paper on "Hospitals" was read by Mr. T. Roger Smith, of which the following is an abstract.

In choosing the subject of hospitals for his paper

Mr. Smith said he had specially in view its fitness as an example of special adaptation to a distinct purpose. There were, however, one or two collateral considerations contributing to the value of a hospital as an object of study. It was eminently a modern building. It held out before the eyes of architects a penalty against ignorance and carelessness, and a premium for knowledge and skill of a graver character than attached to almost any other work. Lastly, the subject was one on which some of the members present could not fail to be at some time practically engaged, and which therefore they might well desire to study from personal motives.

He would ask the members of the association to endeavour to look at his paper not merely as intended to convey information about hospitals, but also as including an endeavour to elucidate some of the conditions of special arrangement of buildings generally, taking hospitals as samples of what had to be done in every class structure and in fact in every separate design.

The peculiarly modern character of hospitals was worthy of a moment's notice. While examples of houses, theatres, baths, and places of worship abounded in the remains of classic times, there existed no remains of a Greek or Roman hospital. The simple and modest infirmary of a monastery was no example to us as to scale, and the vast establishments of the sixteenth and seventeenth centuries were of little value as specimens of arrangement and detail. It would therefore be to most recent examples that he should direct their attention.

Referring to the stimulus afforded to architects by the great interests at stake it was absolutely certain that if one hundred patients were treated in an ill-contrived hospital, and the same number in a thoroughly good one, many more would die in the bad building than in the good one. He could not give even a fair guess at relative numbers, but, place them at the very lowest and say that by good planning one life might be saved in each hundred, and one week's illness saved on the average to each patient, and we had a most powerful incentive to labour and study. Imagine an architect at 30 rebuilding a hospital of only sufficient capacity to accommodate 100 patients per annum. What a subject of recollection to him at the age of 70 to think of 40 human lives saved and 4,000 weeks, or more than 75 years, of human suffering saved through his instrumentality. On the other hand, if by carelessness and ignorance he had failed in his hospital what a large number of human lives had been lost in his lifetime only by his fault.

Thoroughly to grasp the subject it was well to group the requirements of a hospital under four heads or divisions, applying alike to the building and working of the institution. First, the inmates or patients—*i.e.*, the sick who were treated and resided in the house; secondly, the administration, embracing medical officers, dressers, sisters, nurses, attendants, cooking places, stores, business offices, &c.; thirdly, the out-patients, who came to the hospital periodically for advice and medicine, and the portions of the buildings where they were received and seen; fourthly, the medical school of students and professors, and their lecture rooms, library, museum, dissecting room, &c.

The most important parts of a hospital were, of course, the wards. Each patient had a separate bed, and for convenience of attendance it was usual to place from twenty to thirty beds in a ward, reserving a few small wards where only two or three beds were receivable for special cases. The most important provision for the sick which an architect can make is a plentiful supply of fresh air. There should be plenty of air, and it should constantly be changed and renewed. The best authorities consider that each bed should have from 1,500 to 2,000 cubic feet of air space, and that the change of air—while, of course, not sufficiently rapid to create a draft or breeze—should yet be sufficient to be felt as an air passing over the face and hands. The sick should not be so placed that the air, to reach any bed, must necessarily pass over any other; there must not only not be too many patients in one ward, but there must not be too many wards under one roof. Next to air, light and cheerfulness of aspect were conducive to health, and the easy supervision of the beds, and access to each side of the bed, and a clear passage up and down each ward, must be provided for. All these requirements were practically best met by wards that were long in proportion to their width, arranged so that one of the long sides shall have a southern aspect, with a row of beds at each side, placed with their heads to the wall, and a row of windows in each wall. A width of 25ft. across the ward was most useful: beyond 30ft. the ventilation became sluggish. The height of the ward should be 15ft. at least.

The best way of supplying fresh air was a subject upon which English and continental authorities differ. The best known and most followed English authorities agreed that the only reliable mode of ventilation was having windows facing each other on the two sides of each ward, and keeping them almost constantly open. This is termed natural ventilation. For this purpose hospital windows should have several casements, each hung at the bottom edge, and capable of opening back at the top, to throw the incoming air upwards. These casements should be capable of great nicety of regulation, so as to remain at whatever angle they were set. They should be glazed with thick plate-glass to diminish the loss of heat; or, better still, double glazed, with perforated zinc taking the place of some of the panes of glass. An appliance for keeping up a supply of fresh air warmed and moistened, and for drawing off foul air, ought also to form part of a hospital ward, and ought to be equal to keeping the wards thoroughly aired in frosty or stormy weather, at night, or at any other time when windows cannot safely be opened. Some such apparatus was now being made for St. Thomas's Hospital. Messrs. Haden had been consulted, and the proposed arrangement consisted of open fireplaces in the centre of the floor, with a vertical tubular flue passing from each up to the ceiling. An outer air tube round this would serve to carry off some considerable part of the vitiated air beyond what goes up the chimney with the smoke, which in all open fireplaces is always considerable. Not content with this the architect supplied four foul air extraction flues, which meet in the roofs, and near the outlet of which a current is kept up by a coil of hot water pipes, which, forming part of the hot water supply system, will be always at work. As an auxiliary for cold weather coils would be introduced on the floor, and the boiler for working them would be a separate one. Air inlets also would exist in the floor, one series bringing air to the neighbourhood of the stoves, another to the hot water coils, and when these are at work the supply drawn by these inlets will be warmed by passing over these coils. These arrangements would be all repeated in the several pavilions of the building, and would be quite separate and distinct from each other.

The ward should be so fitted and furnished as to harbour neither vermin nor infection. Wall paper and skirting boards must therefore of course be dispensed with, but there was also great risk of infection in the very material with which the faces of the ward were lined. Ordinary plaster was porous, so was soft wood. The floors should be of the hardest wood, such as oak—not tile, which is chilly to the feet—and should then be rubbed with bees wax and oil till all the pores are filled up, or else oiled and lacquered, as is the practice in Berlin, so as to render the surface smooth and hard. The walls and ceilings should be of the hardest obtainable material, Parian cement being the best for the purpose so far as surface goes and also being white, grey colouring cements being objectionable as looking dirty. For the heating of hospitals English authorities concurred in recommending open fires, either in ordinary fireplaces in the side walls of a ward, or in open fireplaces formed in some sort of stove, which ought to have earthenware surfaces, not iron, in the middle of the ward. The latter plan seemed to be gaining ground at the present day. It required of course a fire-proof construction of floor. The French frequently warmed their hospitals by hot air apparatus, but they thereby ran a risk of diminishing the advantages of their excellent arrangements in other respects.

Attached to each ward there should be one or two rooms for purposes of administration.

The sister or head nurse required a separate room with a window looking over the ward. This was best provided for at the end of the ward next adjoining the main buildings, and, excepting the window mentioned, would be like any ordinary room. A smaller room, called a ward scullery, with a fireplace, and hot and cold water laid on, and a sink, were also wanted. At the opposite end of the ward must be placed a group of closets and one or more baths and a lavatory. A cross current of air should constantly traverse the passage between the ward and the closets, to prevent any effluvia entering the ward, and each closet should have separate and direct ventilation. It was also desirable if practicable to retain an end window to the ward for cheerfulness' sake. The Leeds Infirmary and St. Thomas's Hospital were examples of perfect arrangement in this respect. A slop sink thoroughly trapped, and for men's wards an urinal, were also wanted. There should not be fewer closets than one to every ten patients. Somewhere near the ward, but not in it, there should be a small lift on which the patients' food could be conveyed from the kitchen corridor, and in each block of buildings a large lift should be provided capable of conveying a patient, his bed, and an attendant. It was also usual to provide a dust shaft and a foul linen shaft communicating from the outside of each ward with the basement.

Having now obtained a single ward, in what way were we to agglomerate a series of wards, so as to make of them one large institution? In the first place, we naturally placed them one above another, but, of course, there was a limit to this. Miss Nightingale firmly maintained that there ought to be but two storeys of wards under one roof, and this was the case at the Herbert Hospital. But partly from considerations of economy and partly from a feeling that the risk of infection vertically was not very great, it was frequently customary to place three, or even more, storeys of wards over each other. All agreed that it was inadvisable to place the sick on the level of the ground floor. The modes in which wards or blocks of wards have been arranged on plan were very various, but there appeared to be a general feeling that the best yet found out was the pavilion plan, or block system. Each pavilion was, in fact, one ward, with its appendages repeated as many times as there were storeys, and having its own independent staircase. It was isolated from its neighbours by a space which ought to be sufficient to keep it all day out of the shadow of the adjoining pavilions, so as to afford its windows all the sun and air they required. A usual plan was to make these pavilions grow out from two sides of a hollow square, and this was first practised in England—the earliest example, according to Horky, being the Hospital for Seamen, at Stonehouse, near Plymouth, built in 1764. The best known example was the Lariboisière Hospital, at Paris, commenced in 1839 and finished in 1854. The buildings of the Lariboisière were arranged round an oblong open quadrangle, and consisted of six pavilions for patients, three on each side, and of buildings for the administration, occupying four other pavilions at the four corners of the quadrangle, and closing up its two ends. The pavilions for the sick were three storeys high each, the corridor connecting them existing on the ground floor only; its roof forming on the first floor a kind of terrace. The wards, according to Horky, were about 21 metres, or about 68ft. 9in. apart, but each one was 18·3 metres to the ridge, and there was danger of their overshadowing each other. In Miss Nightingale's admirable "Notes on Hospitals," and in other standard works, other plans of arrangements would be found which were not necessary to be mentioned. The plan of the Blackburn Infirmary was, however, worth noticing as a very ingenious adaptation of the pavilion system, whereby great airiness and roomy space were secured between the wards, and yet the building was kept tolerably compact and the corridor of communication short.

Day rooms, convalescent rooms, a library, a chapel, and covered exercising ground, these, or some of them, were parts of most complete hospitals, but their use varied with the degree of severity of the diseases treated. None of these things were of much service to patients who were very ill.

Wards having been considered, the next thing was to provide for the administration. This was no trifle. The personal attendants on the sick, comprising sisters, nurses, and helpers, numbered, in a good hospital, one to every seven or eight patients, that was one-seventh or one-eighth as many as the patients. There would also be a certain number of persons engaged in household duties—some in the dispensary and stores, the superior nursing staff (in case any sisterhood looked after the hospital), the medical staff, and clerks—to be provided for. Bedrooms away from the wards were wanted for nurses when off duty. For the sister, provision was made, as before mentioned, in a room overlooking the ward. The

practice was reviving in this country of entrusting the care of the sick to sisterhoods, most of them being formed on the basis of religious orders, and most efficiently did these excellent women perform the work. In any hospital where a sisterhood was engaged a residence should be provided for them within the precincts of the hospital, detached as far as possible from all other parts of the building. The kitchen should receive special attention. It should be as central as possible, should be surrounded by stores, and easily accessible from without to tradesmen. A wine cellar and an ice-house should not be forgotten. Near this department of the hospital the residences of the steward or matron ought to be placed. A dispensary must also be provided in a central situation; this must be placed conveniently for out-patients. Linen stores and laundry required a department to themselves. A comptroller's offices, board room, and ante-room would be necessary adjuncts. For the medical staff sufficient preparation should be made. One or more residences must be provided for the house surgeon or other resident medical officer, and also accommodation for a certain number of dressers or clinical clerks. Easily accessible from the wards there must also be an operating theatre with a northerly top light; adjoining this a private surgeon's room and a small ward for patients who cannot be at once carried to their beds after an operation.

Out-patients should have a separate entrance into a hall from whence they should be passed by an attendant into the physician's or surgeon's room. This hall should be spacious and airy, as many persons were sometimes congregated in it. Each patient when seen should leave the medical room by a different door from that by which he entered, and should then be able to go to the dispensary to receive his medicine. The rooms of the physician and surgeon should of course communicate with a corridor leading to the interior of the hospital.

The medical school required a certain amount of provision to be made for it; lecture rooms, proper professors' rooms, a library, museum, one or more dissecting rooms, a dead house, and an inquest room were also needed.

Lastly, in connection with the school, it was in some cases customary, and always desirable, to provide near the hospital a building constructed in sets of chambers where a portion of the students might reside.

As to sites for hospitals, opinions differed. Miss Nightingale said unhesitatingly they should all be in the country. But this for many considerations was impossible. Certain it was that pure air and plenty of space should be primary considerations. A gravelly soil of a sufficient elevation was preferable. A bed of concrete over the whole site was recommended as a preventive against moisture. This had been done at St. Thomas's.

Having shown in detail the different units of which a great hospital is composed Mr. Smith proceeded to illustrate their harmonisation by references to the best known principal hospitals.

The typical modern hospital, as it had been considered by modern writers, was the Lariboisière. This building was planned round an oblong open quadrangle, with blocks of buildings in front and rear, and ten blocks arranged end on at the sides. Of these six only were for the sick. The front centre building was of one storey only in height. In its side blocks were the kitchen buildings on the left, and the pharmacy on the right. On the first floors of these blocks were quarters for the officers, and on the second floor apartments for pupils. Of the rear lateral blocks one had a laundry, store, and dormitories for female attendants; and the other contained sisters' rooms and stores. In the centre at the rear were the chapel, two operating theatres, bath-rooms, a stable, dead-houses, &c. This hospital was designed for 606 beds. The main defects appeared to be the small distances apart of the wards, and the position of the kitchen in one of the front blocks, as being very far from some of the wards. The same objection also applied to the two operating theatres in the rear.

The plan of the Herbert Military Hospital, Woolwich, was arranged much as though the whole quadrangle and lateral corridors of the Lariboisière had been omitted and the wards then brought together. Economy of construction and simplicity of working were thereby promoted. There were in this building seven blocks, the two next each extremity being double blocks, and the three in the centre less complete. The centre block included a day-room, library, and chapel. The blocks were hardly so far apart as at the Lariboisière, but then they were a storey lower. The kitchen was excellently well placed in the very centre of the building in the basement under the library. There were only two storeys of wards. The large wards held 32 beds each, and the building contained 620 beds in general hospital and 28 beds in the prison ward. The plans of this hospital were published in a small bluebook, and were very valuable as completely worked out examples.

The Leeds* Infirmary, designed by Mr. G. G. Scott, contained five blocks of wards—two double blocks placed end to end at the sides, like the end blocks of the Herbert Hospital, only with a gap between their ends on the top floor, and one single central block. These were arranged on opposite sides of a quadrangle, the corridors around which were only the height of one storey of wards. The position and arrangement of the blocks containing the latrines and baths deserved notice as fulfilling all the conditions of good ventilation, and as furnishing very picturesque features in the building. The way also in which the out-patients' and medical schools' department was kept out of the way of the in patients' hospital was extremely good. The chapel and operating theatres were on the first floor (the level of the lowest floor of wards). The kitchen on the lowest floor was very centrally placed. The walls and ceiling of the wards were of Parian cement.

The new St. Thomas's Hospital, now erecting from the designs of Mr. Currey, might be described, as far as ward arrangements go, as half the Lariboisière plan—that is, one main corridor with blocks projecting from it all on one side. A number of administrative buildings were clustered round the main corridor line on the ground floor, and occupied a considerable portion of the pavilions on that floor. This left six blocks for the patients, in two groups of three blocks each, with the chapel in the centre. There would be three storeys of wards, each 120ft. long by 28ft. wide, and 15ft. high, and containing twenty-eight beds, giving 1,800ft. of air to each patient. The appliances to each ward were unusually complete, including a kind of balcony overlooking the Thames. There was an excellent series of rooms for out-patients, and a distinct series for receiving and treating casualties not sufficiently serious to render the patient an inmate of the wards. The kitchen was very central, and a distinct building was proposed for the medical school. The total number of beds contemplated for this hospital was 588.

The Blackburn Infirmary showed another version of the pavilion plan with one corridor, but with the ingenious mode of shortening this corridor by throwing off the wards on either side.

As an example of simple plan and smaller design, Mr. Smith exhibited a plan of the European Hospital, at Bombay, designed by himself. This was a straight block of buildings, three storeys high, with a centre and two slightly accentuated ends. The ground storey throughout and the back of the centre of the block was occupied by rooms for administrative purposes. The wings were wards placed end to end, with baths and latrines in the blocks at the end, separated from the wards by an open space. The peculiar construction of the verandah (usual in all Indian buildings) to screen the wall rendered it possible to suppress the nurses' rooms, ward sculleries, &c., and to use portions of this verandah, Indian fashion, for those purposes. This hospital was for not quite 150 patients.

Of cottage hospitals a good example existed at East Grinstead. This description should be a good roomy cottage improved, or a homely but cheerful building like a cottage, put up on purpose, surrounded by a garden, and fitted for the occupation and treatment of a few poor cottagers, and with such surroundings as they were used to in their own homes.

Among the points of agreement in the various examples referred to it was noticed that none provides for more than six hundred beds or thereabouts, and it was stated that this was about the largest number that could be conveniently treated in one building. Those who desired further information on the subject would find it in the works of Miss Nightingale both in her "Notes on Hospitals," and in her "Notes on Nursing." In French there were by Husson, *Etude sur les Hopitaux*, and by Blondel and Ser *Rapport sur les Hopitaux civils de la Ville de Londres*. In German we had Horky, *Studien uber Kranken Anstalten*, and a work by Dr. Oppert.

* Illustrated and described in BUILDING NEWS of July 5, 1867 (No. 652).

From these works, but more especially from careful study of existing examples, much information could be gained. It must be remembered that in no branch of architectural practice was it of more importance to master every detail completely, and yet to combine the whole into a sagaciously considered and comprehensive design than when planning a hospital.

DISCUSSION.

Mr. HAYWARD, on being called upon by the president to speak, after proposing a vote of thanks to the lecturer, asked if all doctors and authorities were agreed in their opinions as to the best method of placing beds and wards. In all the hospitals described by Mr. Smith the rule appeared to be the same, except a slight difference in the construction of the windows. He thought it was remarkable that people seemed to have so made up their minds on the subject, and that while people were taking the present method to be undoubtedly correct there might possibly be yet a more perfect way. Another point that struck him was that the advantage claimed by some for cottage hospitals was more complete isolation. If this was really an advantage, was not the great elaboration of modern London hospitals a great mistake? He certainly thought medical men were in danger of going too far and getting more into their hands than they could manage.

Mr. BLASHILL, seconding the vote of thanks, said that while the great idea of modern hospitals seemed to be ventilation and cleanliness, he should like to ask Mr. Smith's opinion of the effect on the patients of the large amount of whitewash and the number of windows, both combining to admit and reflect so much light. Would not patients be hindered from sleeping, and if that was the case would it not retard their recovery?

A member said that in the case of patients being distressed by too much light he had seen used in hospitals a small head curtain, which while not interfering with the ventilation excluded the air. He should like to ask Mr. Smith's opinion of the general average cost per bed of the erection of any of the hospitals he had referred to.

Mr. LACY RIDGE said he believed that the Lariboisière Hospital, to which Mr. Smith had referred, had been found in practice to be anything but a model to be copied from, the deaths being very numerous owing to the practice of French doctors of keeping the windows shut and depending entirely on artificial ventilation. This he thought was a great argument in favour of the English system. He thought the old mediæval hospitals seemed to come much nearer perfection than any since erected. Concerning the architectural treatment of a hospital, in his opinion it was best to treat it as a building exclusively for the recovery and treatment of the sick, and not to attempt anything more.

Mr. RIDELL asked if Mr. Smith would give some information about the amount of gasfitting required in a hospital; whether, for instance, most of the night work was done by the nurses by the help of a hand lamp or candle.

Mr. SMITH, replying in order to the questions asked, said that while he thought the present system of placing beds in wards was the best, Mr. Hayward and the meeting were reminded that he had only attempted to describe things as they were in the most recent examples. He thought the probability was that hospitals were getting too elaborate, but great elaboration was the spirit of the times, and it would not do to run contrary to it. With regard to the ill effect of light, as had been already stated, a curtain was used where it proved hurtful. He was sorry he had not come prepared to give any reliable information as to the cost per bed of erection. In one example he knew the estimate had been £500 per bed, but he thought that was a very large amount. It was quite true that the deaths at the Lariboisière had been numerous, and from the cause assigned, insufficient natural ventilation. The amount of gasfitting required in a ward was not very great, one or two shaded gaslights for the sister or nurse being all that was requisite, lamps or candles being used by the nurses.

A very cordial vote of thanks was unanimously passed to the lecturer, which he briefly acknowledged, and the meeting terminated.

AN ARCHITECT'S DIFFICULTIES.

THE difficulties which architects have to contend against appear to be pretty much the same all the world over. Listen, for instance, to the following remarks made by Mr. Gilman, of

New York, before a meeting of the American Institute of Architects, a short time since. It may perhaps be thought, says Mr. Gilman, the bane of all art, that it is so dependent upon the public feeling,—that it flourishes not in proportion always to the degree of talent among its professors, but according to the degree of taste or sensibility for it among other classes of the community. But there can be no doubt that such is really the true state of the case. Particularly will it always be readily admitted by those who know anything of the public mind, that the public, as a body, too often, even the best of them, are very ill-informed in architecture. It is seldom that the means of patronage in their hands are accompanied by that knowledge or judgment which are so necessary to give value to that patronage. Hence it is that we are so often placed in that peculiarly trying position, of attempting to do our best before an uninformed and a perfectly irresponsible tribunal, when we know perfectly well, from the start, that the best is not what will be best appreciated,—in fact, not what is wanted,—and stands no possible chance of meeting with success. And herein lies, I think, the peculiar hardship, the anomalous and sometimes almost helpless position of the architect. The painter can retire to the privacy of the studio, and with his canvas and box of colours—certainly no expensive outfit—can paint what he pleases, according to his own fancy of the beautiful; as crazily sometimes, if you please, as his wildest whims can dictate; and somebody comes along and buys it; his nonsense, as King Charles said of the preacher, just hits their nonsense,—the crazier perhaps the better for the quality of the patrons,—and the finished picture is bought and taken away. Whether it ever ought to have been produced or not, is quite another question; but the completed picture is the end of the matter so far as he is concerned. It is all in the painter's own hands, the child of his own uncontrolled wishes, and he alone is responsible for it, from first to last. So with the sculptor, the impediments of tools and clay being in his case, perhaps, even of less account than the canvas and colours of the former. But when we come to the labours of the architect, how different, how infinitely more embarassing are the conditions? He can put nothing into the permanent form of a building,—can produce nothing that shall be seen and known and read of all men as his finished and completed work, except by the consent, with the co-operation, and at the expense—the large expense often—of other people. His work must be passed on before it is fairly begun, and stands no possible chance of ever coming to a successful beginning—in a permanent form, I mean—unless the people who are to pay have been all along previously conciliated. And you can readily understand that, should he have independence enough, or occupy a position strong enough to say from the start that he will design nothing, draw nothing, specify nothing, superintend nothing, put his hand to nothing but what he fully approves and what he knows beforehand is just the very best thing to be done, it would result, ninety-nine times in a hundred, in his being abandoned by his employers and the general public as in their view only a crotchety, impracticable, and conceited abstractionist. And it is my opinion, half a dozen such cases of professional self-assertion would render any one of us practically *hors du combat* for any important work for the balance of our natural lives. The late Sir Charles Barry, whom we all of us, I take it, look upon as a tolerably successful man in the profession, once remarked to me in speaking of Dr. Reid and his attempted ventilation of the Parliament buildings, with a warmth of feeling and an energy of expression which I never saw this most amiable man exhibit on any other subject: "The world," said he, "can never know, and nobody but a professional architect, perhaps, would ever believe, the amount of arrogance, of supercilious interference, of downright brutality even, that I have all along been subjected to in this matter. Forty times I have been on the point of throwing it up altogether, and had it not been for Lady Barry and my son, who have had little else to do but quiet me down at home, I should long ago have done so." I was sorry that I did not think to remind him of what I remembered not long after, of a letter of the Duke of Wellington, printed in Colonel Gurwood's edition of his letters and despatches. It was written to a young subaltern officer in India, the son of an old friend of the Duke, who contemplated throwing up his commission on account of some treatment he had received at the War Office. The veteran remonstrated with him, as nearly as I remember, in these effective terms: "You are dissatisfied with your treatment, and perhaps justly, but it is what we are all liable to in this world. The nation, doubtless, thinks me a man accustomed to have things pretty much as he likes, but I assure you, my young friend, that in thirty years of service, I have never had one single thing just as I wanted to have it. I have been obliged always to do the best I could under the circumstances."

Perhaps a fair illustration of the position of the architect in relation to his employers may be had by a comparison of it with that of the legal advocate. The lawyer, in conducting the management of a case, is compelled to take the facts as he finds them, and to do the best he can with the argument, under their admitted or proved relations. Could he have the power to make his own facts in every case just as he would like to have them, it would scarcely be granting him an easier task than what some architects appear to expect is going always to fall to their lot. The requirements of locality and convenience are one part of the facts of one class of cases which may often, it is true, admit of some ingenious modification at the hands of the architect, and perhaps greatly to the benefit of all concerned. But there is a second and often a harder class of facts to contend with, and this is the tastes, the wishes, often the fixed and unalterable resolutions of the employer; and just how to keep the line between what we know to be right and what he declares to be admissible, how—in the language of the compilers of the Book of Common Prayer—"to keep the mean between too much readiness in accepting and too much stiffness in refusing," this is the true *crux*, the veritable *pons asinorum*, which, when I confess myself to this day, and after three and twenty years of active practice, to be often sorely puzzled to cross with dignity, I know that I shall be by no means alone in the feeling in this assembly.

IRRIGATION IN INDIA.

ON the 21st ult., a paper was read on this subject before the Institution of Civil Engineers, by Mr. Allan Wilson. The author having had fourteen years' experience in India, was entitled to speak with authority on the subject.

The value of artificial means of irrigation for increasing the utility of the soil was recognised in India at an early date. In the Punjaub, canals for this purpose, as well as for navigation, were constructed as far back as the middle of the fourteenth century. But it was in the southern parts of India, where the rainfall was more precarious, and the river supplies less easily available, that the most extensive works were to be found. It had been estimated that, prior to the establishment of British rule, there were, in fourteen of the principal irrigated districts of the Madras Presidency, upwards of 43,000 tanks and channels in repair, besides about 10,000 out of repair, having, probably, 30,000 miles of embankments, and 300,000 separate masonry works. Some of these tanks and reservoirs were on an immense scale, for irrigating many thousand acres, while there were smaller tanks, wells, and springs, which watered only a few acres. It was remarkable that the Government should have allowed so many fine works gradually to fall into decay, without replacing them by others; as great natural facilities existed for storing water, and for forming canals to lead it on to the land. The irrigation works on the Godavery and Kisna rivers, in the northern Circars, and on the Coleroon, in Tanjore, have only recently been completed; but many large rivers were still allowed to flow into the ocean, almost unused for agricultural purposes.

With regard to the most general and least expensive mode of irrigation by means of artificial reservoirs, and to the methods adopted in forming such reservoirs, it was stated that in selecting a site it was essential to ascertain in the first place that the foundation was suitable; the next point to be determined was, the extent of land to be irrigated, and the quantity of water necessary for such irrigation. The area of the drainage or gathering grounds could be estimated from the trigonometrical survey maps of India, and the quantity of water that would pass into the tank during floods should be calculated according to the known rainfall, due allowance being made for absorption and evaporation. With these data, the dimensions of the different works could be fixed. It should, however, be borne in mind that depth of water was of greater importance than a large surface area, as the evaporation would be less in the former case. An examination should also be made of the valleys in the vicinity of the proposed reservoir, with a view to ascertain whether the surplus water flowing through the tank during floods could not be carried across intervening ridges, and be stored in natural basins at a small outlay, so as to fill a chain of tanks. It was explained that a tank was simply a reservoir formed by throwing an embankment, or bund as it was called in India, across a valley to dam up the drainage. The most simple description of bund was constructed entirely of earth, which was generally dug from the bed of the intended reservoir. The breadth at the top was usually about 12ft. The inner slope was 3 to 1, and this was faced with a pitching of loose stone, while the slope of the land side varied from 2 to 1 to 1 to 1. Puddle was seldom if ever used; indeed, it was not required, as owing to the lodgment of silt, a tank would puddle itself as soon as it had been once filled. In illustration of this fact it was mentioned that Major General Sir Arthur Cotten had stated that in a channel cut through loose sand, within a yard of the water's edge to a depth of 5ft., not the least moisture was found in the excavation; the lining of silt having rendered it completely watertight. In addition to this embankment some of the large Hindoo works had a massive retaining wall of masonry in front. Many of these walls were built of dressed stone, close jointed, backed with rubble and a rough description of concrete: and flights of steps of cut stone were constructed down to the edge of the water.

In order to draw off the water for cultivating the fields, each tank was provided with one or more sluices; their size and number depending entirely upon the area of land to be irrigated. The sluice in general use in Southern India was exceedingly simple. It was merely a tunnel through the bank, built of brick or rubble, either arched at the top or covered with flat stones, the floor being paved with flat-jointed flags, and the side walls lined with the same. The inner end, or head of the sluice or tunnel, was closed by stones, and the water was allowed to enter through one or more orifices, generally from 3in. to 5in. in diameter, cut in these covering stones. The flow of water through these orifices was regulated by means of conical plugs of wood, each of which being attached to a long handle could be withdrawn or inserted as required. At the end of the sluice tunnel, below the bank, a cistern was generally built, having its sides pierced with holes at different levels, to enable the water to be drawn off at various elevations. From this point the water was carried forward in open ducts of the requisite dimensions, in the sides of which subsidiary or distributing channels were cut, generally at the expense of the farmer, to lead the water on to the land to be irrigated. The mode of preparing land for wet cultivation was by laying it out in squares, rectangles, &c., each plot being separated from the rest by mud walls of sufficient height and thickness to prevent overflow or percolation. These squares or rectangles were kept level, and were as large as the nature of the ground would admit. When one was sufficiently flooded, the water was let off at the lower corner of the field into the next division, and so on until the whole area had been irrigated.

With a view of showing how favourable some parts of India were for forming reservoirs of large capacity, attention was directed to a design for a large artificial lake, which it was proposed to construct by damming up the gorge of a valley. This reservoir would be capable of storing sufficient water to irrigate 200 000 acres of land, an area equal to the county of Buckingham, allowing the usual average of 500 acres to the square mile as being under cultivation. Taking 170,000 acres as the extent of land to be irrigated for a single crop this would require provision to be made for the discharge of 170,000 cubic yards of water per hour at each end of the tank; and discussion was invited as to the best description of sluice for discharging such a vast volume of water.

On Saturday last the Sheffield Architectural and Archæological Society made their first excursion this season. They first proceeded to Conisbro' Church, which was examined. They then visited the old castle, where the Rev. J. Stacey read a paper on the building. They afterwards proceeded to Sprotborough, where the Rev. S. F. Surtees conducted the party over the fine old church. The party returned to Sheffield at ten o'clock at night after spending an interesting and instructive day.

THE LIBER STUDIORUM AND TECHNICAL EDUCATION.

IN these days of manufacturing art it is interesting, and may be useful, to remind the world of the existence of those very few things which yet bear the impress of the mind and hand of the artist. They are few in number, because time has been at work with them and destroying them, and the restorer in these modern days has been unfortunately yet more industriously and destructively at work in getting rid of all the evidences which they bore of individual artistic skill and labour. This last process has well nigh ruined every remnant of past art, while it is a certain and deplorable fact that, with but a very few exceptions, no modern art like the old—and produced in the like way—is being now brought into existence. There is, in short, no modern fine art in the real sense of the word, art *manufacture*, as I said before, having taken the place of it, the world receiving it as a substitute, not knowing the difference between them. It is not a little interesting, therefore, to note any exception, if there be any, to this now universal rule. *Cabinet painting* would seem to be the only thing in art which cannot be manufactured and disposed of as fine art, and made to pass current.

This very singular fact, unnoticed hitherto in our societies devoted to art and artists, makes everything connected with painting of high artistic interest; what would otherwise be but one thing out of many is raised by it into a thing *per se*. There is in the world of art nothing else like it. The drawings or paintings called the "Liber Studiorum," by Turner, become in this way unique, and make up a series of examples of personal and artistic power (for they are connected one with another) to be found nowhere else in the history of modern art. In this "Liber" Turner has endeavoured to represent Nature in a vast variety of aspects, and to show to the world what was never manifest before, that there is no aspect in Nature which is not worth simply representing and perpetuating. Considering the evil influences under which this great and original man was brought up, it seems truly wonderful how he came to do it—how he condescended to it. We have real reason to be thankful for this series of efforts to delineate Nature. It seems to me to have been a glorious accident, and a wonderful instance of how natural feeling and instinct can triumph sometimes over education and the pressure of the times. When these drawings were made any attempt to represent things as they are was looked upon with simple contempt, and one can hardly understand how anyone ever came to buy any of them. But there is a power in truth. A series of these drawings, which were at first published and sold for some twenty pounds, are now discovered to be worth a thousand.

But my object in asking for a little attention to these drawings at present is not to attempt to point out in detail their singular merits, but to remind the artistic reader and people in general that those wonderful performances were brought into being by a person who was wholly without "*technical education.*" This subject is now so fashionable, and sounds so learned, that it seems impossible to do otherwise than join in the general talk about it, for how can it be expected that our intelligent working man can compete with the foreigners, whether French or German, working in either metal or wood, without "technical education" to back him up? But what, some may perhaps say, is it to be technically educated? Why, shortly and simply, to be able to answer by *rote* almost any question, scientific or artistic, that may be put to you out of some book. Of either science or art as a matter of experience and practice you need to, and can, know nothing. It may, therefore, under these circumstances, be useful to venture a few practical remarks about it. I confine myself to *art* work.

First, in every old country there are always to be found in art matters *two* influences at work—the past and the present. In England at the present time there are not only the remains of the art proper to the country, and executed by those who have gone before us, as the cathedrals and churches, but museums and collections as well, full of art works of other countries, and executed by men of other races. There is, too, of course, the work now going on. Without "technical" and scientific art education, we are everywhere told, nothing can now be produced of any value, either scientific or artistic, by our present race of workmen and others practically engaged in the production of art. But let anyone consider this subject for a moment away from the hubbub and attend to *facts*.

It will not be denied that the value of the means of producing anything is best tested by the result. Let us, therefore, by way of example and comparison, instance three works certainly not yet surpassed anywhere *not* the results of *educated* artistic power—the Parthenon Frieze in the British Museum, the cartoons of Raphael at South Kensington, and the drawings from the Liber Studiorum, also at South Kensington. Nothing can be done without technical education. Now it is quite certain that the first of these productions, the Greek frieze, could not have been the result of art education as it is now understood, for it did not and could not exist. Phidias was not a scientifically educated man, nor was he acquainted with the history of art, and for myself I am quite sure that if he were in existence at this hour his acquirements would be looked down upon with sovereign contempt by our modern professors and art authorities. It could not be otherwise, for the means he had at his command and his mode of work, as evinced in the sculptures themselves, were nothing more or less than the objects before him, good eyesight, and a flexible hand, and he did his own work. He would not pass a third-class examination on the subject of the "Early History of the Helenic Race." Very many have been the attempts to copy and rival one of those frieze horses by our modern educated sculptors with the best of assistance, but without any success. This the London equestrian statues sufficiently prove.

We have been told but lately that Raphael lived all his life "like a lord," walked among kings and popes quite on a friendly and familiar footing, and must have been consequently a highly educated and deeply learned person. All that we now have to say about it is that the cartoons do not show anything of it. We have now before us a sketch from the "Slaughter of the Innocents," one of his most famous works, and a more ungentlemanly, unmannerly, unlearned production it would be hard to find, and quite certain it is that if this very painting were to be sent to the coming Royal Academy exhibition the "hanging committee" would not give it blank wall space. Yet let the reader go round the Academy rooms, make the most of the performances, and compare them (as evidences of art power) with but *one* of the groups from this drawing, *e.g.*, the mother screening the child. It will be quite enough, and he will soon discover that "technical education" has had nothing to do with it; nay, education, art education, *must* have destroyed it, and refuses to look at it. It is art power of the highest possible kind—but it is art education set at defiance. This man Raphael can certainly never be appealed to to show the value of education. Tested by education—modern education—these cartoons fail everywhere and utterly.

If the Greek marbles and the Raphael drawings show observing powers, common and simple, without either education or "enchantment," and set at nought the wisdom of modernism, what shall be said of Turner's "Liber" drawings? Here there is no past mystery, no human beings supposed to be deities, the spectator not knowing what he is looking at, no fancied scenes, but quite common scenes and places and occurrences—a corner of a farm yard, with a cart and horse, a mill, an opening in a forest, the sea, a river view, and so on. They were executed at a time in the life of the artist when he appears to have thought that, after all, there must be something in reality almost, if not quite, as good as an old black picture or a modern imitation of one. He copied bits of everything, says Mr. Ruskin, that could be found wherever he went—literally copied them as well as he could. No education whatever was needed to do this; it was the result of the simple power of being able to draw, and the consenting and condescending to copy. Turner seems to have begun his art life by innocently copying common things on the banks of the Thames, and without any sort of education. Of course he got in time to be artistically educated, and then imitated Claude Wilson and a number of others. The majority of the "Liber" drawings are in reality a protest against this very education—improved modern art education. He seems to say in them, "Now I am working in my own natural way without any surrounding help. This is how *I* see the nature before me." These "Liber" drawings are, to my mind, much greater works than his pictures, and are in reality to nature and landscape what the Greek frieze figures are to men and horses. It is the positive absence of artistic education that has rendered their production and existence possible. Turner cannot be appealed to as a proof of the necessity of educating a man, technically or otherwise. His greatest works were the results of his ignorance. How much more might be said about it; but my object is merely to show how little can be accomplished in these days towards the production of art by any process of education, as it is at present understood. Here we see the three greatest of England's possessions in the way of art produced by men on whom their education had no power artistically, and who did not, and could not, have had any technical education in our present sense of the term. They educated themselves. The great art want of the present day is not education, of which there is enough and more than enough, but the means of properly and fairly exhibiting the *results* of such education as the working artists of the time have. I say fairly because, as everybody connected with art knows, all our exhibitions are only for a few, and, what is far worse, those few are for the most part not the real producers of the works so exhibited, but "employers." To exhibit nowadays, no one need to draw, paint, or carve himself, as Phidias, and Raphael, and Turner did, but with a well-lined pocket to employ the labour of those who draw, or carve, or paint. This is the great modern art evil, and truly wonderful it is that no one is to be found to utter a protest against such a system as that now in such active operation. I do so because no one else does. No hope of anything better can ever be entertained till the time comes when those gifted with artistic power shall work with it themselves, and personally, and shall exhibit such productions in their own names; and until the public come to distinguish between manufactured and real art—between the art of such workmen as those I have named and the modern Mintons and glass-stainers—between the work to be yet seen in our cathedrals and in architectural exhibitions—this must precede education, and until it does no technical education can avail, even if conducted on the wisest of systems.

C. BRUCE ALLEN.

A new cemetery for the use of the Roman Catholics of Durham has just been completed. The site lies between the Bishop Auckland Branch Railway and the "Priors' Path," and the grounds have been tastefully laid out. The chapel and lodge have been erected from designs by Mr. C. H. Fowler, architect to the Dean and Chapter of Durham, and the total cost is about £600.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday next the annual meeting of this society will be held. The Institute was established in 1851, and since 1852 it has continued to increase in numbers and prosperity; and we find that during the last year a larger number of new members were elected than during any preceding year. The Institute now consists of 623 members, 262 being fellows, 14 honorary fellows, 10 honorary members, 78 honorary and corresponding members, 236 associates, 11 contributing visitors, 10 students, and 2 temporary students. During the past year the Institute has lost by death three fellows—namely, John H. Taylor, Thomas Cundy, and Charles Fowler; one honorary fellow—namely, Sir Robert Smirke; two associates—namely, C. J. Kelly and Charles Raggett; and one honorary member—namely, M. Faraday.

The report, of which we have received a copy, speaks of the re-election of Mr. Tite as president, after an interval of four years since he held the same office, and of his handsome donation of £500 towards the enrichment of the library. In competition for the medals and prizes offered by the Institute for 1867 an unusually good display of designs and drawings was submitted. The Pugin Travellership for the year was bestowed on Mr. C. Henman, jun., who distanced, by the excellence of his drawings and testimonials, eleven candidates for the honour; and the sum of £40, the proceeds of the Pugin Fund, was paid to Mr. H. Walker, who was appointed the travelling student for 1867. Mr. A. H. Layard, M.P., D.C.L., has received the gold medal for 1868. The board of examiners for candidates for certificates of competency to act as district surveyors have recommended ten out of sixteen who applied for the requisite authorisation. In order to secure a systematic method of preparing questions, and a regular attendance of a sufficient number of examiners on all occasions, three members of this board have been definitively appointed to undertake the duty. The council in their report regret that their efforts to establish voluntary architectural examination have met with scarcely any response from the younger members and students of the profession, only one member having presented himself for the ensuing examination. It is, however, intended to hold the examination. It is evident that unless a deeper interest is felt in this department of the Institute, the machinery for examination, which has been established with care, will be discontinued. As students do not appear to care for such examinations unless stirred to action by the hope of reward, it is, says the report, "worth consideration, whether the granting of some certificate would be desirable, in order to attract a greater number of applicants."

The committee for the conservation of ancient monuments and remains have continued their labours. As Mr. Beresford Hope intends to take public action in this matter, he requests members of the Institute and others to forward to him at once at 1, Connaught-place, Hyde Park, all the information they may possess on the subject of buildings remarkable for their historical or archæological interest, and in the custody of public departments. He solicits information on the name and situation of such building, its present condition, the probable date of its erection, the name and address of its owner, whether the building is occupied or otherwise, and whether it is accessible to the public.

The report glances at the doings of the Professional Practice Committee, at the competitions for the National Gallery and New Law Courts designs; at the Paris Exhibition committee, and congratulates those gentlemen connected with the Institute who succeeded in obtaining awards, and particularly Mr. Waterhouse, who obtained the grand prize; and the exploration of Jerusalem and the Holy Land, from which important results appertaining to the history, topography, and architectural antiquities of Palestine are expected. The council are also glad to be able to report that the financial condition of the Institute is satisfactory.

PAPERS READ BEFORE THE INSTITUTE.

The following are the titles of the papers read at the Ordinary General Meetings since the publication of the last annual report of the Institute:—

"On Chinese Architecture" by Dr. J. Lamprey, M.B., F.R.G.S., Surgeon H.M. 67th Regiment. "Remarks upon Grinling Gibbons as made to the Master of Trinity and A. J. B. Beresford Hope, Esq., M.P., in the Library of Trinity College, Cambridge, in November, 1866," by W. G. Rogers. "A Memoir of the late Sir Robert Smirke, R.A., &c., Honorary Fellow," by Edward Smirke, Esq. "A Memoir of the late Charles Fowler, Fellow," by Professor Donaldson, Fellow, Past-President, Honorary Secretary for Foreign Correspondence. "On the Relations of Geology with Architecture," by Professor Austed. "On the Photographs taken for the Architectural Photographic Association in the year 1867," by J. P. Seddon, Honorary Secretary. "On the Mural Decorations at the Mansion of Sir Walter Trevelyan, Bart., at Wallington, Northumberland," by W. B. Scott, Esq. "A description of the proposed School of Art at Bombay," by W. Burges, Fellow. "On Mural Paintings for Penkill Castle, Ayrshire," by W. B. Scott, Esq. "Communication descriptive of the Old Roof recently discovered over the Nave of West Church, Stirling, N.B." from J. M'Lean, Esq. "A Letter from M. Kaftangioglu, Honorary and Corresponding Member, Athens, describing the Architectural Operations carrying on in that City and proposed at Delphi." "On the Architecture of Moscow," by Edward P'Anson, Fellow. "On the Peculiarities of Architecture in America," by Gervase Wheeler, Fellow. "On the Exploration of Jerusalem and the Holy Land," by George Grove, Esq., Honorary Secretary to the Palestine Exploration Fund. "On the Antiquities of Fréjus, in the South of France," by Professor Donaldson, Past President, Honorary Secretary for Foreign Correspondence. "On the Mediæval Architecture of Central and Southern Germany," by H. W. Brewer, Esq. "On the roof over St. Pancras Station, Midland Railway Terminus, now in course of erection," by Professor Donaldson, Past-President, Honorary Secretary for Foreign Correspondence. "On Dirton Church," by Fairless Barber, Esq. A supplement to the former Paper "On American Architecture," by Gervase Wheeler, Fellow; and "On Buildings for Tropical Climates and especially for India," by T. Roger Smith, Fellow.

THE GIANTS' STAIRCASE, VENICE.

OUR illustration this week is a double page lithograph of the Giants' Staircase and cortile at the Doge's Palace, Venice. This staircase derives its name from the two colossal statues of Mars and Neptune, by Sansorino, which stand on either side at its head. The whole structure is inlaid with the finest marbles very delicately worked, and the steps are inlaid in front with metal intarsiatura. It was on the platform at the summit of these steps the Doges were crowned.

THE EARTH SYSTEM.

ON Monday evening last, at the weekly meeting of the Social Science Association, a paper was read by Captain Fishborne, on the "Earth System." The paper alleged the usual objections to the water system, and dwelt upon the destruction of a quantity of valuable manure. Mr. Edwin Chadwick, C.B., was in the chair. Mr. Beggs took exception to the statements made in the paper, and contended that water-closets, when properly constructed, were the best means of conveying away from human habitations the excreta. It was the most economical, the most cleanly, the least offensive, and the most healthy mode; and the value of the excreta, when mixed with clay, was greatly exaggerated.

Dr. Hawksley spoke in favour of the earth system, and urged examples within his own experience of the evil effects of water-closets, and of the perfect inoffensiveness of the earth system.

Dr. Holland contended that the earth system was an entire fallacy, and that there was no reason why water-closets should not be made perfectly inoffensive. He also objected to the statements made as being entirely unfounded.

Mr. Robert Rawlinson, C.B., spoke on the same side in defence of a water-closet system when connected with drainage scientifically carried out. He said that he wished the advocates of the earth system every success in their experiment, but was sorry to find that they were building upon data which had no substantial foundation.

Several other gentlemen took part in the debate, and the chairman concluded by speaking in favour of the water system.

THE ALEXANDRA PALACE AND PARK.

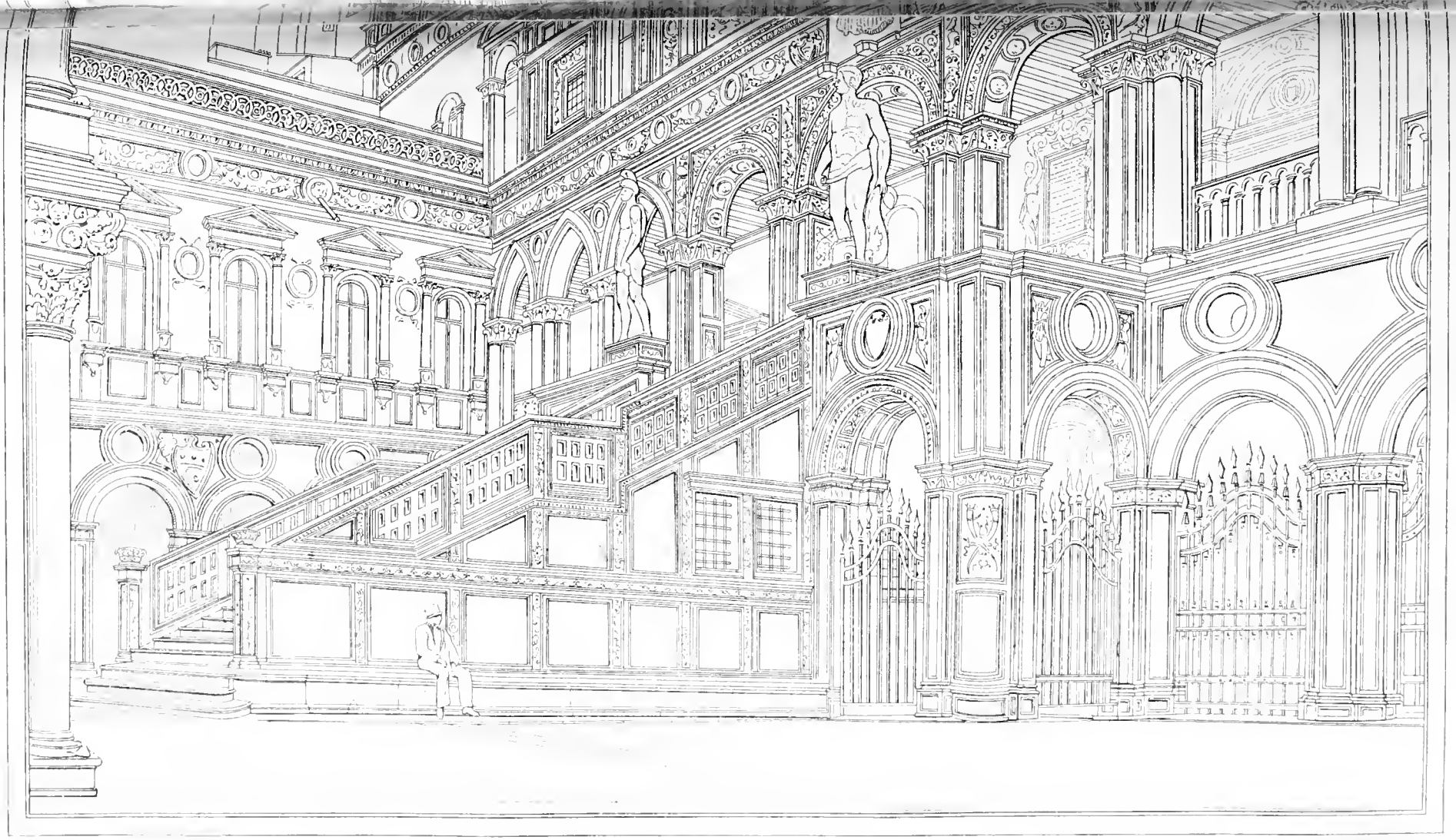
THE Alexandra Palace and Park are steadily approaching completion, and on Saturday last about 300 gentlemen, comprising many members of the literary and artistic professions, and others interested in the social welfare of the people, were invited by the directors on a visit of inspection. We think the directors have to congratulate themselves on the great natural beauty, not only of Muswell Hill itself, but also of the magnificent landscape which its elevated position commands. The park, which has been laid out by Mr. Mackenzie, is in good taste, and is really what it professes to be—a park, not merely a garden. The palace (of which we gave a description in the BUILDING NEWS of November 15, 1867) stands on the top of the hill, and is built in the Italian style, having a rather florid appearance, and presenting internally, from the amount of stained glass used, a somewhat ecclesiastical aspect. The decorations have been executed by Mr. Smith, and have a striking effect. Above the roof, in the centre of the building, rises a bold tambour, pierced with windows, from which springs a great dome, terminated at the top by a simple balustraded parapet and a standard mass 50ft. high. At all sides of the building are formed handsome and spacious terraces, on which and on the ornamental slopes adjoining them stand many large and handsome trees giving relief and effect to the building. The terrace on the north-west side is 1,000ft. long and 100ft. wide, supported by Italian arcades, and will cover a noble railway station, from which access will be had directly with the building at the ends of the three transepts, and to which all the railways of London will be ultimately brought. There will also be covered carriage entrances at the ends of the nave, communicating by an easy drive with the public roads.

A special feature of the Alexandra Park will be its race-course, which is now complete.

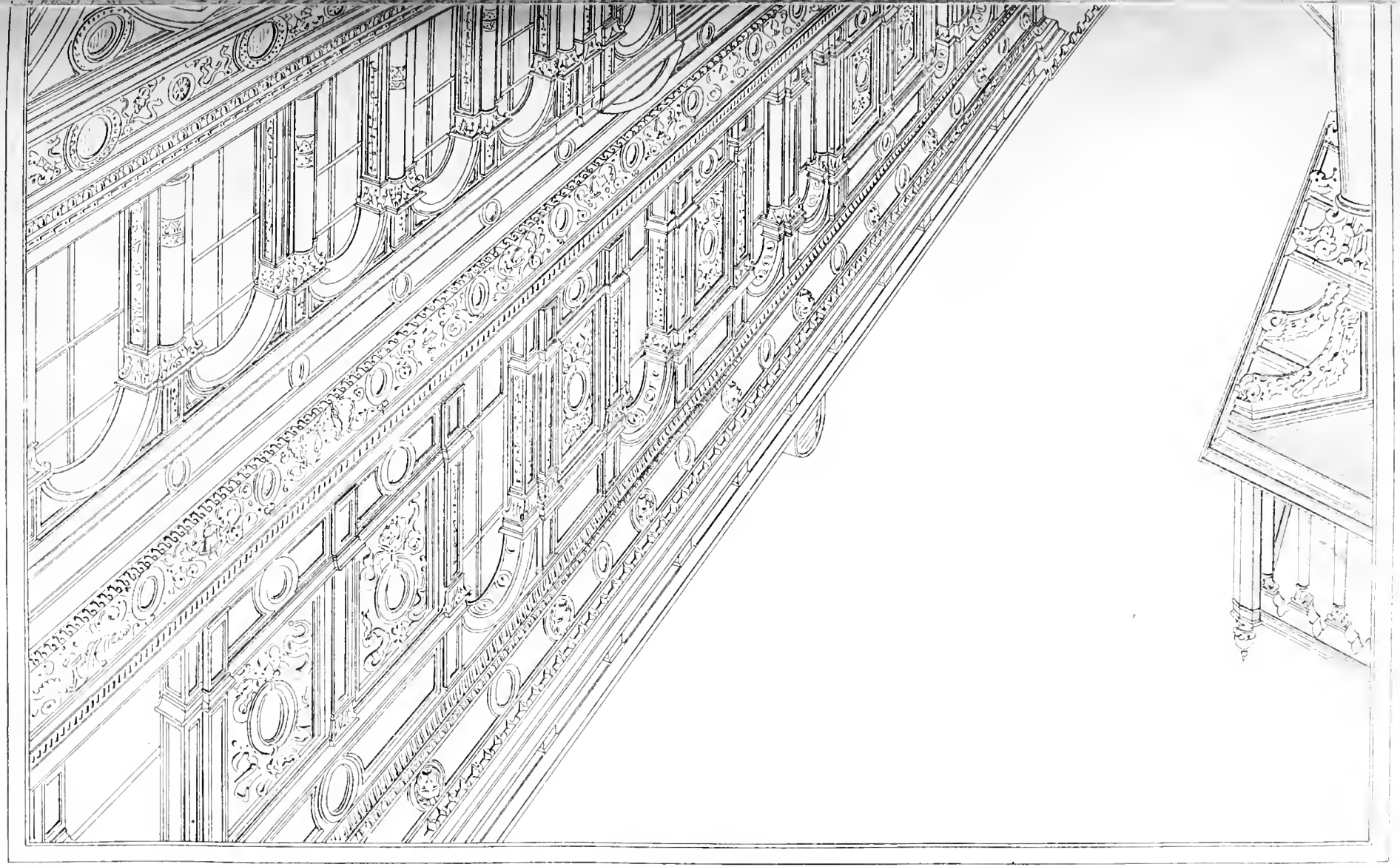
The "Muss Well," from which the hill derives its name, was in the olden time supposed to possess such valuable medicinal qualities that the Knights Hospitallers of Clerkenwell built a sanatorium in its vicinity. There is a tradition also that a Scottish king once came thither to be cured of some sore disease.

TUTBURY CHURCH.

CLOSE to the remains of Tutbury Castle—one of the oldest fortresses in Great Britain—stands the parish church, part of a magnificent Priory, built and richly endowed by Henry de Ferrers towards the close of the eleventh century. The original building, says Sir Oswald Mosley, in his history of Tutbury, with the cloisters, dormitories, and other apartments for the monks, covered three acres of ground. The massive columns which separate the nave from the north and south aisles, the lofty arch at the east end, and especially the west front, with its grand Norman doorway and window, sufficiently show how noble a piece of architecture this originally was; and, indeed, few finer specimens of the Norman style of ecclesiastical architecture are to be found in the kingdom. The south aisle is Gothic, and less massive than the nave; and Sir Oswald supposes that it was erected at the end of the thirteenth century by the first two Earls of Lancaster, who succeeded to the Tutbury estates after they became forfeited by the rebellion of Robert de Ferrers, last of the Earls of Derby, and during which troublous period the building probably suffered severely. The Priory, then greatly reduced in value, was dissolved in the reign of Henry VIII.; and the site was granted by Queen Elizabeth to the Earl of Lincoln, and was in the same reign acquired by Sir William Cavendish, ancestor of the Dukes of Devonshire, who pulled down the greater part, erecting with the materials a house in Tutbury for his eldest son. The nave and south aisle were, however, left for a parish church. The north aisle was built about forty years ago, when the church was re-pewed. The church had, however, no chancel, but this want has just been supplied by the munificence of the patron, Sir Oswald Mosley, Bart. It is built of stone in the Early English style, is circular in form, with a dome roof. There are a sedilia and piscina on the south side, with marble columns and richly ornamented caps. In addition to the erection of the chancel, the nave has been restored, and the roof raised to its original pitch. The whole of the work has been executed by Messrs. Critchlow and Ward, of Uttoxeter. Mr. G. E. Street is the architect.



View of the Giants' Staircase and Cortile at the Doge's Palace, Venice. — Drawn by Wm Perdue.



THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

THIS society was established in 1860, and from that date it has made a certain and rapid progress. In December, 1860, it consisted of 20 branches, 608 members, and had funds in hand to the extent of £321. In December, 1867, it consisted of 203 branches, 8,022 members, and its funds in hand amounted to £15,153. Owing to the depression of trade, and also, no doubt, to the ordeal through which trades unions have had to pass during the past twelve months and more, the Amalgamated Society of Carpenters and Joiners has not made such a marked progress, and particularly as to augmentation of numbers, as during the preceding six years of its existence. But it is stronger in number, funds, and strength of organisation now than it ever was before. This may be a disagreeable fact for many to hear, but it is nevertheless true. It shows that trades unions are not going down; that they are neither diminishing in numbers or efficiency, but that in the face of unpopularity they are maintaining their position and even increasing in strength.

It is when we come to the ways and means of this society that we see the remarkable power of organisation, the economical arrangement, and the minute accuracy, by which the proceedings of some of the chief trades unions are conducted. The report before us is a triumphant vindication of the ability of the working classes to manage their own affairs. Let anyone compare this report with the report of any insurance society in the city of London, and he will find that the workmen are not only good financiers, but economical in their expenditure and honest in their dealings. A true history of the joint stock companies of the city of London, which have in ninety-nine cases out of a hundred been originated and administered by what is called the middle class, is a history of intrigue, and in too many cases of fraud and corruption. It is frequently very difficult to ascertain where the money expended is gone, and who is responsible for its malappropriation. In the report before us there is a record of the expenditure of every farthing; and, though there are 203 societies, numbering 8,022 members, all of whom are in vital communion with the central society, and though there are a variety of channels through which the funds of the society pass, still the appropriation of every penny can be traced with ease. Every item is tabulated with accuracy and will bear microscopic investigation. It will be seen on reference to Table 2 the expenditure for the various benefits connected with the society during the year has been as follows:—Donations, £5,270; tool benefit, £524: sick benefit, £3,271; funerals, £581; accidents, £200; superannuation, £16; trade privileges, £1,818; benevolent grants, £308; grants and loans to other trades, £103. The whole expenditure during the past year amounted to £16,144, and the income to £18,245. The balance of £2,101 is added to the funds in hand. It is evident from this report that trades unions are not decaying, that working men possess remarkable business ability, that they are on the whole free and frank in their dealings one with the other, that the policy of strikes is not the principal object these unions pursue, and that they are the means of diminishing distress, mitigating suffering, and "lightening the lot of labour." Strikes, which are often resorted to with rashness, and the intimidation which has too frequently accompanied and disgraced them, have brought trades unions into disrepute, but reasonable men should not forget that these unions are also benefit societies.

A very strong metallic cement is formed when a mixture of equal parts of oxide of zinc, sulphate of lead, peroxide of manganese, and oxide of iron is made into a paste of proper consistence with boiled linseed oil.

BUILDINGS FOR EUROPEAN OCCUPATION IN TROPICAL CLIMATES, ESPECIALLY INDIA.*

THERE exists nothing of a physical nature which causes so entire a revolution in our feelings and habits, in ourselves, and our surroundings, as the addition or withdrawal of a few degrees of heat; and if we look to climates which lie at the extreme limits of human endurance, either of heat or cold, we find almost every condition of life reversed. So many hot countries are connected with this country, either by commerce or colonisation, that from time to time English architects are called upon to design buildings for erection within their limits. It is, therefore, our business to consider the differences between such buildings as suit our climate and those which are adapted for the tropics, and to notice some of the peculiarities affecting the actual erection of the buildings, and the most obvious of the difficulties to be apprehended.

It may provoke a smile to say that the great peculiarity of a tropical climate is that it is very hot there; nevertheless, that is the great peculiarity, and the one an architect must never forget, remembering that even the cold season is hotter than our summer. It is also very light in such a climate, and at some period of the year it is further very wet. Climatic disturbances, such as wind-storms, dust-storms, thunder-storms, and possibly earthquakes, must be expected occasionally, and such disturbances are more sudden in their visits and more violent in their force than with us. Household pests there include such formidable enemies as the cobra, the scorpion, and the white ant, the latter of which is an enemy of the most destructive powers. The essential oils of teak and blackwood seem to protect them, but all ordinary wood is liable to be eaten by this ant. The damp of the monsoon time is another destructive agent, any unpainted or ungalvanised surface of iron being oxidised by it to a considerable extent; and either from this or the saline particles in the air, or the extra actinic power in the sunlight, the climate of Bombay, though free from frost, acts as injuriously on building stone as that of London. The people again are different. The servants, nearly all natives and of various castes, will dispense with many things wanted by Europeans; but, again, will require some things that in Europe would not be thought of. The workmen will also differ from ours in their ideas of workmanship, accuracy, and finish. Their setting out will be defective to an European eye, yet if the right sort of men be obtained and employed in the right way, their ornamental work will be very beautiful. The joinery and cabinet-work especially, executed with very rough tools, and put together without glue, will surpass most English work for solidity and durability.

It is almost self-evident that rooms in such a climate should be large and airy, windows and doors opening so as to admit every breeze of air, yet shaded to keep out the light and heat as much as possible. Outside the external walls a verandah is necessary; and is, in fact, the leading feature of a building for the tropics. This, where practicable, had better be of masonry, and of course as many storeys high as the building. The floors of the verandah should be water-tight and slope away from the building. The verandah affords a fine opportunity for external architecture, and in some of the more artistic native houses it is beautifully treated in carved wood. Allied to it, in the best Mahometan work, are corbelled balconies and open oriels thrown out to catch the breeze and afford a cool evening nook. Behind the shelter of the verandah the doors and windows should be spacious, and made so as to catch the prevalent breeze. The rooms should be arranged *en suite* from side to side and openings opposite openings, that the wind may blow quite through it, having windows opening down to the floor and doors placed opposite windows, both being made wide and high. The general plan should be compact and roomy. All servants residing apart and few stores being kept in any house, buildings and residences are relieved from all necessity of complicated arrangement. Over this simple mass a simple roof should be thrown. If not a terrace its pitch should be flat and its eaves overhanging, so as to give most shadow, and throw the heavy tropical rains off the foot of the wall. Flat roofs are the rule; the dome also forms a leading feature of many oriental buildings. The ordinary height of a storey is 18ft. or 20ft., and buildings of many storeys are uncommon. An underground basement is not usual, the ground floor being generally 2ft. to 3ft. above the surrounding level, and raised on a solid terrace. Between the top storey and the roof there should be a space well ventilated, and unoccupied to keep the top storey cool. No fireplaces or chimneys are ordinarily required, and kitchens ought to be built apart from the house. The ordinary window is a large casement hung folding, and each fold in two flaps, divided into several heights, and filled with louvres, like those of a Venetian blind, only finer, and capable of being set close or open.

The water closet system has never been established in India, and would probably not be found available, while Moule's earth-closet system would not obviate the necessity of removing more or less frequently the fecal matter by hand. This is done at present by sweepers, who, from the lowness of their caste must not come into contact with other servants, and therefore an external staircase leading to the verandah, and so along to each dressing-room, has to be provided, and often several such. Eaves, drain pipes, gutters, and means of storing rainwater, do not seem to exist. All houses and most public buildings require a carriage porch sheltered from the wet of the monsoon and the heat of the other seasons, and also stabling and coach-houses.

Wherever practicable an Indian building is placed within an ample walled enclosure called a compound, a compromise between meadow, orchard, and garden, and in this compound are settled the attendants' huts. These dwellings and the stables should be arranged so as not to come to windward of the buildings they belong to, on account of the bad smells likely to arise from them.

We now come to the structural difficulties mainly to be apprehended, which may be summed up in one general term—*want of appliances*. A building in progress is a strangely uncouth sight to European eyes. The scaffolding seems insecure, and only fitted to fall, yet does its work; vast crowds of half-naked workpeople—those carrying burdens being mostly women—each bearing on her head a light load; the mason squatting on the stone he has to dress, holding his chisel in the tips of his finger, and dealing dainty taps with a small hammer; the smith squatting over his fire, as though his feet must be among the sparks and cinders as well as his iron; and among them all the dusky overseer in his long white robes and an enormous red turban. On such a work as this the introduction of machinery of any kind would be an almost insuperable difficulty; in short, in designing for the tropics, the architect should suppose that his work is to be carried out almost as in mediæval times, and without any modern appliances whatever.

As a specimen of materials an account is given of what is obtainable at Bombay—a very favourable specimen of an Indian city. The island being volcanic, no stratified stone seem obtainable there or for many miles round. The ordinary building stone is a hard, rough slate coloured basaltic trap, quarried with difficulty used in stones of small size as rubble, laid with plenty of mortar, and plastered externally. For dressings and ashlar there is Coorla stone, very difficult to procure in large blocks, hard, and unyielding; and Porebunder stone, a brownish granular limestone, resembling the worst Bath stone. This latter is imported from a distance, is liable to discolouration, and is very costly. Native bricks are dear, small, thin and mostly defective. A coarse material called Kurial, a species of coral, is used for filling in. Gravel there is none, and the sea sand at Bombay is not siliceous, being ground up basalt rounded by the action of the water. Cement, where required, has to be imported from England. Lime and timber are the only two good materials for building to be found. In all joinery recourse is had to one material, teak timber, which is very tough and strong, and can be got in great scantlings. It is hard to work, but has three cardinal virtues: the ants do not eat it, the rain does not rot it, and when seasoned in India the sun does not warp it. The native tiles are an exceedingly bad roof covering; they are almost semi-cylindrical in section and about 9in. or 10in. long. They are laid fourfold in thickness, and, except at the eaves course, quite loose on the roofs: consequently a relaying of them, called

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* Abstract of a paper read before the Royal Institute of British Architects, April 27, 1868, by T. ROGER SMITH, Esq., F.R.I.B.A.

tile-turning, is an annual preparation for the rainy reason. Galvanized corrugated iron, though not well suited to the climate, is an improvement. It ought to be used double, with an air space of 10in. or 12in., well ventilated.

All ironmongery must be of brass to withstand the damp of the monsoon season, and, if it is to act at all as Europeans like hinges and latches to act, it must be brought from Europe: so must window-glass, and marble or tile pavement.

Dennett's arch used in connection with Phillip's girder and Ransome's artificial stone seems appropriate for use in tropical cities, but they are little available in Bombay, owing to the absence of gravel or any other suitable substitute. Plumber's work is all but unknown in Bombay. Gas-fitting, however, has been lately introduced.

The available modes of carrying out a building are as at home either by contractors, or by engaging labour and buying materials. Native contractors are to be found in almost all Asiatic towns, and in many places English and American contractors are to be met with. The documents sent out by the architect need not be translated into any foreign language, as good English, if free from technical terms, is understood by all native contractors. Drawings should be full and clear. Simple bills of quantities will ordinarily be valuable, but they should not be taken much in detail. If the work is for any colonial government, the probability is very great that it will be handed over to an officer of Royal Engineers to carry out by day labour, or, as it is officially termed in India, departmentally. In this case the great evil which the architect has to fear, and if possible to guard against, is his work being wholly or in part modified, set aside, or superseded. To prevent this precautions should be taken, first, of being quite sure that there is nothing which will require necessarily to be set aside as unsuited to the climate, to the local materials, or to rude and imperfect workmanship and means of execution; secondly, that there is nothing to be added to the plans; and, thirdly, all the documents should be in the form customarily used and understood by the engineers, especially the detailed estimates. Lastly, no opportunity should be omitted of getting any official sanction and mark in the shape of seals or signatures on the drawings or such official memoranda in their favour as can by hook or by crook be obtained.

The Bombay Government has officially recognised the scale of professional charges issued by the Institute, but there is no doubt that in the case of architects practising and residing in India these rates ought to be increased, as it is customary for members of other professions to charge double the English fee for their services.

There still remains the ultimate question, and the most purely architectural question of all. What aspect as works of art shall we as artists strive to impress upon the buildings whose arrangement and construction we have considered? The solution of the question lies, first, in the adoption of a type essentially European; and, secondly, in the retention and blending with it of such admissible features as are to be found in the best styles already elaborated in tropical climates. Had we a distinctive modern English style we ought to use it in our colonies, as did the Romans in theirs, with such changes only as local circumstances necessitated. Though this is denied, as there exist distinctive European styles, and as our administration exhibits European justice, order, love of law, energy, and honour, so our buildings should hold up a high standard of European art. Most of our eastern work is not creditable to our taste. The proper corrective is, not the direct imitation of Asiatic types, but the adoption of European styles born in sunshiny regions, such as ancient Roman or Greek, the Renaissance and Gothic of Southern Italy or Spain, or the early Gothic of Southern France. In treating these, and still more in any northerly modifications of them, a leaning to the peculiarities of the best Oriental styles is desirable. Amongst these peculiarities are walls of ample thickness, often covered with a profusion of delicate surface ornament, frequently beautifully coloured; an absence of such vertical breaks as buttresses, and a prevalence of horizontal cornices and level projections; openings, usually wide and frequent, artistically grouped and often filled in with exquisite pierced patterns; mouldings infrequent; balconies and various sorts of corbellings, covered usually with carving; roofs of low pitch, flat or domical; walls, often replaced by lines of piers or columns; structures for the most part of moderate height, but of great extent and elaborate surroundings. All these have an aspect of breadth, richness, and shade.

These peculiarities may be found perfectly worked out in the best of the Mahometan buildings, which mark, as ours should do, the presence in India of a conquering race—a race, alas! far more artistic than we, and whose works are nobler monuments of art than it can be hoped ours may be. Many of these works are partly represented by the aid of photography, and are so available for study, and if, in addition to affording such information as at least a few of our members may find useful and interesting, I shall have succeeded in inducing architectural students to dig in this hitherto all but unexplored mine, I shall have the gratification of knowing that this paper has not been quite barren of results.

THE GROWTH OF LIVERPOOL.

THE fortnightly meeting of the Architectural and Archæological Society was held on the 15th inst. at the Royal Institution, Colquitt-street, Mr. Kilpin, the president, in the chair. Mr. H. H. Vale presented a magnificent photographic album to the society, for which he received a vote of thanks, passed by acclamation.

Mr. Samuel Huggins then read the paper of the evening, which was entitled "The Growth of Liverpool and its Architectural Results." The rapid growth of Liverpool, he said, had been among the marvels of the present age; perhaps it was as unrivalled as regarded the quality of the material which, in the course of its enlargement, had entered into its composition. While the old or business part of the town had undergone one continued process of improvement in architectural character, the private department, or that devoted to residences, had retrograded. The extension of Liverpool in every direction had been mainly by the erection of dwellings for the poorer classes of people, and this had been left for the most part to men profoundly ignorant of art, and with scarcely an idea in their heads: and the consequence was that art in these productions had not only been ignored, but a degree of meanness and wretchedness had extended over wide districts of this town that could scarcely have been deemed possible by those who had seen its pristine beauty. But he should not have brought this matter forward but for the conviction that these things had been growing worse of late, and that at no former period had such houses been built as were then obtruding themselves on the pleasantest and most respectable neighbourhoods. Assuredly a more melancholy contrast was never presented in architecture than was then presented between the character and quality of the buildings they were pulling down and those they were rearing. He was quite sure the New Zealanders would build for themselves, with the same means and materials at command, more pleasant-looking, less heart-sickening habitations than those now rearing in many parts of the town, which appeared to him more like a superior class of pigstye than abodes of humanity. The destruction was not confined to one locality. Every beautiful and retired spot of private residence, in whatever direction in the town, north, east, or south, was in course of destruction; and there was not a private house or neighbourhood anywhere but was in danger of being at any moment rendered valueless for private and genteel abode, not by the erection of small houses, but of ill-built houses. He had little hope of any effectual remedy for the evil being forthcoming. A new building act might do something, but nothing less than the extension of legal protection to certain neighbourhoods would be effectual—protection by laws, which would be no more inimical to the proper and rational liberty of the subject than those that were enacted against theft. The remedy he mentioned had not and probably would not for some time be applied, owing to the indifference to architecture that everywhere prevailed, and was operating prejudicially on most of our towns and cities. A striking instance was seen of it at Chester, which had lately exchanged some of its characteristic and best Italian buildings for the most entire abortions that ever insulted the eye. Even the cathedral itself was in danger at least of serious injury, and had been already roughly handled by the new dean in the course of carrying out some new arrangements for the public services. Dr. Howson would, he had no doubt, in other ways do honour to his new appointment and to the church; but, from what had already occurred, the friends of art had reason to tremble for the material church in such hands. It was under the impression that it was the duty of all who felt this to raise their voice in the matter that he now ventured a word in behalf of the venerable pile, the nave of which, hitherto unbroken by bench or pew, was dotted all over with a myriad of little bedroom chairs of the meanest and slimmest description, furnished by the maker, he was told, at 1s. 9d. apiece. There was talk of restoring the cathedral, which to the ear of an artist simply meant destroying—destroying its antiquarian and historic interest and picturesque beauty. The most important operation in the central or business part of Liverpool was the erection of the new Exchange-buildings. In a former notice of this work he had condemned it for being dissimilar in style from the old one, and so departing from that of the Townhall. But on a walk round it the other evening he was glad to perceive an advantage resulting from this which had escaped him before—namely, that it had caused it to become one with the chief buildings around it, uniting several hitherto dissevered blocks of commercial buildings into one continuous series. It united, for instance, Mr. Cockerell's block on the east of it with Messrs. Picton and Son's on the west, and so on of others at the northern extremities, till there would, when it was finished, be a complete district of fine commercial buildings, all in perfect accord, and unmistakably commercial in character, that he believed the metropolis only could parallel in this country. The monument of Nelson was greatly improved by being brought nearer to the Townhall, and it would be by being elevated had the basement retained its unbroken solidity. The widening of Church-street was an improvement worthy of the cost, whatever that might be. It was to be hoped the future new buildings in it would be the better for the example set them on the opposite side by the renewed Compton House, which it was only just to say was an excellent specimen of shop or commercial architecture carried to the utmost legitimate extent of the stately in character. The demolition of the railway façade was, for obvious reasons, not to be regretted. If the Wellington column could have been included in the scheme of destruction it would have been so much more satisfactory. He would venture to say there was not among the relics of the ninth or tenth centuries, in the darkest corner of Europe, an object more truly barbarous than that column. It was to be hoped that the north end of the fine area next the library would ere long be completed by the proposed new fine art gallery, one object of which was to wipe off the disgrace to Liverpool of being without the refining influence of an annual exhibition of pictures.

A discussion followed the reading of the paper, and at the close a vote of thanks was passed to Mr. Huggins.

ROYAL INSTITUTE OF ARCHITECTS.

THE ordinary general meeting of the members of the Institute was held at Conduit-street on Monday, under the presidency of Mr. W. Tite, M.P. The Royal gold medal for the year 1868 was awarded to Mr. A. H. Layard, M.P., and the following prizes and medals, submitted for competition in 1867, were also awarded:—The Soane medallion, for the best design for a townhall, to Mr. W. George Vialls, and in the same competition a second prize of £10 (presented to Mr. W. Tite), to Mr. Henry L. Florence, and a medal of merit to Mr. Herbert A. Marshall; the late Sir Francis W. Scott's prize of £10 10s. for the best design for the establishment of baths and wash-houses, in the style of the thirteenth or fourteenth century, was awarded to Mr. Ernest Lee; the Institute silver medal, with five guineas, for the best set of drawings illustrating the restoration of the choir of old St. Paul's, to Mr. Edmund B. Ferrey, and in the same competition a medal of merit was awarded to Mr. H. Renault Mangin; the Institute silver medal, with five guineas, for the best set of measured drawings of any buildings erected before the year 1700, and hitherto unpublished, to Mr. W. Henman, for his drawings of the church of St. Thomas, Winchilsea, and in the same competition a medal of merit to Mr. Charles H. Heathcote, for his drawings of St. Mary's Church, Portbury; the drawings of Mr. Morton M. Glover, illustrating Caistor Castle, Norfolk, were also honourably mentioned; and the Institute silver medal, offered for the best essay on the "Origin and Progress

of Window Tracing," was awarded to Mr. W. Scott Champion.

Mr. Roger Smith then read a paper on "Buildings for European Occupation in India and other Tropical Climates." A report of this paper appears on another page.

CONTAMINATION OF WATER.

THE paramount importance of a plentiful supply of pure water for domestic use is now attracting great attention, and with happy results. It must, however, be borne in mind that health is injuriously affected by a cause which the most liberal supply of the purest water will not remove—the pollution of the water itself in our cisterns, through defective mechanical arrangements. Dr. Frankland Smith says:—"In many towns, and notably in London, the water in our cisterns, and the air in our houses, are polluted by the gases which we allow to enter through waste-pipes descending into drains and sewers." There exists no doubt that these so-called waste-pipes act simply as poison channels, through which most noxious gases hourly ascend, and convert the pure water in the cistern into a dangerous infectant. A very simple contrivance, just introduced by Mr. Bishop, of Camden Town, called the "Camden Sanitary Valve," strikes at the root of the evil, by rendering a waste-pipe entirely unnecessary. A float and valve perform the work of the waste-pipe in a novel and efficient manner. The arrangement also combines cheapness of cost with perfect efficiency, the expense of its application being 50 per cent. below that of the usual imperfect cistern fittings, whilst it can be fitted to any cistern as at present in use for about ten shillings. We believe it has only to be better known to secure its general adoption.

CO-OPERATION IN THE BUILDING TRADES.

ON Wednesday evening a public meeting of operatives in the various branches of the building trades, and others, was held at the Drill-hall, Chelsea, in furtherance of the company now being established for building purposes on the co-operative principle. Sir Henry Hoare, who occupied the chair, said this was one of five meetings to be held during the present week in support of the Co-operative Building Company, which he was happy to say was already making considerable progress. He was informed there were about 2,000 shareholders, and that the list was daily increasing. Mr. A. A. Walton, the originator of the movement, then addressed the meeting at some length on the benefits that would accrue to the working men in the building trades by adopting the principle of co-operation, and, as far as possible, becoming their own employers. In addition to the many benefits, both moral and material, that would flow from the adoption of co operative self-employment and production, it would be the most efficient means of preventing those strikes and lock-outs that were so ruinous both to employers and workmen. Several other gentlemen having addressed the meeting in support of its object, a number of shares in the company were taken up, and a vote of thanks to the chairman concluded the proceedings.

SCHOOL OF ART.

THREE thousand pounds, the proceeds of the exhibition held in Wakefield in 1865, have been devoted to the establishment of an Industrial and Fine Art Institution in that town. To inaugurate the institution an exhibition of various articles was opened on Tuesday, and a public meeting took place in the evening under the presidency of the mayor. Mr. W. H. Leatham, M.P, Mr. Mundella, Mr. Redgrave, and others were present. Mr. Mundella described the results that had followed the teaching of science and art in Nottingham, where there are some fifteen hundred children learning elementary drawing in schools. He stated, also, that he had seen the progress made by continental workmen, and his belief was that it had not been made by their energy, for in this they were surpassed by British workmen; it was not because of their inventiveness, for in this British workmen could not be reached; nor was it because British workmen were inferior to them, for if they had the same training as other people, they would ever be first in ability; but it was because the Governments of Prussia, Saxony, and North Germany had taken care to give the populations under their control a first-class education. He asked that the same advantages should be given to Britain, and expressed an entire agreement with the remark of Mr. Cole, that to teach science and art properly a beginning must be made with children when at school.

BUILDING AND LAND SOCIETIES.

A NEW land company has just been started under the title of the United Land Company (limited). It has been formed as an adjunct to the well-known Conservative Land Society, for the purpose of extending, with a fixed capital, the operations heretofore carried on under the Friendly Societies' Acts. The operations of the new undertaking will comprise the purchase and sale of freehold and leasehold property of every description, the creation and sale of ground rents, and the company will carry on the business of a general land and building association generally. The capital is to be £250,000 in 50,000 shares of £5 each, with power to increase, the first issue being limited to £100,000. The deposit will be £1 per share on application and £1 on allotment. The new company has generally the same directorship as the Conservative Land Society, the offices of both also being the same—33, Norfolk-street, Strand.

WATER SUPPLY AND SANITARY MATTERS.

THE total indifference alike of the town authorities and smoke producers to the smoke consumption clauses of the Sanitary Act, 1866, has induced some of the inhabitants of Hanley to take the subject of remedy in hand; and a memorial to the Home Secretary, praying for an inspector to be sent down to enforce the Act, has been signed by about 200 ratepayers. The Duke of Sutherland has kindly volunteered to present the memorial and to support its prayer, and other powerful influence in its behalf has been secured. The nuisance arising from the smoke has become really intolerable, and is most prejudicial to health. The other towns of the Potteries are in a similar position to Hanley; and if an inspector is sent down, as no doubt there will be, the whole of the Potteries will possibly be put simultaneously under the operation of the Act, the central Government doing what the local government dare not or cannot do.

By a mutual contract between the tenants of the cottages at the village of Copley, near Halifax, and the proprietor of the dwellings, the late Colonel Akroyd, M.P., a sanitary committee or association has been formed, to carry out the sanitary objects of a local board of health. Copley is a neat village of about 150 houses, uniformly built, in the Gothic style of architecture, and pleasantly situated in the valley of the Calder. The population being only about 900, principally employed at Mr. Akroyd's works, advantage could not be taken of the Local Government Act, which requires a population of at least 3,000. However, by a mutual agreement between the landlord and the tenants, a sanitary board has just been formed. It is composed of nine members, three of whom are nominated by Colonel Akroyd, as landlord, and six are elected by the tenants.

Building Intelligence.

CHURCHES AND CHAPELS.

On Wednesday, the Bishop of London laid the foundation stone of a new church in Grove-street, Commercial-road East, dedicated to St. John the Evangelist. The proposed style is Decorated, and the cost will be £3,500, the building to seat 600. Messrs. F. and H. Francis are the architects.

On Tuesday the Bishop of the diocese consecrated the new church of St. Mary's, Upton, near Birkenhead. The style is Early English, and it will seat 300 persons. It is built of Stourton and other local stone. Attached are two schoolhouses capable of accommodating 220 children, with residences for master and mistress, built of brick with stone facings. The cost of church and schools is about £5,300. Mr. J. Cunningham, of Liverpool, is the architect, and Mr. John Wright, of Birkenhead, the contractor.

The chapel at Hampton Court Palace was recently reopened for Divine service, after having been closed for nearly five months for alteration and repairs. The high unsightly pews occupied by the soldiers quartered at the Palace have been removed, and the chapel has been fitted with open oak seats capable of accommodating at least a hundred more persons.

The Marquis Townsend has rebuilt the nave of East Raynham Church, Norfolk, at a cost of £4,000. The rector, the Rev. R. Phayre, has rebuilt the chancel at a cost of an additional £1,000. The reopening of the church has just been suitably celebrated. The style is Perpendicular, and the church consists of nave with north and south aisles, chancel, tower, and north and south porches. The walls are faced with squared flints and Ancaster stone dressings. The works have been carried out from the designs of Messrs. Clarke and Holland, architects, of Newmarket, by Mr. W. Hubbard, of East Dereham.

On Friday last the foundation stone of the first Scandinavian Missionary Church in England was laid at North Shields [see BUILDING NEWS No. 667.] The church has been designed by Mr. F. R. N. Haswell, architect, of North Shields, under whose superintendence it will be erected.

On Tuesday last the jubilee meeting of the Incorporated Church Building Society was held at Willis's Rooms, under the presidency of the Archbishop of Canterbury. During the fifty years of its existence this society has made grants to 5,303 places of worship in England and Wales, either for the purposes of erection, rebuilding, or restoration.

On the 18th ult. the foundation stone was laid of Emmanuel Church, Preston. The style is Geometrical Gothic, and the building will seat nearly 1,000 persons. It will be built of brick interspersed with strings and bands of coloured and moulded bricks with stone weatherings and dressings. The dimensions are—extreme length, 125ft.; extreme breadth, 86ft.; breadth of nave, 40ft.; chancel, 20ft.; length of nave, including the vestibule, 86ft. 6in.; length of chancel, 27ft.; height from ground to top of finial, 96ft. The architects are Messrs. Myres, Veevers, and Myres, of Preston. The amount of the contract, which has been taken by Mr. Bamber, is £5,200.

It is definitely settled that a new church is to be at once erected at Foxlydiate, Warwickshire, at the cost of the Baroness Windsor. Mr. Preedy, of London, is the architect appointed.

On Monday the Bishop of Hexham laid the foundation stone of a new (R. C.) Presbytery and chapel at Haverton Hill, Port Clarence. The chapel, which is to cost £700, is only temporary, and is dedicated to St. Michael.

BUILDINGS.

The first stone of the new Keble College was laid on Saturday, at Oxford, by the Archbishop of Canterbury. Mr. Butterfield has proposed plans for the whole building. The front facing the museum mainly consists of gateway, chapel, library, and hall, while the three other sides of the quadrangle, which is to be 220ft. square, consist of sets of rooms for one hundred students and six tutors. The whole is to be of red and grey brick and Bath stone, in the Decorated Gothic style. As, however, the £35,000 promised will only suffice for the erection of the three sides of the square devoted to the students' and tutors' rooms, the trustees have resolved to proceed with that, the most necessary portion of the building, at once, and to postpone for the present the erection of gateway, chapel, hall, and library. They hope, however, to obtain the necessary funds while the present works are going on, and to be able to finish the building out of hand. There is room on the site for a second quadrangle, should the requirements of the college demand it, besides allowing for a fair-sized garden.

A block of new almshouses at Victoria Park, Harrogate, have lately been finished. There are twelve houses in all. The style is Gothic, and in the centre of the main block a clock tower rises to the height of 60ft. The total cost of the buildings is about £3,000. Messrs. Andrews, Son, and Pepper, of Bradford, were the architects.

The foundation stone of new buildings in connection with the College of Bishop Fox, at Taunton, was laid last week. The architects are Messrs. Giles and Robinson, of Furnivals Inn, the builder being Mr. Spiller, of Taunton. The style of architecture will be thirteenth century Gothic. About £11,000 will be spent in the first instance on the building, and the ground costs £3,000.

On Saturday last the foundation stone of the new Turner Free School, at Coatham, was laid. The schools will be built in the Gothic style, and will be 103ft. 6in. long, 52ft. wide, and four storeys high. At the gable end there will be a lofty tower. The entire cost of the building will be under £4,000.

The foundation stone of the new National Schools at Wilmscote was laid on Friday by the Bishop of Chester. The site is near the old church, lately restored in the Perpendicular style, and with it the schools have been designed to harmonise. They will be built of grey bricks relieved by slight touches of red in arches, bands, and stringcourses. There will be accommodation for 120 boys, 100 girls, and 130 infants. The architects are Messrs. J. Medland Taylor and Henry Taylor, of Manchester. The cost of the schools is estimated at £2,500.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—E. W.—B. J. T.—W. R. H.—W. S.—F. R. N. H.—S. C.—O. W. D.—J. G. H.—I. E. L., jun.—I. N.—W. R. T.—E. W. G.—I. H.—C. L. E.—E. P.

Student.—Season tickets to the Architectural Exhibition are issued.

G. C. S.—It is purely a legal question.

F. Pither.—You have to undergo no examination to become a member of the Society of Arts. You require two members, one to propose and the other to second you, and you may calculate on being duly elected. The annual subscription is two guineas.

Correspondence.

ARCHITECTS' CHARGES IN PARIS.

To the Editor of the Building News.

Sir,—Looking through some papers to-day, I came across the enclosed circular. Oftentimes I have noticed in your valuable journal remarks about architects' doings—working for paltry sums in competitions against the profession. What think you of the enclosed, where an architect circulates such notes from house to house to thank his friends for past favours, gives notice of removal, and quotes his commission?

This circular was left by a lad, who had a handful, at my brother-in-law's house. He had never built, neither did he know the man, and certainly should never employ him. Having conducted works in France for a long time, and knowing something of French architects, I confess I was somewhat surprised, although well aware that there are surprising things abroad as well as at home.—I am, &c.,

Alfred A. Anderton.

31, West Hill-road, Brighton, April 22.

[COPY.]

Paris, le 10 Avril, 1864.

CHANGEMENT DE DOMICILE.

Monsieur,—J'ai l'honneur de vous informer que mes Bureaux situés rue Notre Dame-de-Lorette, 52, seront transférés, à partir du 15 courant,

Place du Havre, 15 (quartier de la Madeleine).

Je saisis avec empressement cette occasion, Monsieur, pour vous assurer que je continuerai, comme par le passé à faire tous mes efforts pour mériter la confiance dont vous m' avez toujours honoré.

En attendant vos ordres, je vous prie d'agréer, Monsieur, l'expression du respectueux dévouement de votre très-humble et très obéissant serviteur,

Edouard Colle, Architecte,
15, Place du Havre, Paris.

HONORAIRES:

1	Jusqu'a 100,000fr.	5 0/0
2	De 100,000fr. à 300,000fr.	4 0/0
3	De 300,000fr. à 500,000fr	3 0/0
4	De 500,000fr. à 1,000,000fr.	2½ 0/0
5	Au-dessus de 1,000,000 de fr.	2 0/0

ORGANS.

Sir,—I have just read with considerable amusement the remarkably edifying letter of your correspondent "R. T.," who, with the characteristic modesty of all really great men, writes anonymously, and even forbears to acknowledge that the opinions he expresses are exclusively his own, but rather seeks to make it appear that he is simply stating well-known facts. "R. T." is evidently a man of research, and doubtless a great authority in organ building matters, but his exceedingly temperate and *unprejudiced* attack on Mr. Henry Willis is open to one slight objection. His charges are utterly untrue in every particular. He is possibly unaware that he also calls in question the intelligence and practical knowledge of our leading organists and all those eminent musicians who know anything on the subject of organs; but I beg leave to inform him that *they* tacitly acknowledge Mr. Willis's great ability, and consider that he has done more for the art of organ building (in this country at all events) than any other man of our time.

Without, however, for one moment questioning the merits of some other English builders, whose existence seems to be utterly ignored by your correspondent, I may state that the pneumatic lever in its perfected form owes its existence to Willis, and surely it must be admitted that his numerous patented inventions and improvements (all being of acknowledged merit) are alone sufficient to entitle *him* to a place amongst *the* organ-builders of Europe. With respect to "*tone*," any competent judge acquainted with his organs will, I feel certain, unhesitatingly affirm that the "wishy-washy" (whatever may be the exact significance of that elegant adjective) diapasons, "devoid of the proper harmonies," the "small, miserable, and screamy" mixtures that will not mix with the rest of the work, as well as the "unpleasant, tight-toned, unequal" reeds on high pressure, exist only in "R. T.'s" singularly imaginative brain, although one really cannot help regretting that such fluent eloquence should so lack the prosaic element of truth.

But this being essentially a question of fact and not of argument, will be instance any organs by Willis (as he is so thoroughly acquainted with them) that are characterised by all the pleasant little faults he mentions, including the "pump-handle" (!) that requires such vigorous treatment? and at the same time he might also furnish your readers with a select list of the "shocking rubbish" to be found in so many English churches, with the builders' names attached, for this would be really interesting.

Now for the vexed question of metal. Neither Schulze nor Cavaillé consider that "spotted" metal affects the tone of a pipe in the slightest degree; the sole advantage it possesses is greater durability. "R. T." has doubtless remarked the "fine singing tone" produced by the former builder, who, nevertheless, invariably uses *zinc* for large pipes. He has also, of course, seen and admired the exquisite workmanship (!) of Herr Schulze, presenting as it does such a strong contrast to the "rough and ready" style of Henry Willis.

I remember some years since seeing a chamber organ built for Lord Brougham by Robson, an instrument containing an open 8ft. diapason constructed of *pure silver*, but the tone was not affected in the smallest degree by this circumstance, and I really think that even the highly sensitive ears of your correspondent would have failed to detect the slightest improvement in the quality of tone thereby produced. The employment of "spotted" metal is simply a question of cost. On the continent it is used much more extensively than in England, because builders there obtain, as a rule, more than double the price paid for similar work here in England. In this country *quantity* is too often considered of more importance than *quality*, and it cannot be denied that we do possess many execrable specimens of so-called *cheap organ building*; but once alter this system of false economy, pay English builders continental prices, and it will be found that we can produce instruments far surpassing anything to be found out of England.

In advocating French reeds—which are certainly very fine—it is frequently forgotten that everything is done to enhance their effect in a French organ. The flue work is entirely of a Gamba and fluty quality, calculated to support and enrich the reeds; not, as in English and German organs, allowed to have a distinct and independent character of its own. The consequence is, that French instruments are never characterised by any breadth or grandeur of tone in their general effect, but partake very much of the nature of an harmonium on a large scale. Place French reeds in an English organ, fairly test them against some of Willis's "tight-toned, unequal" specimens—especially in combination with the rest of the work—and I feel satisfied that the result would be in his favour.

In conclusion, allow me to add that if so many eminent musicians state their opinion that Mr. Lewis is *the* organ-builder of England, it seems somewhat strange that, with the additional advantage of obtaining their instrument at "prime cost," the Committee of the Albert Hall of Science and Art did not avail themselves of his services, as they were guided in their decision by very eminent musicians, and Mr. Willis was unanimously selected to execute the important work.

Apologising for so intruding on your space, and assuring you that I have not the slightest personal interest in this question, I am, &c.,

Frederick Archer.

81, Regent-street, April 23.

THE EARTH SYSTEM.

Sir,—In your publication of the 24th inst., your correspondent "B." has stated two facts with regard to the above system which are most erroneous. He speaks of the manure as, "after all, a very doubtful article, one I am sure no experienced or scientific farmer or gardener would think worth the labour of fetching from the common depôt. Now, I am able to contradict this, as I know several instances in which the earth, after passing through the closets, is sold for 60 shillings per ton. Again, he says, "and yet we are asked to sanction a system equivalent to this, that of placing dried earth in the hopper and removing the receptacle that receives it; and this daily, for it must not be told us that the contents might remain longer without becoming offensive." If your correspondent will go to the offices of the Earth Closet Company he may there see in the cellar quite a cartload of the earth, after having passed through the closets, and from which not the slightest smell arises; moreover, the contents of the receptacle of a commode may be kept in a bedroom for months and not the faintest smell is perceptible. In the West Riding Prison at Wakefield there are closets in nearly 200 cells, the receptacle is only emptied once a week, and no smell whatever arises.—I am, &c., H. J. Girdlestone.

31, Duke-street, Westminster, April 29.

THE EARTH-CLOSET.

Sir,—"R.," in your issue of the 24th inst. admits the extreme evils of the present system of disposing of the sewage from houses when he says, "We carry away by very imperfect contrivances the refuse of dwellings into the rivers and streams, thus polluting the waters, and wasting a product that would be highly useful manure." The argument that follows is simply a *laisse faire*—I suppose on the principle that it "is better to bear the ills we have than fly to those we know not of," forgetting its inapplicability, as he has admitted after proof that these ills had no existence in fact. He says, "An earth-closet in itself may be made as little liable to derangement as a water-closet; but what would happen in the majority of households if the water to supply them had to be placed in a receptacle, and the contents had to be emptied every day? It would be impossible to avoid very much annoyance and discomfort, to say nothing of greater evils." This no doubt would be true of water, but he adds, "and yet we are asked to sanction a system equivalent to this—that of placing dry earth in the hopper, and removing the receptacle that receives it, and this daily, for it must not be told to us that the contents might remain longer without becoming offensive. If allowed to remain until decomposition sets in, which would be within twenty hours—and very often decomposition of solid matter has taken place before it leaves the human body—then no kind or amount of earth would prevent the escape of effluvia." I have seldom met with so many inaccuracies expressed in so few lines. The public are not asked to remove the contents of the receptacle daily, nor weekly, nor monthly, nor even quarterly; the removal will depend upon the number of persons using a closet, and upon the cubic contents of the vessel or vault which is the receptacle. And I must tell him that hundreds can prove that the earth may remain without offence for an indefinite time. In Wakefield prison there are

two hundred of the cells fitted with earth-closets, and the earth is removed weekly, but it has remained on occasions for a month.

No matter how long it may be allowed to remain, decomposition does not set in, as it is prevented by the application of earth, which is chemical in its action. Even in case of disease, where decomposition has begun, earth takes up all the gases, arrests further decomposition, destroys the effluvia and poisons that previously emanated. Notwithstanding the argument which "B." has indulged in, to the inconsistency of which we learn he was blinded by the products of a "dust cart," he had written: "I had tried a closet devised by a gentleman of Reading for several months, using peat charcoal as the best deodoriser known to us, and nothing could be more successful;" and yet he recommends instead that which he characterises as part of the very "imperfect contrivances," and in justification admits that the earth-closet does save for use the excrementitious matter; but adds: "I am sure no experienced or scientific farmer or gardener would think it worth the labour of fetching from the common depôt." This statement is best answered by the following testimonials:—

"Mr. J. Gadsden, who holds upwards of 600 acres, who has applied earth once passed through the closet to a turnip crop, and has produced some of the finest roots I ever saw, estimates its minimum value at £3 per ton."

"Mr. Gamble has arrived at the same conclusion."

"Mr. Hy. Taylor, manure dealer, Dorset, estimates it at from £2 to £3 per ton."

"Rev. H. Bnuen, Belvedere, obtained crops from employing it when stable manure had failed. His peas grew to 7ft., and were covered with pods, while the white heads of his cabbages weighed four pounds."

It remains only to point out how limited is the chemical knowledge of your correspondent. He offers in proof that earth does not possess deodorising or chemical properties, for he says, "if a shovelfull of the mixed excreta and earth be placed in the fire foul gases will be given off." That is, if any chemical compound is placed on a shovel, over a fire, and it gives off fumes, its ingredients were not chemically combined. Perhaps your correspondent would give us the history of this discovery.—I am, &c.,

E.

THE NATIONAL COTTAGE HOSPITAL FOR CONSUMPTION.

SIR,—My attention has been called to a letter in a recent number of the BUILDING NEWS, signed "W. Bosworth," and which calls for a few brief remarks. The internal or ground plans of the cottages have been in the main definitely agreed upon. For these we are indebted to Mr. Hellyer, the honorary architect. The advertisement in your paper was for designs of the external elevations, &c., of the cottages, these to be, in their main features, in accordance with the ground plans furnished. The remuneration for the plan selected (should choice of any be made), I am sure I shall be supported in stating, will not be confined to the premiums mentioned, but such terms will be offered as appear to the general committee to be right and fair, and in the action of that committee I am satisfied competitors may place the fullest confidence. Owing to the delay which has taken place in furnishing the lithographed plans the time will now be extended to the 21st of May.—I am, &c.,

ARTHUR HILL HASSALL, M.D.

Ventnor, April 28.

MANCHESTER TOWNHALL COMPETITION.

SIR,—With reference to Mr. Charlesworth's letter in your last week's impression, you will perhaps allow me just to say that I am glad he has quoted at full length the passage in the instructions, from which in my former note I gave an extract merely. I had no wish to ignore the lines Mr. Charlesworth has italicized, and your readers can now judge for themselves whether the instructions do, or do not, allow some degree of latitude with regard to the projections in the Princess-street and Lloyd-street fronts. At all events, I was by no means alone, among the eight competitors, in interpreting the instructions as I did.—I am, &c.,

ALFRED WATERHOUSE.

8, New Cavendish-street, Portland-place, W., April 29.

SIR,—I had much pleasure in perusing your admirable critique on the second set of designs for the above, and the public are much indebted to you for laying before them an unbiased statement of the faults and merits of the same; but I think it would have been far preferable, and the public would have been much better satisfied, if your suggestion had been carried out, and the first selected designs exhibited with the last, instead of being kept hidden; more especially those of Mr. A. Waterhouse. In commenting upon the designs finally selected, you said "it is only when we come to the plan that we find anything commendable, and here Mr. Waterhouse has been very successful." Now, in order that the public may have some idea of the way in which justice was done to the competitors by the professional gentleman who made the first selection, I can, if required, give you the name and address of one of the first competitors who would have no objection to show his rejected plans, *the main features of which are the same as those of the ones finally selected.* This will also show what reliance may be placed in the pompous article of your contemporary, called by one of your correspondents, "*Couleur de rose*," and prove once more the truth of the proverb, "*Tout ce qui brille n'est pas or.*"—I am, &c.,

April 28, 1868. A NON-COMPETITOR.

Intercommunication.

QUESTIONS.

[839.]—CONSTANT FOR MEASURING STRENGTH OF GIRDERS.—I should feel obliged if any correspondent would state the value of the constant to be used in calculating the strength of solid rolled girders with equal flanges.—J.

[840.]—STONE PIPES AND FROST.—Would any one of your correspondents, who has had practical experience in executing stonework, kindly give me his opinion as to whether a stone down-pipe, 10in. in diameter, the bore 4in., would be liable to fracture by frost or the action of water in any way; and farther, if lead lining would secure against this danger, or be otherwise desirable?—X. Y. Z.

[841.]—ORGAN BUILDING.—Would some correspondent be kind enough to oblige an amateur by answering the following questions?—1st. What proportion should the height and width of the mouth have—to the diameter of a pipe—for open diapason, principal, and fifteenth; and height of mouth for wooden st. diapason; and is the same proportion observed in both large and small pipes? 2nd. What thickness should the languette be, and should the upper lip be immediately over the opening between under lip and languette; and what angles should the upper and under lips be bent to? A sketch would much assist.—AMATEUR.

[842.]—DRAIN TRAPS.—Can any of your readers inform me whether there is manufactured and sold a better form of trap for kitchen sinks than the ordinary brass bell trap? The bell trap, as now in use, is defective; because, by the carelessness of servants, the grating (and with it the bell, and of course the trap) is frequently left off, so as to allow the passage down the waste pipe of the dirt which accumulates in sinks, and when this is the case the sink acts as a ventilator from the sewer into the house. I recollect having business in the kitchen of the house of a gentleman who stands prominently forward in the literary world upon sanitary subjects, and who I found paid so little attention to his own house that he thus had a constant supply of sewer gas in it. Some people, to avoid this inconvenience, have no trap in the sink, but allow the waste pipe to communicate with the drain immediately above a syphon pipe. This is objectionable, as the refuse from the sink frequently stops up the syphon pipe; and the same objection applies to a brick cesspool and dip trap in the drain. Others, again, in the case of a kitchen built as an outbuilding in a yard, allow the waste pipe from the sink to project from the wall over an iron D trap or bell trap in the yard. But this system is not always practicable; and when it is, is the cause frequently of a damp, greasy, slimy wall, and unclean paving. What is wanted is some adaptation of the D trap for sinks. In a D trap the grating may be removed without destroying the trap, and at the same time without allowing the entrance of rubbish to the drain. Whilst upon this subject, allow me to state that local boards and sanitary inspectors should, for the most important reasons, entirely discard the old bell trap for surface and yard drainage. From my experience, I find that half the bell traps in London are minus the gratings, which are slightly made of cast iron, and soon get broken; the consequence is, that the new system of house drainage is the cause of an extensive amount of disease, by bringing under the very nose of the occupier of the house a beautiful contrivance for the direct ventilation of a vast network of sewers. The D trap, or others equal in efficiency, ought to be the only trap allowed. Its advantages are—1. That the grating may be removed or broken without destroying the trap. 2. It prevents the entrance of dirt into the drain. 3. It is more easy to cleanse, and its stoppage by dirt in the trap more easily understood. 4. It has an advantage over the bell trap, because its form prevents children taking the top off and dropping sticks and stones into the drain, an extremely frequent cause of stoppage in poor localities.—A. KIRKBY.

[843.]—DENNETT'S FIREPROOF CONSTRUCTION.—Can any of your readers tell me what is the principle of Dennett's fireproof construction for floors, ceilings, and roofs?—INQUIRER.

[844.]—BURNING CLAY.—What is the best method of burning clay into brick ballast to form road bottoms?—FREEHOLDER.

[845.]—ROYAL ACADEMY.—How can I become a student of the Royal Academy; what is the expense; and what are the advantages attached to the studentship?—PUPIL.

REPLIES.

[816.]—MIXED CEMENT.—Let me advise your correspondent not to mix his half and half in the way he proposes, or he will repent it. Roman cement cannot be relied upon for outdoor work. Portland is the only cement trustworthy where water is concerned. A case came under my notice a couple of years ago, where the employment of Roman cement in some foundations cost those using it £250 for pulling down the wall and rebuilding it in Portland. It was no better than dirt; had neither set nor bond, and common mortar would have made a better job.—EXPERIENCE.

[813.]—BULGING WALL.—I am afraid "Nep" has not built his wall upon a proper plan, and that it has no buttresses, as he mentions that it is 1ft. 6in. thick. If so, a wall 20ft. long and 12ft. high could not do otherwise than bulge. I take it his wall is built as represented in the plan (fig. 1), whereas, it should have been constructed as in fig. 2.

FIG. 2

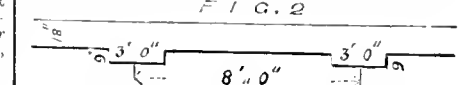
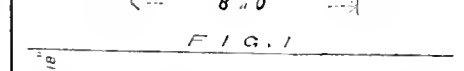
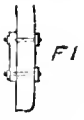


FIG. 1



However, the thing to be done now is to prevent it falling down, as it seems likely to do. This can be prevented by the following plan, which is often adopted in similar cases:—Get a balk of timber, or, better still, an iron casting, and place it against the part bulging out as in fig 3



taking care to screw it well up by bolts passing through the casting and the wall, good substantial washers being used at the other side of the wall.—J. S.

[816.]—STAMPED SPECIFICATIONS.—There is no doubt but that it would be a safer plan to stamp a specification; but if a man put his signature to a deed, and afterwards refused or failed to carry it out, pleading that there was no stamp to it, he would certainly lose his case in equity, although he might not in law. But now there is a better spirit pervading our law courts. It was only the other day that an eminent judge decided dead against a man who strove to escape from his obligation by a legal quibble; and remarked that the time was gone by for allowing justice to be thwarted by such puerile pleas.—CLERK.

[817.]—MORTAR FROM OLD MATERIAL.—Allow me to inform "Builder" that I have frequently used old bricks and rubbish in the manner he mentions for the purpose of making concrete, but never for mortar. At the same time, I have known them to be so used when it was impossible, except at an enormous price, to procure any suitable sand. A great deal in this instance depends upon the quality of the lime, and the old materials should not be ground too fine, or the mortar will be weak in binding properties. With proper care I should not hesitate to use them if I could not get sand.—CONTRACTOR.

[821.]—GILDING.—Oil gilding is used for outside work, and the adhesive material used is called oil size. It must always be kept free from dust, and well stirred before it is used, and laid on as thinly as possible. The gold leaf is then applied after some time, when the size has so far sunk into the surface to be gilded as to be what is called "tacky" on the face. Water gilding is used for such purposes as picture frames, and the material used for sticking the leaf is water size; this must be applied in a succession of coats until a perfectly flat face is obtained, and then when it has set the face of the size is wetted, and whilst wet the gold leaf is applied. Both processes require great skill, and success cannot be attained in them without much practice.—HOPE.

[822.]—COMPO ORNAMENTS.—The materials used in compo ornaments are glue, resin, and raw linseed oil. Boil the glue in water in the proportion of a pound to half a pint; melt the resin in the oil in the proportion of a pound to a pint of oil; then boil all together, and when well boiled mix a quantity of whiting to about the consistency of dough, and it is then ready to put into the mould, or otherwise.—F. R.

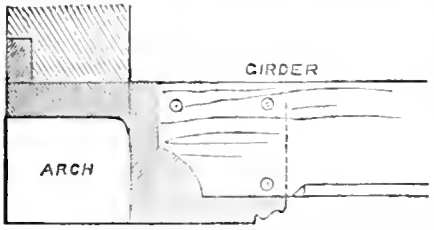
[823.]—CHANGE RINGING.—If "Changeling" will apply to the Society of Ringers at Leeds they will send him a book, at the cost of about 3s., which will give him the information he requires for change ringing from two to eight bells.—F. R.

[825.]—PAINTING ON WINDOW-GLASS.—If the decoration is intended to be for inside work, a not very lasting, but pleasing, effect may be obtained by using only the most transparent colours, such as gamboge, lake, Prussian blue, in cake colours, carefully rubbed on a palette, and when dry varnished with copal varnish.—EXETER.

[826.]—RUST ON STEEL ORNAMENTS.—There is no way of entirely cleaning off rust spots when they are formed, but they can be prevented entirely by coating the steel with a colourless lacquer.—CHAIN MAIL.

[829.]—SUPPORTING A BEAM.—The manner "G. M." described for inserting a wooden girder into an arch in your last issue is not practicable, because, in the first place, he removes the "key," and then substitutes wood, which would

shrink, and the whole building collapse. I would suggest using a strong cast-iron saddle, and set over the keystone, in the centre of which I would form a central web, and the wood girder be bolted to it, as per sketch. By adopting



this plan, the girder and saddle might be removed without difficulty, and the wall made good, as though it had never existed.—F. H. L.

[832.]—PAPER-HANGINGS.—In reply to "J. Gold," I beg to say that the powder used to produce the raised flowers on paperhangings is composed of very finely ground cloth. It is applied thus:—The pattern block having been dabbed down, a prepared size covered with size is pressed on the paper, and the impression is of course left in size. The sheet thus prepared is then taken to a "hammock" on treadles covered with the powder, a lath being employed to strike up the under surface of the hammock, and so fix the powder on the sized sheet.—C. W. T.

[833.]—BUILDING CHIMNEYS.—In answer to "Edwin Hale," I may say that building chimneys of great height the shaft should diminish from base to top, round or square, with flue circle of one diameter. By this you gain the reverse bond in your brickwork. At the same time, you should be particular in your bed and quarter joints. Four courses to one foot will make the work solid for great heights.—JAMES SAXBY, Guilford Lawn, Ramsgate.

WAGES MOVEMENT.

The strike of the bricksetters at Stockport for an advance from 5s. 6d to 6s per day, is seriously affecting several large undertakings now in course of erection in the neighbourhood.

The Bricklayers' Union at Liverpool have caused a strike at the works of Messrs. Holme and Nicol, large builders and contractors there, the grounds of dispute being understood to be the refusal of Messrs Holme and Nicol's foreman to pay a penalty of £5 towards the expenses of a former strike, and an opposition to a new code of rules of which the master builders had given notice. The Master Builders' Association have intimated that, unless the strike against Messrs. Holme and Nicol be immediately withdrawn, steps will be taken to protect that firm, and that, after May 4 next, the master bricklayers will only employ men who are willing to work under the new code of rules.

STAINED GLASS.

A memorial window has just been placed in the Guild hall, York. The subject commemorated is the marriage of King Edward III. and Philippa, of Hainault, in York Minster, on January 24, 1328, and occupies the principal portion of the four chief lights of the window. Among the figures represented are the young King and his bride, the Archbishop (William de Melton), who is giving the nuptial benediction, Nicholas de Langton, who, in 1328, was for the seventh time Mayor of York, the Earl of Lancaster and Lord Mortimer.

STATUES, MEMORIALS, ETC.

The Polish patriots have determined upon erecting a monument commemorative of the struggles of Poland to regain her national independence. The site chosen is in one of the most beautiful districts of Switzerland, on the heights of Rapperswyl, bordering the Lake of Zurich. This memorial will consist of a column of black marble, 25ft. high, standing upon three platforms of granite, each of the latter serving as a step up to the pedestal. On the summit will be an eagle with out-spread wings. Historical inscriptions and the arms of Poland are to be carved upon four tablets on the lower part of the shaft; and the whole will be surrounded by an iron railing. The work will be completed in the course of the summer. A circular from Count Ladislas Plater, dated Villa Bloelberg, near Zurich, April 22, has been issued, in which an appeal is made to all who have the cause of Poland at heart to assist in carrying out this patriotic demonstration.

LEGAL INTELLIGENCE.

COPYRIGHT IN PHOTOGRAPHS.—Graves *v.* Beale.—Mr. Francis moved for a rule calling upon Alderman Sir R. Carden and other justices to show cause why they should not state a case for the opinion of the Court of Queen's Bench in a matter in which they had adjudicated, relating to copyright in certain photographic pictures. Beale was a photographic artist and picture dealer in St. Paul's-churchyard, and Mr. Graves was the owner of three pictures, namely, "The Sermon," "The Second Sermon," and "Ordered on Foreign Service." The defendant took photographs of the engravings, and sold a number of them, and he was convicted in twenty-six cases, and fined by the justices 5s. in each case. The fines were paid under protest. The magistrates were called upon to state the grounds of their decision, but refused on the plea that there was sufficient evidence of the registration of the copyright, and that the infringement of the act constituted the offence. The Court held that the registration was sufficient, and that the photograph of a thing or picture was a picture itself; and, therefore, that the sale of the twenty-six photographs having been proved, it did not matter whether it was one transaction or twenty-six offences. Rule refused.

MEETINGS FOR THE ENSUING WEEK.

MON.—Society of Engineers.—"On the Marseilles Docks," by M. De Merritens.
TUES.—Institute of Civil Engineers.—Renewed discussion upon the papers on Irrigation in India and in Spain, &c.
FRI. — Architectural Association. — Special business meeting, after which a discussion on the best means of utilising superfluous heat from ordinary fires. Chair taken at 7.30.
SAT.—Associated Arts Institute.—Committee meeting.

Our Office Table.

Adulteration would seem to be the order of the day. In a recent lecture to the Social Science Association, Dr. Letheby, analyst to the corporation of the city of London, mentioned that water is put into milk, lard into butter, chicory into coffee, and black tea is faced with black lead, the green is also "got up" with minerals, powdered gypsum, and Prussian blue. The Doctor might have added that sugar is extensively sanded, and that there is hardly a beverage we drink that is not more or less adulterated, or, in other words, poisoned.

The annual dinner of the Institution of Civil Engineers is to be held at Willis's Rooms on Wednesday next, May 6, when the chair will be occupied by Mr. Charles Hutton Gregory, the president.

Early next week the portion of the Southern Thames Embankment, extending from Westminster to Lambeth Bridge, will be opened to the public. To-morrow the members of the Metropolitan Board will walk in procession along the footway, and inaugurate the opening.

The authorities of Trinity College, Dublin, are about to modernise the quadrangle in front of their buildings where the Prince of Wales uncovered the Burke statue. They intend to plant shrubs and to place a handsome *jet d'eau* in a suitable position.

Dr. Lunge gives, in *Dingler's Journal*, a method of making an excellent black varnish for ironwork. He distils gas tar until nearly all the volatile products are got rid of. He then stops the distillation, and dissolves the residual pitch either in the heavier oils, or, if a very quickly drying varnish is required, in the light oils or naphtha. This varnish is, of course, the original tar minus the ammonia water, carbolic acid, and other things which give it its disagreeable odour, and make it so long in drying.

It is only right to state that Mr. Cole has determined to decline the bonus of £1,500 in addition to his usual salary, which he is returned as having received in a paper recently laid upon the table of the House of Commons, in consideration of his services in Paris while superintending the British Section of the Exhibition. This matter was alluded to by us last week.

Donors and constructors of drinking fountains would do well to remember that not the least interested of the public in their philanthropical endeavours are the young, and so design their structures that they may not be inaccessible to thirsty juveniles under 4ft. 6in. At the fountain in Lincoln's Inn-fields we noticed this week a *gamin*, after several unsuccessful endeavours to obtain a footing on the iron guard protecting the part assigned to dogs, who in this respect are by far the better provided for, tumble backwards into the gutter, with the result of increased dampness to his breeches and dryness in his throat.

A sad accident occurred at Chicago on Good Friday. The Roman Catholic Cathedral of St. Mary was filled with worshippers, and the weight of the multitude caused a portion of the floor to give way, which, raising a great dust, led some one to cry "Fire!" A terrible panic ensued, and in the rush that was made for the doors four women were crushed to death, and twenty or more persons were seriously injured, three of them having since died.

A fund is being raised for the archæological exploration of Rome. Of the vast importance of such an exploration there cannot be two opinions. Mr. J. Parker, treasurer of the British Archæological Society of Rome, would be glad to receive subscriptions for the purpose.

At a meeting of Commissioners of Supply, held at Selkirk on Tuesday.—Mr. Rhind, architect, being present—the contracts for the erection of the new County Buildings were adopted, subject to the approval of Government. The total estimates are slightly over £7000.

The Society of Arts will consider the award of the Albert medal at their next meeting. The medal was instituted to reward "distinguished merit in promoting arts, manufactures, and commerce." In 1864 Sir Rowland Hill obtained the medal for his reforms in the postal system. In 1865 the Emperor of the French obtained the medal for his judicious "patronage of art, his enlightened commercial policy," and for the "abolition of passports in favour of British subjects." In 1866 Professor Faraday obtained the medal, and in 1867 W. F. Cooke and Professor Wheatstone in recognition of their joint labours in establishing the first electric telegraph.

Mr. Maclagan, M.P., and Mr. T. G. Murray have lately been in communication with the Enclosure Commissioners, in reference to their requirements for cottages erected in Scotland under their sanction. The commissioners say that while they still adhere to the principle of four-roomed cottages as the best means of separating the sexes, under the representations made that the cost operates as a restriction on improved cottage building, every facility shall be given to extend the practice, which already has in many cases been adopted, of sanctioning cottages composed of three rooms, to be charged on the estate. In such cases it is recommended that the living-room should not be of a less size than 16ft. by 18ft., and 10ft. in height, but in no case should the size be less than 12ft. by 15ft., nor the height less than 8ft.—they think 9ft. preferable. They are further of opinion that the method of structure which encourages the practice of having recesses in which box-beds are placed should be avoided. A scullery or wash-up place as well as the usual out offices should, of course, be also provided.

We view, with great surprise and disappointment, the obstacles thrown by the Government, on Wednesday last, in the way of Mr. Torrens' "Artisans' and Labourers' Dwellings Bill." It was universally understood that no opposition was likely to arise to the measure from any quarter, but at the last moment, Lord John Manners offered a number of purely technical objections, and the consideration of the Bill is postponed for a week for the avowed purpose of giving the Attorney General an opportunity of conferring with Mr. Torrens, and surmounting the legal impediments that are said to exist. We trust that the result may show that the Government have really intervened to help and not to hinder. This or some similar measure must soon become law if we are to encounter with any chance of success the mass of crime and sorrow, so great a part of which originates in the filthy condition of the homes of our people.

On Saturday afternoon last the church of St. Paul's, Little Chester, near Derby, was struck by lightning, and the south-east and largest pinnacle completely shattered. Stones were hurled in all directions, the slate demolished, and the lead ripped off from the roof. A portion of the stonework of the opposite tower was also carried away. The interior of the church was but slightly damaged. No lives were lost, although many persons live in the vicinity of the church.

A clock of very extraordinary and beautiful workmanship, designed by Raingo the Elder, and of the period of the First Empire, is now on view at M. de Boos', 20, Down-street, Piccadilly. In the base is a musical box, which plays every hour. The front dial has, in addition to the usual index of time, a record of the days of the week. The signs of the Zodiac and days of the month are also registered, and in connection with these is an extremely beautiful mechanical arrangement, exhibiting from day to day the relative positions of the moon, earth, and sun. The whole of this marvellous mechanism is worked by three springs; and the design, notwithstanding its seemingly complicated machinery, is very light, graceful, and chaste.

The slowness of the removal of St. Benet's old church, Gracechurch-street, turns out to be this:—The person who undertook to remove it had a certain time allowed by the contract, and so put up his hoarding. Instead, however, of carting the materials away himself, he preferred to sell them upon the ground, and opened a truck and store-yard. The licence expired on the 24th of last month, when the church should have vanished and the hoarding have been cleared away. Neither of these events have been completed, and, the inhabitants grumbling, the affair got into the Court of Common Council, a summons was issued, and another fortnight has been allowed.

Visitors to the Architectural Exhibition now opened at 9, Conduit street, are informed that the Museum of Building Materials, which adjoins the exhibition, is open daily free of charge. The museum will amply repay a visit.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2676 J. FLETCHER. IMPROVEMENTS IN STEAM OR OTHER POWER HAMMERS. Dated September 23, 1867.

This invention relates, first, to the hammers driven by a crank or cam shaft actuated by steam or other power, and consists in an improved mode of starting, stopping, and regulating the speed of the hammer by a lever upon a shaft having two cams, one of which applies a break to the fly-wheel, and the other throws the driving power out of gear, or shuts off the steam. The invention consists, second, in making the top or upper part of the hammer block hollow for the reception of two spiral springs acting above and below a disc or piston, which is connected by a link to the crank shaft driven by steam or other power. As the crank shaft revolves, the disc or piston, acting on the springs, raises and lowers the trip or hammer block, the force of the blow depending upon the weight of the trip or hammer block and parts connected therewith, the speed of the crank shaft, and the strength of the springs. Instead of springs, atmospheric air, or other elastic medium, may be employed.—Patent abandoned.

2688 G. BATCHELDOR. IMPROVEMENTS IN TROUGH WATERCLOSETS. Dated September 24, 1867.

The object here is to provide trough waterclosets at a less price with rounded surfaces, or surfaces sloping towards the outlet valve, and in part, that is to say, as regards the trough part, of non-absorbent and more durable materials than those now in use. For this purpose the patentee makes or constructs the troughs of earthen or stoneware, and in or over the soil pipe leading therefrom he fixes or forms a valve seating, the valve of which is connected to a lever or its equivalent, and is led into a locked-up space, the key of which is in the possession of a person whose duty it is to see that from time to time the trough is emptied and flushed. The seats are of the ordinary form.—Patent completed.

2701 W. WOODCOCK. IMPROVEMENTS IN APPARATUS FOR WARMING AND VENTILATING BUILDINGS. Dated September 25, 1867.

This invention, under one head, has reference to improvements applicable to stoves of the character of Gurney's stoves, or any stove having a number of plates from its outer surface, with the plates vertical in a trough of water, or any stove of analogous construction or action, and consists in constructing the said stoves with feeding door, fire door, and ashpit door, so arranged that they shall open into a stoking chamber or compartment, which is otherwise entirely separated from the stove, such stoking chamber or compartment being wholly separated from the building to be warmed and ventilated. —Patent completed.

Trade News.

TENDERS.

ALSAGER.—For new Wesleyan Chapel, Alsager, Cheshire. Mr. Geo. B. Ford, architect, Burslem:—

Stringer	£2522
Booth	2440
Keon	2230

BERMONDSEY.—For erecting premises at Bermondsey for Mr. Wallace. Mr. J. Gale, architect:—

Epps and Gates	£630
Wells	584
Maiers	563
Nightingale	555
Wood	507
Sheppard	495

CATERHAM.—For a pair of semi detached houses to be erected on the Godstone-road, Caterham, Surrey. Mr. George Robson, architect:—

	With attics.	Without attics.
Ward	£985	£915
Elliff	894	845
Baldwin*	900	830

* Accepted subject to reductions.

CANNINGTON.—For erecting a new Congregational Chapel at Cannington, near Bridgwater, Somerset, for the Rev. B. Hurman and committee. Messrs. E. Habershon, Brock, and Webb, architects:—

Shorney	£910
Kitch Brothers	790
Paddon	767
Hartree	750

CHUBBY (SALOP).—For erecting a new farmhouse and buildings at Lower Lane. Mr. E. Powell, architect. Quantities supplied:—

Lockley and Ward	£1570 0
Woolley	1039 0
Evans	995 10
Hankinson and Williams	945 0

COVENTRY.—For building new Baptist Chapel Schools at Coventry. Mr. John D. Webster, architect, Sheffield. Quantities supplied:—

Hewitt	£2560 0 0
Woff and Kendall	2400 0 0
Marriott	2378 0 0
Norwood	2250 0 0
Trow and Sons	2200 0 0
Makepeace	2108 0 0
Claridge	2070 0 0
Bennett	2063 3 0
Haywood	2000 0 0
Wilson	1900 0 0
Hallam and Co. (accepted, with slight modification)	1900 0 0

COWFOLD.—For works at Cowfold, Sussex. Messrs. E. Habershon, Brock, and Webb, architects:—

Keys	£3305
Manley and Rogers	2790
Simpson	2675
Hatten	2523
Wilcox and Spurgeon	2395
Bland	2348
Bish	2277
Nightingale	2267
Pengoe	2247
Hall	2245

DARTFORD.—For new Wesleyan School, &c., at Dartford. Messrs. Pocock, Corfe, and Parker, architects:—

Lathey	£1780
Sharp	1129
Gumbrell	1025

GRAYS (ESSEX).—For the erection of a village residence for Messrs. Sturgeon and Sons. Mr. D. A. Cobbett, architect. Quantities supplied by Mr. George Mortimer:—

Harris	£2620
Rivett	2530
Crabb and Vaughan	2455
Hall	2347
Forrest	2269
Blake (accepted)	2265

HARTFORD (BERKS).—For parsonage house. Mr. H. Woodman, architect:—

Dover	£1600
Bland	1499
Matthews	1486
Wheeler	1400
Lovatt	1319
Wheeler Brothers	1192

LIVERPOOL.—For alterations at the Church of St. Francis Xavier. Messrs. Picton, Chambers, and Bradley, architects. Quantities supplied:—

Haigh and Co.	£5350
Westmorland	4898
Mullen	4799
Urmson	4654
Jones and Son	4649
Hughes	4590
Callie	4510
Rowe (accepted)	4444

LONDON.—For alterations and repairs at 310, Strand, for Mr D. Lane. Messrs. Clarkson, architects. Quantities not supplied:—

Emery	£785
Howard	685
Macey	678
Stone	650

MAIDENHEAD.—For the restoration of White Waltham Church, Maidenhead. G. E. Street, A.R.A., architect:—

Rogers and Booth	£4180
Silver and Son (accepted)	3969

NOTTINGHAM.—For the County Court. Mr. Thomas C. Sorby, architect. Quantities supplied by Mr. J. Scott:—

Hall	£6280 0 0
Barke	6250 0 0
Huddlestone	6188 0 0
Simpson and Co.	6078 0 0
Marriot and Co.	5880 0 0
Dennett	5879 0 0
Bell and Co.	5839 10 0
Stephenson and Co.	5698 0 0
Johnson	5650 0 0

WINCHMORE HILL.—For a wing to Beaumont Lodge, Winchmore hill, Middlesex. Mr. J. H. Rowley, architect. Quantities by T. T. Green:—

Crabb and Vaughan	£1354
Field and Sons	1226
Rivett	1213
Bayes	1191
Shepherd	1129
Patman	1084
King and Sons	1071
Smart ton and Cole	1048

WOLSTANTON.—For three houses at Wolstanton, near Burslem, for Mr. Clement Marsh. Mr. Geo. B. Ford, architect, Burslem:—

Sutton	£2818 14 0
Woolrich	2822 4 3
Bennett and Cooke	2766 0 0
Brindley and Critchlow	2560 0 0
Blackhurst	2486 0 0
Bowden	2432 0 0
Newton	2020 0 0

PROPERTY SALES.

APRIL 27.

By Mr. J. T. NEWMAN, at the Guildhall Coffee House—Freehold building land, on the Harold Wood estate, Essex, in lots: lot 19, sold for £305; lots 36 to 39, £130 each; lot 40, £300; lot 47, £85; lots 48 to 52, £80 each; lot 60, £125; lot 61, £80.

APRIL 28.

By Messrs. DEBENHAM, TEWSON, and FARMER.—Leasehold residence, No. 1, Rectory place, Rectory road, Stoke Newington, annual value £45 per annum, term 32 years unexpired, at £6 per annum—£320.

Leasehold business premises, Nos. 255 and 256, Tottenham court road, also stabling in the rear, let on lease and producing £138 10s per annum, term 99 years from 1798, at £8 per annum—£1,610.

Leasehold residence, No. 10, Fitzroy-place, Kentish Town, let at £38 per annum, term 72 years from 1799, at £6 6s. per annum.—£115.

Freehold ground rents, amounting to £163 14s. 6d. per annum, secured on 39 houses in and near the Old Kent road—£3,400.

Leasehold cottages, Nos. 5 and 6, Sussex place, Ferdinand street, Hampstead road, producing £39 per annum, term 55 years unexpired, at £3 10s. per annum.—£165

By Messrs. HARDS, VAUGHAN, and LEIFCHILD.—Freehold cottage, situate at Horton Kirby, Kent, let at £9 2s. per annum.—£105.

By Messrs. OWEN and JAMESON.—Leasehold two residences, Nos. 52 and 54, St. Paul's road, Camden Town, producing £104 10s. per annum, term 76 years unexpired, at £17 per annum—£1,155.

By Messrs. WARLTERS and LOVEJOY.—Freehold building estate, known as the "Annerley Tea Gardens," Annerley, consisting of 6a. 2r. 31p. of land, and 1a. 0r. 27p. of water, together with the buildings and erections thereon—£5,050.

APRIL 29.

AT THE MART—By Messrs. CHINNOCK, GALSWORTHY, CHINNOCK, and Co.—Freehold house, No. 29, King street, Cheapside, let at £120, subject to an annuity of £52 on four lives—£1,260

The Rocks Estate, near Bath, a fine freehold residential property, comprising an Elizabethan mansion and 839 acres of land—£31,000.

Nine lots of reversions, life interests and annuities, belonging to the late firm of Overend, Gurney, and Co. (limited).—Lot 1, sold for £7,150; lot 5, £3,500; lot 6, £1,800; lot 7, £500; lot 8, £5,350; lot 9, £2,100; lot 4 (sold before the sale), £6,300; total for all the properties, £78,960.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George William Bodda, Thornton-heath, builder, May 27, at 11.—Edward Henry Cogswell, Hatfield Broad Oak, builder, May 27, at 11.—Michael Mason, Cambridge, contractor, May 27, at 11.—George Purser, Leighton Buzzard, plumber, May 5, at 2.—Henry Vere, Kensington Park, builder, May 8, at 12.—William Henry Dowland, Ramsgate, builder, June 1, at 11.—Benjamin Froud, Wandsworth-common, builder, May 8, at 2.—William Green, Hayes, Middlesex-road, contractor, May 9, at 12.—William Nunn, Hanover-street, Peckham, builder, June 1, at 11.—Elizabeth Steddy, Howard-road, Stoke Newington, builder, May 9, at 12.

TO SURRENDER IN THE COUNTRY.

George Arthur Cates, Bristol, engineer, May 8, at 12.—Banks Ebbritt, Great Staughton, plumber, May 7, at 2.—John Senior, Wombwell, near Barnsley, joiner, May 7, at 11.—John Robinson, Woodhouse, near Leeds, bricklayer, May 7, at 12.—John Whittle, Peterborough, builder, May 9, at 11.—Thomas Willan, Chorlton-on-Medlock, contractor, May 5, at 9 30.—John Batty and Stephen Wake, Middlesborough, builders, May 11.—Joseph Gore, jun., Herne Bay, contractor, May 12, at 12.—William Mason, Manningheath, Sussex, builder, May 4, at 11.—Thomas Ralls, Cardiff, builder, May 8, at 11.—Josiah Stantau, Portscatha, Cornwall, builder, May 11, at 4.—John Hardy Stothard, Morton, near North Shields, joiner, May 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

May 28, G. Philo, East India Dock road, timber dealer.—May 25, S. E. Marples, Ramsgate, surveyor.—May 20, F. Young, Brynmawr, railway contractor.—May 6, S. Heyman, Torquay, builder.—May 19, T. Johnson, South Stockton, builder.—May 28, H. Barfoot, Princes-road, Nottinghill, slater.—May 15, C. Field, Hereford, bricklayer.—May 18, J. Jefferson, Blackburn, joiner.

DIVIDENDS.

May 25, Sir S. M. Peto and E. L. Betts, Great George-street, Westminster, contractors.

DECLARATION OF DIVIDENDS.

W. Mowbray, Leicester, engineer, div. 8d.—J. Heatley, Whitehaven, plumber, div. 10s.

SCOTCH SEQUESTRATION.

John Ewen, Glasgow, contractor, May 1, at 12.

PARTNERSHIPS DISSOLVED.

Smith and Jackson, Huddersfield, brickmakers.—The Nottingham Mills Company, timber merchants.—Williams and Watkins, Helston, plumbers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12 10	Archangel, yellow	£11	0 £12 0
Quebec, red pine		3	10	4 15	St. Petersburg, yel.	10	10 11 0
" yellow pine		2	15	4 5	Finland	7	10 8 10
St. John N.B. yellow		0	0	0 0	Memel	0	0 0 0
Quebec Oak, white		5	15	5 15	Oothenburg, yellow	8	0 10 0
" birch		3	10	4 10	" white	8	0 9 0
" elm		3	10	5 0	Gefle, yellow	9	0 10 10
Dantzic oak		4	0	6 0	Soderham	9	0 10 10
" fir		2	5	3 5	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir		3	0	3 15	yellow	12	0 15 0
Riga		3	0	3 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15 1 3
Swedish		2	2	2 8	Pumice Stone per ton	8	0 8 0
Mast, Quebec red pine		6	0	7 0	Oils, &c.		
" yellow pine		5	0	6 0	Seal, pale...per tun	38	0 0 0
Lathwood, Dantzic, fm		5	0	7 0	Sperm body	98	0 100 0
" St. Petersburg		8	10	9 5	Cod	35	0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Whale, 8th. Sea, pale	36	0 0 0
Quebec, white spruce		18	0	19 0	Olive, Gallipoli	73	0 74 0
St. John, white spruce		13	10	15 10	Cocoanut, Cochin, ton	54	0 55 0
Yellow pine, per reduced C.					Palm, fine	40	0 43 0
Canada, 1st quality.		17	0	18 10	Linseed	33	10 34 0
2nd do		11	0	12 0	Rapeseed, Eng. pale	37	10 0 0
					Cottonseed	33	0 40 0

METALS.

IRON:—

Welsh Bars in London	per ton	6	5	0	6	10	0
Nail Rod	do	7	5	0	7	12	6
Hoops	do	8	5	0	9	0	0
Hoops, Single	do	8	0	0	8	0	0
Staffordshire Bars	do	7	5	0	7	15	0
Bars, in Wales	do	5	7	6	6	0	0
Rails	do	7	6	0	7	12	6
Nail rods	do	7	12	6	8	0	0
Foundry Pigs, at Glasg. No 1	do	2	12	6	2	14	0
Swedish Bars	do	10	0	0	10	10	0

STEEL:—

Swedish Keg, hammered	per ton	15	0	0	15	5	0
Swedish Faggot	do	0	0	0	0	0	0

COPPER:—

Sheet & Sheathing, & Bolts	per ton	85	0	0	87	0	0
Hammered Bottoms	do	96	0	0	0	0	0
Flat Bottoms not Hammered	do	80	0	0	0	0	0
Cake and Tough Ingot	do	80	0	0	83	0	0
Best Selected	do	82	0	0	85	0	0
Australian	do	82	13	0	50	0	0
Y. L. Metal Sheathing & Bolts	per lb	0	0	7½	0	0	7½

LEAD:—

Pig, English	per ton	21	5	0	0	0	0
,, Spanish Soft	do	19	0	0	0	0	0
Shot, Patent	do	22	15	0	0	0	0
Sheet	do	20	12	0	20	15	0
White	do	27	0	0	31	0	0

RED LEAD OR ANTIMONY

French	per ton	44	0		45	0	

ZINC:—

English Sheet	per ton	26	10	0	27	10	0
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20	0	0	0	0	nett
Quicksilver	per btl	6	17	0	0	0	0

TIN:—

English Block	per ton	98	0	0	0	0	0
do Bar	do	99	0	0	0	0	0
do Refined	do	101	0	0	0	0	0
Banca	do	96	0	0	97	0	0
Straits	do	93	0	0	0	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 8, 1868.

ARCHITECTURE AT THE ROYAL ACADEMY.

ARCHITECTURE, we are sorry to say, cannot sing a Jubilate in this the centenary year of the Royal Academy. It has taken nearly a hundred years to do it—such is the vitality of our art; but the academicians have very nearly strangled Architecture amongst them, and if we are to take a diagnosis of its condition from the presentment here set forth, we must declare that it is indeed in a moribund state. Perhaps, fortunately, we have another exhibition which reveals a very different state of things. We say perhaps, for we cling, in spite of many cogent reasons to the contrary, to the opinion that a union of the arts would be good for all, and we think that, whilst the title of the Institute is that of the Royal Academy of Arts, the parent art of Architecture should be more hospitably received and better treated. We, alas! are old enough to recollect the time when good men thought it an honour to find a place for their works within these walls, when one of the rooms was known by the name of the Architectural Room, and when the annual exhibition was a fair illustration of each year's progress; but we have seen Architecture kicked out of its old snug quarters, and made to wait like a lackey in the ante-room, turned out like poor old Lear by ingrate children to perish in the cold, and next year we expect to find it somewhere amongst the umbrellas and walking-sticks. We know it will not be turned loose in the porticos, because the sentries posted there might seem to do it honour, and this evidently is not the object of the painters. In a year or two a new home will be found for this society, and with a new home we trust a new and truthful name will be found. Let them then call themselves the Society of Oil Painters; they may even take the epithet Royal, if they will, but, in the name of all that is honest and truthful, do not let them hypocritically dub themselves, as they now do, the "Royal Academy of Arts." Watercolour artists have been driven from their rooms; sculptors they have buried, and architects they have condemned to death by the old and barbarous process *peine forte et dure*. How it is that so notoriously irritable a class as architects undoubtedly are could have stood this treatment so long has been a never-ending wonder to us, and that any will still continue to send their works is inexplicable; still we see a natural law working its way in spite of all human opposition, and the supply is limiting itself to the demand. Year by year the exponency of architecture gets weaker and weaker, and if there should be another year of it we may safely say it will have reached its weakest. This year's exhibition comprises 1,206 works of art, and of these forty-three are of contemporary architecture. We do not think that any comment of ours can put this fact in more forcible terms than this statistical statement, that only about one-thirtieth part of the exhibition is appropriated to our art, and that thirtieth in the very worst position. All this has wrought its bitter end, for even this small space is occupied with much that is worthless, and we have again to complain that the best men do not send at all, and those who do send do not send their best works. Of the forty-three drawings here submitted not half a dozen are worth the wall space they occupy. Numerically first amongst the architectural drawings (831) is Mr. T. R. Smith's "Brambletye, near East Grinstead," now erecting for Donald Larnach, Esq. The drawing is large and the landscape well put in, but the penn'orth of bread to all this sack is small indeed. Not but that the bread is wholesome; indeed, it is so good that, like Oliver Twist, we ask for more, and would far rather have seen somewhat more of the house and somewhat less of the district in which it is placed. At present we simply see an octangular staircase and a gable, both good in their way, but this is not very much to be given for all that large consumption of wall space. In 842, Mr. Gibson gives us an octagon "mausoleum of Sicilian marble and granite," erected in the Kensal Green Cemetery. Neither the description nor the design at all denote the quality or calling of the deceased thus lapidated. We are, therefore, left to form our own conjecture as to its fitness, and have come to the conclusion that the useful mission the thus-commemorated life was spent in was the practical furtherance of the noble science of gastronomy; for, by a delightful union of imaginative genius with archæological research, the design is that of the Abbot's Kitchen at Glastonbury, executed after the manner of confectionery; and though the idea may be pleasing, yet the effect is most appropriately heavy, and we feel that the well-worn Classic monumental inscription would be a desecration on this Christian monument.

The Paxton Memorial, which adjoins this, designed by Messrs. Goddard and Son, is a striking contrast, and together they afford a remarkable illustration of how many ways of going wrong there are in this world. Neither is good. This is long and thin, and that is short and thick, and, to use poor Hood's expression, "that's the long and short of it." Mr. D. Brandon's design for a mansion to be erected at Encombe, Dorsetshire, for the Right Hon. the Earl of Eldon, is a very simple and somewhat Jacobean building, of no particular merit, certainly not worth exhibiting. In Nos. 850 and 857 we have the interior and exterior of Miss Burdett Coutts' market in Bethnal Green, now approaching completion, from the designs of Mr. H. A. Darbishire. This very admirable work of charity disarms all criticism by its purport. We only wish the buildings were as unostentatious as the deeds of their donor, and we would rather have seen a good, well-ventilated covered market than the most picturesque of piazzas. We are sorry to say it, but it is a costly mistake, and in this case we prefer the will to the deed. Mr. G. E. Street, A.R.A., presents us with a most wholesome and satisfactory drawing and design. It is the exterior of the Convent of St. Margaret, East Grinstead (851), very simple and good, remarkable for an absence of all fussiness or striving for effect. The plan has developed the exterior, and the result is a truthful expression highly grateful to us after the masquerading we have been compelled to see so much of. The treatment of the entrance is noteworthy, and the honesty which could place its doorway from under the centre of the gable and the taste which could correct this irregularity by placing the niche to hold the image of the patron saint on the opposite side are alike commendable, and the introduction of the Holy Rood in the tympanum of the gable is very effectively managed. Above the rather low range of buildings forming the main front rises the chapel, apparently separated from a retro-choir or Lady chapel by some connecting buildings, but in the absence of the plan we cannot quite read this portion of the design; and above all this rises a circular bell tower of somewhat Spanish character, the least satisfactory portion of the design. Mr. G. G. Scott, R.A., sends an exterior view of the new chapel of St. John's College, Cambridge (852), which is not a pleasing production. It is exceedingly heavy, the apsidal chancel by no means harmonises with the square transeptal projections which occur at both ends, and the poverty of expression induced by the blank traceried windows in the easternmost of these is not worthy of an R.A. Mr. Ferry's church about to be built at Taunton is simple, and, if it had a better developed chancel, would be good. There seems to be a mania spreading amongst architects which developes itself in apses everywhere, and, much as we love a good apsidal termination to a long and grand chancel, we confess we very much dislike it when the chancel consists of the apse only, as in this case. Internally perhaps the chancel may continue so far as the western face of the tower, and thus help it, but even in this case, a square-ended chancel would have been very much better, and would have harmonised more with the other features of the design. The placing of the aisle porch at the extreme western end is a judicious expedient, as it prevents cutting the seating in two, but a better effect is obtained when a baptistery is placed westward of this, so as to prevent the very abrupt termination of the porch at the west end of the building. Mr. Parnell's design for the "Lawn front of Bushey Grove, near Watford, the seat of Edward Majoribanks, Jun., Esq." (856), is very Institution-like, with the regulation chequer work in blue bricks, the usual bay windows, and the unusual curved gables, which we had hoped had passed from the repertory of second-rate architects into the limbo of forgotten iniquities. Mr. T. T. Smith has a very good and simple little interior of a Benedictine Chapel at Nice (860), where an apsidal retro-choir is separated from the main body of the chapel (consisting of a nave only) by a simple reredos flanked by open iron grilles. Mr. E. M. Barry, A.R.A., sends some more bits of his restoration of Crewe Hall, which are very good in their way, but of course show no individuality or general progress; and Mr. M. D. Wyatt the interior of the India Office courtyard, which he exhibited in Paris, and which we then commented on.

Mr. A. Waterhouse sends us his best bit of his Manchester Townhall, the angle drawing, taken from the corner of Princess-street and Albert-square, and the which, as we have so recently commented on it, we shall simply point out to the visitor as a very admirable drawing, as may be seen by our illustration.

In No. 870 we have the interior of the Crimean Memorial Church at Pera, Constantinople, just completed from the designs of Mr. G. E. Street, A.R.A. This is very good and simple; the altar well raised, and backed by a simple reredos of inlay work bearing the symbol of our redemption, and flanked by slabs of marble separated by strips of mosaic work in the usual manner of wall-lining in the East. The circular window above this is of very severe type, and altogether the building is dignified, because it is not vain and fussy. The pulpit is somewhat obtrusive and overdone; but the two drawings which Mr. Street contributes show far more of the real spirit of architecture than any others in the room. Mr. Law sends an ordinary French château in very red brick and white stone, with a British propensity to bow windows, of no merit as a work of architecture, but a very admirable drawing. By the same colorist is 875, House at Coombe Lammas, Esher, designed by Mr. F. Wallen, a most extraordinary specimen of architectural fooling, being a heap of incongruous materials put together in the most abominable form. It makes us almost weep to see such beautiful work thrown away on such a subject. Mr. M. D. Wyatt's design for Mr. Huth's house at Passingworth seems to be largely composed of conservatory; what building we see is good and simple. Alleyn's College, Dulwich, as finally arranged, and now in course of erection from the design of Mr. C. Barry, is a curious mixture. We know its detail is very fine, but as a whole we do not like it.

Mr. Cockerell's design for "Sir Roger Cholmeley's school at Highgate" is very unworthy of his abilities; his having, by external pressure, been compelled to produce is possible, but that he should exhibit it passeth all understanding. There is little else to see

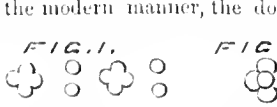
or say. Mr. Burges sends a sketch of the west doorways of "Cork Cathedral," which is "skied" so high we cannot read it. Mr. D. Brandon is even more unfortunate than usual in his "Eagle Insurance Offices," and Mr. Edis has stolen one of Mr. Barry's hotel designs and knocked it into some "New Mansions, Bayswater-road" sadly. Like the little boys we have, however, saved a plum till the last, and in Messrs. Godwin and Crisp's premiated design for the new townhall, Bristol, we have a very healthy and vigorous attempt. The lower storey is boldly treated in blocked masonry, its centre pierced by a simple doorway, and three two-light couplets flank it on each side. Above this is a rather singular range of small windows, forming a continuous panelling, the spaces required for support being filled in with figure sculpture; this feature is more novel than pleasing, and somewhat detracts from the massive dignity which pre-eminently distinguishes this design. The principal storey is well composed, consisting of a series of windows having plain traceried heads, and surmounted by pedimental canopies divided from each other by sculpture. The tower is very singular, and would be much more effective in work than appears by the drawing. From these same able artists, we have a couple of gateways at Castle Ashby, and a sketch of Glenbegh Towers in course of erection near Killarney, which is hung too high for criticism. Mr. Kerr sends a porch for Bearwood, Berks, in which Thorwaldsen's "Night and Morning" are tried to be turned into brackets with signal failure,—they do not even seem to be able to carry themselves. As to the other drawings they form a residuum, and must not complain if it finds no representation in our columns. We do not care to crush the weak. Of past architecture we have some good renderings, but Mr. Dobbin is not equal to last year. Mr. Phené Spiers contributes three admirable drawings, but these do not come under our present consideration, and we are much too dispirited with the painful task we have performed to be in the vein for pleasure; so with a heavy heart we descend the steps and wander away wondering why it is so. We have great and good men amongst us, a higher range of architectural talent now than England ever had before, a heartier appreciation for our art is manifest each year, and yet we have allowed ourselves to come to this. If architecture is to be represented at all, it should be fairly so, and we call on the profession either to withdraw entirely from the so-called Royal Academy of Arts, or to put their shoulders to the wheel, and with right good will push on until they have made its name a truth.

THE MUSEUM OF BUILDING APPLIANCES.

WE propose to commence a review of the contents of the Museum of Building Appliances in Maddox-street, with an examination of the tile and mosaic floors and other surfaces in plain, encaustic, majolica, and other ware there exhibited. Copeland's works seem first to call our attention, not from the quantity he sends, but his name is a power, and we wish that as much could be said for the beautifully delicate drawing and colouring in those he exhibits, which are intended for fireplace and wall decoration. Such an intense horror of positive colour appears throughout the collection that it is necessary to examine some parts very carefully to realise the exact tint aimed at; and when it is remembered that all these half tones (for colours they certainly are not) are for the interiors of our dark rooms, we cannot but ask for something a little stronger. Some hexagonal tiles of blue and buff grey for stable floors are still of the same delicacy of tone as those intended to be used in the decoration of rooms. Whilst we speak so freely as to the taste shown in these magnificently made productions, do not let it be supposed that we wish to say aught but what is respectful concerning their make, which is exquisite. The glaze of every tile is as smooth to the hand as glass; each tile is so exactly like its fellow that to even wish for a difference would in Staffordshire be considered a sin.

As a curious illustration of the difference in manner and tone of thought between the manufacturers of to-day and those of past days, we might mention some Dutch tiles in the jambs of a very eccentric grate near the Maddox-street entrance of the museum. Each of these tiles has been drawn by hand, and although but in one colour (blue, with white for the ground), and although the drawing is rude, and the figures dressed in flap hats, jerkins, and knickerbockers, with all these drawbacks, no person who possesses any feeling for colour could walk direct from these homely but earnest attempts to render what the artist and workmen knew to the modern productions before spoken of, which are so perfect in their way, and yet so unsatisfactory in their result, without drawing unfavourable conclusions as to the taste and energy of the latter. To argue that they are made to suit the tastes of purchasers, and to harmonise with the furniture of our rooms, is but to say, so much the worse for the taste of the purchasers and their furniture. Some modern "imitations" of the old Dutch tiles are in the upper gallery of the museum, but then they are unlike them both in colour and drawing. The largest exhibitor is Godwin, of Lugwardine. In some tiles made for Hereford Cathedral his imitations of the texture and colour of old encaustic tiles are wonderful, whilst in fracture the pattern appears to be inlaid at least 1-16th of an inch thick. This is an important matter, for in some inferior tiles that we have seen the pattern was so thinly inlaid that a sharp blow cracked them at once, and if the clays forming the several colours are not of precisely the same substance they do not contract equally in burning and cannot make a lasting material. It is certainly strange that the practical advantages connected with some of the peculiarities of these imitations of old tiles by Godwin never seem to have occurred even to the maker. Take, for instance, the slightly roughened surface, which if merely looked at from the common-sense view of comfortable foothold certainly ought to be one of the considerations in a pavement and must be a point in their favour. Let anyone who doubts this spend some time in the new galleries of the South Kensington Museum. If he wear good stout walking boots he will come to the conclusion that either his feet or the pavement ought to be "roughed." Then the play of light and the chance of their being some diversity of tint where the surface is not at such a dead level ought also to count for something in favour of such an alteration. As an instance of how a pattern may be carefully imitated, whilst the spirit that dictated its design may be utterly lost, take a border tile from Hereford, buff on a red ground (fig. 1). This is simple and effective, but in some tiles made by Godwin, after the modern manner, the dots are made

FIG. 1. FIG. 2.



white, and a white dot is inserted in the centre of the quatrefoil (fig. 2), utterly destroying the breadth and simplicity of the old pattern, and, indeed, vulgarising it.

Some green and black pattern tiles are very good in colour, and would, if very cautiously used, give great richness to a pavement. Maw and Co. also send some well-made tiles, but those for floors have the same fault of flatness of treatment and dulness of tone before mentioned in other manufacturers' works. There are several grates designed by Bodley, Webb, Truefitt, and Waterhouse, and manufactured by D. O. Boyd. Their make and other peculiarities will be reserved for future consideration, but at present the tile filling in of the jambs comes under our attention. The grate designed by Mr. Bodley, and which has old Dutch tiles in the jambs, has been alluded to. Mr. Truefitt's grate has some black and yellow tiles forming the back, sides, and hearth, the yellow being noticeable as apparently an attempt to imitate the old majolica yellow, and is very praiseworthy, but there is still a slight rawness in the tone that must be conquered. The back hearth is raised about 2in. above the front hearth, the advantage of which is not very clear, whilst the nosing of the riser being formed in tiles would be very likely to chip. The general tone of colour in these last-named tiles is a decided improvement upon those used in Mr. Webb's grate, where black and red tiles, with a buff and red border, are laid down for the hearth. It would have been much better to have kept the centre one colour, say red only, the border being at present discordant with the rest. Mr. Waterhouse, bolder than the two other gentlemen, has used many more colours, but with great loss of harmony and repose. Godwin and Maw both exhibit majolica tiles for fireplaces in several colours. The tints might have been more harmoniously chosen in some cases, but some of the patterns of both manufacturers are very good indeed. One error in their make ought to be pointed out, and that is in the raised surfaces, many of them having a sharp angle in the bed. This would make them difficult to clean, and in some measure neutralises the advantages gained by their use. Amongst the tiles exhibited by Maw and Co. there is one pattern in white, green, blue, and buff, a flat glazed tile for wall surfaces, treated with a chintz-like pattern. This is very free in drawing, and a great improvement upon many tiles made for the purpose.

Messrs. Minton do not appear as exhibitors, but their white tiles are used in lining the lavatory, and cause the question to arise, why are our white tiles always such a dead white? Put beside them a so-called white tile of Dutch manufacture, and the Dutch work will look quite yellow by contrast, and in consequence of this small amount of colour in them, they never, when used to cover large spaces, give such a cold appearance as the English work. Some of the narrow courts in Austin Friars, lined with Dutch tiles, are case in point.

Whilst remarking upon the choice of tints, there is another colour about which a few words might be useful, and that is the blue as used by all our tilemakers. The tone which they all affect is French blue, a cold colour in itself, and one difficult to harmonise with others. If some warmer tint were aimed at, such, for instance, as the blue upon gris de Flandres ware or in Neapolitan tiles, it would take much from the hardness of the patterns. This hard metallic blue is certainly not used because of any mechanical difficulty arising to prevent other tints being used, but probably has grown out of the attempt to imitate so called Gothic colouring, and this might be all very well in a church, or where strict mediæval treatment is desired, although the reason for its use, even in this case, remains to be proved; but where rich and harmonious colouring, unfettered by archæology, is tried for, certainly the best tint obtainable ought to be used, and for floor or wall decoration a sky-blue is not the best for the purpose. Somewhat similar objections may be raised against the buffs and greens. There are great difficulties in obtaining good tones of the latter colour, but the buffs still leave much to be desired. They would have much more life in them if they were a little more yellow in tone.

Before leaving the subject of floors some terra cotta, grey and red pavers, exhibited by Blashfield, claim attention. They are very pleasing in tone of colour, are thoroughly well burnt and made, are cheap, and are well adapted for their intended purpose—stable floors, or courts, and office paving—and their wear would be very even and satisfactory.

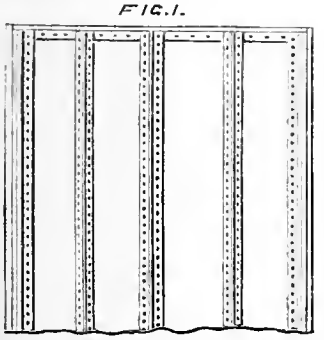
ELEMENTS OF ENGINEERING.

Caissons.—I.

FROM piles to cylinders, and from cylinders to caissons, are but stages of progress in subaqueous foundations.

A cofferdam enclosing a pier is nothing else than a caisson composed of a multitude of parts, instead of consisting of a few divisional sections. So long as timber piles were the only means of enclosing a water-tight area, there was no other resource but to form dams in the manner selected, and make them as staunch as the circumstances of the case would permit of. Partly owing to the introduction of iron and the success which attended its employment in the hollow or box shape, and partly to the increased dimensions required for all future bridges, which rendered the formation of a cofferdam upon the old pile system a work of great labour, uncertainty, time, and expense, engineers commenced to seek another principle of construction, which would afford the same result in considerably less time. The object to be achieved was, the surrounding of a certain space below the level of high-water mark with a water-tight casing, and manifestly the point to be aimed at was the accomplishing of the task with as few individual or separate portions of material as possible. Wrought iron was found to answer the purpose best, and this modern method of sinking foundations has met with well deserved success at the works of the new Blackfriars Bridge. The chief particulars claiming our attention are, the construction or mode of putting the caisson together, whether in separate divisions or in the whole, and the manner of sinking them down to a firm and solid substratum. As the ends of the piers of a bridge in a tidal river like the Thames will be both furnished with cutwaters or starlings, the end sections of the caisson will be of a different shape to the central ones, but the principle of its build will be identically the same. For the sake of example we have selected one of the central sections of a caisson, which is, in fact, a rectangular box open at both ends, and composed of wrought-iron plates, angle, tee, and stiffening irons. Fig. 1 represents an elevation of a portion of

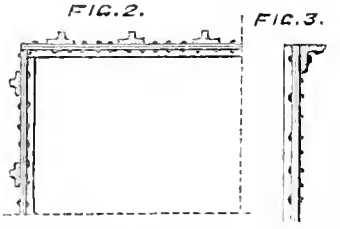
FIG. 1.



it, in which the plates and connecting irons are shown riveted up. The tee iron stiffeners which run longitudinally upon the sides may be placed either upon the outside, as shown in the figure, or upon the inside. It must, however, be borne in mind that this arrangement is not admissible in those portions of the caisson which are intended to be sunk below the bed of the water, as the obstacles offered to the free penetration of the substratum would be seriously increased by any projecting angle or tee irons. The outer surface must, in those lower sections, be perfectly smooth and flush, and all flanged ironwork that may be necessary either for the absolute strength or the rigidity of the caisson must be placed inside. Cases might arise, where the ground was of a very hard, impenetrable character, in which it would be advisable to countersink the heads of all the rivets showing upon the outside, but this would be attended with a good deal of extra trouble and expense, as an extra price per ton is always charged by contractors for ironwork if there is any departure from simplicity and plainness in the general character of the work they tender for. It is not to be understood by this remark that the necessity for countersinking the heads of a few rivets in a large design would suffice to increase the price of the work per ton, but simply that there should be no undue proportion of extra labour entailed. As a rule, a few rivets in every bridge are countersunk, generally under the bottom flanges, when the girders bear upon the bed plates over the abutments. Sometimes, instead of this precaution being taken, grooves are sunk in the castings for the bed plates, so as to allow the heads of the rivets to lie in them, while the remainder of the flange rests down upon the raised part of the plates.

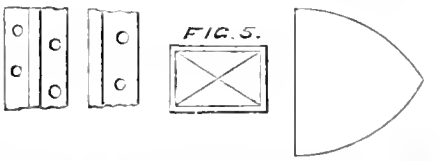
A portion of the plan of a caisson is shown in fig. 2, by which it is seen that the interior

FIG. 2. FIG. 3.



is preserved free from all diagonal struts or ties, in order to leave the maximum amount of room for the men to walk in, and also to allow of the passage of materials up and down. Frequently, however, it becomes necessary to temporarily strut the interior of the caisson to prevent it bulging inwards under the pressure of the water. Strong balks of timber are the best means of accomplishing this result. They can be readily fixed at any moment, can be easily removed as the masonry or brickwork is carried up, and can be used as often as required for a similar purpose. The necessity for strutting the caissons internally is usually confined to those sections situated below low-water mark, unless they have been constructed of materials of too small a scantling, which has occurred in one or two instances. The mistake of making the plates too thin should be carefully guarded against, for although the tee iron stiffening pieces impart much additional strength, yet they only act to the full extent at certain intervals, and, moreover, their assistance is bought at some sacrifice, since they cause a loss of material in the solid plate by the punching out of the holes to receive the connecting rivets. The chief use of all longitudinal stiffening irons, whether for caissons or plate girders, is to maintain the sides in shape, and so enable them to exert their full powers of resistance against the strains brought upon them. Against a direct cross strain tending to force the plates either inwards or outwards, they cannot be relied upon as possessing much value. Security against a direct lateral force similar to the action of the water upon the exterior of a caisson is best obtained by internal cross bracing and strutting, the use of which is attended with much difficulty in this instance, as we have already explained. A section through one of the sides is represented in fig. 3, showing the riveting of the tee irons to the plates. Unless tee irons of large scantlings are required, it is preferable to employ angle irons, as they do not occasion so great a loss of material by the insertion of rivets. Referring to fig. 3A, we observe that a tee iron, no matter how small its dimensions may be, requires a rivet upon each side of the central web, whereas an angle iron, having no central web, only requires one rivet in the same length of plate. The rivets attaching tee irons should always break joint, as shown in the figure, although it is a common plan to place them in the same line across the breadth of the iron, which weakens both the tee iron and the side plates as well. If we suppose the distance between the rivets situated upon each side of the central web of a tee iron when placed in a straight line to be two inches, and their longitudinal distance apart, or pitch as it is technically termed, to be four inches, then the line of fracture across the plate from rivet to rivet, when they are placed as in fig. 3A, is to that when they are

FIG. 3A. FIG. 5. FIG. 4.



placed in the same straight line across the tee iron as to 4 to 1. As the strength is directly proportional to the line of fracture, the advantage of making the rivets break joint is at once apparent.

The wedge-shaped form of the cut-water sections of a caisson, as represented in fig. 4, is evidently very favourable to its resisting powers. Its construction is similar to that of the central divisions, but owing to its curvature it is comparatively much stronger. In fact, it acts upon the principle of the arch, the two curved portions being regarded as the semi-arches, while the straight side acts the part of a tie and maintains the whole in equilibrium. A very usual form of curve for cut-waters is the one shown in the figure, where the chords of the arcs and the tie together constitute an equilateral triangle. Consequently, the horizontal thrust is not of any great amount, which lightens the strain upon the tie or straight side of the section. To save expense, the engineer of the new Blackfriars Bridge has employed the buckled plates to be used in the permanent roadway as a means of assisting in the construction of the temporary caissons, which purpose they answer exceedingly well. The strength of Mallett's buckled plates, and their advantages where lightness and a large area of surface are concerned, are too well known to need description. They have a small border or fillet round the edges, from which they gradually and uniformly rise, as shown in plan in fig. 5, to a point or crown. Upwards of 18 tons have been placed upon one of these plates without inducing any temporary, much less any permanent, deflection or set. They were extensively used in the superstructure of Westminster Bridge, and it is probably in consequence of the satisfactory results attending their employment there, that they have been selected to perform a similar duty upon another of our metropolitan bridges. There is a practical point to be mentioned with respect to sinking caissons in sections or divisions which has constantly puzzled the amateur and occasionally those who ought to know better, and that is how the joints between each division are made good. There has scarcely been a visitor to the works in progress at Blackfriars who has not asked this question, and the answer is very simple. A pile driven down tightly between the two sides makes all secure. Formerly it was the plan, regardless of the evil consequences likely to ensue, to draw timber piles after they had served the purpose of the dam for the sake of the wood. Such a course, it is needless to remark, would be not only equally culpable, but hardly possible, with a caisson. Those portions sunk in the bed of the river and up to the level of the water mark remain so and serve to enclose the solid contents in a perfect shell, as it were. The divisions above low water are disconnected as the work inside is carried up, and when once high water mark is passed, the whole of the caisson may be removed. Its duty is finished for that particular pier, and it may be transported to the site of another to similarly aid its erection. The methods adopted for sinking caissons are principally three in number, and the particular one to be chosen depends upon the nature of the substratum to be got through, and

other circumstances which affect various localities. No absolute rule can be given on the subject, except that where possible, sinking by dead weight, owing to its simplicity and cheapness, is the method to be preferred. We must reserve for our concluding article the descriptions and applications of the three methods ordinarily employed in sinking caissons.

THE EARTH SYSTEM.

To the Editor of the Building News.

Sir,—In reply to Mr. Girdlestone, I am acquainted with the whole process adopted by the Earth Closet Company; nay, more, some fifteen years ago I carried it out in every particular, with the exception of depositing a cartload of the earth, which had passed the closet, in a cellar. That idea, I confess, which is quite original, had never occurred to me. I submit, however, that on a matter of such grave moment we require more evidence, and evidence of another kind, than that supplied by a trading company, and which is merely the result of experiments conducted on their own premises and under their own supervision. We require evidence of the process having worked under the ordinary circumstances water-closets have to meet. The Wakefield prison is a case more in point. I know something of that too, but lest I should be accused of misstating the facts, I will ask Mr. Girdlestone to supply us with them—how long have they been in action? how many closets and how many inmates? what supervision is there? and, indeed, all the items of information which may assist us to a judgment. This is all material, but I will remind him that no one has disputed that the earth system is applicable to certain situations, and if it be so in any class of cases, prisons and workhouses are the most likely ones. The question is not, however, whether they can be made to act in certain circumstances, but whether they will act as well or better than the water-closets they are intended to supersede. Unless this is proved, nothing is proved; and I maintain that wherever a water supply exists the water system is, on the score of decency, economy, and health, decidedly the best. This is really the issue to be tried.

I scarcely know what to say to your correspondent "E." I apprehend that he occupies a high stool in an office over the cellar where that cartload of clay mixed with excreta is placed, that he imbibes the floating ammonia without knowing it, and that the fumes have made his perceptions rather giddy, and this must be his excuse. His letter is a perversion of my statements, and where such liberties are taken in quoting sentences and parts of sentences, and dovetailing them in positions to suit his purpose, it is, of course, easy to make a writer guilty of inconsistency, inaccuracy, ignorance, or of any folly or contradiction. This may be ingenious, but it is not honest. Surely we do not adopt a *laissez faire* policy in admitting that there is a great waste in passing the refuse of our habitations into the rivers because we do not immediately accept a crude system, which after all only proposes to deal with a small part, and that the least valuable, of the refuse. The statements made by me are the results of actual experiment made by scientific men in dry closets with my assistance, every one of whom had a desire to bring about a success, and had every motive to do so but that perhaps of direct pecuniary gain. I attach no value whatever to the testimonials extracted and given by your correspondent "E," for we all know how easily they may be obtained, and how lightly they are looked upon by men of discernment. Such as are quoted do not invalidate any statement I have made. I am not desirous to vindicate my skill in chemistry, for I am no chemist; but the experiments carried out in my presence show that the solid and fluid excreta, mixed with earth, are mere mechanical mixtures and not a chemical combination, and that the work of assimilation does not properly begin until the agencies of the sun and air are brought to bear upon them. The earth so used is a mere absorbent.

All this is little to the purpose, and I must apologise for being drawn away from the main argument. If we grant all that the advocates of earth-closets demand it brings us very little nearer to the desired end. There are two propositions before us; each is of vast importance—first, that of conveying away, without offence and without injury to health, the refuse of human habitations, and, second, to apply it as nutriment to the land. The first I hold is the one of paramount importance, to which all other considerations must yield, that upon which health, and consequently human happiness, so much depends. The saving of the soil, important as it is, is only a secondary matter. There is, I assert, no difficulty about the former; that problem is already solved by the introduction of the water-closet system, but the problem remains as to the second—how, in fact, to make the two work in harmony. We will look at the case of water-closets a little more minutely. In this contrivance everything committed to it is at once conveyed away from the house to the sewer, and the return of offensive gases is prevented by the trap. The drain pipe, which exists for the purpose of carrying away the liquid refuse of the house, and which cannot be dispensed with even were the earth system adopted, conveys away the deposits. There is nothing for the person using it to do but to pull a handle, and nothing for servants to do. The water is conveyed to a closet by a pipe from the main or from a cistern, and the refuse carried away without any menial labour being required, without the carriage of offensive matter along corridors and stairs. It is simple, inoffensive, economical, and decent. I am now speaking of arrangements on a correct principle, and not of the wretched contrivances of which I have already, in my former letter, spoken, and which do not deserve the name of water-closets. We are told, however, that water-closets are liable to all sorts of accidents and disasters, that they smell offensively, that they are sometimes frozen and often out of order, and that a certain class of diseases has assumed a more malignant form since their introduction. In fact, some very bad closets are taken, and these are given as examples of the water-closet system. This is not the way to serve any cause, and the course pursued is flagrantly unjust. The worst class of closets is taken and presented as a sample of the whole. A man diligently seeks for a bad orange in a basket and cries out, look! what bad fruit! This is exactly what the advocates of earth-closets are doing. They find instances where closets have no water, where the overflow pipe of the water cistern empties into the soil pipe, where the traps are defective, where a supply pipe has been frozen, and where rats have entered, and they cry, lo! here is your water-closet system! This is the vendor of an inferior kind of orange producing a rotten orange as a sample of his neighbour's fruit. None of these things belong to a water-closet system, they are the results of ignorance, neglect, and dishonesty. I have a house with a water-closet on every floor above the basement, one above the other, four in number; I rebuilt the house seven years ago and so constructed it. I have never had one frozen, I have made it impossible that a rat could get in or find shelter, I have never had any of them in a condition that a person going into them blindfold could tell whether he was in the closet or in a bed-room, and the whole repairs have not for that term cost me forty shillings. Of course I took care at the outset to have everything carefully considered and properly carried out, to select closets of the simplest construction and of the best workmanship, and to have them well fixed. My closets are all ventilated, the traps all communicate with the outer air by an air pipe, and thus I have neither trouble, inconvenience, nor expense, and have had no disease that could be traced to malaria. The overflow pipe of the water cistern communicates with the rain water pipe, so that both shall aid in flushing the soil pipe, but so arranged and trapped that no effluvia can be brought back into the water cistern. It must be remembered that the water cistern is itself an evil incidental to an intermittent supply, but the water-closet is in no way responsible for this. I can point to hundreds of instances where the water-closets are equally efficient and inexpensive, and what has been done in these cases can be done in all, if the same precautions are taken.

I expect that water-closets, like any other mechanical contrivances, are liable to wear and tear and to accident. We are not seeking an arrangement that will be entirely free from defect, but one that is less so than others, and in water-closets especially we desire to find that system which will require the least attention on the part of those who use them and least liable to derangement. This is attained by our present system; it is the best known to us, and the earth system cannot equal it in simplicity, nor in any other way. What have we to do in cities if we adopt the earth system? We have to dispense with our present appliances in the shape of water-closets, which will be an expensive matter, and then what do we get? Simply a piece of mechanism [I grant that may be made exceedingly simple, but not more simple than a water-closet, and of those I have seen that patented by Mr. Carrick, of Glasgow, is the most complete], but one that, equally with the water-closet, is liable to derangement from use and accident. The manipulation is greatly increased, for the hopper must be filled; it does not matter at what intervals it requires to be filled. The receiver must be emptied, and it is very easy to calculate how often that operation will be necessary in a family of five persons. Some place must be found to store it until it can be carted away, and really we must not be told that it is quite a safe and convenient method to make a store room for an indefinite period in a cellar of the house for the mixed earth and human excreta. It is simply disgusting and absurd.

After all this, what has the earth system done towards meeting the great evil of polluting our rivers and streams with that which ought to be food for the land? They take away the solid portion and some portion of the fluid parts of the human excreta, and they leave nine-tenths of the refuse of the house, with a large portion of urine (that from the bed-rooms), to find its way into the sewers, and from thence into the rivers. They exclaim against irrigation, but they do not tell us what we are to do with this large bulk of refuse that does not go into their earth-closets. They are silent on another matter. They do not tell us how it happens that the earth, which acts, as they say, chemically and rapidly upon refuse matter, so as to make it as inoffensive as sea sand, should not have the same effect when the refuse is thrown upon it in a fluid state, when in addition to the earth there are the roots of plants hungry for aliment, and the agencies of light and air to assist the assimilation. I admonish them in no unfriendly spirit to deal with this matter fairly. There are purposes to which the earth system may be adapted, and there are plans of carrying it out to which they have evidently paid no attention. It is a practical question of no great difficulty, and will not be solved by putting the supposed advantages of their own system against the acknowledged errors in carrying out another. This Cheap Jack method of securing public attention will only bring discredit upon themselves.—I am, &c., B.

P.S.—I have a little more to say in another letter, if you can afford me space, as to irrigation.

A NEW VENTILATING STOVE IN USE FOR BARRACKS AND MILITARY BUILDINGS.*

THE fireplace about to be described dates from 1859—60, and was designed to meet the conditions laid down by the Barrack and Hospital Improvement Committee at that period, and which aimed at supplying at all seasons every room in a building, by itself, and independent of the other rooms, with a sufficiency of air, and at the same time to prevent the temperature from falling below a desirable point. The committee, not being satisfied with the form of grate already in use, adopted the fireplace which this paper is intended to describe. The stove, which is not patented, is made of the best cast iron and consists of three pieces, connected by screws. The first piece forms the moulded projecting frame, the second the body of the grate, and the third the nozzle or connection with the smoke-flue, the bottom flange of which is bolted to the back of the grate. The stoves are made in three sizes. The fireplace has a lining of clumps in five pieces—two sides, one back piece, and two bottom pieces. A clear space half an inch deep is formed between the back lump and the iron back to receive a supply of air through the ash-pit, which passes through a slit in the fire lump immediately above the fire. By this means a more perfect combustion of the smoke is effected. The flame, heated gases from combustion, and small amount of smoke as exists are compelled to impinge upon a large heating surface, so as to subtract as much heat as possible out of them before they pass into the chimney, and the heat thus extracted is employed to warm air taken directly from the outer air. The fresh air when warmed is passed into the room by a flue near the ceiling. The flue, which has been adopted for barracks, is carried up by the side of the smoke flue in the chimney breast. The grate (No. 1 size) will contain about 18lb. or 20lb. of coals; 40lb. will maintain a good fire for 16 hours, that is, at the rate of about 2·5lb. per hour.

In new buildings it would be very desirable to carry up the smoke flue inside the warm air flue, and so extend the heating surface. This plan was adopted in the wards of the Herbert Military Hospital, where the fireplace is in the centre of the ward, and the chimney consequently passes under the floor, and by this means an additional heating surface of 36 square feet has been obtained. The limit to which the heat from the fire can be so utilised is the point at which it cools down the chimney so as to check the draught and combustion of the fuel. With respect to the application of the grate to existing buildings, the recess in which an ordinary fire grate would be fixed forms the chamber in which the air is warmed. The front of the stove can be easily removed, thus rendering the air-chamber accessible for cleansing purposes.

In applying the stove to existing fireplaces the air-chamber must be left as large as possible, cleansed from soot, and lime whited. Should the fireplace be deeper than 1ft. 6in., the depth required for the curved iron smoke flue, a lining of brickwork is built up at the back to reduce it to that dimension. The chimney bars, if too high, must be lowered to suit the height of the stove, or to a height of 3ft 3in. above the hearth. They must also be straightened to receive the covering of the air chambers These coverings should be of 3-inch York or other flagging, cut out to receive the iron smoke flue, and also to form the bottom of the warm air flue in the chimney breast. In new buildings the air chambers may be rectangular. They must be 4in. narrower than the extreme dimensions of the moulded frame of the stove, so as to give a margin of 2in. in width all round for a bedding of hair mortar.

General results of numerous experiments show that the air is admitted to the rooms at a temperature of from 20 deg. to 30 deg. Fah. above that of the outer air. The design of the grate was intended to preclude the possibility of such a temperature as would in any way injure the air introduced. The principle of these arrangements has been adopted for barracks in the case of grates for married soldiers: these would be useful as cottage grates. These grates have a small oven, and an open fire; warmed air is introduced into the room by means of an iron flue, carried up from the fire-brick lining of the stove inside the chimney, and introduced into the room near the ceiling through a louvred opening; by this means the heat of the smoke is utilised. This description of grate was devised for the purpose of combining a power of cooking for a cottage with great compulsory economy of fuel. It must, however, always be observed that in proportion as the heat is removed from the chimney, so is the draught, *i.e.*, the effect of the chimney as a pumping engine to remove the air, diminished, and the combustion of the fuel to some extent checked.

There is one point connected with the flue which must be carefully attended to, viz., the fresh air should be taken from places where impurities cannot affect it, and the flue must be so arranged and constructed as to afford easy means of being periodically thoroughly examined and cleaned. In barracks the rule is that such cleansing should take place at least once a year.

Now that the question of economy of fuel is becoming daily of more importance, it is desirable that we should adopt every means of utilising, to the fullest practical extent, the fuel which we burn. If this was done in all households the saving of fuel to the country and of money to individuals would be considerable.

In conclusion, the merits which are claimed for this fireplace are:—

1. That it ventilates the room.
2. That it maintains an equable temperature in all parts of the room, and prevents all draughts.
3. That the heat from radiation is thrown into the room better than from other grates.
4. That the fire-brick lining prevents the fire from going out, even when left untouched for a long time, and prevents the rapid changes of temperature which occur in rooms in cold weather from that cause.
5. That it economises fuel partly by making use of the spare heat, which otherwise would all pass up the chimney, and partly by ensuring by its construction a more complete combustion, and thereby diminishing smoke.
6. That it prevents smoky chimneys by the ample supply of warmed air to the room, and by the draught created in the neck of the chimney.

I believe that the principles adopted in these fireplaces are sound; they have been largely applied to military buildings, such as barracks and hospitals, and they have been recommended for introduction into workhouse wards. I recommend them to the attention of architects and builders, and I have the less hesitation in doing so, as there is no patent in question, and there is no one can claim any pecuniary interest in the manufacture of the grate.

* Abstract of a paper read before the Society of Arts on Wednesday evening by DOUGLAS GALTON, Esq., C.B., F.R.S.

THE WHITWORTH SCHOLARSHIPS.

We have been requested to give insertion to the following:—

THE INSTITUTION OF CIVIL ENGINEERS,
25, Great George-street, Westminster, S.W.,
2nd May, 1868.

SIR,

At the moment when it is considered by many that more systematized methods of instruction are necessary for those intended to follow industrial and scientific pursuits, you, Sir, come forward with the best practical help that could possibly be devised. In the learned professions numerous forms of endowment already exist; but for all those occupations which are intimately associated with the applications of pure science to the affairs of every-day life, hitherto there has been no such encouragement.

I have the greatest pleasure in being the medium of conveying to you the accompanying extract from the minutes of the Institution of Civil Engineers; and I am sure that the general feeling of your brother members is, that any words very inadequately express the sense of their indebtedness for your princely liberality.

I am, Sir,
Your obedient humble servant,
JAMES FORREST,
Secretary.

To
JOSEPH WHITWORTH, ESQ., F.R.S., M. Inst. C.E.,
&c.

At the ordinary general meeting of the Institution of Civil Engineers, held on Tuesday, the 28th of April, 1868, Mr. Charles Hutton Gregory, the President, being in the chair, the following communication from the Council was brought forward, was adopted by acclamation, and a copy ordered to be sent to Mr. Whitworth:—

"Attention having been called to the foundation, in perpetuity, by Mr. Joseph Whitworth, M. Inst. C.E., of thirty scholarships, of the annual value of £100 each, for the instruction of young men, natives of United Kingdom, to be selected by open competition for their intelligence and proficiency in the theory and practice of mechanics and the cognate sciences, with a view to the promotion of engineering and mechanical industry in this country, it was

"'*Resolved unanimously*,—That this meeting desires to record, on its own behalf, and on that of the members of all classes of the Institution of Civil Engineers, its grateful recognition of this act of munificence, and its high appreciation of the services which have thereby been rendered to the cause of technical education and national advancement, and of the advantages that may be expected to accrue, alike to the profession and to the community generally.'"

Signed on behalf of the Institution of Civil Engineers.
JAMES FORREST, Secretary.

ARCHÆOLOGY.

QUITE a puzzle for the archæologists has been found by the Rev. James Robertson, of Swinton, North Riding, who for some time past has been engaged in the examination of a mound of 70ft. diameter, situate close by the village, and within a few yards of the old Roman road from Eboracum to Praetorium. The mound is popularly known as "St. Peter's Liberty" and "The Intake," and was formerly enclosed, but is now part of the estate of Mr. Thomas Preston, of Norton, East Riding. The mound was opened in expectation of its proving a tumulus. This, however, has proved otherwise. After some weeks of digging, a cruciform excavation of 8ft. 9in. in depth, cut into the solid rock, has been exposed. The arms of this cross were to the cardinal points, were exactly of a length, measuring from N. to S. and from E. to W. 19ft., being 6ft. wide at the point of junction and 5ft. at the ends. The sides were perpendicular, and the bottom was a perfectly flat surface of coraline oolite. Upon this level bottom of the excavation was raised a platform, also in the form of a cross, the arms of which extended the whole length (nearly) of the cutting and were 2ft. in height and 2ft. wide. At the point of intersection was a large square block of calcareous freestone, and the whole of the platform was made of the same rock, in large blocks at the bottom and smaller stones upwards, all carefully placed. This rock crops out about a mile distant, and there is no other bed of it in the locality. The space between the sides of the excavations and the platform was filled with soil. Over all was a thick bed of beaten clay. Above this in ascending order the excavation was filled up with soil, containing Roman pottery, a Roman horseshoe (so thought), beds of clay and charcoal, quantities of mediæval pottery, burnt stones, slates (squared) of flagstone, with a hole bored in one corner, a worked bone pin, &c., and over all this a mound of about 3ft. altitude of soil, clay, and burnt stones. The use of this place, or the reason of its formation, is enigmatical. If formed in early times it must have remained open to the mediæval period, as evidenced by the pottery found. At present archæologists are at fault in arriving at a conclusion as to the nature of this relic. A very similar structure, but formed on the natural ground, with a mound over it, was found at Helperthorpe, on the Wolds, about 18 months ago, by Mr. William Lovel, of Scarborough. In that case the cross (platform) was formed of clay, supported by rough chalk walling, and that mound also produced Roman and middle-age pottery, glass, a horseshoe, bits of iron, &c. Doubtless, both are of a similar nature, whatever that may be.

A large legionary tablet, belonging to the wall of Antoninus Pius, has been found within the last few days on the property of Mr. Henry Cadell, of Grange, parish of Carriden, Linlithgowshire. This stone, which is of a large size, 9ft. in length by 2ft. 1lin. in breadth, is in a very perfect state of preservation. It is divided into three panels. The centre one contains the following inscription, carved in large clear letters:—"Imp. Caes. Tito. Aelio. Hadri. Antonino Aug. Pio. P. P. Leg. II. Aug. Per M. P. III DCLII Fec." The translation of this inscription was the subject of discussion for several days in the neighbourhood, until it was finally settled as under by the visit of some of the members of the Antiquarian Society:—"To the Emperor Cæsar Titus Aurelius Hadrianus Antoninus Augustus Pius—the father of his country."

On Tuesday evening last the opening *conversazione* of the Architectural Exhibition was held at Conduit-street. There was a numerous gathering. Mr. Beresford Hope gave an address, in which he spoke favourably of competitions limited and unlimited. He spoke of the exhibition as an improvement on preceding years, and called attention to Sir Charles Barry's drawings and sketches for the Houses of Parliament, the marvellous drawings by a French artist, to whom was awarded a gold medal in the late Paris Exhibition, and the other French drawings, and the competition designs of the Manchester New Townhall.

NEW PAVING FOR THE CITY.

A NEW method of laying granite pavement, which appears to have been attended with considerable success in Manchester, has been tried this week in Duke-street, Smithfield. The plan consists in laying the granite blocks in the ordinary manner, but instead of using a lime grouting to cement the stones, the interstices are filled in with a very coarse gravel, and a hot liquid cement of gas-asphalte is then poured on. The liquid asphalte so flown between the blocks to the bottom and firmly cements the pavement into one solid mass, rendering it impervious to water either from above or below. By the adoption of this system a greater degree of cleanliness will be attained, as the rain at once runs off and no mud is accumulated. Whether it will stand the heavy London traffic remains to be seen. This the roads as at present laid down do not do, but we do not think the fault rests with the grouting. A road requires at least a week's rest—in wet weather more—after being laid down before traffic should be admitted upon it. This, in London, it seldom has, and, consequently, the stones soon get loose again. When New Southwark street was paved plenty of time was given for the stones to set, and no better road, except where it may have been disturbed and botched up again by gas and water companies, can be found in all London. It is as hard as a rock and capable of standing any reasonable amount of fair wear and tear. Gas and water companies again are names full of terror to London paviors. Their pipes appear to be afflicted with chronic leakage, and the roadway is for ever being disturbed to put things right for a little while. Some relief may be looked for in the future from this evil in the subway system, which is now generally adopted in the construction of new streets, bridges, and other works. Another great hindrance to good paving is the want of a good sound bottom for the stones to rest on. The City is pretty well off in this respect, but round about it the only foundation in many places for the granite blocks to rest upon is mud alloyed with an infinitesimal amount of sand. Of course, when paving is laid down like this it will never be firm while exposed to a heavy traffic, but in this case it is not the lime grouting that should be blamed but stingy vestries and dishonest contractors.

THE SOUTH THAMES EMBANKMENT.

ON Saturday last Sir John Thwaites, attended by Mr. Bazalgette, and other chief members of the Metropolitan Board of Works, inaugurated the opening of that portion of the South Thames Embankment extending from Westminster Bridge nearly to the Lambeth Gasworks. The embankment in its form and construction differs slightly from its northern neighbour. It is built on concrete faced with granite, while that on the Middlesex side is built of brick faced with granite. There are also no recesses for the steamboat piers in connection with the South Embankment, in consequence of the shallow foreshore on that side. In both cases, however, the walls are of equal strength, and have a similar curve inward. At intervals of about 60ft are plain pedestals, to which are to be fastened massive bronze lions' heads and mooring rings, similar to those which already ornament the northern shore. The foundations of the walls are carried down to a depth of 3 ft. below Trinity high-water mark, and the foreshore is to be excavated to a depth of 18ft. At the pottery works of Messrs. Doulton, and others, entrances are to be formed to docks situate on the land side of the Embankment road. These entrances will pass under the roadway without interfering with its level, and will be as sightly as circumstances will permit. Similar openings are to be formed to give access to the river to carts and waggons now using the White Hart draw dock. The Southern Thames Embankment was not a part of the original plan, but a concession granted by Lord Palmerston to a deputation, which pointed out that the south side needed embanking more than the other, as lying much lower. The whole of the portion just opened has been completed by the Board of Works within two years.

The long-delayed opening of the railway over Mont Cenis is expected to take place shortly. An engine with a load of 25 tons made the journey to Susa on the 29th of April, and returned on the following day.

THE WORKING MEN'S COLLEGE BUILDING FUND.

AFTER a successful and self-supported existence of fourteen years, the Working Men's College in Great Ormond street is making its first appeal to the public for assistance. In the year 1857 the council purchased for £1,500 the freehold house and ground at present occupied. For some time past, however, both students and teachers have been sorely pressed for space, and a site, 1,200 square feet in area, being already provided at the back of the present house, the Council have determined on the erection of a substantial but plain building at a cost of about £3,000, comprising rooms for the art department, meeting room, adult school, museum, and class rooms. Towards the amount required the Council have in hand about £1,000, and plans, prepared by Mr. Webbe, have been accepted, and the building will be commenced at once. For the amount required to complete the work they appeal to the public, and we feel sure their appeal will not be made in vain. In fact, there is not an institution in England more deserving of public encouragement than this—the first working men's college. It was regarded in the first place purely as an experiment, and many supposed it was too good to last. It has, however, prospered better than its originator, F. D. Maurice, anticipated. The number of students at the end of the first term was 145; it is now 509. The £1,500 first expended was raised by means of a loan of £1,000 and £500 subscribed by Mr. Maurice. In all other respects the college has been self-supporting. Had Professor Maurice done no other work in the world than this, he would deserve to be everlastingly remembered by Englishmen.

INDUSTRIAL PARTNERSHIPS.

ON Wednesday evening, at a meeting of the Department of Economy and Trade (a branch of the National Association for the Promotion of Social Science), at the office of the association, in Adam-street, Adelphi, Mr. Currer Briggs read a paper "On Industrial Partnerships." Mr. Thomas Hughes, M.P., had intended to preside, but Mr. Fawcett, M.P., who in his absence was voted to the chair, explained that sudden illness prevented Mr. Hughes from attending the meeting.

Mr. Briggs commenced by observing that industrial partnership was the last and most important phase of that co-operative movement, the idea of which, twenty-four years ago, was first conceived in the shrewd brains of a few Rochdale flannel-weavers. The special object of such an association was to establish a direct intercourse between the producer and the consumer, whereby the intervention of middlemen or dealers was dispensed with. Co-operative workshops went beyond that, and were attempts on the part of labourers to dispense not only with the middleman or dealer, but also with the capitalist or employer. Such attempts, however, could prove successful only in small, and, as it were, retail businesses. The employment of capital was essential to production on a large scale. Industrial partnerships between capitalists and their workmen possessed combined elements of success which did not belong to the ordinary relations between employer and employed or to any association of mere labourers unsupported by capital from without. Those elements of success which were essential to the prosperity of any combined enterprise—viz, first, unity of authority in management, and, secondly the stimulus given to the productive energies of the labourer by granting to him a direct personal interest in the prosperity of the undertaking wherein he was engaged—were practically illustrated in the report which he was about to lay before the meeting of an undertaking with which he was connected—the Whitwood and Methley Junction Collieries. He had carried into actual practice the system of industrial partnerships in that undertaking, which dispensed nearly £1,200 weekly in wages to 1,200 men and boys. A few years ago there were constant struggles between the employers and the employed; Whitwood was a hotbed of strife and ill-feeling between them. During the ten years that he had actively participated in the management of the collieries previous to the adoption of the industrial partnership principle, there were four strikes, which lasted 78 weeks, besides innumerable miners' disputes and consequent interruption of work. Since August, 1865, when the industrial partnership principle was introduced, there had been no strike, and it had not been necessary to bring a single case of neglect before the magistrates. Peace and prosperity had succeeded perpetual strife and suffering. In November, 1864, the employers announced to their workmen that they were willing to register their company under the Act of 1862, with the primary view of securing the co-operation of all connected with the collieries, whether as managers, workpeople, or customers; that they would retain at least two-thirds of the share capital, which would be taken at the sum then standing on the books of the company as capital, that they would retain in their own hands the control and management of the collieries, and that in the distribution of the remaining third of the share capital a decided preference would be given to applications for shares, first from the officials and the operatives, and secondly from purchasers of the produce of the collieries. They also announced that whenever the profits of the collieries exceeded 10 per cent. on the capital employed, the officials, agents, and workpeople should receive one-half of the excess profit as a bonus in addition to their respective earnings. Eighty per cent. of the workpeople had taken shares in the company. Recently the company afforded a dividend of 12 per cent., and the results were so gratifying that he hoped the industrial partnership principle would be established throughout the country. He was convinced that it was the only means of putting an end to quarrels between masters and men.

In answer to a question, Mr. Briggs said the company allowed their workpeople to contribute to a union. The majority of the men, however, said there was now no necessity for making such contributions. Some years ago 600 or 700 of the workmen contributed 1s. weekly to a union, but now only twenty did so.

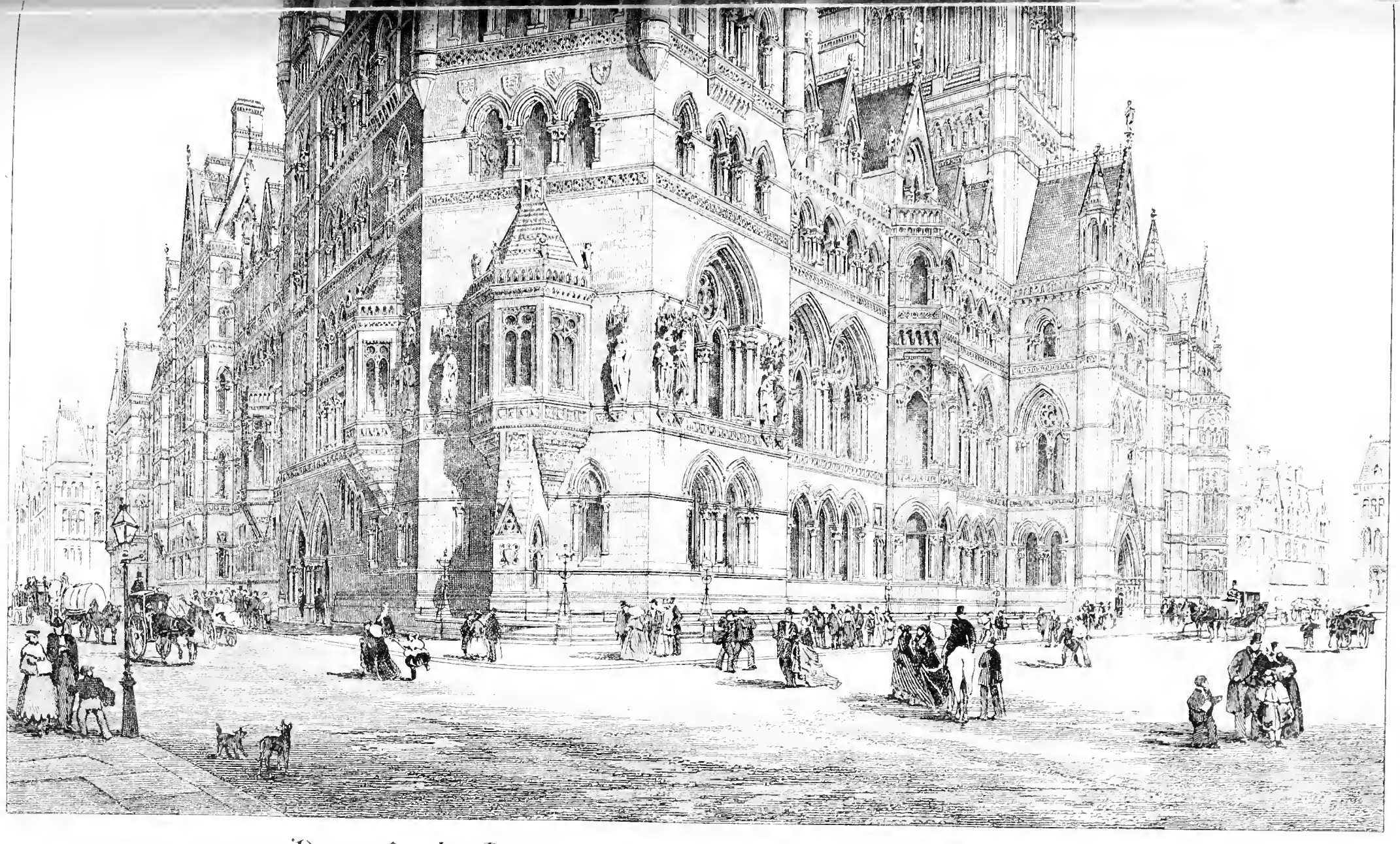
After some conversation on the subject of the paper, and a vote of thanks to Mr. Briggs, the meeting separated.

BUILDING AND LAND SOCIETIES.

THE annual meeting of the Stafford Permanent Building Society was held in the Guildhall, last week. The Mayor, W. Silvester, Esq., who is one of the trustees, presided, and expressed great satisfaction at the fact that the society during the first year of its existence had done a very large business. The balance sheet showed that the subscriptions received during the year amounted to £7,187 6s. 7d., and that advances had been made to the amount of £12,990. The report as read was adopted, the retiring directors unanimously re-elected, and a vote of thanks carried to the mayor for presiding.

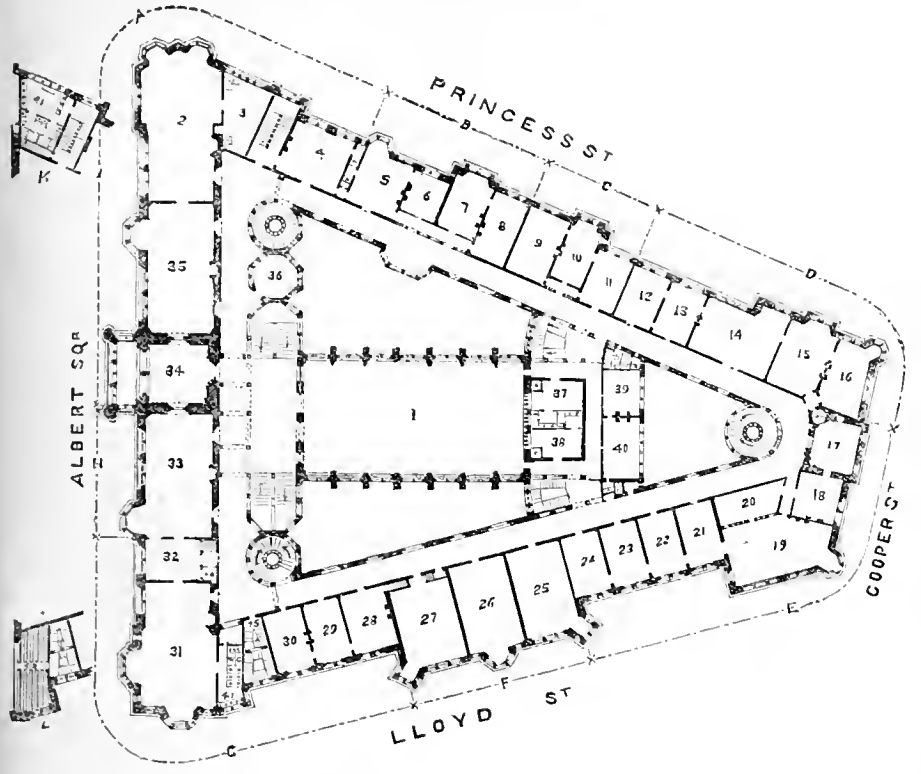
The ordinary general meeting of the City of London Permanent Building Society was held on Monday evening at Radley's Hotel, New Bridge-street, at which the twenty-first annual report was presented. It showed an increase during the year of 82 members and 1,223 shares. The total receipts of the year, including a balance of £1,308 brought forward, were £68,500; the advances made to members on mortgage, £27,025; payments to depositing members in dividends and subscriptions withdrawn, £6,044; and £22,378 loans repaid. The number of members at the close of the year was 382; the number of deposit shares 2,496; and of advanced shares, 3,230, the society being debtor on the former £61,792 9s. 5d., and creditor on the latter as mortgagees £97,064 1s. 6d., of which £68,036 19s. 3d. represents cash advanced, and £29,028 2s. 5d. interest in suspense, or profit secured for division in future years. The profit for the year is reported at £4,418 7s. 10d., of which £3,193 7s. 11d. has been credited to the deposit shares, being interest at the rate of 6 per cent. per annum; £408 6s. 7d. to the reserve (which now amounts to £1,640), and the balance carried to the bonus account, and will allow a bonus of 10s. a share on the deposit shares, making the profits on such shares equal to 8 per cent. The total losses of the society during the twenty-one years have been under 3s. 6d. per cent. on the total advances of £135,631.

THE annual meeting of the Stirling School of Art took place in the Union Hall on Wednesday week. The report, which was read by the secretary, showed that the average attendance on the seventeen lectures which had been delivered during the session was 420, and the total number of members 760.



Design for the Manchester New Town Hall. Mr WATERHOUSE, ARCHT

PLAN OF NEW TOWNHALL, MANCHESTER.—ARCHITECT, MR. WATERHOUSE.



REFERENCES TO PLAN.

	Dimensions. ft. in.		ft. in.	Area in sq. yds.
1 Public Hall	100 0	by	50 0	555
2 Dining Room	60 0	,,	34 0	227
3 Butler's Pantry	26 0	,,	19 0	55
4 Mayor's Private Room	28 0	,,	25 0	78
5 Town Clerk's Office	26 0	,,	23 6	67
6 Spare Room	18 6	,,	17 6	36
7 Waiting Room	26 6	,,	17 0	50
8 Clerks' Office	31 0	,,	17 0	58
9 Clerks' Office	31 0	,,	20 0	70
10 Waiting Room	25 0	,,	15 0	42
11 Private Office	27 0	,,	16 6	45
12 Private Office	27 0	,,	16 6	45
13 Waiting Room	25 0	,,	16 6	45
14 Drawing Office	80 0	,,	26 6	180
15 Plan Room	51 6	,,	23 0	80
16 Contractor's Room	30 6	,,	19 0	64
17 Out door Superintendent	20 0	,,	19 0	42
18 Water, No. 1	21 0	,,	21 0	49
19 Drawing Office	39 0	,,	22 0	95
20 Plan Room	20 0	,,	18 0	42
21, 22, 23, and 24 Water Rooms, each	24 0	,,	17 0	45
25 Committee Room	36 0	,,	24 6	98
26 Ditto	37 0	,,	25 0	103
27 Ditto	32 6	,,	26 6	95
28 Gas, No. 1	16 6	,,	24 0	55
29, 30 Gas, No. 2 and 3, each	24 0	,,	17 6	46
31 Council Chamber	56 0	,,	35 0	218
32 Ante Room	26 0	,,	18 0	52
33 Committee Room	54 0	,,	31 6	189
34 Ante Room	42 0	,,	26 0	121
35 Reception Room	59 0	,,	31 6	206
36 Hat and Cloak Room	13 0	,,	13 0	35
37, 38 Retiring Rooms, each	20 0	,,	12 0	53
39 Private Office	21 0	,,	16 6	38
40 Clerk's Office	27 6	,,	16 6	50
41 Lavatory over Butler's Pantry.				
42 Gallery over Council Chamber's Retiring Room.				

A. The Mayor. B. Town Clerk. C. Assistant Town Clerk. D. City Surveyor. E. Water. F. Committees. G. Gas.

MR. WATERHOUSE'S SELECTED DESIGN FOR THE MANCHESTER NEW TOWN-HALL.

WE give this week a double-page illustration of Mr. Waterhouse's selected design for the Manchester new Townhall. Having in former articles offered observations on this and the other competitive designs, we will only now give a description of the accompanying plan, as submitted by Mr. Waterhouse:—

In addition to the accommodation specified in the instructions, there are on the second floor 17 spare rooms having an area of 1,278 yards, on third floor 36 spare rooms with an area of 2,121 yards, and on the fourth floor 12 rooms having an area of 712 yards. There are also in the roofs a number of available rooms. The schedule at the end of these remarks gives the dimensions of every room, and shows how the specified areas have been complied with or exceeded.

It has been my endeavour to make everything subordinate to a general simplicity of plan, so as to enable those frequenting the building to find the particular office desired as quickly and easily as possible.

Most of the business rooms look towards the street; the corridors and staircases, on the other hand, are lighted from the internal courts. This arrangement secures the maximum of light and air to the rooms, and admits of the corridors and staircases being everywhere well lighted and ventilated by windows, instead of their having to rely upon wells or borrowed lights.

The corridors have been placed so as to take up the least valuable space and to be as short as possible. They have a minimum width of 10ft. along the Cooper-street and Lloyd-street sides, and of 12ft. 6in. along the Albert-square front. They open out at intervals into wider spaces, convenient for consultations, and which break the monotonous effect of long corridors of uniform width. On the ground and main floors they are entirely without any change of level, and above this only occurs at the extremities of the Albert-square corridor.

A spacious porch and groined entrance hall (in the centre of Albert-square front) with porter's offices on either hand, lead into the grand staircase hall, 52ft. by 35ft. Out of this the main staircases are carried up, by double flights, one on either side, each of them 10ft. wide, to a similar hall on the main floor which gives access, on the one hand, to the public hall in the centre of the building, and on the other, to the suite of reception rooms. On the ground floor the principal hall is lighted by the staircase windows on either side.

In addition to the main entrance in Albert-square there are three other principal entrances to the building; one in the centre of the Cooper-street front, another near the corner of Albert square and Princess-street, and the third near the corner of Albert-square and Lloyd-street.

The positions of the latter two have been selected with reference to the principal streams of traffic approaching the building, to avoid the necessity, in many instances, of walking some hundreds of feet outside the building to a central entrance, only to retrace the same distance within.

Each entrance has its porter's office, double-swing doors, one within the other, and close to it one of the three principal staircases placed in the angles of the corridors, which staircases ascend to the uppermost storey in the building, and descend to the basement, thus giving direct access to the various storeys from the street.

These three principal staircases are circular on plan and average 21ft. internal diameter. In order to obviate the usual and serious objections to spiral staircases, an open well has been placed in the centre, thus making the steps at their narrow end not less than 11in. or 12in. on the tread, with a rise of 5½in. They therefore present the advantage of a rapid ascent for those to whom this is an object; while, at the same time, the offer on the outer edge an easier gradient for those for whom that is desirable.

There are, in addition to the grand staircase and the three principal business staircases, two secondary flights in the middle of the Princess-street and Lloyd-street corridors, rising up to the third floor. They are united together by a hall or corridor on each floor, thus giving easy intercommunication between the centres of the Princess-street and Lloyd-street fronts.

The private entrance for the mayor adjoins the public entrance in Princess-street, and is placed there in order that the same porter may command the two. It gives separate access not only to the mayor's private rooms, but to that portion of the Albert square corridor which runs behind and communicates with the reception rooms.

The public hall is placed in the centre of the building in order to be equally accessible from every point, and be free from street noises. It would be approached by the public from Albert square by the grand staircases through a large hall on the main floor, forming a sort of ante-room to it, and adding about one-third more available standing space on the occasion of a crowded town's meeting. This ante-room would, in the event of a rush from the hall, do very much to prevent accident, as it leads to other staircases besides that immediately adjoining. The hall is lit on either side by lofty two-light windows. The roof, though of hammer-beam construction, has a ceiling of an average height of only 42ft. (to render successful the acoustic properties of the room), while, at the same time, enough of the structural portion of the roof is left below it to destroy echo and give a varied and picturesque appearance.

In order to prevent outward thrust at so great a height from the ground, the roof is tied across as shown in the perspective view. The walls of the central hall would be of stone, the lower part panelled in oak with seats in the window recesses.

At the farther extremity of the hall are two entrances with retiring rooms attached, which communicate with the two secondary central staircases, and the Lloyd-street and Princess street corridors. Above these retiring rooms is a gallery for an organ and orchestra, or capable of seating 60 people.

It will be observed that the hall is on the same level as the reception rooms, and is so placed as to be capable of convenient use in connection with them.

The mayor's reception rooms front Albert square; the large committee room and the council chamber being placed in a line with them, so as to make one magnificent suite of entertaining rooms 300ft. in length, and occupying the whole of the principal front of the building on the main floor. These rooms are 23ft. in height.

The space over the main entrance is occupied by the ante-room, which can be approached either by the grand staircases or by the mayor's private staircase.

As it would doubtless often be desirable to use these rooms in various combinations with each other, and with the public hall, I have shown how this could be done by temporary barriers being placed across the corridors.

On one side of the dining room is a serving room and butler's pantry, with a staircase and hoist from the kitchen. From this staircase another flight, for servants, leads to the higher portion of the mayor's staircase, and so to his private rooms. A portion of this serving room might, if desired, be cut off for a waiting room in connection with the mayor's private room; but this I have not shown, as it is not specified in the instructions.

The mayor's private room is in easy communication with the town clerk's.

The cloak room is placed so as to be easily accessible either from the grand staircase or from the mayor's private staircase.

Above the serving room, in a mezzanine, are placed lavatories and other conveniences, and below it, if thought desirable, a retiring room for ladies might be introduced, as a mezzanine, approached from the mayor's private staircase.

I have found it most convenient to place the mayor's suite of apartments wholly on the second floor, looking for the most part towards Albert-square. In addition to this suite there is an extra sitting room over the mayor's business room on a rather lower level approached like the rest of these rooms by the mayor's private staircase. At the same time there would be no difficulty in approaching any of these rooms from the public corridors if required.

Below the reception rooms are placed the kitchens and servants' apartments, which it is believed are on a scale commensurate with the requirements of the rooms above. Tradespeople would approach the kitchens by the cart entrance from Lloyd street.

Adjoining the ante room on the main floor is placed the principal committee room, so as to be in immediate connection with the reception rooms, and only separated from the public hall by the Albert-square corridor. Annexed is a small serving room, with staircase and lift down to basement, so that this principal committee room might be made use of as a supper room, if required.

Beyond the committee room comes the ante room of the council chamber. The council chamber itself would be a well-lighted and noble apartment, with a retiring room on one side. It is planned so as to be approached by members either from the ante room or the retiring room, or, if needful, direct from the corridor. Above the retiring room is a gallery capable of seating 113 people, with a separate staircase from the principal Lloyd-street entrance. The other three general committee rooms are in the centre of the Lloyd-street front, with the committee clerk midway between them and the town clerk and assistant town clerk's rooms.

The town clerk's rooms, connected together by a private corridor, face Princess-street.

The assistant town clerk's rooms adjoin and are brought into close contiguity with the committee rooms by a corridor running across the centre of the building.

The clerk of prosecutions is placed immediately over the assistant town clerk, with the Princess-street staircase connecting the rooms.

The treasurer's offices look into Albert-square, and are so placed as to be contiguous to the two entrances nearest the centre of the town, so that persons receiving cheques from other departments could pass the treasurer's office on their way out of the building.

The surveyor occupies a portion of the main floor looking towards Princess-street, adjacent to the assistant town clerk. His offices have a north light and a private staircase to the room on the second floor.

The chief constable I have placed in the centre of the building under the public hall, so as to be reached with facility from all the public entrances. There is in addition a private entrance from Lloyd-street, with a bridge over the area. Another private approach to this department would be through the cartway leading into the basement, and this would give the most direct access to the cells. A private staircase connects the two floors together. In placing the chief constable's department in this as it appeared to me the most convenient position, it was necessary to separate the office for keys and to put it at some little distance from the other rooms, giving it a separate entrance from Lloyd-street.

The Lloyd-street staircase leads direct from this depart-

ment to the committee rooms on the main floor in the centre of the building. The department is still more contiguous to the committee-rooms on either side of the main entrance.

The water department is placed at the Cooper street end of the building. On the ground floor the rooms look into Princess street, and on the main floor into Lloyd street. The two floors are connected by a hook lift and by the Cooper street staircase. From the ground floor rooms, a private staircase descends to the stores in the basement.

The gas offices occupy the centre of the building, chiefly on the Lloyd street side, and would be approached with equal facility from Lloyd street and Cooper street entrances. The rooms on the ground floor and main floors are connected together by a private staircase and paper lift.

The building, sanatory and nuisance, and hackney carriage departments, are placed on the southern half of the Albert square side. Doors have been placed across the corridors, cutting off these and the scavenging departments from the rest of the building, and so admitting of the corridors adjoining the departments being used as waiting halls if desirable.

The scavenging department is on the Lloyd street side. The men when coming for pay would enter through the cart entrance to the basement, which would thus form a waiting place, instead of the street.

The work-shops for the weights and measures department are in the Lloyd street front, towards the Cooper street end, and have a recess for carts to unload. I have placed rather more of the rooms of this department in the basement than was specified, because these basement rooms would be thoroughly well lighted, conveniently connected with those on the ground floor, and approached by carts with equal facility.

The markets, and paving, and highway departments are placed on the Princess street side of the building.

The Court of Record is on the ground floor adjoining the Cooper-street entrance. The muniment rooms are in the basement. They intercommunicate and have a separate staircase.

The lamps' department, though in the basement, have a ready approach from the street by the cart entrance. The inspector is conveniently placed for supervision, and the store room has direct communication with the large internal area.

Large cellars have been provided for coal stores, in a central position accessible by the cart entrance, with lifts to the upper floors on either side. Housemaids' closets have been placed on the different floors in convenient positions.

In addition to the private water closets, lavatories, &c., connected immediately with the principal officers' rooms, I have arranged groups of retiring rooms, in close connection with all the three staircases in the basement, and on the second floor with the staircases on the Lloyd street side of the building—placed there because they would not be so much wanted on the other side.

If more of this accommodation were thought desirable one or both of the spire rooms on the second floor, looking into the eastern area might be suitably appropriated to the purpose.

The head porter's rooms are on the third floor, approached from Lloyd street by a separate entrance and staircase. His rooms are in connection with a large dining room in the centre of Lloyd street front.

Wherever there is no separate staircase to connect portions of the same department on different floors, it will be found that this connection would be amply provided for by a public staircase. In all cases the store rooms are underneath the departments to which they belong, and are readily accessible by private or public staircase.

It has been my care to make all the rooms of as good a proportion as possible, not only with regard to their dimensions on plan, but as to their height, and in all cases, the very desirable rule has been observed that no room having an area of less than 50 square yards should have a greater depth than 25ft. from the windows.

With regard to the warming of the building, I propose to place in a large sub-basement, three hot water boilers, two of them for ordinary use, the third as a reserve for use while either of the others was under repair. The smoke from the furnaces would pass through two wrought-iron smoke flues, encased in brick-work, between which and the iron flues would be an intervening space for extracting vitiated air, as hereafter described.

From these boilers hot water pipes would traverse the main corridors, in channels below the floors, everywhere on the window side. These lines of hot water pipes would form the mains from which coils of pipes, wherever wanted would be fed—as at the foot of each of the principal staircases; near the porters' offices at the general entrances; in the public hall under the seats in the window recesses; the council chamber; the public offices of the gas and water departments, the reception rooms; and in most other large rooms to supplement the fires.

Wherever possible, the coils covered with ornamental gratings, would be placed in the window recesses to correct the cooling influence of the glass, and to admit pure air from without directly behind the coil, instead of passing it through long dusty channels.

The three principal and most powerful coils would be placed at the foot of the well of the three circular staircases in the inner angles of the building, and these would be amply supplied with fresh air from the open courts. The prisoner's cells would also be warmed by hot water.

These arrangements provide for the introduction of fresh air in the summer as well as in the winter, whenever it would be undesirable to open the windows. Every room in the building would partake of these advantages by louvred and valved openings being placed above each door.

For the extraction of the vitiated air it is proposed, in the case of the public hall, to have a horizontal air shaft above the ceilings with numerous openings into it, communicating with the two vertical extraction shafts before alluded to. These shafts would be warmed by the boiler fires in the winter and by special means in the summer.

All the rooms below and about the public hall, as well as the prisoners cells, would also be ventilated into the extraction shafts.

The clock tower and the Cooper street tower would form convenient means for the extraction of vitiated air from the other portions of the building. Horizontal air flues carried behind the cornices would lead to vertical shafts in the angles of the towers, accelerating power being provided as required for summer ventilation, or whenever the reception rooms happened to be crowded. Especially would all water-closets and retiring rooms be ventilated by these means.

Over the three principal circular staircases would be louvred and valved openings, chiefly for summer ventilation. In the sub-basement there would be room for steam power, if ever required.

The whole of the building would be fire proof, constructed, where practicable, on the principle of the Dennett arch.

The internal areas would be lined with light glazed tiles, and ceramic ware would be largely introduced against the walls of the corridors, staircases, and the principal rooms.

The main entrance projects only five feet beyond the street line (12ft. beyond the "building line"), so as not to interfere with the footway, and not too much to cut up the main front.

The clock tower in the centre of the Albert square front would be 235ft. high to the gilded globe at its summit, and 158ft. to the illuminated clock dial, which is shown 15ft. wide; and as chimes would be the proper accompaniment of such a clock, a bell chamber is provided in the storey below the dial.

At the other end of the building I have shown a secondary tower, and a staircase tower in the Princess-street front, so as to give as great variety of sky-line to the building as possible.

With regard to cost, I have designed the building not to exceed the £250,000 mentioned as the sum the corporation are prepared to spend. The building contains above the ground floor, exclusive of towers and chimneys, 3,956,815 cubic feet, and below the ground floor line, 956,518 cubic feet.

APPLICATION OF SEWAGE.

THE important question of the economic application of sewage will continue to occupy public attention until it is met with something like a satisfactory solution. The question may not be attractive—it may be repulsive to many minds; and we can imagine a certain class of people turning up their noses at articles on it. It is, however, a question which must be looked at full in the face. It cannot be shirked or shelved, and no journal can be more fitted for its discussion than one devoted to the erection of substantial, beautiful, and healthful habitations for the people. We are not about to enter into the general merits of the question now, but merely wish to record the results of an experiment recently made at Paris, instituted by M. Dumas.

In carrying out this plan the sewage is collected in reservoirs, and precipitated with a solution of sulphate of alumina. The quantity is not stated, but the cost of the precipitant is said to be one centime to the cubic metre of sewage—that is, less than half a farthing a cubic yard. The precipitate is quickly deposited, and contains all the phosphoric acid, and nine-tenths of nitrogen, and organic matters in the original sewage, and it is therefore a valuable manure. The weight of dry precipitate obtained is six kilogrammes (7lb.) per cubic metre. The supernatant liquor is limpid and completely deodorised, and may be run into a stream without any fear of disagreeable consequences. It is only right to say that the use of sulphate of alumina has been suggested in this country, but with addition of lime and sulphuric acid, which have greatly lessened the value of the precipitate for agricultural purposes. There are many towns in England where this precipitation by sulphate of alumina alone might perhaps be carried on with profit.

Another suggestion, says the *Mechanics' Magazine*, much less reasonable has been made for the extraction of ammonia from town sewage. The inventor of this process adds phosphoric acid and magnesia to the sewage, with the idea of precipitating the ammonia in the form of ammonia-magnesian phosphate. The precipitate he gets, he collects and dries, and then distils with quicklime in gas retorts, condensing the ammonia, which passes over in the usual way. The residue in the retort will contain the phosphoric acid, and be applicable for manure. As a method of obtaining ammonia, this process is not worth a thought. But while writing on sewage, we may remark that a similar precipitation formed the subject of a patent by Mr. Blyth, the chemist to the Board of Health, which never, we think, attracted the attention it deserved. The patent has long expired, and the information contained in it is fully at the service of the public. The sewage being conducted into reservoirs, a calculated proportion of superphosphate of lime was added, and the mixture strongly agitated. Lime water was then added in sufficient quantity to render the whole rather alkaline. The mixture was again strongly agitated, and then allowed to deposit. A precipitate was thus obtained rich in ammonia, and all the suspended matters were carried down by it to the bottom of the reservoir. This we believe to be a valuable process, but it requires intelligent superintendence.

Mr. John Mellor, an antiquary of Derby, states that he has discovered the remains of King Alfred at Hyde Abbey, Winchester.

WATER SUPPLY AND SANITARY MATTERS.

A MEETING of landowners and occupiers of Cheltenham at a recent public meeting adopted the following resolution to the Local Board of that town: "That should the Local Board determine to abate nuisance by the irrigation scheme, we, the undersigned, are willing to take the flow of sewage over the number of acres attached to our names, for such times, and on the payment of such reasonable sums to the Local Board as may be agreed upon." (Here follow the names of twenty-nine owners and occupiers of some 2,000 acres of land, all of whom are willing to take the sewage on their land.) Mr. Bateman, C.E., who has reported on the state of the sewage to the Commissioners, has advised them to discontinue the present treatment of the sewage by deodorisation, in favour of the system of irrigation. It is well known that the cost of the deodorising agents is some £800 or £1,000 per annum, and yet the present plan is so ineffectual that the authorities are in constant dread of being dragged into Chancery at the suit of adjoining landowners.

In a very careful paper on the statistics of the recent epidemic of typhus in Aberdeen, Dr. Beveridge, of the Royal Infirmary, traces its origin to overcrowding and sanitary neglect of the dwellings of the lower classes. The number of deaths was 610, occurring apparently in 4,631 cases. Estimating the loss of labour of each adult at 10s. a week, and the loss of life according to the value of labour over the estimated working life of the persons who perished in this epidemic, he calculates the probable cost of the epidemic at £55,000.

The Royal Commission on the pollution of rivers have inspected the farms of the Metropolis Sewage Company, near Barking; and, among other things, they witnessed the cutting of the second crop of rye grass this season, weighing nine tons to the acre, and representing the growth since the 12th of March. Dr. Frankland, the representative of chemistry in the commission, took several samples of sewage, both before it went on the land and after it came off, for analysis.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Congregational Chapel was laid at Blyth, near Newcastle, on Thursday week. The proposed style is Gothic, and the building will consist of nave and two transepts with galleries around the entire building accommodating 420 persons. The works will be carried out under the superintendence of Messrs. Darling and Wood, architects, of Newcastle, the contractor being Mr. James Nairn, of Blyth.

A new Roman Catholic Church is being built at Glenealy, County Wicklow. The church is designed with transepts opening to nave, with double arches; the west front is surmounted by a belfry, and a gablet furnishes the east end, dying into apsidal roof. The architects are Messrs. Pugin and Ashlin, of Dublin.

The church of St. Matthias, lately erected on the newly formed district of Ballyeglish, in the diocese of Armagh, has been consecrated by the Lord Primate of Ireland. The style is First Pointed, and the church is built of white limestone relieved with bands of red stone. It consists of nave and apsidal chancel with a south porch. Sittings are provided for 200 persons. The works have been carried out by Mr. G. Tipping, of Castledawsen, from the designs of the architect to the Ecclesiastical Commissioners.

The ancient parish church of Darenth, Kent, was reopened on Thursday week, after careful restoration, under the supervision of Mr. W. Burges. The nave has been reseated and paved with glazed tiles. In the chancel carved oak benches have been erected for the use of the clergy and choir; and a neat lectern placed on the south side. The font, which is large and apparently very ancient, is perhaps the most curious object in the church. The building, which is supposed to have been begun about A.D. 900, is a mixture of Norman and Gothic architecture, and contains a nave south aisle, and chancel, accommodating about 200 persons. The worshippers in the aisle obtain a view of the chancel through an opening pierced in the corner of the wall adjoining one of the pillars supporting the chancel arch.

A new church is to be erected at Brighouse, Yorkshire. Plans have been prepared by Messrs. Mallinson and Barbe, architects, of Leeds. The style is Geometric Decorated Gothic, and the edifice is intended to seat 500 people. Internally it will be divided into nave, 69ft. long by 22ft. wide, and two side aisles, each 10ft. wide, and chancel 28ft. long by 18ft. wide. On the south side of the chancel will be an organ chamber and vestry. There will be no tower or steeple, but a turret for two bells at the west gable, which will be crocketted, and from which will rise a pinnacle finished with a stone cross. The cost will be about £4,000.

The ancient parish church of Eccleshall has been restored, and was reopened a few days ago. It belongs to the early and the late English periods, chiefly to the former. The restoration was entrusted to Mr. Street, A.R.A., and the work was done by Mr. Cobb, builder, of Newport, who commenced it in September, 1866. The total cost of the work is between £7,000 and £8,000.

BUILDINGS.

The new freight depôt of the Hudson River Railway in New York, will be, it is stated, by far the largest building ever erected in that part of the world. It will have an area of 178,327½ square feet, or over four acres under one roof. It is to have three storeys and a basement, will be about 60ft. high, and will be built wholly of brick, iron, and stone, so as to be absolutely fireproof.

The city gaol of Limerick has recently undergone extensive alterations and improvements, at a cost of £5,300. The works have been carried out by Mr. M. Clayton, builder, of Limerick, from the designs of the city architect, Mr. W. E. Corbett.

A design for new schools for Gaddesby, Leicestershire, by Mr. R. W. Johnson, of Melton and Leicester, has been selected in a limited competition, and the works will be proceeded with immediately. The building, which is Gothic in character, will be of dressed red brickwork, with Bath stone dressings. The roofs will be covered with Staffordshire ornamental tiles.

The first stone of the New Temperance Hall and Public Institute, Finedon, North Hampshire, was laid on Monday last with the usual ceremony. The building, which is in the Gothic style, will be built of Finedon brown stone, with dressings of Box stone, and will contain on ground floor large club-room, reading room, ante-room, kitchen, &c, and a dwelling for the hall-keeper. The upper room, which covers the whole, will be spacious and lofty, with an open timbered roof. The site chosen is a good one, being on a plot of ground known as "The Green," having roads running all round, and being slightly elevated. Mr. R. W. Johnson, of Melton and Leicester, is the architect, and the contract for the erection of the building has been taken by Mr. W. Henson, builder, of Finedon.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—I. E. G.—E. W. Y.—D. O. B.—A. D. S.—E. P.—G. T. R.—W. L. B.—O. N. S.—E. W.—B. Son and B.—H. I. J.—I. and E. G.—T. C. and Sons—W. C.—L. and Co.—A. A. R. and Co.—G. H. G.—G. N.—P. and S.—W. H. B.—I. T. C.—Col. S.

Correspondence.

THE EARTH SYSTEM FOR VILLAGES.

To the Editor of the BUILDING NEWS.

SIR,—The question of the disposal of sewage has become of such vital importance that it ought to have the earnest attention of everyone. In an article in the last "Quarterly Review," entitled the "Use of Refuse," the following paragraph occurs:—"The value of this sewage (speaking of the sewage of London) Professor Way has estimated at two millions per annum, and whilst we were absolutely throwing this away, we were ransacking the islands of the Pacific for guano, a refuse that had lain there for ages untouched by the hand of man. A more flagrant example of wilful waste on our part could not well be quoted, inasmuch as guano, though obtained at a very high cost, is not so valuable as that we had ready at hand when in a concentrated form." Now, Sir, is it right that man should, day after day, and year after year, take his nourishment from the earth, but never return a fraction of it back. It surely could not have been intended by the Maker of the Universe that there should be this waste, but ever a reproduction. The question is, how is man to nourish the earth in return for the nourishment he takes from it. In the case of isolated houses and small towns and villages, the earth system seems to me to be the best method of solving the difficulty, as it is the only one that can do this in "a concentrated form." I think that excrementitious matter should be treated distinctly and separately from the slops or washings of houses. No slaughter house refuse—in fact, no solids whatever, ought to be permitted to pass into the drains. All the pluvial waters also ought to be treated by themselves, and for this reason, that you reduce the amount of liquid to be dealt with to a minimum and constant quantity. Many objections have been raised against the earth system, on account of the quantity of earth required. Now this quantity is not so very large after all, and persons seem to forget that it is only borrowed, and will all be returned again in the shape of human guano. The quantity of earth required is four cubic feet for each person per annum when the earth is used four times, which can easily be done, for in five weeks the whole of the excreta and paper entirely disappear, not a vestige of either remains, and this earth, if dried by a moderate heat, can be used over and over again up to twelve or even twenty times, and then is of far greater strength than any guano that was ever imported.

In treating small towns by this system, there can be no doubt that it must not be left to each individual householder to find his own earth, but a company must be formed, whose duty it shall be to supply and take away the earth, just as a water company supply water, and I am quite certain that it would prove most remunerative. With regard to villages, the system ought to be taken up by the large landed proprietors, just as it is at Halton, and they would soon find that they would be amply repaid for the outlay; or a company might be formed to supply a certain district of so many miles radius. In most villages slops could be dealt with within the immediate precincts of the houses, but in small towns, where this can't be done, then a small system of pipe drainage must be carried out, and the slops dealt with either by sub or surface irrigation, or in precipitating tanks and filtration, and if the slops are kept to a minimum quantity, I do not see much difficulty. Of course the great difficulty is prejudice, and the unwillingness of owners of property to go to the expense of converting the privies into earth-closets. The great objection to the water system for small towns and villages is the cost, and it reduces the value of human excrement to a minimum, whereas earth raises it to the maximum. In the one case you can only grow Italian rye grass, and in the other case any crop whatever. One might enlarge upon this subject to a great extent, but I know your space is valuable.—I am, &c., REFORMER.

MODERN ART.

SIR,—The Greeks attained a very high degree of culture. The lowest classes of citizens attained even a considerable amount. The mythology to them was household knowledge, universally known. They comprehended the very conventional treatment of the legends in sculpture. They were interested in the tragedies of Æschylus. Considering the population of their towns, the attendance at these plays was astounding. We have no culture like it in the world since. Since the beginning of this century there has been a complete national movement for culture in Germany. Education has been extended to all classes. Modern culture can go no further than it has in Germany. Every class is educated to the utmost, considering the age at which different classes are obliged to withdraw their children from school. Of course the boy who can go through his university course attains more than the boy who is obliged to leave the Burger schule at fourteen. The great school of poetry, of which Goethe is the head, is a poetry arising out of the very high culture of the highest educated classes. The painting of Cornelius appeals to such a class only; but both this painting and literature must be said to be above the masses. Art has, even with the universal high culture, remained above the masses. Now the question to be asked is this—admitted the highest amount of culture attainable in modern times to the middle and lower classes—what form of art and poetry will that class be interested in? What subjects will interest them? Will art for the future be of two kinds—one for high culture, one for lower? Do the masses prefer art or physical science in the present day? which does the intelligent artisan like best? In ages when art was a tradition and universal, were the masses interested in it as art? In the painted cathedrals was their interest in the art, or in the history of the paintings taught? We shall not probably attain in this country the general culture of Germany, not even in fifty years. There is no very earnest desire for culture; therefore, what is the course of art to be? In considering these questions read M. Arnold's report on foreign education (Macmillan), Heines' "Reisebilder," Lewes' "Goethe," and "the Life of Humboldt" These will essentially give the tone of modern German culture. It is probably in music that culture has extended its influence furthest in modern times in Germany. Compare the number of Liedertafel in Vienna with vocal societies in London. Compare the populations of the two towns. Such choirs as the Cologne and Berlin are unknown in England. We have in London how many performances in a year of serious instrumental works, and how many are there in Dresden? Compare the populations. These are merely suggestive thoughts as to what modern times, with their particular turn for commerce and exact sciences, will and can produce. What this phase of the world's civilisation, this period, has to do. What is its object? To what extent does art enter into its pleasures?—I am, &c., A. B. C.

Intercommunication.

QUESTIONS.

[846.]—COLOURING PLASTER.—I should be favoured if any of your correspondents would let me know the best means for size colouring new plaster without showing the colour stained or having the appearance of damp.—E. J. H.

[847.]—WROUGHT-IRON PLATE GIRDER.—I am getting out a wrought iron plate girder, 5ft. 3in. deep and want to have the plates in as long lengths as they can be rolled, so as to avoid having a great number of joints. Will you kindly tell me what is the greatest weight iron manufacturers, such as M'Naught, Robertson, and Co., will roll plates without charging an extra price for. Ten years ago 3 cwt. used to be the greatest weight; but this must have long been altered, on account of improved machinery used in the rolling mills. No doubt some gentleman correspondent can give this information, which would be very valuable to—PLATE GIRDER.

[848.]—THEODOLITE.—Will any of your readers kindly inform me of the best work to be obtained on the use of the theodolite for a beginner?—E. M. S.

[849.] IRON AND WOOD GIRDERS.—Is there any work out on cast and wrought iron and wood girders, giving a scale of dimensions for resisting compressible and tensile forces? If so, I should be glad if any of your readers would inform me of the same through these columns. —A BEGINNER.

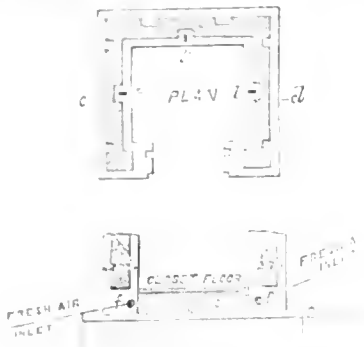
[850.]—SELF-ACTING ASH CLOSET.—Will you please to inform me, through the medium of your valuable "Intercommunication," where I could obtain a self-acting portable ash closet?—J. CLARKSON, 6, Dryden-street, Manchester.

[851.]—TAKING OUT QUANTITIES.—Can you, or any of your readers inform me where I may get a work on the "Taking out of Quantities in Buildings?" I should also like the price to be mentioned.—A. J. L.

REPLIES.

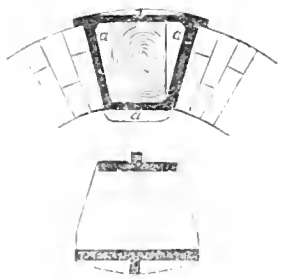
[818.]—A DAMP SAFE.—(STRONG ROOMS.)—As so much has been said during the last two weeks in the BUILDING NEWS about Damp Safes, I beg to suggest that to ensure a dry room would be to construct the foundations and superstructure as per sketch. First, 12in. below floor level, flag over the room and under walls with 2½in. York flagging, well bedded and pointed in cement. Second, the substance of walls should be 2ft. 7in. out to out, built with 9in. brick walls, and inverted pilasters to strengthen them *f f*; *t t t* are small flues for fresh air to pass through; to fix hit and miss gratings 6in. above floor of closet *t t t* and to pass up to ceiling of strong room, and from thence escape through a 4in. stoneware pipe to eave of main building. The space between wall of strong room, and also from the flagged course to floor line of closet to be filled with smith's ashes, passed through an inch-mesh sieve

and well rammed as the work is being built up. The closet floor should be laid with tiles in cement. This plan would not cost more than those usually built with solid



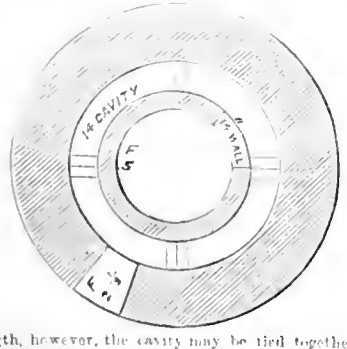
walls, and, for a certainty, would always be a dry, strong, and ventilated room, which I would recommend to "Banker" and other gentlemen similarly situated. "G. M.'s" plan would not do, wherever slate is employed every change of atmosphere would produce condensed moisture; and, as to Mr. Burfurt drying the closet with gas, no doubt it has had a temporary effect, but wait till frosty air returns.—FRANCIS HANSOM LEEDS.

[820.]—SUPPORTING A BEAM.—Perhaps I ought to have been more descriptive in my reply to the above, as it is evident "F. H. L." has mistaken my meaning. What I proposed was to make the strap a key by giving it a proper form, making the sides radiate in a line drawn from the centre of the arch. Of course, I understood the strap to have a top as well as bottom. My second diagram (sketched with a pen, as at the time I had not instruments at hand) was intended to show that it should be a complete cell. I certainly should never have dreamed of either removing the key or substituting wood, though I have heard of a man, and know him too, who set his ladder against a beam and then went up to knock away the fastenings, and was very much astonished when all came down together. With regard to the material, I interfered as little as possible with what was proposed in the query. If wrought iron was used, it should be of sufficient thickness and strength to bear the crushing strain without collapsing, and special care must be taken to weld it thoroughly. The effect of the beam on it is a tensile strain downwards. I annex two sections for a key of cast metal—one through the line



of arch, and one taken transversely; the parts marked *a* to be central webs. The bottom of key may be made broader, that the thickness of arch and the sides bear by cut in a slope to it. Or, thus giving additional support to the part carrying the beam. The sides might be projected downwards, to look the bottom, if necessary, as shown by the dotted line, to rest the web underneath. There are many cases where a saddle such as your correspondent recommends might be preferable. We can conceive of cases, however, where it might be requisite to thus carry a beam in the centre of its length, or at some distance from the end, the entire length being no doubt used as a binder or tie. Such a shoe as "F. H. L." proposes could be imbued with a metal key in one casting to carry the end of a beam, but I would suggest that, instead of forming the shoe with a central web, it have one at each side, and so avoid wounding the beam.—G. M., Norton.

[832.]—BUILDING CHIMNEYS.—The best method of building a chimney is to carry the flue one uniform width all the way up. The flue ought to be left inside and a 9in. wall, with a cavity of 1in. to prevent the heat from injuring and cracking the outer course. For the sake of



strength, however, the cavity may be tied together with four brick piers carried up twenty yards; still the outside will taper with the cavity. There is no utility, in so far the draught is concerned, in contracting the flue at the top. The area of the flue at the top ought to be equal to the flues connected with the chimney, so that the smoke may have a free passage through.—J. W. O., Oldham.

[824.]—DRAWING SCHOOL.—The Working Men's College, Great Ormond street, is the best drawing school near King's Cross, and is very reasonable in its charges. I should like to warn your correspondent against a noted advertising architectural farm in the neighbourhood.—F. R.

[825.]—GAS-MAKING. There is a small apparatus made by Porter and Co., of John street, Adelphi, which would most probably suit your correspondent's wishes.—X. P.

[826.]—RESPONSIBILITY OF AN ARCHITECT.—Your correspondent first asks whether he is responsible as the architect to a building if the construction fails, he having been employed to superintend, although only verbally, and not being employed to write a specification. It would appear from the form of his question that he would only take the position of a foreman to his employer, and in that case would only take the position of an agent; but this would depend upon whether the payment for his services was in the form of a percentage or as wages for the time employed, because clearly he was employed to superintend; and if he passed bad material in workmanship, he, as an architect, is liable; and it must be very clearly proved that the building failed from those causes, and not from the construction shown on the plans, before he can be acquitted of all liability.—F. R.

[842.]—DRAIN TRAPS.—The direct answer to the question "Whether there is manufactured and sold a better form of trap for kitchen sinks than the ordinary brass bell trap?" I must leave some one else to give; but as I entirely approve of the condemnation of bell traps, I wish to add my testimony to that of Mr. Kirkby of the inefficiency of that form of trap. My experience confirms every word that Mr. Kirkby says about bell traps; and I, for my part, prohibit their use where I have any authority. But I think there ought not to be a trap of any kind in the sink itself, or in any part of the kitchen. I think all drains ought to terminate outside the wall, in the open air, and that a trap, either D trap or gully trap, should be placed right opposite to the kitchen sink, and close to the wall, to receive the waste water from the sink through an open pipe. The end of this pipe at the sink may have a plug to prevent any current of air, if that be desired; but in general no inconvenience will be experienced by leaving it open. I have found a few cases where the position of the sink did not admit of this, but in the great majority of cases it does, and in some I have altered the position of the sink to make it practicable. I believe that no form of trap will prevent the eruption of gases from the drains when they are flushed with water, either by natural rainfall or artificial means; and, therefore, unless a special ventilating pipe be carried up at the head of every house drain, up which the gases can find an easy escape at such times, the gases will be driven through any trap, however well constructed; and to suffer these gases to be driven into a kitchen, or anywhere else inside a house, is to induce a poisonous state of the atmosphere.—A TOWN SURVEYOR.

[843.]—DENNETT'S FIREPROOF CONSTRUCTION.—In answer to "Inquirer," in last week's BUILDING NEWS, it will perhaps be sufficient to tell him that the principle of the construction consists of cast-iron girders at stated distances, from the bottom flange of which spring flat brick arches, and the top is made flush with concrete filling between the crown and the haunches. For any other information he can refer to the patentees, who advertise regularly in this paper.

[845.]—ROYAL ACADEMY.—There is no expense in becoming a student; the instruction is gratis. The first step for a student to take is to ascertain when probationer's drawings are to be sent in, which can be ascertained from one of the porters. A design of some kind must be sent in, and if approved of the student is admitted as a probationer. He is then required to draw out a design from a given subject on the walls of the Academy, and if this is also approved he is admitted, and after having attended a course of the lectures on geometry, perspective, anatomy, painting, and sculpture, he is eligible to compete for any of the prizes, and can study from the antique models for seven years.—F. R.

WAGES MOVEMENT.

The threatened strike of the masons at Keighley has been averted by the yielding of the masters, accompanied by a slight concession on the part of the men. The men consent that in future the stone may be worked at the quarries, and sent from thence ready for the wall. They bind the master not to take more than one apprentice to seven journeymen, and in no case to have more than three apprentices at one time—an exception being made in the case of masons' sons. And they demand that when sent more than a mile from home to labour, the time shall count from their leaving the yard.

All questions as to wages in the carpenters', plasterers', and bricklayers' trades in Wolverhampton are settled by arbitration under Mr. Rupert Kettle's plan, with that gentleman for umpire. A series of meetings lately held had suggested the desirability of a general conference of the masters and operatives of all the building trades in the town. The conference was therefore convened, and was held yesterday week in the council chamber of the Townhall. After an amicable discussion the following resolution was agreed to:—"At a general conference of the three branches of the building trades who have accepted arbitration as the means of settling the rate of wages and the trade rules for the town of Wolverhampton, held at the Council Chamber of the Townhall, on the 30th of April, 1868, it was unanimously resolved that, upon condition that the masters now give wages at the rate of 6d. per hour, with the Saturday half holiday (that is, to cease work at one o'clock), then that no alteration whatever be claimed, either in the rate of wages or in the rules for the next three years—that is, until May, 1871. That, except as to the rate of wages per hour, and the half holiday in the trades who have not half holiday already, the rules stand the same in all things as those now in force." This resolution was signed by six masters, six plasterers, six carpenters, and six bricklayers. On the suggestion of Mr. Kettle, it was spontaneously determined that there should be an annual celebration of the successful manner in which masters and men in these three branches arranged questions which had hitherto to be decided by the arbitrament of a strike or a lock-out—the day to be observed as a holiday, and the proceedings to begin with a service at the Old Church, followed by a *soiree*, or some similar entertainment, in which masters and men could unite.

A serious strike has taken place at Liverpool. The new code of regulations adopted by the Liverpool Master Builders' Association was announced to come into effect on Monday. The result was that a number of the men struck work, and a deputation was arranged to meet the masters on Tuesday. The masters met the deputation, and a proposition was made by them to submit the matter to arbitration, the men in the meantime to work under the new rules. This the men refuse; a general strike has taken place, and a number of important public works are brought to a standstill.

The bricklayers and labourers of Walsall have struck work, to enforce upon the masters their trade rules, and an advance of wages. Trade is very slack, and a revival is not likely to be encouraged by the strike.

The stonemasons' strike at Birmingham, which commenced on Friday last, still continues. The chief points which the men seek to enforce are those relating to the introduction of worked stone and piecework. These are embodied in the two following rules:—"No worked stone to be allowed to come into Birmingham, with the exception of tooled York flags, common tooled steps, and the like." "That no master mason or master builder sublet any mason work, and no mason to work by the piece, or subcontract with any master mason or master builder, unless he finds his own materials. Ornamental carving and turning balusters, small columns, and the like, may be done by contract, but the roughing out, and all the other cutting about the same, not being carving or turning, and the fixing of the same, to be done by day-work."

STAINED GLASS.

A handsome chancel window has just been erected in St. David's Church, Birmingham. In the centre of the window is placed David, King of Israel; on his right are Moses and Aaron, and on his left Elijah and John the Baptist, representatives of the Law and Prophecy. This window was executed by Mr. T. W. Canom, of Smethwich.

A memorial window to the late Earl of Craven has been erected in the church of St. Michael and All Angels, Coventry. The window contains seven lights, and the subjects illustrated are incidents in the life of David. It was executed by Messrs. Heaton, Butler, and Bayne.

STATUES, MEMORIALS, ETC.

The bronze statue of the late Sir Robert Peel, which has recently been removed from the original site chosen, is now placed on a granite pedestal at the public entrance to the Houses of Parliament, opposite Parliament-street and Great George street. The statue was uncovered on Monday without any ceremony.

A monument to the memory of Luther, at Worms, is to be inaugurated on Thursday, June 25. The fêtes will last three days—the 24th, 25th, and 26th.

It is stated by the *Owl* that a plaster cast of Baron Marochetti's statue for the Albert Memorial in Hyde Park, was lately put into its position in order to judge of the effect it would produce. The result was so unsatisfactory that the statue has been condemned as unworthy of the shrine prepared to receive it.

LEGAL INTELLIGENCE.

CLAIM FOR ERECTING A MONUMENT.—Daniel *v.* Chaplin. This was an action at Nisi Prius to recover £100 for the erection of a tomb or monument in Christ Church Cemetery at Forest Hill. The defendant had ordered the plaintiff to erect the tomb at the agreed price of £100 and it was to be built of Dove and Sicilian marble. It was contended for the defence that the marble was of inferior quality and the workmanship bad. Witnesses having been examined on both sides, the jury found a verdict for the plaintiff for the amount claimed.

PARTY WALLS.—At the Marylebone Police Court on Friday last, Mr. Benjamin Taylor answered a summons taken out against him by Mr. Henry Baker, district surveyor of St. Pancras, for that "he, the said Benjamin Taylor having recently erected the 'Lichfield Ale Stores', Frederick-street, Hampstead-road, which was hitherto in but one occupation (viz., that of himself), did divide the same into two or more separate tenements, each having a separate entrance and staircase, or a separate entrance from without," contrary to the 27th section of the Metropolitan Building Act. Mr. Baker prosecuted in person. Mr. Taylor was represented by Mr. Yarde, solicitor, assisted by Mr. W. F. Potter, architect. Mr. Yarde said this was a case never contemplated by the Act of Parliament, which intended that no building should be divided into separate buildings, except by proper party walls. This case more properly came under the second clause of the 27th section, as to the separation of a building into "sets of chambers or rooms tenanted by different persons," and, as the building did not exceed 3,600 square feet in area

the act had not been infringed. Moreover the building had never been in one occupation as contemplated by the act, in the third clause of the 27th section, but had always been in the joint occupation of Messrs. Taylor and Parish, and Arnott, as offices or chambers. Mr. D'Eyncourt, after a lengthened hearing, dismissed the case.

Our Office Table.

A new public park, 30 acres in extent, was on Friday last formally opened by Mr. Peter Wood, the mayor of Southport, amidst the general rejoicings of the inhabitants and visitors.

It is stated that the ground hitherto in possession of the Strand Hotel Company is to become the site of a new metropolitan theatre. A gentleman who has built one metropolitan and one suburban theatre since 1864 has become the purchaser of the property, and in a few days the work of re-construction will commence. It is not proposed to make the new theatre as large as the New Queen's even if the space will permit, but to build a house larger than the Olympic, but not so large as the Lyceum.

On Friday last a crowded meeting of operatives connected with the various branches of the building trades was held at the Cabinet Theatre, Liverpool-street, King's Cross, Mr. W. Morrison, M.P., in the chair, in furtherance of the co-operative movement in the building trade. The chairman entered at some length into the principles of co-operation as applied to production, and expressed the pleasure he felt at finding the building operatives now about giving practical effect to these principles. Mr. Alfred Walton, architect, then addressed the meeting, giving some practical advice as to the working of the proposed company. He was pleased to hear that already about 2,000 shares had been taken in the company by building operatives. Mr. George Potter pointed out the advantages and benefits of co-operation. It was a most effective weapon with which to meet strikes and lock-outs. He believed the present movement had in it all the elements of success. Resolutions in accordance with the object of the meeting were adopted.

The fortnightly meeting of the Liverpool Architectural Society was held on Wednesday evening, Mr. T. J. Kilpin, president, in the chair. The competition designs for a village church, sent in by the students, were exhibited, and the President, in announcing the award of the council, congratulated the society on the great talent, industry, invention, taste, and architectoral knowledge which all the drawings evinced in a very considerable degree. The first prize, he said, had been awarded to the design whose motto was *L'ouvrage du Soir*, and the second prize to the design marked *In loco*; and he had great pleasure in expressing to the students the thanks of the council for their exertions. The paper of the evening, on "Fashion in Architecture," was read by Mr. Herner, and was followed by a brief discussion.

Baron Haussmann is proposing, by a system of sluices, to raise the depth of the Seine at Paris to an extent which will enable vessels of considerable tonnage to ascend to the metropolis.

The Dean and Chapter of Durham have had forwarded to them, through a lady, the ring of the venerable Bede, which was extracted from the tomb in the Galilee when it was opened many years ago. The ring will be placed among other relics in the Dean and Chapter Library.

A popular meeting of the Edinburgh Architectural Association was held on Wednesday week, when there was exhibited, by means of the lime light, a large collection of photographic views illustrative of ecclesiastical architecture, principally Gothic. The chair was occupied by Mr. John C. Hay, president of the Association. The views were described by Mr. Hippolyte J. Blanc.

Mr. Carmichael, the painter, died very suddenly at his residence at Scarborough on Saturday morning last. He was sixty-eight years of age.

A statement has appeared in some of the papers to the effect that the Government had resolved to purchase a portion of Hayling Island, to which we drew particular attention a few months back. The statement, however, is premature.

The well-known ceramic manufacturer, Richard, of St. Christopher, near Milan, has made known his process for varnishing the pottery exhibited by him at the Paris Exhibition. The following are the ingredients and their proportions to be fritted: Carbonate of soda 1·000, boracic acid from Tuscany 0·800, kaolin 0·125, carbonate of lime 0·250, sulphate of lime 0·250, crystalled feldspar 0·750, quartz from the Tessin 0·280, fluorspar 0·150. Piedmont oxide of manganese is added to obtain the desired tint. The whole frit is ground fine, and then mixed with 110 parts of kaolin, and 52 parts of feldspar for every 460 parts of the above frit. It is applied as usual in glazing, but as the specific gravity is less than that of the leaden coating, the same weight of the new glaze will cover a greater quantity of pieces.

The cupola of the church of the Holy Sepulchre is very nearly finished. Three months hence it will be completely done; nothing is wanting but the sheets of lead which will cover it. The Princess de la Tour d'Auvergne has made a donation to France of the spot on the Mount of Olives where, according to a Latin tradition, our Lord taught the "Paternoster" to His disciples. An iradé of the Sultan has confirmed this gift, and signified the same to the French Government. The Princess intends to make a cloister round the spot, like the Campo Santo at Pisa, and to cover the cloister walls with porcelain tiles, on which the Lord's Prayer will be read in all the languages of the world.

Doubts appear to have been started as to the existence of lych-gates before the Reformation, principally on account of the majority, in fact nearly all the existing specimens, being constructed of wood, a material, it is supposed, of too perishable a nature to have lasted 300 years without decay. A correspondent in *Notes and Queries* refers to Britton's "Antiquities" (no mean authority), which says that formerly there stood near Gloucester Cathedral a lych-gate, where the corpse of Edward II. rested on its way to interment. Probably much stress will not be laid on the argument of timber being prone to decay, when the fact is remembered that the earliest Christian churches in England were built of wood, particularly in districts where stone was rare. A splendid specimen of lych-gate exists at Arundel, at a church for ages under the patronage of the Dukes of Norfolk. A few years since it was removed from the graveyard and erected as a porch on the north side of the church.

The whole of the remaining works of Mr. Clarkson Stanfield, R.A., deceased, will be disposed of under the hammer of Christie, Manson, and Woods, at the rooms in King-street, St. James's. The sale commences to-day, and will extend over six days. The collection includes the original sketches and drawings made during his various tours—in France, in 1824; Switzerland and Italy, same year; at St. Michael's Mount, Cornwall, in 1828; in Germany, the Tyrol, and Italy, in 1830; on the Moselle, in 1837; again in Switzerland and Italy, in 1838 and 1839, including the series of drawings made during the eruption of Mount Vesuvius, Christmas, 1838; tour in Holland, in 1843; the drawings made between 1847 and 1851, at Hampstead, Dover, and in Wales; tour in the south of France and north of Spain and the Pyrenees, and in 1856 in Ireland. Also the contents of his studio, consisting of armour and arms, bronzes, costumes, models of boats of different countries, Rembrandt etchings and engravings, pictures by Le Poitevin, Constable, and Bright, and water-colour drawings by Sir E. Landseer, Sir A. W. Callcott, Sir D. Wilkie, C. R. Leslie, R.A., David Cox, Muller, and Boningten.

Greystoke Castle, near Ullswater, formerly the seat of the Dukes of Norfolk, was destroyed by fire on Monday morning. It contained many valuable paiotings—portraits of William Warham, Archbishop of Canterbury, and Erasmus, by Holbein; a picture of the Saviour on gold ground, inscribed 1400; portraits of Charles I. and Charles II. and James II.; a large picture of "Solomon's Feast," by Hamilton; a portrait of John Duke of Norfolk, who was the subject of the lines "Jockey of Norfolk, be not too bold, for Dickon, thy master, is bought and sold;" several family portraits, by Vandyke; "A view of Venice," by Canaletti; a piece of needlework by Mary Queen of Scots; and many other art treasures. Some, if not all these, it is feared, have been seriously injured.

Mr. E. M. Ward has just finished three paintings for the corriders of the House of Lords. The subjects are "William and Mary receiving the Lords and Commons," "The acquittal of the Seven Bishops," and "Monk declaring for a Free Parliament."

The municipal authorities of Paris have caused to be erected, in the Valley of Saint Germain, in the Côte d'Or, Burgundy, where the Seine takes its rise, a handsome ornamental edifice; the waters from the various sources are brought together in an artificial cave and fall from the rockwork into a small basin, whence they take their natural course, and form with their confluents the well-known river which enlivens Paris, and in Normandy becomes a grand stream covered with the ships of all nations. Over the entrance of the cave is the recumbent figure of a nymph, with the traditional urn, the work of Mr. Jouffroy, the eminent sculptor. A square or public garden has been formed around the source.

An important undertaking is now under hand in Paris—namely, the piercing of two streets, from the junction of the Rue de la Paix with the Boulevard des Capucines. One of these streets will run from the Boulevard to the Théâtre Français, and form a broad and direct line to the Louvre and its neighbourhood; this street will be about 2,600ft. long. The other, starting from the same point, will pass to the Bourse, and be afterwards continued to the Boulevard Sebastopol, and will be about twice as long as the former. One effect, and a very fine one, will be the formation of a handsome open space opposite the Place of the New Opera House.

The *Pall Mall Gazette*, in an article on Mr. Solomon's sketches, says:—This collection of designs reminds us forcibly how rapidly the mediæval moonlight is fading away from the field of English art before the returning sun of Renaissance and Greek influences. The spirit of Michael Angelo, Raphael, Titian, and Correggio, which Mr. Ruskin in 1851 described as composed of "indolence, infidelity, sensuality, and shallow pride," is again in the ascendant, and everything seems to promise that its new victory will not be easily disturbed. The truth seems to be that art must consent to be an exotic in our northern climate, and in our busy modern life, to renounce popularity, to rest upon literature, and to present the ideals of the cultivated class. It has no medium at its command to express humanitarian impulses, or to hinder or forward any one of the causes which divide the mass of mankind. When we see it returning, therefore, to the old Pagan worship of beauty, to the study of gesture and contour rather than of action or expression, we know at least that these things are within its domain, and that what it has to say in this matter will be clear and attractive, if only to a small audience.

MEETINGS FOR THE ENSUING WEEK.

TUES.—Institute of Civil Engineers.—Renewed discussion upon the papers on Irrigation in India and in Spain, &c.

WED.—Society of Arts.—"On the various Methods of Lighting Streets by Gas, with proposals for the Introduction of a New System," by S. Tucker, Esq.

FRI.—Associated Arts Institute.—Paper on "Art and Artists under the Tudors," by W. Jerrold Dixon, Esq.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2712 J. SYME. IMPROVEMENTS IN SUPPORTING WINDOW SASHES, SHUTTERS, DOORS, AND OTHER SIMILAR STRUCTURES. Dated September 26, 1867.

This invention consists in supporting window sashes, by elastic rollers formed of india rubber, gutta percha, or compounds thereof, or other similar elastic substance affixed to the sash, and working against the frame in which the sash slides. The rollers are supported with capability of revolving in bearings affixed to the edge of the sash, and should be of such a diameter that, when the sash is in position, they may be slightly compressed by the frame in which the sash slides, and, by the friction obtained by such compression, hold the sash securely in any position required.—Patent abandoned.

2729 S. PARR AND A. STRONG. IMPROVEMENTS IN THE CONSTRUCTION OF BUILDINGS, ARCHES, BRIDGES, AND SUCH LIKE STRUCTURES, AND IN THE FLOORS OF BUILDINGS AND IN OTHER SITUATIONS. Dated September 27, 1867.

This invention comprises various features, among which are the following:—As regards the roofs of buildings, the inventors propose to construct them as follows:—The

framework of the roof being principally of metal, they cover the same by fixing a wood centre to the framework by any convenient means, the said centre being made the desired shape and covered with sheet metal, if necessary. Upon these centres they arrange metallic or earthenware tubes (half tubes in combination with concrete, or they form a coating of concrete only, in which case they mix together ballast, broken brick, or pottery, and Portland cement in varying proportions, according to the strength required, and this concrete may be or spread on the wood centre, or not, as required, to the desired thickness, the outer surface being worked into shape, as in plastering. Where half-round tiles or half tubes are used, they might simply be laid on the wood centre, and their outer surfaces be covered with liquid or semi-fluid cement, or fine concrete, they then apply a coating or covering of ordinary concrete to make up the required thickness. Cylinders or tubes may be laid in the above manner, and be similarly covered. They propose to so fix and dispose some of the tubes of the roof or covering as that they may be used as ducts for the passage of air, water, gas, or smoke when required. They also propose to fix the chimney pots on the roof, and thus dispense with chimney shafts. They propose to form openings for windows by employing barbs of wood, iron, or terra cotta to receive the sash frames or skylights, and they further propose to bed iron fastenings in the concrete for attaching internal or external framings.—Patent abandoned.

2760 T. PARKES. IMPROVEMENTS IN THE MANUFACTURE OF CERTAIN DESCRIPTIONS OF NAILS. Dated October 2, 1867.

The patentee claims the manufacture of nails known as "clasp," or such like description of nails requiring small heads and sharp points, in the manner substantially as described, that is to say, such nails being cut from the ends of metal strips rolled thick in the middle and thin at the edges.—Patent completed.

2776 F. J. JEFFERY. IMPROVEMENTS IN URINALS. Dated October 2, 1867.

This invention consists, first, in supporting the urinal proper on or by hinges or trunnions, or their mechanical equivalents, so that it can be folded up when out of use, and made to lie flush with the wall, wash-stand, or other structure in which it is fitted, and practically be invisible, presenting only its side or back, which can be ornamented in any desired manner. Second, in combining with urinals supported according to the first part of this invention a water supply pipe with a valve or tap therein, so that the folding down into position for use shall open the valve or tap, and allow water to flow, and the folding up close of such flow; and, third, in making urinals constructed according to the first or both the first and second parts of the invention self emptying and closing. For this purpose the patentee forms a receptacle at the back of the urinal proper into which the liquids flow. When these reach a certain weight, the projecting part is over balanced, the contents discharged at the back, and the flow of water shut off.—Patent completed.

2819 D. SWAN. IMPROVEMENTS IN THE MANUFACTURE OF ZINC. Dated October 7, 1867.

This invention consists in separating the zinc from the materials operated on, and condensing it in the form of fume, which is collected and afterwards treated by well-known processes to obtain the pure metal. For this purpose, a cupola blast furnace, or other convenient furnace, is employed, and into it the ore or materials are introduced with such a quantity of coke or other carbonaceous matter as is sufficient to bring the entire mass to the heat that will reduce and volatilise the zinc, when the impurities will sink to the bottom of the furnaces, whence they can be withdrawn from time to time. In order to collect the zinc fume the furnace is provided with a flue leading into a series of chambers of sufficient capacity to allow the whole of the vapours to condense, and the zinc is collected in these chambers and is removed thence to be treated in the ordinary way.—Patent abandoned.

2824 E. BENINGFIELD. AN IMPROVED LIFTING MACHINE, APPLICABLE AS A FIRE ESCAPE AND FOR REPAIRING AND DECORATING HOUSES AND OTHER BUILDINGS. Dated October 8, 1867.

Here the inventor takes three pieces of light metal tubing, or tough light wood, from about 20ft. to 30ft. long, more or less, and hinges or otherwise connects each piece about midway of its entire length, so as to be capable of doubling up when out of use, and of forming three entire long legs when undoubled for use, forming, in fact, three long legs as a tripod stand.—Patent abandoned.

Trade News.

TENDERS.

ADDISCOMBE.—For the erection of St. Paul's Church, Addiscombe. Mr. E. B. Lamb, architect.

Cook	£6649 0 0
Parman and Fotheringham	6600 0 0
Carter and Sons	5979 0 0
Hill, Claxton, and Hobbs	5939 7 0
Fish	5850 0 0
Gammon	5773 0 0
Keys	5500 0 0
Staines and Son	5498 0 0
Wardle and Baker	5100 0 0
Mundy and Hutchinson	5250 0 0
Holtidge	5200 0 0
Knight	4989 0 0
Lacey and Flaxman	4888 0 0
Wright	4845 0 0
Hatton	4643 0 0

BRIDGWATER.—For erecting a new Congregational Chapel at Cannington, for the Rev. B. Hurman and the committee. Messrs. Habershon, Brock, and Webb, architects:—

Shortley	£910 0 0
Kitch Brothers	790 10 0
Paddon	767 10 0
Hartree	750 0 0

BRITON FERRY.—For erecting an assembly room, for Mr. David Bowen. H. Francis Clarke, architect:—

Treharne	£889 15 0
Jenkins and Cox (accepted)	766 10 0

BASINGSTOKE.—For house, cottage, &c., for Mr. John B. Soper. Mr. Charles Smith, Reading, architect:—

Kendall	£2190 0 0
Barnicant	2158 0 0
Thorne	2003 7 0
Musselwhite	1997 0 0
Peel	1931 15 0
Matthews	1851 0 0
Stevens	1830 0 0
Dover	1827 0 0
Grover	1816 0 0
Bland	1679 3 7
Alway (accepted)	1630 0 0

DULWICH.—For the erection of a public house at Dulwich, for Mr. McLeod (exclusive of fittings). W. Adams Murphy, architect:—

Shapley and Webster	£1192
Colls and Son	1090
Sharpington and Cole	1050
Mitchell (accepted)	1000

EDMONDSTHORPE.—For alterations at Edmondsthorpe Hall. Mr. R. W. Johnson, architect, Melton and Leicester:—

Halliday and Cave	£1510
Past	1476
Neale and Sons	1469

KETTERING.—For houses in Gold-street, Kettering. Mr. R. W. Johnson, architect, Melton and Leicester:—

Coates and Fletcher	£1569 12 0
J. and G. Henson	1261 0 0
Hawthorne	1249 0 0
Wilson and Barlow	1212 0 0
Sharman	1185 0 0

LONDON.—For re building No. 83, Old street, Goswell road, for Mr. Harris. Joseph S. Moye, architect:—

Barnett	£700 5 0
Walton	630 0 0
Rudkin	537 0 0
Grover	496 0 0
Sabey (accepted)	475 0 0

LONDON.—For new lecture-room to Gospel Oak Chapel, Kentish Town. W. Allen Dixon, architect:—

	1st Contract.	2nd Contract.
Mann	£525	£475
Garrod	497	474
Manley and Rogers (accepted)	454	478

LONDON.—For a house and shop, No. 17, Crown-street, Finsbury, for Colonel Wilson. Messrs. Haywood and Blashill, architects, Old Jewry Chambers. Quantities supplied by Mr. D. Cubitt Nichol:—

Myers and Sons	£1322
Colls and Son	1258
Browne and Robinson	1220
Axford and Whillier	1185
E. B. Gammon and Sons	1137
Newman and Mann	1086
R. Beeton	1080
T. J. Tully	1075
Hill and Keddell	1060

LONDON.—For excavating and foundations for warehouse, 35, Camomile street, for Mr. E. Smith. Mr. Henry Fuller, architect:—

Browne and Robinson	£325
Hill and Keddell	305
Perry	299
Axford and Whillier	257
Pritchard	227
Ashby and Sons	215
Piper and Wheeler	208
Sewell and Son	200
Staines and Son	187
King and Sons	172
Woodward	163

NEWCASTLE EMLYN, S.W.—For erecting a new chapel for the Welsh Presbyterians. Rev. T. Thomas, Swansea, architect. Materials fit for use from the old chapel to be taken by contractor at the architect's valuation, and the sum deducted from amount of tender:—

Woodward and Davies	£1491 17 10
Jones and Thomas	1370 0 0
Jones and Williams	1350 13 5
Lloyd and Evans (withdrawn)	1192 7 8
Edwards and Evans (accepted)	1180 0 0

SOUTHEND.—For detached villa, coach house, and stables, for the Rev. A. T. Richardson, Southend. W. Allen Dixon, architect:—

Manley and Rogers	£1065
Mann	1035
Staines	947
Garrod	936
Thorne	917
Garrod (accepted)	855

SOUTHEND.—For detached villa for T. Baylis, Esq., Southend. W. Allen Dixon, architect:—

Manley and Rogers	£880
Mann	860
Staines	778
Thorne	747
Garrod	726
Garrod (accepted)	698

WALTHAMSTOW.—For house on Prospect Hill estate. Mr. W. A. Longmore, architect:—

Munday and Hutchinson	£750
Palmer	745
Bailey	595
Elms (accepted)	580

PROPERTY SALES.

APRIL 29.

AT THE MART.—By Messrs. CHINNOCK, GALSWORTHY, and CHINNOCK.—Freehold (small part copyhold) property, situate in the parishes of Marshfield and Colerne, Gloucestershire, known as the Rocks Estate, comprising about 839 acres of arable, meadow, pasture, and wood land, with noble mansion, park, farms, homesteads, water corn mill, house, and several cottages, annual value £1,701—sold for £51,000.

Absolute reversion to a sum of £20,000 4 per cent. debenture stock, Great Eastern Railway, expectant on the decease of a lady aged 60 years—£7,150.

Life interest, in possession, to £20,000 invested on mortgage, at 4 per cent., receivable during the life of a gentleman aged 77 years—£3,600.

Life interest of a gentleman, aged 42 years, in the income arising from £8,000 invested on mortgage, at 4 per cent.—£3,500.

Life interest of a gentleman, aged 42 years, in the income of £4,000, invested partly in a freehold estate, at Thorpe, near Norwich, and the remainder in bank stock—£1,800.

Life interest of a gentleman, aged 52 years, in the sum of £6,574 19s. consols, expectant on the decease of his wife, aged 55 years—£500.

Absolute reversion expectant on the decease of a lady, aged 55 years, in the sum of £5,479 2s 6d. consols, and in the proceeds of an estate at Arley, Stafford, comprising a residence, cottages, and 192 acres, producing £300 per annum—£5,350.

Life interest of a gentleman, aged 46 years, expectant on the decease of his wife, aged 40 years, in the income arising from trust moneys at present consisting of the following investments, viz.:—160 shares Stockton and Darlington Railway, 5,000 dols. Pennsylvaniau 5 per cents., 52,000 dols. United States 10 40 bonds, £17,000 Great Indian Peninsula Railway debentures, £320 10s. 2d. new 3 per cents., producing about £1,650 per annum—£2,100.

Freehold premises, No. 29, King-street, Cheapside, let at £120 per annum—£1,260.

APRIL 30.

AT THE MART.—By Messrs. Fuller, Horsey, Son, and Co.—Freehold residence, No. 47, Brunswick square, Brighton—£3,980.

Freehold house and shop, No. 98, Shoe lane, Fleet street, let on lease at £82 5s. per annum—£1,600.

Freehold, the "Crown and Anchor" public-house, No. 1, New street hill, Fleet street, let on lease at £70 per annum—£2,120.

Freehold nine houses, four with shops and premises, situate in New street hill, Gunpowder aller, Dove court, and King's Head court, Fleet-street, producing £219 10s. per annum—£3,800.

Freehold house, No. 2, New street hill, let at £18 4s. per annum—£340.

Freehold three houses, one with shop, Nos. 4 and 5, New street hill, and 11, Gunpowder alley, producing £89 2s per annum—£1,380.

Freehold house, No. 12, Gunpowder alley, Fleet street, let at £24 per annum—£410.

Freehold house and shop, No. 93, Shoe-lane, Fleet street, let at £49 10s. per annum—£1,000.

Freehold house and shop, No. 98, Shoe lane, Fleet street, let at £41 8s. per annum—£830.

Freehold two houses and shops, Nos. 97 and 97½, Shoe lane, Fleet street, let at £100 per annum—sold for £1,930.

APRIL 29.

AT THE MART.—By Mr. Davenport.—Freehold residence, known as Chestnut House, Chislehurst, Kent, with coach-house, stabling, and paddock, containing 2a. 3r.—£3,800.

By Messrs. E. Fox and Bousfield.—Freehold cottage villa, known as the Limes, Marlborough place, St. John's wood, let at £63 per annum—£1,460.

Freehold seven houses, Nos. 1 to 7, Lack's cottages, Douglas place, Vauxhall bridge road, producing £110 10s. per annum—£930.

Freehold house, No. 24, Vine street, Westminster, let at £26 per annum—£365.

By Messrs. Candy and Luckin.—Leasehold two houses, Nos. 2 and 3, Upper Mary street, St. Leonard street, Bromley-by-Bow, producing £27 6s. per annum, term 80 years from 1846, at £5 7s. per annum—£135.

Leasehold house, shop, and stabling, No. 24, Wynford road, Islington, annual value £52 15s. per annum—£530.

Leasehold residence, No. 7, Douglas road, Canonbury, let at £70 per annum, term 77¾ years unexpired, at £10 per annum—£830.

By Messrs. Temple and Moore.—Leasehold four houses, Nos. 1 to 4, Church road, Homerton, producing £72 16s. per annum, term 90 years from 1858, at £11 per annum—£600.

Leasehold four houses, Nos. 11 to 14, Temple street, Queen's road, Dalston, producing £88 8s. per annum, term 75 years from 1841, at £10 per annum—£750.

By Mr. Bone.—Leasehold residence, No. 23, Blomfield terrace, Harrow road, let on lease at £70 per annum, term 93¾ years from 1849, at £10 per annum—£650.

APRIL 30.

By Mr. Newbon.—Leasehold residence, No. 5, Highbury Park North, let at £85 per annum, term 94 years from 1854, at £8 per annum—£935.

Leasehold residence, No. 6, Highbury Park North, let at £110 per annum, term 94 years from 1854, at £12 per annum—£1,210.

Freehold four tenements, premises, and gardens, at Hornchurch, Essex, producing £60 per annum—£670.

By Mr. W. H. Moore.—Leasehold house and shop, No. 5, Margaret-terrace, Harrow road, annual value £80, term 21 years from 1861, at £65 per annum—£80.

Leasehold house, No. 112, Chalton-street, Euston-road, let at £38 per annum, term 14½ years unexpired, at £4 13s. per annum—£200.

Leasehold house and shop, No. 12, Northam-buildings, Skinner street, Somers Town, let at £40 per annum, term about 16 years unexpired, at £2 per annum—£205.

Leasehold house and shop, No. 58, Middlesex-street, Chapel-street, Somers Town, let at £53 18s. per annum term 19 years unexpired—£250.

Leasehold two houses and shops, Nos. 11 and 13, Cromer street, Gray's Inn road, producing £80 per annum term 80 years from 1810, at £33 12s. per annum—£320.

Leasehold residence, No 58, Camden-street, High-street Camden Town, let at £65 per annum, term 99 years from 1855, at £6 per annum—£700.

Leasehold residence, No. 170, Stanhope-street, Hampstead road, annual value £55, term 94 years, from 1843, at £ per annum—£840.

By Messrs. Wood, Langridge, and Co.—Freehold residence, No. 3, Brook-street, Hanover-square, let on lease a £200 per annum—£4,990.

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 15, 1868.

FLATS FOR THE MIDDLE CLASSES.*

WHY should the places in which a vast number of the working and lower middle classes of the great towns of England pass the whole of their lives be called their "lodgings?" Throughout every second or third rate street in London we perceive unmistakable signs that the houses generally contain as many families as they have storeys, and sometimes more. And yet every one of them has been planned exactly as if the builder thought it was to be occupied only by a single family. We are not alluding solely to those districts from which the wealthy inhabitants of a past generation have flitted and in which some inconveniences are almost inevitable, but to the rows upon rows of new houses which the builders well know will each be tenanted by several families, but which are planned after the old conventional plan, without a thought of the conveniences of the future occupants. Not long ago we went over one of several houses just built in Foley-street, not far from Langham-place. The once aristocratic street is evidently in a state of decadence, and its houses are one and all peopled like so many rabbit warrens. Yet, if we may form a judgment from the rents demanded of them, we can scarce call the inhabitants less than respectable middle-class people. In the house we visited the terms were placarded in the front window almost before the brickwork was dry, and were for two parlours and kitchen, 13s. 6d. per week; second floor, 11s. per week; third floor, 10s. per week. This betokened that the builder well knew that the house was to be tenanted by "lodgers," and as a further indication of this destination he had adorned the doorpost with a row of no less than six brass bellpulls. These brazen signs deceived us. They induced the notion that we might have stumbled upon a builder bold enough to free himself from conventionality, and to plan a house with some regard to the known circumstances of its future occupation. Our delusion lasted no longer than till we peeped into the "parlour." In this, everything was strictly conventional. Paper of a light pattern decorated the walls, the marble chimneypiece was fitted with a "register" stove, which is, of course, quite a useless affair for culinary purposes, and there was no cupboard room provided beyond the orthodox pair of dwarf "sideboards" or cheffoniers, one on each side of the fireplace. The back parlour was a reduced copy of the front, minus the cheffoniers. The front kitchen, dark as a London kitchen with but a small "area" in front usually is, was fitted with a range, a dresser, and some other arrangements for domestic convenience, which, however, were to be monopolised by the tenant of the "parlours" in consideration of his 13s. 6d. per week. There was a smaller cooking range in the still darker back kitchen, and this apartment, we understood, was to be left for the joint use of the five other families. Whether it was likely to prove of any practical use to persons who would have to descend several flights of stairs to get a fifth share of its "comforts" seemed exceedingly doubtful. On the first floor we found a front room blazing in all the glory of a "satin" paper, a showy mantelpiece, an elaborate cornice, a plaster ornament in the centre of the ceiling, and—nothing else. The back room consisted of four walls with a fireplace, and was a copy of the back parlour. No less than 12s. per week, or £30 per annum, would be the rent demanded for these two apartments. On the floors above the rooms were much the same, except that the papering was less magnificent, the ceilings not quite so lofty, and the rents were a shilling a week less. The whole house was, in fact, an ordinary ten-roomed house, planned exactly like its old neighbours built in the last century, and would have been convenient enough had it been, like them in their first days, intended for the occupation of but one family. In such case the domestic work would have been comfortably performed by the servants in their kitchen, and the members of the family would not have required more accommodation than was provided in their special apartments. When, however, instead of one family, it was to be occupied by so many as six, one could not help thinking that the contriver was very much to blame for providing no more extra accommodation than a separate bellpull to each. A bellpull all to one's-self is not a bad thing in its way. It saves Mrs. Jones having to descend to the bottom of the house and climb back to the top in no amiable mood, through having been summoned in mistake for Mrs. Brown. It will not, at the same time, carry clean water or coals to the top, nor will it convey refuse water, ashes, or vegetables to the bottom, and Mrs. Jones and Mrs. Brown have to do this every day, and several times every day. Why should not a water supply have been provided on every floor, and why should there not have been a shoot provided for conveying refuse to the bottom? In the matter of cooking, too, we wonder how Mrs. Thompson on the third floor, who has but two rooms, and more than two children, manages to prepare a meal for her family. It is out of the question for her to descend to the depths of the back kitchen for her one-fifth share of that apartment, and what with that little grate in her room which has next to no hobs, no oven, no boiler for hot water, no anything, as she says, the whole thing must afford a curious example of that state of existence popularly called "hugger-mugger," from which doubtless both the temper and the digestions of the Thompsons suffer considerably. In describing this house and the inconveniences resulting from its want of special arrangements, we are only describing the normal condition of the whole class of "lodgers" in our towns and cities, and our picture will be recognised as true in thousands of homes, not only of the artisan class but of the comparatively well-to-do class. This matter is of real importance. None can say how very much of our want of social progress, of sickness, and of the daily slackening influence of family ties upon young men, with all its fearful results, are to be traced to the influence of homes where every office of the household has to be performed in the presence of all, to their great discomfort, and where domestic privacy is impossible.

A movement began some twenty or thirty years ago to provide dwellings in flats, that is, complete houses fitted with every convenience upon each floor, for the poorer artisans, and it has met with considerable success among them. The fact of its being a philanthropic movement, however, created some prejudice against it in the minds of the classes just above them, and we are aware of only one building in London divided into flats, and let to tolerably well-to-do occupants of the middle classes.* The prejudice is, however, utterly unreasonable, and no person abroad who has actually lived in a flat, or who in England has had the good fortune to get into some of the very few that exist, shares in it. If a few places were only built they would speedily become popular, and a demand would be created for them. That they would pay is beyond all question. If the artisans' model dwellings, which are let at from 2s. to 2s. 6d. a week per room, pay from 5 to 8 per cent., dwellings for the middle classes, who could afford to pay much more, would satisfy any reasonable investment. We should be glad to see something attempted on the co-operative principle, and with prudent and honest management success might be secured.

Dwellings in flats, however, are no longer built exclusively for the lower classes. They are being adopted by the other extreme of society, and the success of those in Victoria-street (a plan of which is included among our illustrations) has led to the building of others in the aristocratic Grosvenor mansions at Pimlico. Having thus been partially adopted by both extremes of English society, we hope before long to see them adopted by the middle strata, and when they shall have had experience of their comforts, privacy, and convenience, they will wonder that they have themselves been such "flats" as for so many years to dwell in lodgings.

As illustrations, we give a series of plans of the upper floors of houses in flats of four, five, six, seven, and nine rooms, and it will be seen that every flat has its own entrance, with its living rooms, bedrooms, and servants' rooms, water-closet, scullery, and every possible convenience entirely to itself, nothing being occupied in common with other tenants but the common staircase.

* See Lithographic Illustration.

* This is not far from the Walworth-road station, and may be seen from the railway. Its privacy is, however, jealously guarded, and an application to inspect it some time ago was courteously declined.

"NO SUPPER NO SONG."

WE are perpetually told that you can always have anything you want if you are only willing to pay for it. There is, however, one point at least where money alone will not do it, though it should help towards it. No one who is much conversant with the progress of art, and especially of that branch of it which it is our particular function to notice, can doubt that the public, though they have been ready enough with their purses, have by no means got an adequate return in the shape of architectural art for their outlay. When we consider how enormous have been the sums spent in the last twenty years, it is not a little astonishing that so little original art has come of it all. Very beautiful and very accurate copies of old work we have had to satiety, but, with a very few honourable exceptions, simply copies, often in mere execution leaving nothing to be desired except that life which can never lighten up any but an original work. This apparent failure of money to produce what is so much desiderated surely to a large extent arises from the misapplication of it. Architects never have been and never will be all of them artists. But still the building, with its art work and furniture, is erected at a uniform rate of commission upon the cost. This would be fair enough if the architect was also the artist, though even then a man with much business on his hands might naturally, unless very unselfish and very devoted to his profession, hesitate before he devoted to some art detail or design as much time and brainwork as would suffice to get through much ordinary but more paying labour. To hope for real fine art from the mere art workman, except in very exceptional cases, is more than is at all reasonable. But it is just as unreasonable to expect a real artist to design goldsmith's work, carving, and sculpture for 5 per cent. upon the cost of the work when executed. The public should get to understand this. They must be taught that they have no right to expect high art in architectural work without paying for it, any more than they would in such arts as painting. No one who takes an interest in the progress of architectural art can wish the same to happen in its case as has happened with painting. When we claim for the architectural artist adequate remuneration, we do not wish him to be pampered and spoiled as the fashionable painter is. The present enormous income

attainable by a painter who has gained any celebrity renders it all but impossible for him to accomplish great and perfect works. The present unhappy habit of painting for the market such pictures as will please and be sure to sell is only a too natural consequence of over payment. In the case we are advocating there is no chance of the same unfortunate result. All we advocate is a sufficient payment, so that an artist may gain as good an income from art work as he would by devoting himself to the mere architectural or rather engineering part of his business, and that more especially in the adjuncts of architecture as furniture, metal work, utensils, and decoration. If the public will recognise the duty of adequately rewarding art labour they will no doubt get it. They will get into the ranks of architects, or associated with them, many that would never dream of such employment at the present day. But this will not take place without the artist also holding a proper position. So long as the designer for the architect is merely a searcher out of old precedents and a skilful adapter of ancient details, his position of course is, and should be, far below that of the architect. But as soon as the mere copyist and draughtsman ends, and we get real original art design, as the remuneration should be higher so should the estimation in which the artists are held. We should not have to lament the acres of bad stained glass if the architect had recognised the claims of his coadjutor, and the public had admitted the value of true art and been ready to pay for it. If stained glass, no matter by whom it was executed and designed, is to be supplied at so much a foot, it follows almost of necessity that it must be merely a manufacture, and the better artists will have nothing to do with it. The same holds good with all kindred subjects, most notably with metal work, in which scarcely any good works have been executed. The failure here doubtless is owing greatly to the extensive use of machinery, which as a matter of course can only produce a mere manufacture—sufficient indeed for the ordinary wants of man, and keeping up with the prevailing fashion of any particular time—but entirely deadening to anything like art of a high order. The terrible want of art power and feeling cannot be a matter of question to those who study the architectural exhibitions. It is sad to see how little attempt at such a thing is discernible in the designs shown either at the Royal Academy or Conduit-street. We cannot fail to observe how in the best designs, clever arrangement of parts, so as to get a sort of picturesqueness, has to serve instead of really artistic treatment. Some may admire the cleverness of the expedient, but the true art lover can scarcely fail to see the incapacity which the mask of picturesque irregularity or crowded unmeaning ornament hides from the general public. A majority of our architects are not artists, and will not be until we recognise the fact that the art labourer is worthy of his hire; that original work is not only better, but more valuable than that which is commonplace or merely copied; and consequently that a higher scale of remuneration should be given for such work.

It is not in the matter of the design alone that more than a mere percentage is absolutely due for really fine art. A design to reach fine art in execution requires perpetual watching and correction. Art workmen are all very well in their way, but unless they possess the art power and knowledge of the designer, the result will be very different from what he meant, unless he is much upon the spot and aids with his advice and correction.

If an artist has very little to do and a peculiar love for unpaying work, he may, for less than the proper value, spend a long time over his design, and also very carefully watch the progress, and do his best to infuse as much as he can of his own spirit into the art workman that carries out his ideas. This may be done in very exceptional cases, but we have no right to expect it. In the case of those who have much to do it is almost an impossibility. If anyone doubts the immense value of such minute and troublesome supervision, he has only to go to any of the exhibitions of works done for the prizes of the Society of Arts and Architectural Museum. He will then see in numberless instances how a very little personal supervision and instruction would have made all the difference. Of course, if we could hope to get first-rate artists in anything else but painting to do their own work, and not to leave the execution of their design in wood, stone, or metal to the hands of others, we should be better off than we are likely to be with the very best ordinary art workmen, under the most diligent scrutiny of the best artists; but till this is possible or probable, we ought at least to get the next best thing, the artist's accurate supervision of the artisan; and, if we are to have this, in simple justice, and so in the long run to our own interest, it must be paid for. It would be to our own interest because in this case, if an adequate remuneration were given for such work in fair proportion to what is given for ordinary straightforward architectural work, surveying, and engineering, it is almost certain that not a few of those who really have some art in their composition would devote more time to the more congenial labours. It is little less than folly to expect that many will do this unless they are to reap the honour and emoluments due to such work—the one as much as the other. It would be unreasonable to expect the artist to be satisfied with a less honourable position in the world than his less gifted fellow worker, even though the matter of remuneration were in a more satisfactory position. This, too, is a matter for the public to take up to a great extent. If they take the matter up and insist upon the best procurable art, they ought also to know by whom it is done, who really designs and executes, and not only properly pay the proper persons, but give them the honour and fame which are their due. In most of the work that has been done lately no great hardship has arisen, because no great art has been displayed. Too often the accessories to the blank building have been anything but adornments, and so when the architect was not also the designer of the ornamental details, furniture, &c., still he has seldom hurt anyone's reputation by keeping his helpers in the background. He has rather had to bear the blame of the incompetency of his assistants. If an architect is indebted to others for works of art, he ought not to be ashamed to confess it, and let the praise or blame due for the work fall to the right person; but what we especially want is that architects themselves should be more conversant with art, and that more real artists should become architects. This can only come to pass if the study of art and the possession of art power pay as well as the study of construction and kindred subjects. If it does not pay either in the honour given to it or emolument received for it, we may be quite sure that it will not exist to any considerable extent. The matter, therefore, though partly in the hands of architects themselves, is mainly in the power of the public. If they are determined to have good art, they must be ready to pay for it, and they should take some pains to find to whom they are indebted for it.

WINDOW LIGHTS.*

MR. LATHAM'S book is a very opportune contribution to the much-vexed question of ancient lights, and a perusal of it by the builder or his principal will be found both profitable and interesting. It can lie on the table for ready and constant reference, which a newspaper could not well do, and it can be slipped into the travelling bag if wanted. It is not intended that every builder shall be his own lawyer in this matter, which, indeed, would be an absurdity, but it will enable any one to see, cleared of the mists of momentary prejudice, whether any principle laid down in the book does or does not govern the particular case in hand. It often happens, too, that, when an appeal to the law has become inevitable, much needlessly lost time, money, and annoyance may be saved by understanding how to plainly describe a case and instruct a solicitor properly. It is well known in the lower division of the legal profession that nothing is so perplexing or worrying to an attorney, should he also happen to be a good lawyer to boot, than the difficulty of extracting safe and reliable instructions from an uninformed client; indeed, we have known many consultations wasted upon what appears to be a very simple matter, *i.e.*, telling your lawyer what you want him to do, and the material he has to do it with. To such an extent is this felt in some offices that it is no uncommon thing to have a shorthand writer present on important occasions. The client rattles away at what he would *wish* the case to be, but which it is not exactly; he is then examined and re-examined, and bowed out. After he has gone the interview is read over, an immense amount of weeding takes place, and notes for drafting are then made. After some half dozen such meetings the case is fit for briefing to send to counsel, and to counsel it goes. But the anxious client is not aware that he has wasted a deal of valuable time, and added considerably, it may be, to "costs out of pocket." Such a book as the one before us, apart from the interest which the reader will find for himself, is calculated by ordinary attention to correct a source of trouble which every respectable solicitor has long deplored.

"The Law of Window Lights" is divided into six chapters, which chapters are again subdivided into sections. Chapter I. treats of the nature of the right to window lights; II., of the origin of the right; III., of the extent of the right; IV., of the loss of the right; V., of the enjoyment of the right under special covenants; and VI., of remedies for injury to the right. The sections into which the chapters are divided deal with the several heads of each division, and will be found extremely handy. On turning to the section, each one will be seen to have under it every paragraph appertaining to its particular subject, so that the reader can ascertain exactly what he is going to read before he reads it. To persons unaccustomed to the perusal of such technical matter as legal literature this guiding subdivision will be of the greatest advantage, and will enable them to save much time and patience.

The first chapter, treating of the nature of the right to window lights, takes us very far back indeed. We are told that in the English as in the Roman law, light and air were things for all of us, and that no man can acquire a personal property in what absolutely belongs to the whole community. In Stephens's Blackstone, 4th edition, vol. i., p. 160, it will be found that "the elements of light, air, and water" are things which "belong to the first occupant during the time he holds possession of them and no longer." The institutes of Roman jurisprudence always lay down that the enjoyment of these elements is the natural-born right of every individual. As a general principle of law every man is owner of the space over his own land, and may do as he chooses with it, providing he erects no public or private injury. The legal maxim is expressed in Latin, as most legal maxims are, in this way:—"Cujus est solum, ejus est usque ad cœlum"—"to him to whom the soil belongs, belongs everything over it, even to the sky."

* "A Treatise on the Law of Window Lights." By F. L. LATHAM, Esq., of the Inner Temple, Barrister at Law. London: Butterworths, Temple Bar, Publishers to the Queen's Most Excellent Majesty.

A misconception prevails extensively among the general public that a man cannot put in a window overlooking your grounds, and even the owners of grounds have gone to law to have a man's light "put out" in this way. Many cases have been tried, and the pleas have been deterioration in the value of the house and destruction of privacy. The law of England recognises no such right to privacy; a man has another remedy in his own hands, and a very effective one, namely, to build to the boundary line of the offending party up to the height of the delinquent window. Should a builder be engaged at any time in building (say) the gable of a house with window openings, and be at some distance from his principal, upon being called upon by the opposite party to build those openings "blind" he must take no heed, but go on. An action for such opening cannot be maintained, and a number of authorities can be quoted in support of this view. The last and most important we will mention. In what is called the great case of Jones *v.* Tapling, arising out of the building of Tapling's great carpet warehouses, in Gresham-street, behind the General Post Office, that point is supposed to have been finally settled. It went through all the various stages up to the Lord Chancellor. In the course of one of the judgments Mr. Justice Blackburn said: "It is quite true that the opening of a new window looking into the grounds of another may not only annoy this neighbour, but may often affect the value of his property; but the law of England considers that no injury." And the late Lord Justice Turner said, in the same case: "The Court has nothing to do with the diminution of the value of a house caused by its windows being overlooked and its comparative privacy destroyed." This was no later than, we believe, the early part of last year, and may be taken to be the law. Lord Chancellor Westbury remarked:—"There is another form of words which is often found in the cases on this subject—namely, the phrase, 'invasion of privacy by opening windows!' That is not treated by the law as a wrong for which any remedy is given."

The law is somewhat singular when carried to what we might call the "nicest perfection." Supposing a man was building on a plot of ground only big enough for the site of the house, and that it was entirely surrounded by another man's land with the exception of a right of way to it, which, of course, he will have; then, that other man might begin to build, too, wall to wall, and completely hem in the first man all round, except the right of way, and the law affords no remedy. In that case one man would be as much entitled to build as another. But, in France, Mr. Latham tells us, the law is very different on this point. There the owner of land is prohibited opening windows to overlook his neighbour's premises unless he leaves a clear 6ft. of space of his own land between the opened wall and the boundary line. When a window is opened in this way with less space than 6ft., it must be placed at such a height in the wall that nobody can look through it. This law is according to the provisions of the *Code Civile*, which is exceedingly intricate and difficult to unravel.

Then, again, with reference to prospect or view. The Roman law acknowledged it, but the English law never has done so. To be sure, decisions have been arrived at on the side of acknowledgment, but they have been reversed. It has been laid down that "prospect," being only a matter of pleasant view, and not of necessity, no action would lie for stopping it; although it has been admitted that a house with a good prospect must be very superior to one with either a very indifferent one or none at all. "Why may I not build up a wall," said Mr. Justice Twisden, "that another man may not look into my yard? Prospects may be stopped, so that you do not darken the light;" and he reversed a judgment that had been given in the court below. And Lord Hardwicke, when the Court of Chancery was invoked to stop the progress of a building that was interfering with the view of the plaintiff's house, also spoke very strongly:—"You come in a very special and particular case, on a particular right to a prospect. I know no general rule of common law which warrants that, or says that building so as to stop another's prospect is a nuisance. Was that the case, there could be no great towns, and I must grant injunctions to all the new buildings in this town." Again, in another case—"It is true that the value of the plaintiff's house may be reduced by rendering the prospect less pleasant, but that is no reason for hindering a man from building on his own ground." The late Lord Cottenham supported these views in much the same language:—"It is not, as is said in one case, because the value of the property may be lessened; and it is not, as is said in another, because a pleasant prospect may be shut out, that the court is to interfere; it must be an injury very different in its nature and its origin to justify such an interference." It will thus be seen that wherever houses are wanted to be built, no matter what the prospect may be of those already there, they cannot in any way interfere with the extension of new buildings. Were it otherwise, we should be in the position supposed by Lord Hardwicke—"there could be no great towns."

Supposing that a builder was told to bring out a shop a little over some spare ground, and that that advance of frontage obstructed the sideway view of other shops, and the other shopkeepers told him to stop, he would be justified in going on, because the people on each side had no right to the view in front of the encroaching shop. As long as the front of their own window was clear, that was all they could claim. According to the Metropolis Local Management Act the Board of Works are invested with a certain power respecting the regulation of the street line. In the recent conversion, however, of the late St. Martin's Hall, Long Acre, into the New Queen's Theatre, a singular advance was made in the frontage line. When it came out it was only level with the public-house on one side, but considerably before the coach factory on the other. Something was said about it, but, as they stood on their own ground, and were fairly abreast of the line of street on one hand, the only remedy was that the coach factory might, if it had any land, follow the example. The matter dropped at that point, and remains there. In another case an action was brought against the Imperial Gas Light and Coke Company for shutting out the prospect by the erection of a large gasometer; but, as prospect was the only point in dispute, Vice-Chancellor Kindersley, after hearing the arguments, declined to interfere. He said, "As to the ground that the gasometer will prevent the view of persons in Ann's-place, it is impossible that that can be a ground for an injunction." And so the gasometer was built, the prospect shut out, and remains so to this very hour.

In common parlance the right to window lights is commonly spoken of as the right to have an obstructed transmission of air over another man's land, or over any houses that may be standing on that land, under certain conditions, which can only be accurately defined in legal phraseology. This right may be acquired in three ways—"by occupancy, by express agreement, and by implied agreement." In the action between the "Fishmongers' Company and the East India Company," Lord Hardwicke laid down the terms of right in the above manner, and further said, in the course of his judgment:—"If the house were built on the old foundation, it would entitle the plaintiffs to their lights as an ancient messuage; but if on the new foundations then the party must show a new agreement, or something to import one."

We will reserve the remainder of our notice of this book for our next impression.

LAND AND MARINE SURVEYING.*

SURVEYING—that is, the profession of the surveyor—may be said to have received its death blow by the preparation and subsequent publication of the Ordnance plans, as those sheets are termed which are the printed or lithographed results of our great national trigonometrical survey. It is no longer a profession *per se*, but may be justly regarded as a branch, an elementary branch, of that of the civil engineer. A surveyor of the old school, in the strict sense of the term, was decidedly not an engineer, but in the present day every engineer ought to be a sound and accurate surveyor, both theoretically and practically. Mr. Haskoll, in the volume before us, devotes the first two chapters to the sole benefit of those who know nothing about the subject, and although it is difficult for an experienced practitioner to read with satisfaction what is of so very simple, almost puerile, a description, yet we suppose that to many this preliminary portion of the book will be of much interest. The remarks on chaining are strictly practical, and the necessity of performing this operation with great care and attention is strongly insisted upon. In fact, whether the system of surveying employed be that by the chain only, or the chain combined with the theodolite or other angular instrument, the whole of the accuracy of the work is dependent upon the precision with which the chaining, or the actual linear measurement of the ground, is accomplished. It is scarcely necessary to remark that what has to be guarded against in chaining is the tendency to an accumulation of error. An inch out one way or the other in a single chain's length would signify nothing, but let that error be constant for every chain in a mile, and at the termination of that distance there would be a total excess or deficiency in the correct measurement of nearly seven feet. This would be an amount very palpable, and one that would not fail to be discovered by another party, especially if there were interested motives to prove the existence of an inaccuracy. Only those who have had a good deal of chaining to do, in surveys and railway work, are aware of the blessing of a couple of good, well-practised chain men, and when they can be obtained they are worth at least half as much pay again as raw hands. It is unfortunately one of the evils attending the lot of the surveyor that he is seldom able to obtain good chain men, for after having trained up a couple whilst prosecuting a survey in one part of the country, his next job may take him hundreds of miles away, and he has all the trouble to begin over again with fresh recruits.

Supposing the field-work to be finished, it must be borne in mind that it cannot be tested until it is laid down upon the paper, or, as it is technically termed, plotted. For this purpose it is not necessary to plot all the fences or smaller lines, but simply to lay down the main triangles with their test or tie lines, and see whether they come in right. We have frequently tested the general accuracy of our work before leaving the locality, or rather the field of our operations, by plotting the main lines very accurately upon a small scale, and thus testing their correctness. When they join at the right points the work is then said to "close." We agree with the author respecting the inadvisability of making extensive surveys with the chain only, but at the same time confess that they can be so made with perfect and even surprising accuracy. We are, however, directly opposed to him regarding the plotting of the day's work in the evening, unless it be unavoidable, as in the case of Parliamentary

* "Land and Marine Surveying, in reference to the Preparation of Plans for Roads and Railways, Canals, Rivers, Towns, Water Supplies, Docks, and Harbours; with description and use of surveying instruments." By W. Davis Haskoll, civil engineer, author of "The Engineers', Mining Surveyors', and Contractors' Field Book," &c., &c. London: Lockwood and Co., 7, Stationers' Hall-court. 1868.

work, where the time is limited. A man's memory must be very bad if it will not last, in connection with a well and clearly kept field book, for a short time, and, moreover we do not believe that after a hard day's work in the field a man is fit, physically speaking, for the night's task. This remark does not apply to simply plotting the main lines as the survey proceeds to check the general correctness of the work. Chapter IV. is devoted to a description of the uses and adjustments of the ordinary surveying instruments, some of which we scarcely expected to have seen noticed in a modern treatise aspiring to the rank of Mr. Haskoll's volume. Thus the cross staff is a very inferior instrument for setting out right angles to the optical square, or the box sextant. The optical square is unquestionably the proper instrument for accomplishing this indispensable operation, constantly occurring, not merely in surveys, but also in setting out what are known as the "side widths" in railway contract work. It is constructed for this especial purpose, and is in reality useless for any other. Compass surveying and the use of the circumferentor are methods which are illustrative of our remarks, and which we thought had died out with the decline of the "old surveyor," and with the improved scientific principles adopted by those engaged upon the Ordnance surveys. The author observes that he does not consider it "quite so accurate as the theodolite." We consider it not worthy the name of a surveying instrument, and should never think of putting it into the hands of a beginner, or allowing him to regard it as one of his future working tools. On the other hand, we perfectly agree with everything that is remarked respecting the box sextant. It might almost be termed a pocket theodolite, so exceedingly accurately can observations be made with it. When once in thorough order and adjustment, and in the hands of one who thoroughly understands it, both theoretically and practically, angles may be taken with it and calculations made from them which, if afterwards checked with the theodolite, will agree without any appreciable discrepancy. Of all the instruments at the command of the surveyor or engineer, the theodolite may be considered the chief, and there is no description of observation or setting out that does not become comparatively easy when one of them can be obtained for the purpose. It is true that they require to be taken care of and used gently, but a good six-inch theodolite by one of the first makers—and there are not many such—if once properly put in adjustment, will not become deranged in its bearings and details unless subjected to wanton rough usage.

While acknowledging the efficiency of the circular protractor with its two arms, we confess that we give the preference to the semi-circular one, but the truth is, that with due care and attention, work can be accurately plotted with almost any protractor, provided it is correctly divided. Excellent surveys have been plotted to almost minute accuracy with nothing better than one of the best made horn semi-circular protractors, and even with the little ordinary rectangular six-inch ivory one it is surprising how closely careful work will check. A chapter on road and railway surveying and another upon traversing bring to a termination what might be called the first and more elementary portion of this useful work.

The remaining and by far the more valuable part of the volume, at least to the professional man, relates to marine surveying, and embraces the more interesting and less known subjects of harbour, tidal, gauging, and other details connected with the duties of the profession. It is a pity that the author does not abandon, at any rate in this portion of the treatise, the somewhat puerile style that runs through all his writings. As an example we select the following.—"The boatman rows on about eleven strokes." This is nearly tantamount to the observation made in the first chapter, that "The first thing to do is to loosen the cord with which the links of the chain are bound together." One might as well be told that it is necessary to open his mouth before he can eat his dinner. These are blemishes in the style of composition which speak well for the author as a practical engineer, but not so well for him as an author, the more especially as a revision of his work by a competent reviewer would have prevented their constant occurrence. Although not new, the remarks in the eleventh chapter relative to gauging streams are to the point, and the exceptional advantages of the triangular method of arriving at the discharge of streams are clearly put forward, and a table of theoretical discharge over one foot in length of any overfall in cubic feet per minute is annexed to them. In order to obtain the actual discharge of the stream, all that is necessary to do is to multiply the numbers given in the tables by the constant or coefficient proper for each particular instance and by the length of the overfall. Thanks to the labours of our meteorological societies, and those of their distinguished members, the average rainfall for any particular district is already known, and, therefore, it is seldom that one is called upon to ascertain it by direct experiment, although in occasional cases it may be advisable to do so. At page 163 there is a little slip, where it is forgotten that an acre is a square dimension, and consequently there is no such thing as a "square acre." A couple of short chapters upon the drawing and preparation of plans, and upon a portion of the ordinary routine of an office, bring to a close the book before us, which we are happy to say is, in every respect, superior to one by the same author that we reviewed a short time ago. The whole volume is well got up, and the plates are clearly and lucidly lithographed, the lettering—a most important point—being especially well executed. It is true that a great part of the information given therein is better learned practically, but the student who first studies his subject in some standard work, and then applies himself to the practice, or as it were to the proving or testing of what he has read, proceeds to his task infinitely better prepared for it than he who has either neglected the means at his command or been, by unavoidable circumstances, debarred from availing himself of the advantages of preliminary study. A careful perusal of Mr. Haskoll's volume will reward any student or young engineer who wishes to know something of his future duties either previously to or after he has joined an office.

THE DURABILITY OF MATERIALS.

MR. EDWIN CLARK read a paper on this subject before the Institution of Civil Engineers, on the 12th inst. The author expressed the opinion that a series of papers devoted not so much to the special application of those philosophical principles which formed the basis of practice as to the consideration of the principles themselves would be of great interest; as numerous questions occurred which could be more effectually discussed in their abstract capacity than in connection with the practical applications out of which they arose. Well-established fundamental principles had been arrived at on many subjects, which it was advisable should be definitely recorded.

The list of materials used by the engineer was small. It included stone and timber among natural productions, and bricks and cement and the metals among artificial products. It was difficult to state, even approximately, the positive life of either of these articles. The durability of any material depended not only on its own inherent properties, but principally on the agencies to which it was exposed; as, for instance, the effects due to climate.

On examining all the facts, and seeking some common characteristic, it was found that among all the causes of decay humidity held the first rank. The decaying influence of humidity was evidently dependent on other coincident circumstances. The mere pressure of water, or even of a saturated atmosphere, was not sufficient to induce rapid decay, which appeared to be caused by humidity only under peculiar conditions. One of these conditions was well known by the popular title of dampness. The decay caused by dampness, as in the case of dry-rot, was as effectually prevented by the presence of water as by a constant current of air, whether perfectly dry or saturated to any degree of humidity. Damp, therefore, was not the mere presence of moisture in the ordinary form in which it was held in solution by the atmosphere. If an hygrometer were placed in a damp situation it would simply indicate perfect saturation; no evaporation took place, but the cotton covering of the wet bulb was speedily covered by a peculiar mould, well-known by its fungus-like odour, and in a short time it was converted into an impalpable powder or ash. Under similar circumstances, timber, leather, paper, and all like materials, underwent the same rapid decomposition; vegetable gums and oils, that were insoluble in water, and even dry hard paints and varnish, became soluble and liquid. Massive timbers were rapidly disintegrated to the core, entirely losing their weight though still retaining their form; and they were often totally free from apparent moisture, although at times dotted externally by drops of brilliant water. Damp spots were, moreover, peculiarly hygrometric, indicating atmospheric changes with remarkable precision, and temporary desiccation in no way disturbed this process. The peculiar odour which always accompanied this condition was one of the best tests of its existence: and the expression that a room smelt damp was strictly correct. The effects were, within certain limits, intensified by increase of temperature and absence of light, and arrested by poisons destructive to vegetable life. If this phenomenon of decay were more closely examined, the process would be found to resemble, in many respects, a slow combustion. The ultimate results of combustion and decay were strikingly similar; the union with oxygen was slowly effected, and the residue was more or less diluted with foreign substances; but whether bodies were burnt or decayed, the remains in the ashes were substantially identical. Decay might thus, to a great extent, be looked upon as a decomposition resulting from the slow chemical combination of oxygen with the matters decomposed. Now, if slow combustion were the cause of decay, and that particular state called dampness were so important an accessory, the inquiry naturally suggested itself, what connection existed between those agencies, or in what way could damp promote the absorption of oxygen? In the case of organic substances, the presence of vegetation in the form of fungus, or mould, was an invariable characteristic of decay, and the decomposing effect of all vegetable growth was beyond question. It might be said that the vegetable growth alluded to was the effect rather than the cause of decay. Doubtless the spores of microscopic fungi followed the law of all other seeds in vegetating only under the peculiar conditions of soil, light, and moisture which were adapted to their growth; dampness and partial darkness, and absolute quietude, and even decay, might be essential to their existence; and therefore it was only under such conditions that they appeared at all. But, nevertheless, when they did appear, their presence rapidly accelerated the decay, and they furnished a vital medium, capable of accomplishing the observed effect—combustion, or slow union with oxygen, of the substances on which they throve. It was probably by some such chemical vital action, the fact could be explained, that even the hardest rocks were rapidly decomposed by the growth of lichens, or that decay should be arrested by poisons which could exert no other influence than the prevention of vegetation. It was equally remarkable that in the putrefaction or rapid chemical decomposition of animal and vegetable substances, the same profusion of the lower forms of animal, as well as vegetable, organisms characterised the phenomenon.

Whatever might be the cause of decay, moisture was an indispensable element. Dry air was incapable of decomposition. Water was a carrier of oxygen in a potent form: and it was only from water, and more especially when in the form of vapour, that the oxygen necessary for decay could be obtained. The durability of tin and iron roofs in Geneva and St. Petersburg was due to the absence of moisture; and the importance of some shelter for timber, and of thorough ventilation wherever it was employed in this moist climate, was a necessary corollary.

The durability of metals, like that of organised substances, depended, mainly, on the resistance they offered to combination with oxygen; and thus their decay might also be regarded as a slow combustion. But their durability further depended on the character of the oxides formed on their surface. Iron exposed to moisture was soon coated with rust, in the form of hydrated peroxides; and as these oxides did not adhere to the surface, additional flakes constantly formed and fell away, until the whole mass was destroyed. Wrought iron in a pure, dry atmosphere suffered, practically speaking, no deterioration in any lapse of time. It was extremely durable in distilled water free from air; but it was slowly oxidised in a moist atmosphere, and with fatal rapidity in air or water containing free acids or other corrosive agents. It was, however, efficiently protected from such agents by paint, which adhered to clean iron with great tenacity. It was also a fact, not hitherto satisfactorily accounted for, that oxidation was to a great extent arrested by vibration. The painting of wrought-iron girders and roofs, more especially in the neighbourhood of smoky towns, was a precaution of the utmost importance. Every care should be taken to expose the iron as freely as possible to the air, to leave no hollows where water could collect, to avoid the contact of damp earth, and especially of vegetation, and to throw the material into the form of heavy bars rather than thin plates. Painting was more economically performed, and was more effectual, when constantly attended to, than under the vicious practice of laying on three or four coats, and then leaving the work for years, till the paint all peeled off, with a layer of rust attached to it. The Britannia Bridge furnished a striking illustration of the value of this system. The maintenance had been effected by two or three men, constantly on the work, who attended to the slightest symptom of local discoloration. As a consequence, the author did not hesitate to express his firm belief that the total loss from rust of the 10,540 tons of which the tubes consisted, did not in twenty years amount to a single pound weight.

Cast iron, when exposed to the action of sea water, slowly decomposed, the iron being dissolved, leaving behind a graphite or plumbago. The action was, however, superficial, and very slow. It could be preserved by painting, where accessible for that purpose, and by any protection which prevented continual renewal of the surrounding medium, as when enclosed by brickwork or masonry. In fresh water it suffered no such deterioration, and under ordinary circumstances its durability in a pure atmosphere appeared unlimited.

In the case of zinc, although the bright metal oxidised even more rapidly than iron, yet the oxide adhered with such tenacity to the metal that it afforded an efficient protection against the continuation of the process. To this property the metal owed its great durability, more especially as its oxide was insoluble in water. In the presence of any solvent of the oxide, this metal was so speedily destroyed as to be practically useless, unless protected by paint. The destruction of zinc in smoky districts was, however, principally due to galvanic action. A similar action produced the rusting away at the base of iron railings, when fixed in stonework, as was usually the case, by being run in with lead. The contact of copper with the iron plates of a vessel was also a source of great danger; and there were numberless other instances in which the contact of metals of different conducting powers was equally destructive. In all such cases the use of paint furnished, at any rate, a temporary remedy.

It was difficult to over-estimate the value of the introduction of the process of coating iron plates with zinc, by simply cleaning and immersing them in the molten metal. All that had been said on the subject of zinc applied equally to galvanised iron, as it was called. In a clear atmosphere its great durability, its stiffness, its freedom from expansion, and its economy, were all qualities of the highest value; while, on the other hand, without constant painting, it was wholly unfitted for the atmosphere of smoky towns, or manufactories, or even stations where it was exposed to the fumes from locomotives. Both the corrosive and the galvanic actions, which in such cases were so destructive, did not cease with the destruction of the zinc, which was soon effected, but continued also to act, with fatal effect, upon the iron itself, as might be seen in many railway stations and sheds near manufacturing towns. The corrosive tendency in zinc and iron obliged the use of the less oxidisable metals, copper and lead. Lead slowly absorbed oxygen and carbonic acid in moist air. It was acted upon by certain waters, and was occasionally riddled with holes by the larva of an insect; and its expansion and contraction required to be carefully allowed for in its use. Its ductility rendered it a valuable material. Copper might, however, in many instances, be used with great advantage in its stead.

Ordinary oil paint was the most efficient material for protecting either metals or wood from the effects of moisture and air; but all oils, resins, and gums exposed to air, and especially to the light of the sun, oxidised and burnt away with more or less rapidity, leaving a powdery residue behind. As a preservative of paint against the heat of the sun and light, attention was directed to the virtue of a coating of silicious sand, dredged on the paint while wet.

The durability of matter was a subject of the highest philosophical interest. The universal law on this planet appeared to be, that no form should be permanent. Never-ceasing destruction and re-construction were characteristic, within the range of the atmosphere, of everything that existed, whether as regarded organic life or inorganic matter: and it was probable that even the atmosphere itself was subject to the same decree.

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this association was held on Friday last, the president, Mr. R. Phenè Spiers, in the chair. The usual routine business was conducted, and Messrs H. Simpson, C. Fuller, and Hagan were elected members. It was announced by the president that at the invitation of Mr. Barlow, C.E., the members would visit the new station of the Midland Railway Company on the 16th inst. Mr. Rickman, the secretary of the Architectural Alliance, attended to request the Association to send four delegates as heretofore to the annual meeting of the Alliance, which would probably be held shortly. Mr. Rickman said that, although the Alliance had not accomplished all that was hoped for at its formation, yet it had been mainly instrumental in causing the adoption in the country of the scale of charges issued by the Royal Institute of British Architects. Through unfortunate and unavoidable circumstances, the last annual meeting was a complete failure, but it was hoped that that would not be the case this year.

Mr. LACY RIDGE, while willing to defer his opinion to that of the meeting, was not—to use his own words—very sweet on the Alliance, neither did he think that the association stood in a true position in sending delegates to the meeting. As a London society, considerable, or at least some, importance was attached to their adhesion to the Alliance, and as the questions within its scope came principally under the notice of practical men, and the great majority of the members of the association were students, he thought that their support was at the best a very weak one, and that at any rate they appeared somewhat out of their place.

Mr. T. ROGER SMITH thought that notwithstanding what had been said by Mr. Ridge, and the lamentable failure of last year's meeting, the association should still continue to send delegates to the Alliance. The Alliance had done a large amount of good, and they should remember that it was their duty to uphold every effort, by whomsoever made, to exalt the position of the profession. He would propose that Messrs. Edis, Rickman, Mathews, and himself, who were the delegates appointed by the association last year, should be requested to act again at the next meeting.

Mr. Smith's motion not being seconded, Mr. Ridett proposed that Messrs. Edis, T. R. Smith, Rickman, and R. Phenè Spiers be elected delegates. A member seconded this proposition, and it was carried.

Mr. LACY RIDGE wished to call the attention of the meeting to a new and improved form of stench trap, manufactured by Mr. J. Antill, of Wandsworth, as being more complete in itself and more effectual against effluvia than any other yet introduced. A specimen was handed round for the inspection of the members, and also a section of the trap.

Mr. MATHEWS then, by way of opening a discussion "On the best means of utilising superfluous heat from ordinary fireplaces," proceeded to describe a suggestion which had occurred to him, and which was referred to in the BUILDING NEWS of February 21, 1868. On the score of economy it was well known close stoves were preferable, but by reason of the English prejudice in favour of an open fire they were by no means generally adopted, and so a vast amount of the heat was wasted. In all the existing means of utilising waste heat, the cold air from the exterior was conducted to the back of the stove, and then warmed and thrown out into the room, and of course a considerable amount of heat escaped up the chimney with the smoke. He proposed to introduce an open chamber or flue at the back of the kitchen range, and carry it right up through the centre of the house to about 5ft. above the top rooms: this flue to be closed at the top. Into this he believed all the heated air would enter. He would then make inlets in the bedrooms, regulated by valves, by means of which the heated air could escape from the flue into the rooms as desired. He did not consider his scheme at all a perfect one, but he thought it at any rate a step in the right direction. He should be very glad if the members would freely discuss it, and find all the fault with it they could.

Mr. T. ROGER SMITH said that he feared the plan would be of little practical use. He thought the air would simply stagnate in the tube or chamber that Mr. Mathews proposed to construct, as it was impossible for a double current of air to pass up and down the tube.

Mr. LACY RIDGE concurred in Mr. Smith's view, and thought that to obtain a current of air it would be necessary in some manner to lay on air from outside. He also thought that, supposing the plan would work, iron-heated air was not by any means desirable in a bedroom.

Mr. RIDETT suggested that the dryness of the heated air, consequent on passing over the iron-work, might in some degree be mitigated by placing a bowl of water at the back of the stove.

The PRESIDENT thought that the members had not taken advantage of the library of the association, and especially had not read Mr. Edwards's book on Ventilation, or they would have been able to criticise Mr. Mathews's plan more fully. He thought there was one fatal objection—the insufficient size of the proposed flue. It was impossible that that small space could conduct sufficient heated air to warm even one room.

Mr. MATHEWS having replied to some of the objections urged, a vote of thanks to him for preparing the subject for discussion was proposed by Mr. Ridge, seconded by Mr. Ridett, and the meeting terminated.

ST. THOMAS'S HOSPITAL.

THE foundation stone of the new St. Thomas's Hospital was laid on Wednesday last, by the Queen, with appropriate ceremony. The old hospital, as will be remembered, was removed to make room for the railway extension at London Bridge, and the managers received a very large sum as compensation from the Railway Company. The new hospital is arranged on the pavilion principle, and is somewhat similar in design to the famous French Hospital La Riboisiére, only, instead of being ranged on two sides of a centre court, as is the case with the French building the plan is extended in a continuous line. The blocks or pavilions are placed at a distance of 125ft. from each other, the distance in the centre court being increased to 200ft., and thus the prominent defect of the La Riboisiére building—the too close proximity of the blocks—is avoided. On the ground floor and first floor the whole length of the hospital is traversed by corridors, connecting the several wards of all the pavilions. These corridors are not carried higher than the first floor, but the flat roof over forms a means of communication to the several blocks of the two pair storey. The pavilions stand at right angles to the corridor, a passage leading direct to the wards, on one side of which is the staircase. The wards will be each 28ft. wide by 120ft. long, and 15ft. high. There will be 28 beds on each, and 1,800 cubic feet of air to each patient. The beds will be placed at distances of 8ft. from centre to centre. Small wards for special cases containing only two beds each are also provided contiguous to the larger wards but not communicating with them. On the opposite side of the passage are the sisters' room, the ward kitchen, and a consultation room for the medical officers. A pleasing feature is the introduction at the river end of the wards of external balconies,

giving a cheerful aspect to the wards, and enabling patients to be placed out in the open air with little trouble. The staircases will be wide and easy of ascent, and the well holes will be occupied by lifts and ventilating shafts. The water-closets, lavatories, and bath rooms attached to each room project from the main building and are divided from the ward by lobbies with windows on both sides.

The hospital proper commences on the first floor and consists of three tiers of wards, four small wards on the ground floor being provided for the reception of accidents. The total accommodation provided for by the plan is as follows:—

	Wards.	Patients.		Patients.
Ground Storey	... 1	... 24 each	...	24
,,	... 1	... 16 ,,	...	16
,,	... 1	... 2 ,,	...	8
First Storey	... 5	... 28 ,,	...	140
,,	... 1	... 16 ,,	...	16
,,	... 6	... 2 ,,	...	12
Second Storey	... 5	... 28 ,,	...	140
,,	... 1	... 16 ,,	...	16
,,	... 6	... 2 ,,	...	12
Third Storey	... 5	... 28 ,,	...	140
,,	... 1	... 16 ,,	...	16
,,	... 6	... 2 ,,	...	12
				788

The general entrance is in the centre, and will be approached from the New Palace-road, Lambeth.

The steward's or superintendent's offices are immediately in front of the hall, and the main corridors branch off from each side, connecting all the departments therewith. The ground floor of the first pavilion to the right is entirely appropriated to the cooking department. The ground floor of the first pavilion to the left is the matron's department, and is provided with a convenient linen store. In the basement of this wing will be extra store-rooms, and living and dining rooms for a class of nurses to be called "The Nightingale Probationers." The remainder of the basement is appropriated to cellars and store-rooms, one part only being reserved for the erection of additional bath rooms if at any time required.

The operating theatres will be large, with a private room attached for the surgeon, and a second room in which a patient may be placed when too weak to be at once carried to his ward. The dispensary and surgery are placed off the main corridor, and the medicine, &c., will be conveyed to the wards by means of lifts. The entrance for out-patients will be in Palace New-road, near Cresier-street. The administration block is at Westminster Bridge end. In the one pair storey, which will be almost on a level with the bridge, will be an entrance hall, waiting-room, counting-house, receiver's-room, strong rooms, almoner's-room, and a suite of offices for the clerk or surveyor of the hospital. On the next floor is the governor's hall and committee-room, with waiting-rooms, &c. The remainder of the block is fitted as a residence for the treasurer, and a staircase leads direct therefrom to the main corridor of the hospital. The two lower storeys are for the residences of three porters and for the offices for the treasurer's house. There will be four houses of eight rooms each, for the resident officers. These will be approached from the Palace New-road, and will communicate at the rear with the main corridors of the hospital.

The chapel is over the entrance-hall, and will accommodate 300 persons. The museum, school-building, lecture theatres, &c., will be placed at the southern end of the site.

With regard to warming and ventilation, reliance will be placed as much as possible on natural ventilation, a simple auxiliary arrangement being contemplated for use at night and in cold weather. Each pavilion will be ventilated independently of the rest.

The building will stand partly on the shore and partly on ground reclaimed from the river. The ends of the blocks next the river have a solid foundation of 22ft. deep over the entire surface. The terrace wall between the ends of the building and the embankment is built on piers and arches. The piers are carried down 50ft. square in concrete, and arches turned from pier to pier in Portland cement concrete.

The foundation stone, which was laid by the Queen, was a fine specimen of Dalbeattie granite, and was supplied by Messrs. Shearer, Smith, and Company, the well known lessees of the Dalbeattie Granite Quarries. The superstructure will be built of red bricks, with Portland dressings, and lined with grey stocks. No other cement than Portland will be used in the building. The brickwork, having brick facings, will be laid Flemish bond, and the rest old English bond. The drain pipes are being expressly manufactured for the hospital by Messrs. Doulton and Co. The interior masonry of the chapel will be Bath stone, from the well-known Corsham Down Quarries. The joiner's work will be superior to the general run of work at present. All glued joints are to be cross tongued; all the locking rails of the doors are to have two double tenons on each edge; and the floors mitred borders round the fireplace slabs. Oak sills of sash frames are to be finished 4in. thick, with outside and inside linings 1in. thick, the back linings ¾in. thick, and pulley stiles of 1¼in. deal. All the girders used will be of Belgian iron. All the detached moulded balusters, terminals, capitals of columns, and pilasters, and the consoles to the second floor windows of the administration blocks will be in Ransome's patent concrete stone.

Throughout the entire building Dennett's fire-proof arches will be used. All the asphalte works, coverings to flats, basement floors, &c., will be executed by Mr. Filkington, of Fish-street hill, who has to maintain his work in an efficient state for five years from the date of its completion. The asphalte used will be "Perrette Volante."

The arrangement of the fire services will provide for the fire cocks to be charged both from the large tanks on the top of each block, and also from the Water Company's main. The fire cocks will be 2½in. metropolitan brigade gauge, and will be of Beck's patent gun metal with two waterways each.

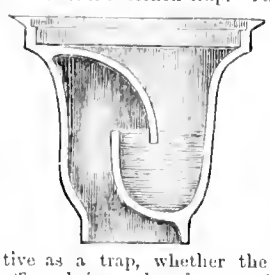
The utmost care seems to have been taken by Mr. Currey, the architect, to ensure perfection of material and workmanship in every particular, and there can be little doubt that when completed, the new St. Thomas's Hospital will be the nearest approach to a perfect building of its kind.

LAON CATHEDRAL.

UNLIKE the generality of French cathedrals, that at Laon has no chevet, but terminates with a square east end, of which we give an illustration. It is of the finest period of French Gothic, having been commenced early the twelfth century, 1112. Mr. Nesfield, in his "Sketches from France," has very fully illustrated this fine cathedral, giving views of its noble towers.

A NEW STENCH TRAP.

THE defects in the ordinary brass bell traps and kitchen sinks are too well known to need comment. Only a week back a correspondent wrote, asking for information, through our "Intercommunication" column, respecting some kind of trap that should "answer its purpose better than that in general use." Our attention has been drawn to a new form of stench trap, patented by Mr. J. Antill, of Merton-road, Wandsworth, which appears at once simple and effectual. It generally occurs in London houses that, by the carelessness of servants, and the perishable nature of the cast-iron material, the gratings are soon broken, and the traps thus transformed into contrivances for the easy admission of deadly gases from the sewers into the houses. This is entirely obviated by the use of Mr. Antill's stench trap. Its action is best described by the accompanying illustration, which represents it in section. It is complete in itself, can be easily cleaned out, and effectually prevents articles being lost by passing into the drain. It is also equally effective as a trap, whether the grating be on or off, and is made of pure pig lead, at a price much cheaper than the ordinary trap. Dr. Connor, sanitary inspector to the Wandsworth Board, has seen the trap, and highly approves of it. He intends to bring it before the board, possibly with a view to its general introduction. At the Architectural Association, where it was introduced to the notice of the members present on Friday last, it seemed to meet with general approval; and we think the qualities in it, to which we draw attention, are sufficient to ensure for it, at the hands of architects and builders, a fair trial, and consequently a considerable amount of favour.



THE ARCHITECTURAL RELICS OF INDIA.

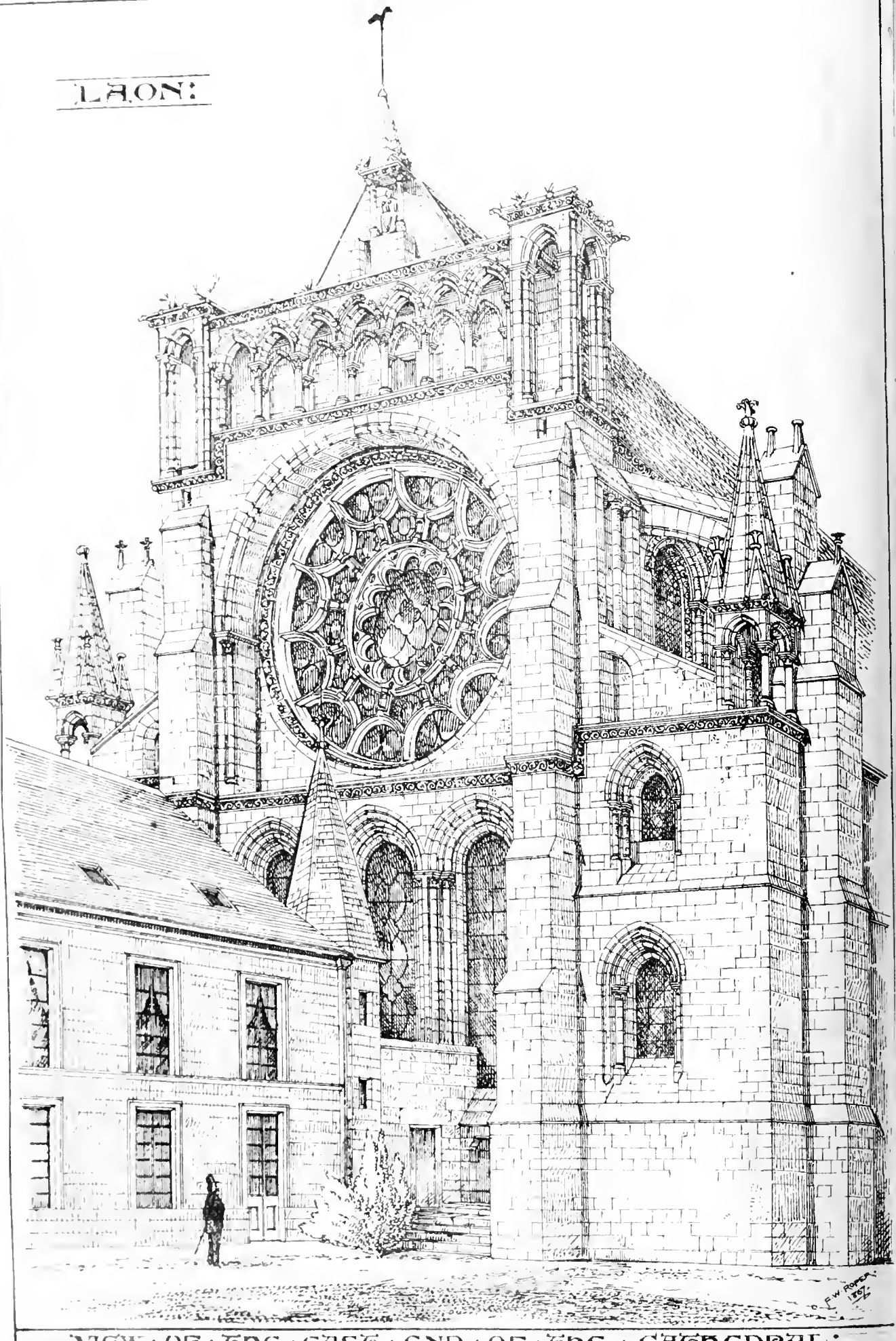
THE Governor-General of India, in council, has resolved to collect information concerning the architectural relics of India. To effect this he asks for the insertion, in every annual administrative report, of a separate chapter on archæology, in which the local governments are requested to notice the condition of all works of art mentioned in certain tests required of them. In the matter of obtaining casts and photographs of the most important architectural works of India, the Governor-General suggests that information may be obtained from H. H. Lake, the Principal of the School of Art in Calcutta. This movement is most likely the offspring of the publications of the Architectural Photographic Association of India. It is no doubt high time that steps should be taken for preserving records of the ancient glories of India. These will not only be an infinite source of interest to the natives, but they will be regarded with curiosity and admiration in this country.

CUPOLAS FOR IRON FOUNDRIES.

AT a recent meeting of the Institution of Mechanical Engineers, held in Birmingham, a paper was read "On an Improved Cupola for Iron Foundries," by Mr. J. Eichhorn, of London. In this cupola, which is the invention of Mr. Henry Krigar, of Hanover, the objects aimed at are to concentrate the heat in the lower part of the furnace, and render the action uniform throughout the operation of melting, and to prevent the blast from injuring the heated metal by oxidising it. The vertical shaft of the cupola, which is made rectangular in form, opens into a lower chamber, the bottom of which forms the hearth to receive the melted metal. Round the bottom of the shaft runs an air passage, into which the blast is delivered from the air main; and the blast entering through this passage cools the brickwork of the cupola, and becomes heated itself; it then passes down into the melting chamber of the cupola through two long slots in the roof, one at the front and the other at the back, extending the whole breadth of the hearth. The front of the furnace is closed by an iron door on hinges, extending the whole breadth, and lined with clay and sand on the inside; and a smaller door is placed at the back to facilitate the drawing of the furnace after each heat. The cupola is charged from the top of the vertical shaft in alternate layers of coke and iron as usual, a filling of coke being first put in for starting before closing up the front door. In the working of the cupola the coke falling into the melting chamber from the vertical shaft stands there in a heap, upon which the blast rushes through the two transverse slots in the roof and the heat from the burning fuel being radiated into the air passage the blast becomes prepared for combining rapidly with the carbon of the fuel before it has an opportunity of coming in contact with the melting metal and wasting it by oxidation, and the action of the blast is finished at a considerably lower level than in ordinary cupolas. The metal obtained in this cupola is found to be very fluid, more so than in an ordinary cupola, while retaining its softness, and the consumption of coke is from 1¼ cwt. to 1½ cwt. per ton of iron melted, according to the magnitude of the charge, the loss of metal in melting being only from 2¼ per cent. to 3½ per cent.

The old saying that we ought not to look a gift horse in the mouth has been disregarded, and most likely properly, by the Liverpool Town Council. Mr. Gower, an English merchant, who recently died at Marseilles, left, on certain conditions, a collection of pictures and works of art to the town of Liverpool. A deputation of the council, who had inspected the collection, reported that none out of about 400 pictures was worth more than £5; while the bronzes—described as old classic works—were of the coarsest modern manufacture, and not even "aged" artificially to imitate long buried works of Roman and Greek art. A question, however, of some importance arises, namely—was the deputation capable of forming an accurate opinion on art works.

LAON:

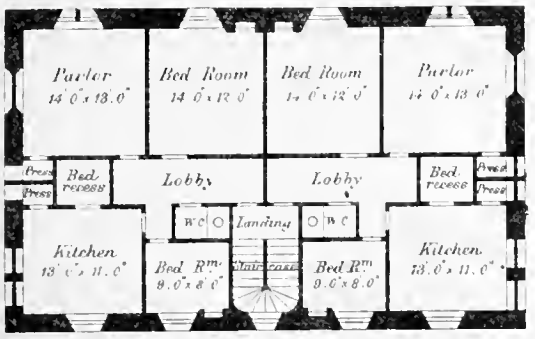


VIEW · OF · THE · EAST · END · OF · THE · CATHEDRAL:

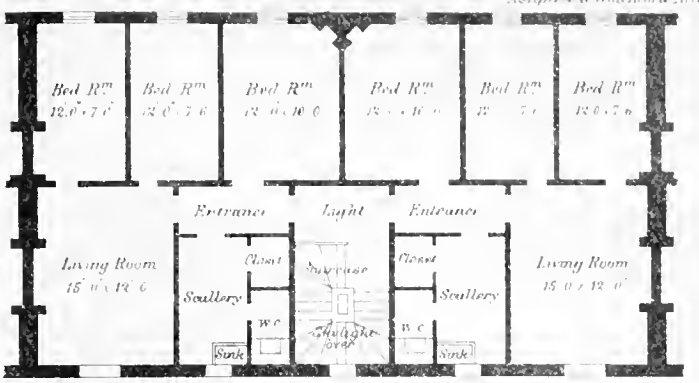
FLATS FOR THE MIDDLE CLASSES.

Flats in a detached House in Scotland.
4 Rooms to each.

Nº 1.

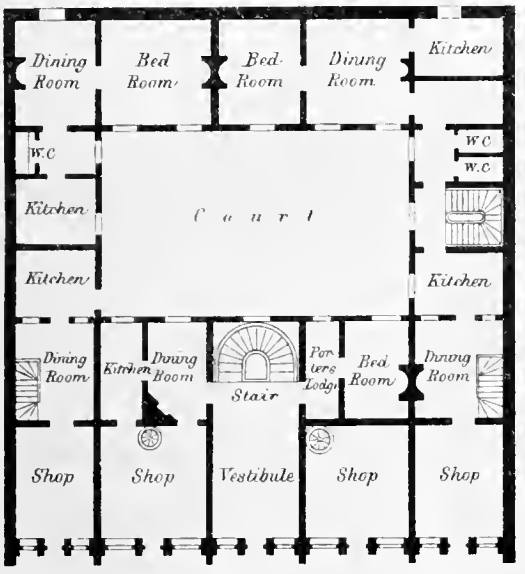


Nº 2. Flats with 5 Rooms to each. Ashpitel & Whichcord Archts



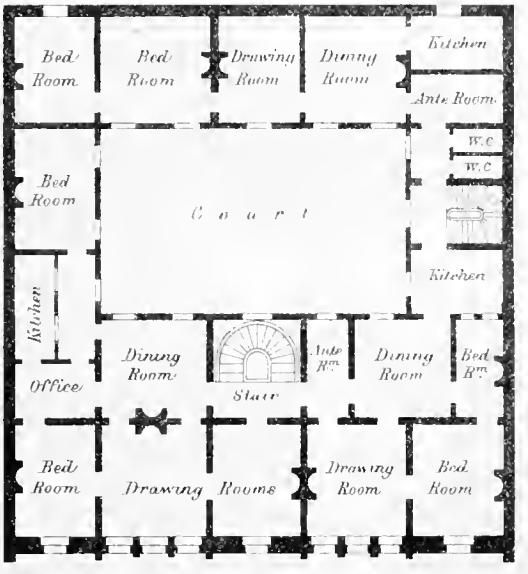
Flats in Paris. 5.6 or 7 Rooms to each.

GROUND FLOOR.

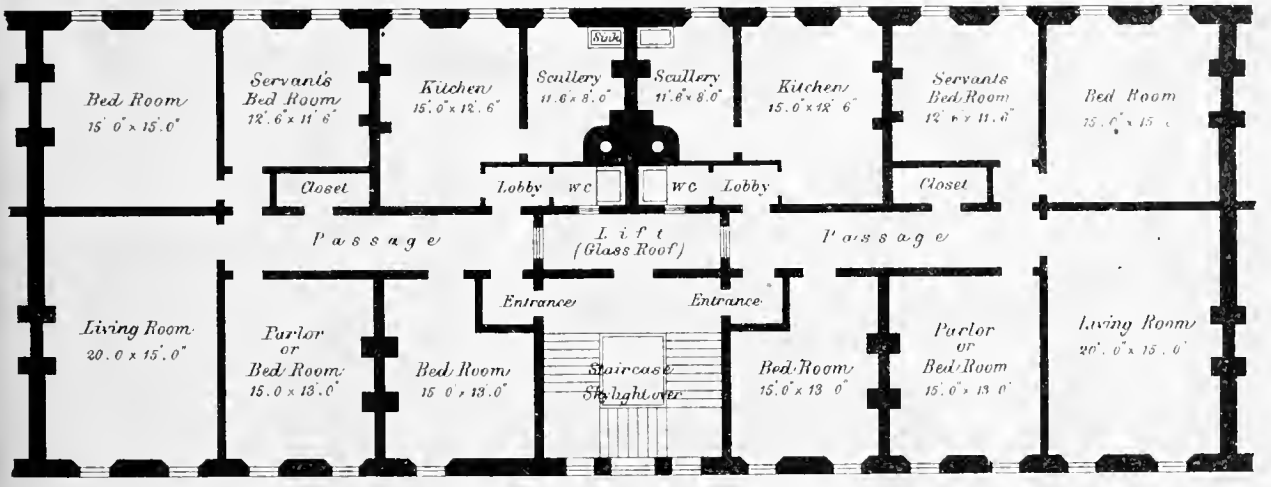


Nº 3.

PLAN OF FLATS.

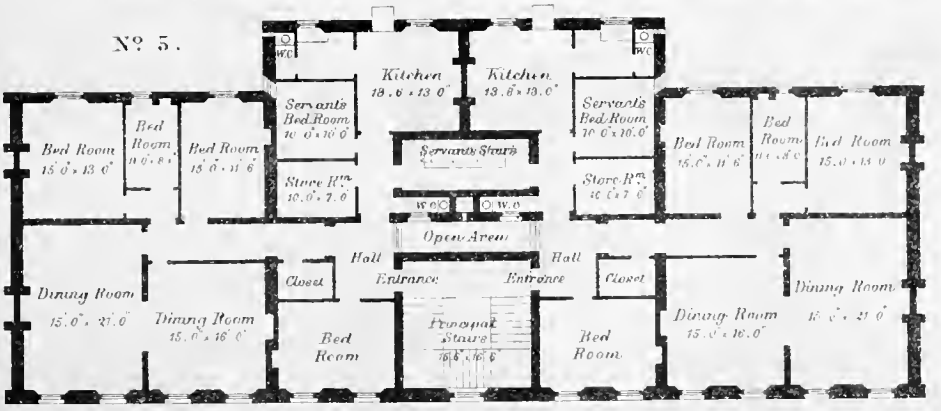


Nº 4. Flats with 7 Rooms to each. Ashpitel & Whichcord Archts



Flats in Victoria Street Westminster. 9 Rooms to each.

Nº 5.



ARCHITECTURAL MUSEUM.

A REPORT signed by A. J. B. Beresford Hope, president; George Gilbert Scott, treasurer; and Joseph Clarke, Hon. Sec. of the Architectural Museum has reached us, and we are glad to learn that the building in Westminster has so far progressed that it will shortly be roofed in. In the course of collecting the fund for building, many most encouraging incidents have occurred, showing the evident appreciation of the step the council have taken. Inquiries have been received from kindred societies respecting space for them in the new premises; new annual subscribers have been added to the list, and new friends and connections secured; many art-patrons hitherto not contributors have come forward with donations for the building fund; and the following offers of materials, &c., have been generously made. Messrs. Clarke and Co., of Rathbone place, have undertaken to fit up the two ground-floor front windows with their patent steel revolving shutters, and Messrs. Bunnett and Co, "in acknowledgment of their employment by most of the chief members of the architectural profession during the last thirty years," volunteered similarly valuable assistance on their hearing of the proposed removal of the collection; the six iron principals for the roof are a gift from Messrs. Kelk and Lucas; Messrs. Burt and Potts promise iron casements for some of the windows; Messrs. Foucard liberally contribute the Caen stone required for the interior of the building; Messrs. Rust and Co. offer glass and mosaic material; Mr. Godwin, of Lugwardine, in addition to £20, will make some ornamental tiles, specially designed for the front of the building; Mr. Fabbrieotti promises carved Carrara marble, of the value of £50; Messrs. Strode and Co. add to a donation of £10 10s., a present of one of their patent gas sun-burners, fixed free of charge; Mr. Chas. Hudson undertakes some coloured decoration; Mr. Robert Chapman (art workman) is willing to make a piece of furniture; Mr. E. Whitehead (art workman) offers to execute some carving; and Mr. N. Thwaites has contributed a model of the museum front.

The building fund now at the disposal of the council amounts to about £2,000, and a further sum in addition to the grants above specified will be wanted to defray the cost of the building alone, exclusive of the legal charges for the lease and of the many incidental expenses unavoidably incurred from the time of selecting the site to that of the removal of the collection to its new home. The council therefore appeal with renewed earnestness to all friends of the museum, for assistance in the useful work they have undertaken.

THE NEW CORN WAREHOUSES AT LIVERPOOL AND BIRKENHEAD.

THE new warehouses built by the Mersey Docks and Harbour Board at Liverpool and Birkenhead for the accommodation of the corn trade of the Mersey are nearly completed, and when finished and at work will be the most perfect buildings of the kind in the world. On the Liverpool side the new warehouses, which are fireproof throughout, have been built on the site of the old Waterloo dock, and comprise three blocks forming a quadrangle, within the margin of which is the corn warehouse dock. The total length of the building is 1,485ft. by 70ft. in width. Besides the quay floor there are five storeys available for storage, and a sixth which is appropriated as a machinery floor. The aggregate clear internal area, including the quay floor, is 11¾ acres. The height of the building from the quay to the top of the cornice is 82ft. The storeys, with the exception of the quay floor, which is 15ft. 3in. high, are 9ft. 3in. from the surface to underside of girder above. Every attention has been paid to the relative strength of each part of the structure, the breaking strain of the beams and girders being three times the load they are intended to carry. An idea of the vast capacity of the warehouses may be gained from the fact that the total weight of grain upon the floors when fully loaded will amount to not less than 77,660 tons. The clear aggregate storage area of all the floors, exclusive of the quay and site spaces, is 48,918 square yards, affording storage capacity for 196,000 quarters of grain. Rails are laid within the warehouses, forming a communication with the main dock line.

Throughout the building the machinery for hoisting and distributing the grain is worked by hydraulic power. There are five self-acting, traversing, rocking cranes for raising the grain in tubs from the hold of the ship. Each crane is capable of raising a ton of grain at a time at the rate of 50 tons per hour, through an extreme distance of 136ft. Having brought the grain to the machinery floor at the top of the warehouses, the cranes discharge it into hoppers, from which, after being freed from dust, it is weighed by a single operation in one-ton lots, and then transmitted by a most ingenious arrangement to any part of the warehouses. This work of transmission is effected by means of endless bands, of which there are two running the entire length of the three stacks of warehouses. This system, we believe, has never before been introduced into England. We witnessed a trial of it on Tuesday last, which was successful in every respect. The bands are of vulcanised india-rubber, 18in. wide, and traverse at a speed of about 500ft. per minute. They are capable of transmitting grain from end to end of the warehouses at the rate of 50 tons per hour. There are shoots for passing grain from one floor to another, into the holds of vessels, or into waggons beneath. Besides one crane there are eleven hoists for barrels and sacks, and twenty jiggers for lowering purposes. The machinery has been supplied by Sir William Armstrong. Mr. J. F. Lyster, the engineer to the Mersey Docks and Harbour Board, has designed and superintended the erection of the whole of the buildings and appliances. The Birkenhead warehouses are in many respects similar to those on the Liverpool side of the water, and are fitted up in the same manner. Their storage capacity is 212,800 quarters of grains. They are not fireproof, but, like the Liverpool warehouses, have been designed by Mr. Lyster. When completed the warehouses on both sides of the Mersey will be handed over by the dock board, under a ten years' lease, to the Liverpool Grain Warehousing Company.

A SARACENIC PULPIT AT SOUTH KENSINGTON.

IN the large court of the South Kensington Museum, says the *Pall Mall Gazette*, will shortly be set up a towering structure some thirty feet high, a Mahometan pulpit from a mosque in Cairo. The work presents a pretty façade composed of a door inlaid with ivory, surmounted by a honeycomb or stalactite cornice; seven steps lead to the platform, above which, in place of sounding board, rises as a crown a decorative canopy rich in detail of Saracenic ornament. The work, with other specimens of Saracenic art purchased for the Museum, formed what is known as the "Meymar collection." These relics, when brought to the Paris Exhibition, naturally excited the rapacity of the South Kensington authorities, who deemed, and we think rightly, that such Eastern products, the like of which seldom find their way to Western Europe, would supply important connecting links in the long historic chain of national arts and industries which it is the professed province of the Brompton Museum to illustrate. This Meymar collection was, we believe, first brought under notice by the Rev. Greville Chester, who recommended it to Mr. Cole. It was then examined and reported on by Mr. J. C. Robinson, Mr. Owen Jones, and Mr. Reginald Stuart Poole. It is no secret that it is mainly due to the elaborate report of the last gentleman, who was selected for his authoritative knowledge of Egypt, modern as well as ancient, that the purchase was made.

The South Kensington pulpit presents a deep, rich tone, which in part is due to the dust of ages, in part to coarse restorations, and let us hope in part also to some remnants of that original colour which shone in prismatic splendour four hundred years ago. It is quite possible that close examination of existing textures and surfaces may yet enable those best versed in Arabic or Moorish decorations to determine how this pulpit was painted when first it came from the hands of Egyptian artificers. Mr. Owen Jones is of opinion that, in the Alhambra at all events, each surface by its first design and position determines its ultimate colour, and hence that form alone may be taken as a true index to polychrome compositions, however complex. However that may be, we trust the authorities at South Kensington will abstain from making any conjectural restoration.

The Indian Government has advanced 52,000,000 of rupees towards the completion of the waterworks of Calcutta.

CHIMNEY BUILDING.*

ON the 22nd of April last Professor Macquorn Rankine gave an account of a chimney recently built at the West Cumberland Ironworks. The chimney now described presents nothing new in design or construction, and is not of any extraordinary size or figure; but as it is a successful example of the application of correct principles and good workmanship to a structure of a useful and ordinary kind, the publication of an account of it may prove serviceable. It has now been in operation for about eight months, and has withstood the gales of an unusually stormy season.

DUTY.—The duty which this chimney has to perform is to carry off the gaseous products of combustion from four blast furnaces, and from various stoves and boilers that are heated partly by burning the inflammable gas from the blast furnaces, and partly by coal. The total quantity of solid fuel consumed may be estimated at about 10½ tons per hour when all the furnaces are at work.

FIGURE AND DIMENSIONS.—Above ground the chimney is a frustrum of a cone with a straight batter. Underground there is a plinth or basement, octagonal outside at the ground line and square at the bottom; cylindrical inside, and pierced with four circular openings for flues. The reason for adopting a straight batter, notwithstanding that a curved batter enables certain theoretical conditions to be more perfectly fulfilled, is that the accuracy of building with a straight batter can be tested at any moment by a glance of the eye, without the aid of instruments. The principal dimensions are as follows:—Height above the ground line, 250ft.; depth of foundation below the ground line (including a layer of concrete 3ft. deep), 17ft.; total height from foundation to top, 267ft. Inside diameter at top of cone, 13ft.; inside diameter at 2ft. above bottom of cone, 21ft. 10in.; inside diameter in basement, 18ft. 10in.; inside diameter of arehways for flues, 7ft. 6in.; outside diameter at top of cone, 15ft. 3in.; outside diameter at 2ft. above bottom of cone, 25ft. 7in.; outside dimensions of square basement, 30ft. by 30ft.; outside dimensions of foundation course, 31ft. 6in. by 31ft. 6in.; outside dimensions of concrete foundation, 34ft. 6in. by 34ft. 6in. The change from the square to the octagonal shape in the basement is made gradually by stepping the brickwork at the corners.

THICKNESS OF BRICKWORK, STABILITY, AND LOAD.—It had previously been ascertained by observation of the success and failure of actual chimneys, and especially of those which respectively stood and fell during the violent storms of 1856, that in order that a round chimney in this country may be sufficiently stable, its weight should be such that a pressure of wind of about 55lb. per square foot of a plane surface directly facing the wind, or 27½lb. per square foot of the plane projection of a cylindrical surface, that is to say, a pressure equivalent to the weight of a layer of brickwork 3in. deep, and of an area equal to the vertical section of a round chimney, shall not cause the resultant pressure at any bed-joint to deviate from the axis of the chimney by more than one quarter of the outside diameter at that joint. (See "Proceedings of the Philosophical Society of Glasgow for 1856," p. 14). By calculating according to that principle the thicknesses of brickwork in the cone were determined to be as follows:—Uppermost 80ft. of height, one and a half brick; next 80ft. of height, two bricks; next 88ft. of height, two and a half bricks; lowest 2ft. of height, increasing by steps from two and a half bricks to four bricks, in order to spread the pressure on the basement. The bed joint of least stability is 2ft. above the ground line; and the deviation of the resultant pressure from the axis of the chimney at that joint which would be produced by such a wind as has been mentioned is 6ft. 4in., being a fraction of an inch less than one-fourth of the outside diameter. The thickness of the arching in the openings for flues is three bricks. The following are the intensities of the mean pressures due to the load on different bed-joints:—At 2ft. above the ground line, eight tons on the square foot; in basement, at the springing of the arches, three tons on the square foot; on the upper surface of the concrete, two tons on the square foot; on the ground below, 1·6 tons on the square foot.

FIREBRICK LINING.—The thicknesses of brick-

* Read before the Institution of Engineers in Scotland, by W. J. MACQUORN RANKINE, C.E., LL.D.

work already stated include the firebrick lining, whose thicknesses are as follows:—In the uppermost 16ft. of the cone, one-half brick; in the lower part of the cone, the basement, and the flue archways, one brick. The firebrick lining is bonded with the common brickwork in the ordinary way, the only difference being that the firebricks are laid in fireclay and the common bricks in mortar. The reasons for adopting this mode of construction in preference to an internal firebrick chimney are as follows:—First, when the firebricks are bonded with the common bricks they contribute along with the common bricks to the stability of the chimney, whereas if an internal firebrick chimney had been used an additional thickness of common brickwork would have been required in order to give sufficient stability to the outer cone; secondly, unless the internal chimney is carried up to the top of the outer cone there is a risk of damage through the explosion of inflammable gaseous mixtures in the space between; and, thirdly, under the same circumstances there is also a risk of the cracking of the outer cone at and near the upper end of the inner cone through unequal heating at that place. Vertical cracks in a chimney are the more dangerous the higher the level at which they occur; because the safety of the higher part of a chimney depends more on cohesion and less on weight than that of the lower part. When such cracks take place near the ground they are of little or no consequence. The basement is paved inside with 6in. of firebrick resting on 6in. of common brick which rests on the concrete.

Ordinary Brickwork.—The ordinary brickwork is built of white bricks of very good quality, supplied by the Iron Company. It is built in English bond. In the basement there is one course of headers to every two courses of stretchers; in the cone one course of headers to every three courses of stretchers. Strips of No. 15 hoop iron, tarred and sanded, are laid in the bed joints of the cone at intervals of 4ft. in height, with their ends turned down into the side joints. Care was taken to bed the hoop iron on the common brickwork, and not on the firebrick lining. The length of hoop iron in each bed joint in which it is laid is twice the circumference of the chimney.

Mortar.—In the concrete foundation, the basement, and a small part of the cone, the mortar was made of hydraulic lime. Owing to an unexpected difficulty in obtaining such lime on the spot, it had to be brought from a distance at considerable expense; and, therefore, the mortar for the rest of the building was made of a very pure lime from the immediate neighbourhood, rendered artificially hydraulic by a mixture of iron scale from the rolling mills at the work; it having been in the first place ascertained that the supply of iron scale could be furnished to the contractor with sufficient rapidity. The following are approximately the proportions of the ingredients of the mortar by measure:—Lime, 2 measures; scale, 1 measure; sand, 5 measures—total, 8 measures. It is scarcely necessary to state that the use of iron scale for hardening mortar and making it artificially hydraulic is familiar to engineers, architects, and builders in Glasgow and its neighbourhood; but in many other parts of the country that process appears to be less known than it deserves. The principal constituents of the iron scale are probably silica and protoxide of iron; but its action upon lime, and the nature of the artificial cement which it forms, have not hitherto, so far as I know, been investigated by chemists. Considering the benefits that have arisen from the chemical analysis of other cementing materials, it is much to be wished that some chemist should undertake the examination of this material also.

Cast-iron Curb—Lightning Conductor.—On the top of the chimney is a pitch-coated cast iron curb 1in. thick, coming down 3in. on the outside and inside. The lightning conductor is a copper wire rope about ¾in. diameter. It terminates in a covered drain in which there is always a sufficient run of water.

Scaffolding.—In the construction of the internal scaffolding care was taken that the needles or horizontal beams should be supported wholly by the brickwork, and not by the upright posts; for great danger has been known to arise from the brickwork coming to bear upon the ends of the needles, and through them on the posts, owing to the settlement of the lower part of the chimney.

Precautions against too Rapid Building.—In order that the concrete foundation might have time to harden before being subjected to a heavy load, it was made by the Iron Company themselves before the contract for the chimney was let; for it is known that intense pressure tends to retard the hardening of concrete. The progress of the building was restricted by the specification to a rate not exceeding 6ft. of vertical height per day.

Contract and Execution.—Tenders were taken from a limited number of builders in the north of England and in Scotland; and the lowest offer was accepted, being that of Messrs. William Wilson and Son, of Glasgow. The work was executed by that firm in a manner that left nothing to be desired.

Cost.—The following were the amounts of the estimated and actual cost respectively:—Engineer's approximate estimate, £1,672; actual cost, including designing and superintendence, £1,560; being at the rate of almost exactly 4d. per cubic foot of the whole space occupied by the building, which is 94,000 cubic feet, nearly.

Present Temperature and Draught.—According to the last account the temperature inside the chimney when doing about three-fourths of its full duty is 490 deg. Fah.; and the pressure of the draught is 1⅞in. of water; which agrees to a very small fraction with the pressure as deduced theoretically from the temperature and the height of the chimney.

Comparison with some other Chimneys.—The dimensions and stability of the chimney which has just been described are nearly the same with those of the second highest chimney at St. Rollox Chemical Works, built about ten years previously, except that in the older chimney the joint of least stability is 100ft. above the ground. In the great St. Rollox chimney, 455½ft. high from foundation to top, the greatest pressure of wind which can safely be borne is almost exactly the same, viz., 55lb. per square foot of a plane surface, or about 27½lb. per square foot of the plane projection of a cylindrical surface. The bed joint of least stability is 210ft. above the ground. In the great Port Dundas chimney, 468ft. high from foundation to top, the bed joint of least stability is 200ft. above the ground; and the greatest safe pressure of wind is 67lb. per square foot of a plane surface, or 33½lb. per square foot of the plane projection of a cylindrical surface; so that here it may be considered that there is an excess of stability.

PARLIAMENTARY NOTES.

On Tuesday evening in the House of Lords, Viscount Hardinge asked what steps the Government proposed to take with respect to the preparation of designs and plans for the new National Gallery. The Earl of Malmesbury said that on receiving the report of the committee of which the noble viscount was chairman, the Government communicated with the trustees of the National Gallery. The trustees reported to the Government on the subject, and gave some very valuable advice. Plans would be prepared in accordance with the suggestions of the trustees; but in consequence of the report of the judges, his noble friend the First Commissioner of Works had not yet decided who the architect should be. He was not at present able to say whether it was intended to purchase the site of the barracks adjoining the National Gallery for the purposes of the new gallery, but he would make inquiry and give an answer on a future evening. Lord Overstone urged that no delay should take place in the building of the gallery, as several of the pictures in the National Gallery were being seriously injured through want of room.

On the same evening in the House of Commons in reply to a question by Mr. Layard, as to the progress made in appointing a Commission for the preservation of ancient monuments in India. Sir S. Northcote said that the Governor-General, in consequence of communications which had passed between him and the Secretary of State for India, had had certain resolutions passed in Council both for the better conservation of monuments and also for taking accurate photographs of them, and transmitting them to this country. These measures would apply not only to Bengal but to the north-western and central provinces, and would be carried out by officers named from the Public Works Commission, selected on account of their training and knowledge of the subject. By this means we should be able to secure correct representations of these interesting objects.

On Tuesday Lord Denman rose in the House of Lords to call attention to the uncertainty which prevailed as to the adoption of any plan for the New Courts of Justice. A certificate had been given that the cost of the undertaking would not exceed £1,500,000, but it was probable that by the time they were finished on the scale proposed, the cost would exceed that of the Abyssinian expedition. The Lord Chancellor said that the referees appointed by the Treasury, who were to determine to which of the plans exhibited the award of superior execution ought to be given, were unable to agree that any one of the plans exhibited in competition was the best, but they selected two, and made an award that they thought the interior plan of one of the competitors and the exterior plan of another were the best. That award having been made, some of the unsuccessful competitors objected to it as being beyond the power of the referee. They said, "We entered into competition each one against every other, but not into competition with the joint production of two others." In the memorandum of the terms of competition it was stated that any matter in dispute should be referred to the decision of the Attorney-General. That had been done, and he believed the reference was still going on, and until concluded it would not be in the power of the Commissioners for the erection of the Palace of Justice to take any steps in regard to the selection of any plan. He hoped that before long the reference would be terminated, and that the Commissioners would then be allowed to proceed with the erection of the building.

Building Intelligence.

CHURCHES AND CHAPELS.

The chapel of St. Anthony, Crowley, Devon, was consecrated last week, by the late Bishop of Gibraltar. The style is Early Decorated. The materials used are Westleigh stone, with Bath stone dressings. Mr. Hawkins, of London, was the architect, and Mr. J. P. White the builder. The stone carving is by Mr. Hurley, of Taunton.

On the 31st ult. the parish church of St. Peter, Roborough, Devon, was reopened after restoration. The church consisted of a nave, south aisle, and chancel. About three-fourths of the walls have been rebuilt, the waggon roof has been abolished and open timbered roofing substituted, a chancel arch has been erected, and a vestry added. The floor and altar steps are laid with Maw's encaustic tiles. The total cost of the work is £900. Mr. Henry Lloyd, of Bristol, is the architect, and Messrs. Cock and Grant, of Torrington, are the contractors.

On Friday last the Earl of Dalhousie laid the foundation stone of a new English Presbyterian church in Camberwell. The church will accommodate 850 persons, and will cost £4,000.

St. Martin's Church, Dorking, which has recently been enlarged by the addition of a chancel, was reopened by the Bishop of Mauritius last week. The architect, from whose designs the works have been carried out, is Mr. Henry Woodyer, of Graffham, near Guildford. The contractors were Messrs. Wheeler Brothers, of Reading, the amount of the contract being £6,000.

On Sunday week services were held to commemorate the reopening of the Unitarian Chapel, Northampton, after enlargement. The enlargement consists of a partial lateral extension to the west, affording additional accommodation for 100 persons. The cost of the work is about £800. Mr. Hall is the architect, and Messrs. Clarke and Heap the builders.

New churches are about to be built at Ellechpoor, Akola, and Budnacra, in India.

On Saturday last the foundation stone was laid of a new Wesleyan Chapel, at Lower Broughton, near Manchester. The building will be in the Italian style, and will seat 800 persons. Its dimensions will be 79ft. by 52ft. (outside measurement), and it will have an exterior of pressed bricks with Yorkshire stone dressings. The chapel is to cost £5,000. Mr. William Waddington, of Burnley, is the architect, and Mr. Foggett, of Cheetham, the contractor.

On Monday the new church of St. James, Stockton, was consecrated by the Bishop of Durham. The cost of the building is £6,000, and it will be one of the most complete ecclesiastical structures in the diocese.

A new United Presbyterian Church is about to be erected in Toward-road, immediately adjoining the New Park, Sunderland, from the design and under the superintendence of Mr. Thomas Oliver, architect, of Newcastle-upon Tyne. It will be in the Gothic style of architecture, with walling of local limestone and sandstone dressings.

On Tuesday the new church of St. Nicholas, Cramington, was consecrated by the Bishop of Durham. The building is Early English, with a strong leaning in the details towards French Gothic. It consists of a chancel 21ft. long by 20ft. wide, and a nave 22ft. 6in. wide by 65ft long, with north and south aisles, porch, vestry, and organ chamber. Seats are provided for over 650 persons. The cost of the church is £3,000 The contractors are Messrs. Waterson and Stafford, of Morpeth.

BUILDINGS.

The new school chapel in connection with the Castle Howard Reformatory, York, was opened last week. The style is plain and unpretending, and in accordance with the reformatory itself. The cost was £700. Mr. J. L. Pearson, of London, is the architect.

A building for the use of the members of the Working Men's Club, Oldham, was opened last week by the Mayor (Mr. John Robinson). It contains several rooms on the ground floor, including a newsroom, and a room for bagatelle, &c. On the second storey is a large room, which will be devoted to educational purposes; and behind the building is an excellent bowling-green, and also a gymnasium. The total cost has been £1,313.

On Thursday week the new "Brunnell" wing of the Newcastle Ragged and Industrial Schools was inaugurated. Increased accommodation is provided for 60 inmates and 100 day scholars. The works were designed by Mr. Thomas Oliver, of Newcastle, and carried out by Mr. William Gibson, contractor, of Red Barns.

The *Bombay Builder* says a pauper hospital, or a hospital for incurables, is much needed in the city of Calcutta.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—C. F. H.—T. B.—T. G. H.—C. K.—R. and B.—J. C. J.—T. R. S.—E. W. G.—W. B.—I. L. D.—R. B.—I. A.—H. J. and Co.—W. C.—R. D. and Co.—P. B. A., with photograph of Albert Memorial Museum.—H. J. and Co.—J. Mc.D.—L. J. D.—T. H. S.—A. W.—J. C. J.—T. C.—I. C.—T. H. A.—P. and S.—R. A.—S. H.—I. L. H.—I. H.—A. W. M.—C. L. E.

Correspondence.

THE MANCHESTER TOWNHALL DESIGNS.

To the Editor of the BUILDING NEWS.

SIR,—In both the preliminary and final stages of the competition, there is perceptible in the designs a marked absence of that principle upon which alone great works of architecture have ever been or can be produced, a principle that underlies all that charms the intellect and imagination in the Egyptian and Greek temples, and those Gothic cathedrals whose organic construction is more marvellous still. I do not know that this elementary law has ever been more concisely propounded than by Greenough, the American sculptor, in a letter to his countryman, Emerson, some thirty years back:—"Here is my theory of structure: A scientific arrangement of spaces and forms to functions and to site; an emphasis of features proportioned to their *gradated* importance in function; colour and ornament to be decided and arranged and varied by strictly organic laws, having a distinct reason for each decision: the entire and immediate banishment of all make-shift and make-believe."

By this standard, one would expect to find the great hall, the council chamber, the banqueting and reception rooms, noble in function as in dimensions, severally and distinctly expressed, each in its order of importance. But what do we see? Masses and groupings without relation to plan; and the observer vainly seeks for what is foremost in his mind, the hall itself. For this predominant feature, the stamp and designation of the pile, he may, and that only if he penetrate the structure, find an interior. Nor is the outward and visible sign of what *is* spaced on the grand front distinguished by specific accordance with the internal arrangement. The apartments and rooms are one thing, and the façades applied to them another. They do not fit, nor in their essence belong to the anatomical or structural organism behind. Instead of growing therefrom with the rigour of logic, and expressing rhetorically—so to speak—but even transparently, the one fundamental law of architectural, as, indeed, of all organised being, we have an array of features imposing enough no doubt, and that in a double sense, but for which there is no *raison d'etre*, except pictorial quality. Picture making, however, is not architecture. It is akin to the loud fault of the Renaissance—the old foe under a new face.—I am, &c., JAMES HIBBERT.

Preston, May 11.

DRY CONSERVANCY v. WATER DRAINAGE.

SIR,—I have been attracted by the controversy going on in your columns on this subject, a controversy which to my mind only confirms the adage that truth does not lie in extremes. The original writer advocates too ardently the dry earth, the other is too much enamoured of water. In truth, either has its appropriate sphere. In the first place, then, your correspondent "B." rightly remarks on the confusion existing in the mind of the writer on dry conservancy as to drainage and irrigation, two things not necessarily connected. Still practically the two cannot now be dissociated in the minds of sanitarians. To the system of drainage with irrigation various objections are urged. First, and what strikes home to every man, is its expense; practically, however, the dry earth system does not, as "B." has well shown, obviate this objection, since all household refuse of a fluid nature has still to be carried away by drains. Nor is this all, for there are certain facts of which both writers seem ignorant, which still further necessitate a separate system of drainage. In practical working the success of the dry earth system depends on the separation of the solid from the fluid portions of human evacuations, for if these be not kept apart the quantity of earth required, and the frequent changes rendered necessary, nullify the advantages of the system. In barracks, where there are none but males, the separation may be secured by a transverse partition in the stool, as is done in India, but one can at a glance see that such a system is inadmissible for household purposes. So, again, in prisons, as at Wakefield, stringent rules may secure the use of the urinal with which each prisoner is supplied, but this cannot be expected in private life. These facts should never be forgotten.

Again, it is urged that the dry earth system is applicable to towns as well as to country places; that contractors would be glad to bring the earth and remove the filth. Practically this is not so. At Wakefield Prison, although lying almost in the open country, the authorities have to pay for the removal of the earthy compound, which, whatever may be said to the contrary, does, when accumulated in heaps, give out a very disagreeable odour.

Further, the advocates of dry conservancy tell us that irrigation entails such a waste of material, whilst they speak of earth as a perfect conservator of every useful substance; but what are they to do with urine, kitchen slops, and such like decomposable materials to which the system is not applicable? Are they to throw them directly into rivers, or are they to make use of a secondary system of irrigation? Again, most of the out-and-out advocates of the earth system ignore the fact that the compost of earth and filth is not applicable to all soils; that if mixed up with clay it constitutes a dense tenacious mass, barren, and almost incapable of cultivation. Also that the only kind of soil likely to be truly benefited by the compost is not adapted for the cultivation of those plants which take up most. Neither is irrigation adapted to all soils, but for that no one contends, whilst against phosphates irrigation is urged the fact that ryegrass suits irrigated lands as a crop better than anything else. If, however, I remember aright, there exists an account of a visit paid by a large number of the Leamington sanitarians to Stroud, where they found blooming fields of corn produced by sewage irrigation. But putting that aside it is no mean matter to have converted a sandy waste into land capable of producing thousands of tons of grass. Not satisfied with so maligning the system of irrigation, its opponents spread abroad a report that the grass thus grown taints the cow's milk. This, however, has been contradicted on incontrovertible authority. The advocates of irrigation might, therefore, well say to their opponents, show us equivalent results.

I now approach a somewhat difficult, and certainly a most important portion of my subject, the effects of the two systems on disease. The advocates of dry conservancy are extremely fond of throwing certain facts in the teeth of their opponents. They cite the case of the Tottenham epidemic of typhoid fever as a proof of the evils produced by irrigation. So, also, certain curious facts observed by Dr. Cloriston in the Carlisle Asylum are employed in the same way; but if you will allow me to trespass on your space with some observations important indeed to a true estimate of either system, yet rather alien to the nature of your paper, I shall try to be as brief as possible. It is now admitted that such maladies as typhoid fever and cholera are propagated by germs present in the evacuations of those ill of such diseases. Whether this is the sole mode of propagation is as yet unsettled. It is further admitted that such germs are by far the most dangerous, and the diseases by far the most prevalent, when they have found their way into drinking water. But, on the other hand, it has not been proved that this is the sole mode of propagating disease; on the contrary, certain facts would tend to show that cholera advances faster when dry winds prevail, indicating that cholera germs are most easily transmissible through the air. There is further the analogy of ague, which prevails most, not when a country is under water, but when it begins to be dried up. If this be the case, about which there is no rational doubt to those who are willing to be convinced, I greatly question if the dry earth system is the better of the two, for it has never been shown that if dry earth possesses the power of destroying smells, that it is also capable of destroying cholera and fever germs, which may thus lie dormant until washed by the rains into rivers or wells, the period during which such germs may survive being altogether unknown.

Let it never be forgotten, further, that the system advocated is not that of any kind of earth, but only of dry earth conservancy. If the above remarks be true—and we challenge anyone to dispute them,—the drying and pulverising of the earthy material would be the very thing to set the noxious particles at liberty. Again, the same fact must not be overlooked when advocating the applicability of the system to large towns. People talk of earth heaps in town, and heaps out of town; they forget our climate; we have not the prolonged droughts of India, which render the system so simple there. Most days in the year we have more or less rain, and to what a sweltering mass a good thunder shower followed by bright sunshine might give rise we shudder to think. It is all very well to show a specimen kept for years in a bottle—that is not the practical question.

That water drainage has evils we freely admit. Closets will get wrong, and then one is liable to an influx of gases, not from his own house alone, but from every other along the line of the sewer. No doubt fever may be propagated in this way. So, again, the basements of houses in low-lying neighbourhoods, as Pimlico in London, are liable at any time to be flooded with the most disgusting matters, but the dry earth system would neither do away with the smells nor with the floods, for a sufficient amount of refuse would be left to give rise to both. These facts its advocates ignore, as they do another—that with improved drainage disease has diminished. Even such an unlikely complaint as consumption has been shown to be lessened wherever a good system of drainage has been introduced.

But, on the other hand, the dry earth system has its merits. Those do it wrong who advocate

its introduction into large towns, with the increased traffic and the increased annoyance it entails. Its true sphere is in the country, among detached houses and small villages, where the horrid cesspool system is still rampant, for although some rabid advocates of dry conservancy uphold the superiority of these over even good drainage, the evils I have witnessed prevent my giving them one moment's heed. Should fever break out in one of these places, the havoc it produces is fearful. Witness the case of Terling; and invariably the worst cases occur in those houses situated near an accumulation of filth. Nor is the malignancy of such diseases only increased. Every malady appears in an exacerbated form in the persons of those living in such houses, and long subject to such depressing influences. The advocates of the dry system point to the change which has taken place in disease in recent times, and kindly attribute the lowered type to water drainage. The men are wilfully blind who talk so. They wilfully shut their eyes on facts like those I have already cited. In the country, then, where earth is readily procurable, and where closets are generally outside the dwelling, this system is likely to be most successful. Its universal adoption in large towns is to be sincerely deprecated. People may think they would thereby escape the expense of extensive drainage works; that has been shown to be a mistake. The evils now complained of in connection with our water systems are remediable. Let us take care that we do not introduce, in their stead, a system which may entail greater cost, and prove more inefficacious, than that we now possess. The present controversy is a most unfortunate one; large drainage works are at a standstill, and towns are left in their old, unwholesome state, until this dispute, which, by one party at least, is being conducted with more noise than judgment, shall have been settled. Let us hope it will be soon; but this can only be by either side partially giving way.—I am, &c., M. D.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

SIR,—By reference to your front page, it will be seen that a special meeting is convened for next Monday evening, to consider whether a present use can be made of the Orphan Asylum Fund towards relieving the distress caused by the death a short time since of one of our fellow workers, leaving a widow and large family comparatively destitute. I feel confident that I shall not appeal in vain to our friends to show their sympathy with suffering by their attendance, and I desire to draw attention to a few facts of which I am afraid some are ignorant. The committee have been empowered for some time past to grant temporary relief (vide Rule 5), but the necessity not having arisen, no use has been made of that power. I am afraid that when this fact becomes better known we shall not want for claimants, and therefore I would particularly press upon the attention of our kind friends (especially our brother clerks) the necessity of affording the Institution all the aid in their power either by donations, subscriptions, or recommendation, or better still by all three. Our funds are totally inadequate to be of any other than temporary avail, but the committee look with hopefulness to the future, in confidence that their past labours will not be lost.

I would also beg to acquaint our friends and supporters who have not yet been waited upon for their subscriptions that it is almost impossible for the committee to collect them personally and it will be esteemed a special favour if they will kindly forward them to the treasurer, Mr. Henry Sharp. I shall be very glad to forward copies of the rules and last annual report or supply information to anyone upon application.—I am, &c.,

F. F. MITCHELL, Secretary.

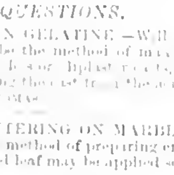
Intercommunication.

QUESTIONS.

[852.]—MOULDS IN GELATINE.—Will you, or some reader, kindly describe the method of making moulds in gelatine from living bodies or plaster casts, together with the method of clearing the cast from the acid of the gelatine mould?—H. THOMAS.

[853.]—GOLD LETTERING ON MARBLE.—I should like to know the best method of preparing engraved letters in marble so that gold leaf may be applied so as to endure.—A. A.

[854.]—RAMPING TWIST.—Will some correspondent be kind enough to furnish me with geometrical working lines for a ramping twist (as per sketch), also giving directions



how to work it?—(a abutment, c coping, 1⅝in. band.)—AN AMATEUR FOREMAN.

[855.]—DAMP BRICKWORK.—Can any of your readers inform me what is the best thing to be done on external bad brickwork, to prevent damp, and not discolour the work? I should prefer something in the way of a cheap wash, to be used with an ordinary whitewash brush. The bricks are very porous.—A. B. C. D.

[856.]—CORROSION OF LEAD PIPES.—It is a well-known fact that when iron and lead are brought into contact galvanic action takes place and the iron gradually decays. I have recently found that lead pipes embedded in the earth were so eaten away as to require renewal after a few years. I should like to know how to prevent this. It is quite evident that it is not the moisture in the earth, or, at all events, the inside of the pipe through which water was constantly passing was smooth and unimpaired. This is rather an important economical question, as thousands of tons of lead piping are being destroyed annually, and if anyone can suggest a remedy he will do a public service. —H. H.

[857.]—TO CLEANSE OLD STONEWORK.—Would any of your correspondents kindly inform me what I should apply to old stonework to cleanse it of coatings of whitewash and paint, and how it should be used? would potash suit the above?—T. H. A.

[858.]—SPECKS ON DRAWING PAPER.—Will you, or some of your readers, be kind enough to inform me, by means of your Intercommunication, the best method to lay on washes of colour on rough drawing paper, without leaving small specks of the paper uncovered?—W. T. F.

[859.]—CHURCH ARCHITECTURE.—Can anyone inform me of any book from which I could obtain information as to the probable origin of the various forms and treatment introduced into church architecture, and what those forms, &c., are emblematic or representative of?—A PUPIL.

[860.]—TWISTED WALL.—Would any of your readers favour me with the geometrical workings of a ramped and twisted wall? By so doing they would oblige—ASPIRANT.

[861.]—SCIENCE AND ART DEPARTMENT.—Mr. Editor,—Will you give me some information whereby I may endeavour to become qualified to enter (say as a clerk) in the Science and Art Department? I want to know what are the qualifications and duties.—ARTHUR.

[The limit of age for ordinary clerks to enter the department is from 18 to 30 years; and the course of examination for candidates includes writing and dictation, transcribing, arithmetic, geography, translation from one ancient or modern foreign language. The salary of ordinary clerks at South Kensington ranges from £100 to £150 annually. Of course, there are many other offices besides that of an ordinary clerk to be filled in this department in London. Let "Arthur" be more specific in his question, and we will endeavour to get for him a more specific answer.]

REPLIES.

[842.]—DRAIN TRAPS.—"A Town Surveyor" recommends in answer to my query that the traps should be kept outside the house, and I agree with him; such a course is desirable where practicable. His experience is, that in the majority of cases the position of the sink admits of such an arrangement. My experience, in London, is entirely different; in houses in confined localities, with underground kitchens, and in housemaid's sinks on the upper floors communicating with water closet soil pipes, a modification of the D trap would be a most useful contrivance.—J. KIRKBY.

[842.]—The most effective, cheap, and simple is the common 4 in. stone ware S trap, the same pattern as the lower part of Messrs. Doulton and Watts' closet, as shown in the BUILDING NEWS last week; no better can be made. Be particular to have the joints of the drain pipes made perfectly tight, as they pass through the wall; and if there be an old brick, or stone drain, put drain pipes in the place of it, or the sewer gases will be liable to pass up the cavities and escape in different parts of the house. Bring the top part of the trap to the level of the flags, so as to have easy access to it, and let the lower end be connected to the drain pipes with a bend or elbow. If there be a bell trap, cut the middle part out of it, dispense with the cup, solder the grate down, and a 1½in. pipe will do to connect the sink to the trap, and leave room to admit a small ladle to clean it when required without disturbing the pipe. I have had the above kind of traps in use for upwards of 12 years, and never had anything to do at them, or had any complaints of anything offensive from them. If there be a rain water tank under the floor it is as necessary to trap the overflow as the sink.—CONSTANT READER.

[842.]—A "Town Surveyor's" remarks last week were very useful. Too much attention can scarcely be paid to such a subject now the hot weather is coming on. At the last meeting of the Architectural Association, one of the speakers called attention to a new and simple drain pipe, recently introduced by Mr. Antill, of Merton road, Wandsworth. The arrangement most effectually prevents the escape of gas from the drain. Of course the adoption of that, or any other trap, will depend, to a great extent, on the price charged for it.—A. W.

[A short description of the trap referred to will be seen in another column.]

[847.]—WROUGHT IRON PLATE GIRDER.—We can supply plates ⅜in. thick and upwards, up to 4ft. 7in. wide and 8ft. 2in. long, maximum weight 6 cwt., at prices which we shall be happy to quote. We charge extras beyond these dimensions and weight.—RIDGWAY and BELLEROCHE, 20, Coleman-street, London.

[850.]—SELF-ACTING ASH CLOSET.—You can witness Moule's Patent Portable Earth Closet in daily operation at 29, Bedford-street, Strand. Ashes are not so good a deodorant as earth, and cannot well be used.—S. H.

[851.]—TAKING OUT QUANTITIES.—"A. J. L." will find the "Young Surveyor's Preceptor," by Mr. John Reid, published by Simpkin, Marshall, and Co., the best work on quantities; price 16s.—H. L. G.

[851.]—A work that will instruct how to take out quantities is always being inquired for in the BUILDING NEWS. Nothing but practical experience will teach this art, and oral instruction from a master of the method; but if it be only required to learn how to assist these instructions, "Hurst's Surveyor's Handbook" contains some very useful memoranda.—F. R.

[851.]—"A. J. L." will find "Hurst's Architectural Surveyor's Handbook" a great assistance in taking out quantities and generally measuring work, besides containing other useful information. The price is 4s. 6d.—T. H.

WAGES MOVEMENT.

A general strike of stonemasons has taken place at Oldham. The dispute relates to both questions of time and money. The masters are in hopes of being able to carry their point.

The operative painters of Bradford some weeks ago struck work for an advance of wages—from 5½d. to 6d. per hour. The masters resisted the application on the ground that it was unreasonable; and the men, who alleged that an implied acquiescence had been previously made, offered to submit the matter to arbitration, but their employers refused. The different masters have now obtained a supply of hands from London. The men who struck work have consequently started an industrial society (limited), with, it is said, great promise of success.

The turnout by the bricklayers of Stockport for an advance of wages has collapsed. The introduction of fresh hands from London and the midland districts has enabled the masters to resume business. Such of the dissentients as have been obstinate have lost their shops, and their places are now occupied by non-unionists. The contest is over, and the pickets have disappeared as intimidators of the imported bricklayers.

On Monday evening a meeting of operative painters was held at Wolverhampton to consider the desirability of placing the trade on a better footing than it now occupies in respect of the rest of the building trades. With little or no discussion it was resolved—"That we solicit the masters for the sum of 1s. advance, and a reduction of two hours of the Saturday." It was explained that the time at which it was desired work should cease on the Saturday was one o'clock, at which time wages were to be paid, either on the job or at the shop.

The masons of Wigan have struck work to enforce the rules of which they had given notice. The great point was a proposed reduction of six hours per week, and this the masters have determined to withstand.

The plumbers' strike at Edinburgh is ended. One by one, at the end of the first week, employers gave way, which led to a general yielding almost immediately. Plumbers' wages are therefore now 6d. per hour in Edinburgh and Leith.

STAINED GLASS.

The east window of St. Silas' Church, Lozells, consisting of three lancet lights, has been filled with stained glass. The subjects of the centre light are St. Silas preaching and SS. Silas and Paul delivered from the Philippian prison. The side lights are filled with two medallions, containing figures of the Evangelists—SS. Matthew and Mark in the dexter light, and SS. Luke and John in the sinister—with their respective emblems. The window accords in style with the early period of the architecture, viz., thirteenth century, and was executed by Messrs. Hardman and Co.

A memorial window has been designed by the Marquis of Bute, and presented to Buccleuch-street church, Edinburgh. The subject is taken from the 21st and 22nd chapter of the Book of Revelations, and represents a bride—typifying the New Jerusalem—adorned to meet her husband. The work was executed by Messrs. Ballantine and Son.

STATUES, MEMORIALS, ETC.

A handsome memorial tablet to the memory of the late Sir T. Noon Talfourd, who for many years represented the borough of Reading in Parliament, has just been placed in the new lodge room of the Philanthropic Society of that town, in which institution the distinguished judge took a great interest. It is on glass, beautifully enamelled, and is the gift of Messrs. Gladden, of Reading, two active supporters of the society.

Nearly £1,500 has been subscribed for the purpose of erecting a statue to the memory of the late Earl Rosse. The committee are about to communicate with Mr. Foley, the eminent sculptor. The statue is to be erected in Parsonstown.

BUILDING AND LAND SOCIETIES.

The sixteenth annual meeting of the Stoke Permanent Building Society was held recently, Mr. Geo. Turner in the chair. The report stated that the society was steadily progressing both in its operations and numerical strength, the present number of shares being 1,050, being an increase in the last two years of nearly 400. The profits made during the year enabled the committee to recommend a dividend of 1½ per cent. in addition to the 5 per cent. compound interest according to the tables. £5,627 had been advanced on good mortgage security. The accounts and report were adopted.

LEGAL INTELLIGENCE.

CAUTION TO BUILDERS.—On Thursday, John Norris, builder, was charged at the Maidstone Petty Sessions, with building three houses in Albert-street, Perryfields, contrary to the bye laws. Mr. Hoar, clerk to the local board, briefly indicated the nature of the evidence, and said that he thought the defendant's plans which he first sent in to the board had been rejected; he had not sent any others, but had gone on building. He then called the borough surveyor, who stated that the three houses in question

consisted of basement, ground floor, and first floor. He had measured the pitch of the various rooms, and the third bedroom on the first floor was 7ft. 3½in., the other rooms being of the regulated height, 8ft. He visited the building as many a dozen times while it was in the course of erection, but did not warn Mr. Norris that he was building contrary to the act, as till the roof was on he could not tell at what pitch the rooms on the first floor would be. If defendant had chosen to have had a sloped ceiling instead of a square one he would have come within the act. The chairman said the case was fully proved. It appeared to the bench to be a piece of obstinacy on the part of the defendant, as at a very trifling expense the room could have been made according to law. To mark their disapprobation of his wilfully disobeying the law, the defendant would be fined 40s. and costs.

MEETINGS FOR THE ENSUING WEEK.

MON.—Royal Institute of British Architects.—Paper on "The Foreign Artists Employed in England during the Sixteenth Century, and their Influence on British Art," by M. Digby Wyatt, F.R.I.B.A.

TUES.—Institute of Civil Engineers.—Discussion on "Engineering Philosophy." "The Durability of Materials," by Mr. E. Clark, M. Inst. C.E., 8.

WED.—Society of Arts.—"On the Condition of the Agricultural Labourer," by J. Bailey Denton, Esq.

Geological Society, 8

FRI.—Architectural Association.—"Modern Furniture," by C. L. Eastlake, Esq.

SAT.—Associated Arts Institute.—Paper on "The Qualities which Constitute the Artistic Mind." By James Barry, Esq.

Our Office Table.

In laying the keystone on a church at Coventry, on Tuesday, a ceremony which was conducted with full masonic honours, Lord Leigh said he held in his hand the mallet with which King Charles II. laid the first stone of St. Paul's, and which was, after the ceremony, presented by his Majesty to Sir Christopher Wren, by whom it was given to the Lodge of Antiquity, No. 2, in London.

On Thursday week Mr. H. Ottley, according to annual custom, delivered a discourse "On the Art Season," at the rooms of the Society for the Encouragement of the Fine Arts. The speaker made a rapid survey of the art history of the year, including all points of interest connected with public works, and the products of art as displayed at the exhibitions of the season and in the printsellers' windows. In the first-named branch of his subject he referred particularly to the late competitions for the Law Courts and the National Gallery, which had each resulted in a dead lock, and which had been so unsatisfactory that he hoped they would be thrown aside altogether, and the questions reopened anew. Speaking of the hundredth exhibition of the Royal Academy, now just opened, Mr. Ottley said that, whether considered as a whole, or in its parts, it did not warrant the repetition of the hackneyed description of newspaper critics, as being "fully up to the average of former years." On the contrary, he considered that it was an unprecedentedly bad exhibition, and one discreditable to the arts of the country. He did not think there was a picture in the whole range of it which the country would be prepared to put forward, whether at home or abroad, as fairly representing the status of our art. This was a sad reflection, and on this hundredth anniversary of the foundation of the Academy the question thrusts itself on the mind how far that institution would have to be held responsible for the result as it stood before them.

Dr. Whitmore, the medical officer for Marylebone, in his last monthly return, says the large number of 40 deaths from consumption and 40 deaths from bronchitis testify to the destroying effects of the cold easterly and north-easterly winds which prevailed during the past month, and ought to furnish a warning of the risk and danger incurred by persons who are accustomed in the early spring to throw off their ordinary winter clothing and adopt that which is only adapted to warm genial weather.

A soldiers' industrial exhibition was opened at Lucknow, in March last. The Government advanced 6,000 rs. for prizes.

The Art Exhibition in Bombay, on which we commented recently (BUILDING NEWS, No. 692), has proved successful. 12,570 people visited the exhibition during the three weeks it was open. The receipts amounted to 14,600 rs., and the expenses were a little over 7,000 rs. Mr. Ellis was the soul of the exhibition. He, however, found a zealous co-operator in the secretary, Mr. Griffiths.

The marvellous rise in real property in the metropolis of America is shown by the following:—The south corner of Broadway and Bond-street has been valued within a lifetime at 10 dols.; it was sold once for 250 dols., then offered for 500 dols., then for 2,800 dols., and in 1839 was again sold for 18,000 dols. Recently 200,000 dols. have been offered for it and declined.

The department of Greek and Roman antiquities in the British Museum appears to have been greatly enriched during the year. Amongst the contributions is a skull sculptured in marble, rather larger than nature, found in the ruins of one of the palaces of Tiberius at Capri. This skull, which appears to belong to the best period of the Greek art, seems to have been carefully modelled from nature, certain abnormal peculiarities of the original being exactly reproduced.

The publication of the "National Records of England and of Scotland" will probably be completed in the course of the present year. It is proposed then to publish the *fac similes* of "National Records of Ireland."

We are informed that the Government, with a view of constituting a separate department of science and art for Ireland, analogous in its constitution to the existing Science and Art Department in London, and of amalgamating, as far as possible, all existing institutions in Ireland receiving State grants for science or art, have appointed a Commission to report on the best means of carrying out this object.

Lord Kinnaird writes in the *Pall Mall Gazette* that he has received a letter from a working man expressing the wishes of a large body of his class in the east of London that the removal of the natural history collection from the British Museum should be prevented, as he says truly that by its removal the great attraction to the working classes would be destroyed. From their earliest youth the poorer classes delight in animals, and those within reach of the British Museum are often led by their examination of the different specimens of natural history there to visit other parts of the museum, and thus a general taste is created for the sciences or works of art.

The works connected with the viaduct across the valley of the Fleet are progressing favourably. The western section of the new street leading from Hatton-garden to Smithfield is completed and paved as far as Farringdon-road, and the eastern section from thence to the Dead Meat and Poultry Market is being advanced favourably. Another new street connecting that just alluded to is being formed, and will run parallel to Farringdon-road, into Farringdon-street, passing beneath the viaduct on the Holborn side; the carriage-way of this is being macadamised and the footway paved. The portion of the viaduct at the top of Holborn-hill is being paved and brought to a level with Holborn, and active preparations are in progress to connect the eastern and western sections of the viaduct by ponderous iron girders at the north end of Farringdon-street.

The notorious "Jack Flint" has been liberated from Bedford gaol after twelve months' imprisonment for the manufacture and sale of spurious arrow heads. The local papers caution the public against him. We confess, says the *Pall Mall Gazette*, that when we daily see auctions carried on at which sham ancient pictures, sham old china, sham curios of all kinds, and sham old wines, are openly disposed of at fancy prices, we cannot help asking ourselves why poor Flint Jack has been incarcerated for a year in Bedford gaol. There is at present at Birmingham a manufacture of bronze phalli, which are exported in considerable numbers to be retailed to collectors who visit the environs of Naples; and nobody thinks of sending the person who manufactures them to gaol under Lord Campbell's or under any other Act of Parliament.

Mr. Headlam's committee of the House of Commons has determined to report in favour of a new chamber to be erected in the Commons Court, according to a plan suggested by Mr. E. M. Barry, A.R.A. The committee came to this decision after a careful consideration of the plans of foreign Houses of Assembly, and of various modes of enlarging the present House suggested by members of the committee and others. The new House is to contain 569 members, and with new division lobbies and other necessary adjuncts is estimated to cost £120,000. The present House is to be restored to its original appearance as designed by Sir Charles Barry, and is to be retained as the entrance lobby to the new House. It will be available for use as at present while the new House is in course of erection.

We learn from the annual report of the Architects' Benevolent Society, just published, that the financial depression generally felt during the past year has affected the funds of the society. Many great works have been postponed or abandoned, and a number of private undertakings have been checked; and the demands on the society have increased. The report says the funds of the society are alike available for administering relief to those overcome by sickness or distress, who have pursued their professional labours either in London or the provinces, the sole object being that of alleviating the sad consequences of those reverses to which all are liable. During the past year a great many new members have been added to the list from Manchester, and it is earnestly hoped that other towns will follow the example thus presented.

The Royal Commission, consisting of Sir W. T. Denison (Chief Commissioner), E. Frankland, Esq., and J. C. Morton, Esq., will shortly hold a preliminary meeting at the offices of the late "Rivers Pollution Commission," 2, Victoria-street, Westminster, to settle their course of proceeding. It is understood that the rivers in the north of England will be the first subject of inquiry before the Commissioners.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2853 R. GEORGE. IMPROVEMENTS IN APPARATUS FOR WARMING AND VENTILATING APARTMENTS OR BUILDINGS. Dated October 11, 1867.

This invention consists in forming a portable heating and ventilating apparatus with a chamber of thin sheet iron enclosing a grate or fireplace, the chamber being of such dimensions that the products of combustion will circulate within it for a sufficient time to part with a large proportion of their heat, and in arranging within such chamber a pipe or other contrivance of thin sheet iron through which a current of air passes from the exterior to the interior of the chamber or building to be warmed or ventilated, and, further, in so arranging the chamber or case and the pipe or contrivance through which the air is admitted that the burning fuel does not come in contact with them, but only the heated products of combustion arising from the combustion of such fuel, substantially as described.—Patent completed.

2880 J. C. PEARCE. IMPROVEMENTS IN FIREGRATES AND FURNACES. Dated October 14, 1867.

Here the grate bars are connected together alternately so as to form two or more lots, which, by way of distinction, are termed lifting bars and traversing bars; the former work up and down edgwise, and the latter backward and forward lengthwise. In a convenient situation, about the front of the furnace, is fixed a revolving shaft provided with cranks or eccentrics, from which the required motions are communicated through suitable rods and levers to the grate bars. A hopper or other receptacle for the fuel is formed at the front of the grate, above the bars, and is fitted with an adjustable plate for regulating or stopping the supply of fuel to the furnace.—Patent abandoned.

2991 H. ADCOCK. IMPROVEMENTS IN KILNS FOR BURNING PIPES, TILES, BRICKS, POTS, AND EARTHENWARE. Dated October 24, 1867.

The patentee claims economising the heat in kilns for burning pipes, tiles, bricks, and earthenware articles, by causing the waste heat from one kiln to pass into a second, and thence to a third or more kilns, as and for the purposes set forth.—Patent completed.

2933 F. W. WADE. IMPROVEMENTS IN THE INTERNAL DECORATIONS OF DWELLING HOUSES AND PUBLIC BUILDINGS, AND IN THE MODE OF MANUFACTURING AND FIXING THE SAME. Dated October 19, 1867.

This invention consists in making such decorations either wholly or partly of cast iron, thereby facilitating the fitting up of the same, and affording great scope for elaborate and durable ornamentation at a small expense. In making these decorations the patterns are made in one or more parts, and of any convenient length, and the castings are nailed or secured to the walls or ceilings, or to both. The improvements in making ceiling centres

[illegible] in re-lating [illegible] ... external [illegible]

[illegible] J. TT[illegible] IMPROVEMENTS IN [illegible] ... Dated October 1[illegible]

[illegible] the following manner:— [illegible] of steel, ... even, the inventor [illegible] ... metal of a sufficient [illegible] ... have to clear, and [illegible] ... He cuts in the iron plate [illegible] ... of the stairs, [illegible] ... is not made usually [illegible] ... the length of the slope of steel [illegible] ... iron plate, turned end to [illegible] ... screw [illegible] in the inside with [illegible] ... He then bends the [illegible] ... for the [illegible] of stairs. Each angle in the [illegible] ... deeper than would be [illegible] ... the back or heel of the [illegible] ... He cuts in each [illegible] ... at the heel of the tread [illegible] ... to which the [illegible] ... suitable metal, and [illegible] ... can [illegible] ... He makes [illegible] of the [illegible] ... the string board, [illegible] ... and supports, and [illegible] ... the flight of stairs, [illegible] ... These pieces serve in putting up [illegible] ... he cuts at the end next the wall a little depth into the length of the [illegible] which he makes rather longer than the width of the [illegible] ... one part forward and the [illegible] ... a cramp or fastening in the wall, the [illegible] ... to each step, and, in case of fire preventing the fall of the staircase. He fixes the [illegible] to the iron plate of the string board instead of [illegible] the tread. To carry the plastering underneath the stairs he proceeds in the same manner as in other stairs, except that, instead of laths of wood, he fixes to the risers small pieces of iron [illegible] from the string board, which are riveted to and project below the tread, and carry strong iron wires longitudinally for the support of the plaster.—Patent abandoned.

2[illegible] J. CUBITT. THE PRESERVATION FROM DECAY OF STONE, METAL, OR OTHER SUBSTANCES, AND FOR [illegible] SO AS TO [illegible] SMOKE OR DIRT FROM ADHERING TO THEM. Dated [illegible] 1867.

Here the inventor applies to the surface to be preserved or hardened a liquid composition which has the property of hardening on the application of heat, and he afterwards heats the surface so prepared by means of a blast or current of hot air, vapour, gas, or flame forcibly impelled against it, or by means of a jet of superheated steam. The ingredients of the liquid composition or glaze will vary according to the nature of the substance to which it is to be applied. A composition of two parts of alumina, two parts of hydrofluoric acid, and one of caustic potash, afterwards rubbed up with ten parts of saturated solution of silicate of soda or potash, forms a good glazing liquid for several kinds of stone and brick.—Patent abandoned.

2[illegible] J. WHITE. IMPROVEMENTS IN MEANS FOR VENTILATING BUILDINGS AND OTHER PLACES. Dated October 22, 1867.

This invention relates to means for withdrawing vitiated air from a room or enclosed space. For this purpose the patentee forms apertures in the ceiling of the room or enclosed space, and he employs suitable channels or passages communicating therewith, and with a chamber connected with the grate or fireplace employed to warm such room or enclosed space, and from such chamber a pipe or channel is carried a short distance up the flue. Thus, by the heat generated by the grate or fireplace in the chamber connected therewith, the air contained in such chamber is rarefied, and in passing off by the flue such rarefied air carries away with it the vitiated air from the room or enclosed space. The vitiated air passes through the apertures in the ceiling and by the channel or passages into the chamber connected with the grate or fireplace, and out thereof through the pipe into the flue.—Patent completed.

2[illegible] R. WEARE. IMPROVEMENTS IN, AND IN APPARATUS FOR, [illegible] FOR THE RECEPTION OF URINE [illegible] MATTER. Dated October 23, 1867.

Here the patentee employs for the reception and treatment of urine and fecal matter a vessel, by preference of cylindrical form, closed at the top and bottom. Within this vessel is an inner lining; it may be conveniently of perforated zinc; the sides of the vessel are thus double, and the space enclosed is packed full of powdered charcoal and dry earth, or other deodorising powder. The soil pipe from the ordinary closet pan is connected with the top of the vessel, so that the urine and fecal matter from the pan are discharged into the interior of the vessel. The more fluid matters then filter through the deodorising material into channels which are formed for it against the outer sides of the vessel, and which are perforated, and these channels lead the fluid matters to a small pipe connected with the bottom of the vessel, and with a drain.—Patent completed.

[illegible]2 L. STOCKMAN. IMPROVEMENTS IN THE CONSTRUCTION OF ROLLERS FOR WINDOW BLINDS. Dated October 25, 1867.

Here the patentee divides the roller through about the central line thereof into two parts longitudinally (except that he does not usually divide its extreme end), and he has one half solid and the other slightly hollowed out (except as aforesaid). These parts he connects together by hinges or joints so that action similar to that of a box and lid is obtained. Into the now hollowed part of the roller he fixes a convenient number of small tenter hooks or catches, whereby the upper edge of the blind is to be secured to the roller, and to facilitate the attachment of the blind he prefers to provide the same with eyelet holes corresponding to the said tenter hooks, pins, or catches, and when the blind is secured the two parts of the roller are to be closed together, and then the blind will be tightly held between them, and the two parts are firmly kept in connection by a pin, bolt, lock, or hook and eye, or other suitable fastener.—Patent completed.

Trade News.

TENDERS.

BRIXTON.—For the erection of Mostyn-road Wesleyan Church, Brixton. John Tarring, architect, 6[illegible], Basinghall-street, E.C.:—

J. D. Hobson	£[illegible]	17	5
John Kirk	9730	0	0
Browne and Robinson	9325	0	0
Hill and Sons	9175	0	0
Brasher and Son	9095	0	0
W. Henshaw	8890	0	0
Jackson and Shaw	8865	0	0
Newman and Mann	8766	0	0
Higgs	8644	0	0
Joseph Thompson	8465	0	0
Saunders	8450	0	0
Myers and Son (accepted)	8293	0	0

COVENTRY.—Tenders for warehouse for Messrs. J. and J. Cash. George Taylor, architect. W. W. Harris, quantities.

Dutton, Coventry	£4600
Makepeace, Coventry	4400
Chandler, Coventry	4320
Hardwick and Son, Birmingham	4275
Matthews, Birmingham	4270
Jefferey and Pritchard, Birmingham	4[illegible]65
Hallam and Co., Coventry	4200
W. and J. Webb, Birmingham	4060
S. Briggs, Birmingham	39[illegible]9
Moffatt, Birmingham	3972
J. Barnsley, Birmingham	3948
Marriott, Coventry (accepted)	3927

DRESDEN.—For the erection of parsonage. Mr. C. Lynam, architect, Stoke-on-Trent:—

Inskip	£1500
Barlow	1280
Collis and Hudson (accepted)	1200

ENFIELD.—For taking down steam flour mill and erecting a pair of cottages for Mr. Thomas Hart. F. Cushing, surveyor:—

Bayes	£210
Field and Son	190
Cross (accepted)	140

ENFIELD.—For erecting four cottages and public house for Mr. Ives. F. Cushing, surveyor:—

M. Holbert (accepted) £756

ERITH.—For taking down buildings and erecting a pair of villas. F. Cushing, surveyor:—

Thompson	£545	0
Churchill	410	0
Archibald	396	10
Dowsett (accepted)	387	10

HANLEY.—For alterations in and additions to the Angel Inn. Messrs. W. and C. Palmer, architects, Hanley:—

Sutton	£897	0	0
Ogden	650	0	0
Matthews (accepted)	611	10	0

HIGHBURY GROVE.—For works in addition to general repairs to premises, No. 46, Highbury-grove, for W. Meyerstein, Esq. J. T. Lepard, Esq., architect:—

Gammon	£867
Smith and Son	859
Nixon and Son	849
Colls and Son	795
Haughton	647

HILDENBROUGH.—For the erection of a new station, inn, and stable buildings, at Hildenbrough, on the New Tonbridge Direct Line. Messrs. Wadmore and Baker, architects. Quantities supplied:—

Wiltshire, Sevenoaks	£1750
Payne and Baldwin, Bromley	1735
Wheatley, Tonbridge	1590
Dove, Tonbridge	1582
Mansfield and Price, London	1550
Punnett, Tonbridge	1243

NEWARK.—For the erection of Gate Lodge, on the Lincoln road, for James Thorpe, Esq. Mr. Charles Baily, architect, Newark:—

Fretwell (accepted) £300

NEWARK.—For the erection of cottage, near Malthouses, Newark, for William Gilstrap, Esq. Mr. Charles Baily, architect, Newark:—

Mackenzie and Fretwell (accepted) £204

NEWARK.—For the erection of residence on the London road, Newark, for Mr. Charles Baily, architect, Newark:—

Fretwell, (Bricklayers, Masons, Plasterers, &c., not including bricks)	£501	10	0
Henderson, (Carpenters and Joiners)	436	0	0
Bousfield, Plumbers and Glaziers	147	12	0
Crossley, Painters	14	0	0

RADNORSHIRE.—For erecting a house with stabling and lodge, near Rhayader, Radnorshire, for the Rev. John Williams. Mr. E. H. Lingen Barker, architect. Quantities supplied by Mr. W. Price:—

D. C. Jones, Gloucester	£2926	0	0
W. Evans, Rhayader	2896	19	6
W. Morgan, Llandinam	2837	0	0
C. Evans, Falgarth	2614	5	0
T. Roberts & Son, London, (accepted)	2507	9	0
J. Mason, Hereford	2355	5	0

The estimates are exclusive of the excavation, water supply, and wall stone.

SUTTON-UPON-TRENT.—For the erection of vicarage house at Sutton upon-Trent, for the Rev. A. C. Graystone. Mr. Charles Baily, architect, Newark:—

Lane	£1615	0	0
Henderson	1612	0	0
Mackenzie	1598	0	0
Fretwell	1598	0	0
Dennett and Co.	1500	0	0
Dennett & Co (revised & accepted)	1259	10	0

MILTON (STAFFORDSHIRE).—For the erection of parsonage. Messrs. Ward and Son, architects, Hanley:—

	House.			Stable.		
Goldstraw	£958	0	0	£63	10	0
G. and J. Moss	940	0	0	70	0	0
Blackhurst	8[illegible]5	[illegible]	0	58	0	0
Walley	888	10	0	60	0	0

PROPERTY SALES.

May 4.

At the Mart.—By Messrs. Wilkinson and Horne.—Freehold ground rent of £115 per annum, secured upon several houses and garden ground, situate in South Lambeth and Wheatsheaf lane—sold for £2,550.

Freehold ground rent of £55 per annum, secured upon six residences, Nos. 96, 98, 100, 102, 104, 106, Camberwell road—£1,430.

Freehold ground rents amounting to £56 per annum arising from 22 houses, Nos. 1 to 11, and 16 to 26, Chapel place, Chapel street, Clapham road—£1,310.

May 5.

By Messrs. Farebrother, Clarke, and Co.—Freehold residential and building estate, comprising a mansion at Balham, with lawns, pleasure grounds, and gardens, and about 44 acres of park-like land; also 6 cottages, a public house and cottage, &c—£36,500.

Leasehold three residences, No. 44 to 46, Cromwell road, Upper Holloway, of the value of £81 per annum, terms 95 and 96 years unexpired at £4 5s each per annum—£615.

By Messrs. Debenham, Tewson, and Farmer.—Freehold two residences, Nos. 1 and 2, Wellington Villas, Wanstead road, producing £73 per annum—£735.

Leasehold ground rents, amounting to £86 per annum, secured upon the Victoria hotel, Falcon road, and eight houses in Ingrave road, Clapham, term 99 years from 1850—£1,450.

By Messrs. Foster.—Freehold stabling, Nos. 3 and 3A, Masons Arms yard, Maddox street, Hanover square, let at £57 15s per annum—£800.

Freehold two residences, situate in Upper Colney Hatch lane, let on lease at £30 per annum—£1,000.

Freehold house, shop, and plot of land situate at Muswell hill, let on lease at £17 14s. per annum—£470.

At the Mart.—By Messrs Baker and Sons.—Copyhold estate, known as Nuptown Town, Warfield, Berks., comprising farmhouse, homestead, and 59a. 1r. 2p. of meadow and arable land—£2,585.

May 6.

At the Mart.—By Messrs. E. Fox, and Bousfield.—Freehold residence, No. 120, New Cross road, annual value £70—£810.

By Messrs. Hards, Vaughan, and Leifchild.—Two undivided third parts of the Dickenson's Bay, or Mackinnon's Estates, in the parish of St. John, in the Island of Antigua, containing 771 acres—£1,500.

Valuable sugar estate, called Tyrrells, or Orleans Plantation, in the parish of St. Paul, in the Island of Antigua, containing 610 acres—£500.

By Mr. George Newman.—Leasehold two residences Nos. 29 and 30, St. John's park road, North, Upper Holloway, term 83 years unexpired, at £14 per annum—£1,155.

By Mr. Saffell.—Leasehold three houses, Nos. 19 to 20, Wood street, Cromer street, Brunswick square, producing £74 per annum, term 20¾ years unexpired at £42 per annum—£120.

Leasehold house, No 19, Thanet street, Burton Crescent, let at £20 per annum, term 35½ years unexpired, at £9 9s. per annum—£50.

Leasehold four cottages, Nos. 3 to 6, Nelson street, Deptford, producing £22 17s. per annum, term 13 years unexpired, at a peppercorn—£110.

Leasehold business premises, with house and yard, known as the Steam Saw Mills, Nelson street, let on lease at £50 per annum, term 18 years unexpired, at £25 per annum—£105.

Leasehold ground rents of £4 5s. per annum (for 18 years) secured on the "Golden Fleece," and cottage adjoining, forming the corner of Nelson street—£40.

Leasehold residence, No. 45, Canonbury park North, let at £56 per annum, term 84¾ years from 1851, at £2 15s. per annum—£670.

Leasehold residence, No. 50, Canonbury Park North, annual value £50, term 86 years from 1850, at £8 per annum—£485.

Leasehold two residences, Nos. 52 and 58, Canonbury park North, producing £98 per annum, term similar to above, at £8 per annum—£1,120.

Leasehold improved rental of £15 per annum (for about 68 years), arising from Nos. 60, 52, and 54, Canonbury Park, North—£265.

Freehold four cottages situate at Carshalton, producing £57 4s. per annum—£300.

Freehold plot of building land, situate as above—£85.

Leasehold two houses and shops, Nos. 125 and 126, High street, Wapping, and two houses, Nos. 1 and 2, Queen's head place, in rear, producing £94 per annum, term 30 years unexpired, at £30 per annum—£690.

May 7.

At the Mart.—By Messrs. Beadel.—Freehold 4a. 1r. 39p. of land, fronting Mott street, Waltham Abbey, Essex—£305.

Freehold 6a. 3r. 37p. of meadow land fronting Mott street and Lippetts hill road, Waltham Abbey—£425.

Freehold 21a. 2r. 38p. known as Aldersgrove wood, fronting Lippets hill road—£1,600.

Freehold and copyhold, 20a. 2r. 18p. of land fronting Lippetts hill road—£1,450.

Freehold residence, known as Springfield, Waltham Abbey, with farm buildings, cottage, orchard, and meadow land, containing 31a. 0r. 7p.—£2,850.

A fuel assignment in Epping Forest, extending over 2a. 1r. 34p.—£40.

At the Mart.—By Mr. Newbon.—Leasehold three houses Nos. 48, 50, and 56, Milton road, South Hornsey, producing £80 per annum, term 99 years from 1852, at £5 per annum—£255 and £265 each.

Leasehold two houses Nos. 60 and 62, Milton road, let, at £26 per annum each term 99 years from 1853, at £5 each per annum £255 each.

Leasehold two residences, Nos. 1 and 2, Ornee villas, St John's road, Upper Holloway, let at £35 each per annum, term 89½ years unexpired, at £7 10s. each per annum £285 each.

Leasehold house and shop, No. 43, Clephane road, St. Paul's road, Canonbury, let at £40 per annum, term 77 years unexpired, at £6 per annum—£410

Leasehold house, No. 31, Manor road, Walworth, let at £44 per annum, term 77 years unexpired, at £5 per annum—£425.

Leasehold house, No. 36, Manor road, let at £42 per annum, term 77½ years from Ladyday, 1868, at £6 per annum—£425.

Leasehold house, No. 13, Sutherland street, Sutherland square, Walworth, let at £30 per annum, term 74½ years unexpired, at £3 15s. per annum—£300.

Leasehold house, No 30, Park place, Liverpool road, Islington, term 21 years unexpired, at £3 6s. per annum—£300.

By Messrs. Foster —Freehold ground rents arising from mercantile premises, stacks of warehouses, &c , situate in Southwark street, &c , London Bridge :—

Freehold ground rent of £570 per annum—£9,300
Freehold ground rent of £250 per annum—£6,400
Freehold ground rent of £115 per annum—£3,025.
Freehold ground rent of £36 per annum—£1,110.
Freehold ground rent of £105 per annum—£2,640.
Freehold ground rent of £114 per annum—£3,200.
Freehold ground rent of £42 per annum—£1,310.
Freehold ground rent of £35 per annum—£975.
Freehold ground rent of £175 per annum—£4,200.
Freehold ground rent of £136 per annum—£3,900.
Freehold ground rent of £60 per annum—£1 720.
Freehold ground rent of £200 per annum—£5,800.
Freehold ground rent of £85 per annum—£2,350.
Freehold ground rent of £165 per annum—£4,400.
Freehold ground rent of £50 per annum—£1,360.
Freehold ground rent of £60 per annum—£1,700.
Freehold ground rent of £30 per annum—£780.
Freehold ground rent of £100 per annum—£2,750.
Freehold ground rent of £300 per annum—£6,550.
Freehold ground rent of £280 per annum—£5,850.
Freehold ground rent of £3.5 per annum -£5,950.

By Mr. J. G. Prevost. Freehold house, No. 2, York Cottages, Wellington road, Bow road, let at £26 per annum—£220.

Leasehold three houses (one with shop) Nos. 1 to 3, Boundary street, Church street, Bethnal green, annu l value £70; also a leasehold ground rent of £7 17s 6d per annum secured on three houses adjoining, in Collingwood street, term 12 years unexpired, at £17 6s. 6d. per annum—£185.

At the Guildhall Coffee house.—By Mr. Franchi.—Freehold plot of building land, situate in Chatsworth road, Stratford—£115.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Francis Foster, Stopsley, Beds, brickmaker, June 1, at 1. —William Gilroy, Maidenhead, builder, June 3, at 1.

TO SURRENDER IN THE COUNTRY.

John Westley Colson, Exeter, house decorator, May 23, at 11.—Benjamin Powell, Burslem, plasterer, June 6, at 11.—George Reece, Harborne, Staffordshire, painter, June 12, at 10.—Thomas Taylor, Wootton Bassett, plasterer, May 26, at 11.—William Bartinshaw, Preston, joiner, May 19, at 11.—Foster Calvert, Halifax, plumber and glazier, May 22, at 10.—Horatio Davis, Gloucester, bricklayer, May 19, at 12.—William Hellyar, Truro, painter, June 2, at 3. —Nicholas Olive, Truro, carpenter, June 2, at 3.—Charles Plumb, Cambridge, painter, May 19, at 3.—Henry Ratcliff, Birkenhead, painter, May 19, at 2.—James Scott, Birmingham, architect, May 20, at 12.—William Ticklepenny, Binbrook, Lincolnshire, joiner, May 27, at 12.—Edward Whittingham, Bridgend, painter, May 16, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

May 28, F. Chadwick, Westminster Chambers, Victoria-street, surveyor.—May 29, R. Warlow, Tavistock-gardens, Cornwall road, Paddington, builder.—June 8, J. Price, Barking, bricklayer.—June 8, D. Fox, Ramsgate, builder. —June 18, J. Lovell, Weston super-Mare, painter.—June 11, T. Collins, Grove-road, Fulham, builder.—June 11, C. B. Bennett, Anns'-terrace, North Peckham, builder.—June 11, J. J Keys, Hammersmith, builder.—June 9, J. O. Millisent, Ann street, Mile-end Old Town, steam saw mills, proprietor.—June 10, T. Willan, Chorlton-on-Medlock, contractor.—May 19, W. Mason, Manningsheath, builder. —May 22, W. Bainton, Hull, bricklayer.—May 22, H. Benson, Hull, painter.

DIVIDENDS.

June 1, J. F. King, Seven Sisters-road, builder.—May 26, J. Nash, Leighton Buzzard, builder—May 28, G. F. Foster, A. Keir, and J. Brotherton, Stockton-on-Tees, timber merchants.—May 23, R. Davies, Kirkdale, painter and plumber.

PARTNERSHIPS DISSOLVED.

Brickell and Gray, Forest-hill, builders.—Gibson and Denison, Northampton, builders.—Newby and Bolton, Oldham, brickmakers.—Sizer and Johnson, Hull, engineers.

DECLARATION OF DIVIDENDS.

T. Oakden, Manchester, encaustic tile maker, div. 5¾d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

IRON :—

		£	s	d	£	s	d	
Welsh Bars in London	per ton	6		0	6	10	0	3
Nail Rod	do	7	5	0	7	12	6	
Hoops	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bars, in Wales	do		10	0	6	0	0	3
Nailrods	do	7	5	0	7	12	6	2½
Foundry Pigs, at Glasg. No 1	do	2	12	5	2	13	0	nett
Swedish Bars	do	10	0	0	10	10	0	2½

STEEL :—

		£	s	d	£	s	d	
Swedish Keg, hammered	per ton	15	0	0	15	5	0	2½
Swedish Faggot	do	0	0	0	0	0	0	

COPPER :—

		£	s	d	£	s	d	
Sheet & Sheathing, & Bolts	per ton	86	0	0	87	0	0	
Hammered Bottoms	do	96	0	0	[illegible]			
Flat Bottoms, not Hammered	do	91	0	0	0			
Cake and Tough Ingot	do	80	0	0	84	0	0	3
Best Selected	do	85	0	0	85	0	0	
Australian	do	84	0	0	90	0		
Yel. Metal Sheathing & Rods	per lb	0	0	7¼	0	0	7½	

LEAD :—

		£	s	d	£	s	d	
Pig, English	per ton	21	5	0	0	0	0	
,, Spanish Soft	do	19	0	0	0	0	0	2½
Shot, Patent	do	22	10	0	0	0	0	
Sheet	do	20	5	0	20	15	0	5
White	do	27	0	0	30	0	0	

REGULUS OF ANTIMONY

		£	s	d	£	s	d	
French	per ton	44	0	0	45		0	

ZINC :—

		£	s	d	£	s	d	
English Sheet	per ton	26	10	0	27	10	0	2½
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0		

* And 5 per cent. discount if laid upon the new system

SPELTER :—

		£	s	d	£	s	d	
On the Spot	per ton	20	0	0	0	0	0	nett
QUICKSILVER	per btl	6	17	0	0	0	0	

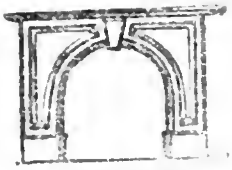
TIN :—

		£	s	d	£	s	d	
English Block	per ton	98	0	0		0	0	
do Bar	do	99	0	0	0	0	0	2½
do Refined	do	101	0	0	0	0	0	
Banca	do	96	0	0	97	0	0	ne
	do	93	0	0	0	0	0	

TIMBER, duty 1s per load, drawback, 1s.

	£	s	£	s
Teak ....load	£11	10	12	10
Quebec, red pine	3	10	4	15
,, yellow pine	2	15	4	5
St John N.B. yellow	0	0	0	0
Quebec Oak, white	5	15	5	15
,, birch	3	10	4	10
,, elm	3	10	5	0
Dantzic oak	4	0	6	0
,, fir	2	5	3	5
Memel fir	3	0	3	15
Riga	3	0	3	5
Swedish	2	2	2	9
Masts, Quebec red pine	6	0	7	0
,, yellow pine	5	0	6	0
Lathwood, Dantzic, fm	5	0	7	0
,, St. Petersburg	8	10	9	5
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				
Quebec, white spruce	13	0	19	0
St. John, white spruce	13	10	15	10
Yellow pine, per reduced C.				
Canada, 1st quality	17	0	18	10
2nd do	11	0	12	0

	£	s	£	s
Archangel, yellow	£11	0	£12	
St. Petersburg, yel.	10	10	11	
Finland	7	11	8	1
Memel	0	0	0	
Gothenburg yellow	8	0	10	
,, white	8	0	9	
Gefle, yellow	9	0	10	1
Soderham	9	0	10	1
Christiania, per C., 12 ft. by 3 by 9 in. yellow	12	0	15	
Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	
PUMICE STONE pr ton	6	0	8	
OILS, &c.				
Seal, pale....per tun	38	0	0	0
Sperm body	104	0	0	0
Cod	38	0	0	0
Whale, Sth. Sea, pale	35	0	0	0
Olive, Gallipoli	73	0	74	0
Cocoanut, Cochin, ton	54	0	55	0
Palm, fine	40	0	40	0
Linseed	32	10	34	0
Rapeseed, Eng. pale	36	10	0	0
Cottonseed	32	0	38	0



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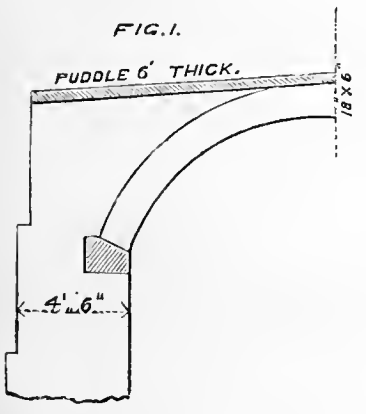
THE BUILDING NEWS.

LONDON, FRIDAY, MAY 22, 1868.

USE OF ASPHALTE IN CONSTRUCTION.—I.

PREVIOUSLY to the introduction of asphalte with its numerous bituminous compounds, puddle was the principal material relied upon for protecting from damp the extrados of arches, the backs of retaining walls, and for forming in general a watertight covering, or impervious layer, over all those parts of a structure whose stability might be endangered by the admission of wet. Puddle, which is still used in the making of embankments, dams, and reservoirs, consists of any good stiff description of clay, free from all stones or foreign substances, and the great secret of its manufacture lies in the thorough amalgamation and complete incorporation of its whole mass. Unless the whole be well worked up and kneaded together in layers of a specified minimum thickness, puddle is of no more value as a watertight material than the most porous substance in existence. Probably one of the earliest applications of puddle, omitting the consideration of it in the cases of the centre of embankments, was to the extrados of arches, and it is in this instance that asphalte has very nearly entirely superseded it. In fig. 1 let a section of a semi arch be represented

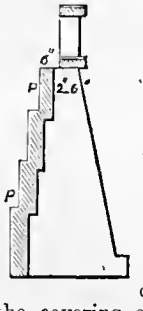
FIG. 1.



with a portion of its supporting abutment, and covered with a layer of puddle 6in. in thickness in the ordinary manner. We have known less than 6in. in depth to be laid on, but that dimension should never be reduced, being the smallest that is consistent with good practice, and which can be relied upon for forming a watertight covering. Partly from bad quality, and partly from imperfect mixing combined with an insufficient quantity, it arises that arches covered with puddle are continually leaking. It is, in fact, well known that to make an arch thoroughly watertight is not by any means a contemptible piece of professional skill, insignificant as it may appear, and only those who, like ourselves, have had to rip open the roadway over arches to repair and make good the puddle know what a troublesome and unsatisfactory job it is to accomplish. Asphalte, or asphaltum as it may be more correctly termed, was employed upon a large scale to replace the use of puddle upon the arches and tunnels of the Metropolitan Railway. Its application is very simple, and much quicker than that of its predecessor, It is heated upon the spot, payed over the arch in a semi-liquid condition, and then covered with a layer of fine dry sand. In addition to the comparative rapidity of the operation the thickness, instead of being 6in., can be safely reduced to 2in., thus effecting a saving of 4in. in depth over the crown of the arch. This reduction of depth, slight as it appears, is of great importance in metropolitan and suburban lines, where the engineer is sure to be pinched for headway in the majority of his bridges, whether over or under the railway. A coating of asphalte uniformly and evenly laid on over an arch may be considered to be completely impervious to water, and to be more efficacious than the best-made puddle.

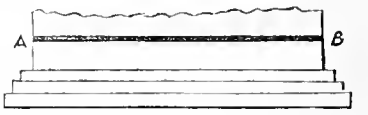
Before proceeding to describe the other applications of this useful and convenient aid to construction, a few remarks upon its nature and composition will not be out of place. Asphalte is one of the four recognised varieties of bitumen, the composition of which is not accurately determined. Judging, however, from the circumstance that its elements are carbon, hydrogen, and oxygen, its origin would appear to be of a vegetable character. It is usually associated with fragments of a calcareous nature, which are separated by boiling, and a mineral pitch is thus obtained, which melts at that temperature and burns with great facility. Bitumen was employed ages ago in the preparation of an extremely hard and durable cement, supposed to have been used at the building of the Tower of Babel. It also enters largely into the composition of the varnish covering the tea chests imported from Japan and other countries supplying us with that indispensable leaf. The principal localities where this substance is found native are the Dead Sea; the island of Trinidad in the West Indies, celebrated for its pitch lake; the northern department of Aniches, Ain, and the provinces of the lower Rhine. The theory of the formation of asphalte found in several parts of Switzerland, particularly in the Val-de-Travers, may be briefly summed up as follows. Regarding it as a calcareous deposit associated with pure bitumen, its origin is due to the decomposition of banks of molluscs, situated in a deep sea, and effected under the powerful influence of enormous pressure combined with a high degree of temperature. The pressure is caused by the great depth of water under which the formation takes place, and this explains the difference between asphalte and pure bitumen. The latter is similarly produced by the decomposition of molluscs or crustacea, but only in shallow water, and consequently there is not a sufficient amount of pressure to force it to become incorporated with the calcareous particles of the oyster and other shells in its vicinity. It appears, therefore, that both a high temperature and great pressure are necessary to the formation of asphalte or calcareous bitumen, and it will now be perceived that the former is necessary to the production of pure bitumen. When this latter influence is wanting, although the pressure may be considerable and the other conditions similar, yet bitumen will not be formed, but petroleum, which may be regarded as one of its varieties, as a sort of imperfect or crude bitumen. We have now to account for the appearance of calcareous banks due to the accumulation of oyster fossil remains, but containing neither bitumen nor petroleum. The most rational explanation is that they were produced under a temperature sufficiently high to evaporate the more volatile constituents represented by the above substances. In contradistinction to this animal origin of bitumen there is also what are termed the fixed bitumens, produced by the decomposition of plants alone.

FIG. 2.



Another usual application of puddle is to the backs of retaining walls, the wing walls of bridges, and similarly situated buildings. A section through a wing wall, with parapet, is represented in fig. 2, showing the method of placing the puddle P at the back, care being taken to secure it well at those places where the steps or offsets occur. Both with respect to the covering of an arch and puddling the backs of retaining walls, it is not merely the question of a watertight layer, but the stability and durability of the masonry or brickwork are also intimately concerned. There is no danger incurred in allowing the mere presence of water at the back of a wall similar to that represented in fig. 2, provided it is not permitted to accumulate or to lodge there. So long as it can find a ready and rapid means of access down to the drainage provided in all such instances, it produces no injurious effect upon the structure, but flows off innocuously. Many engineers, in lieu of puddle at the backs of retaining walls, place what is termed "dry lining," which consists of broken stones, or small metalling, packed loosely together, constituting a porous stratum for the water to pass through, should it penetrate to the back of the wall. It is easily perceivable that asphalte would have to be applied in a somewhat special manner to form a good watertight coating upon a vertical surface, and care would have to be taken that the layer was uniformly distributed. In instances of damp walls its use is frequently resorted to, but in many cases fruitlessly so, as the evil has taken too deep a root to be eradicated. One of the most valuable applications which can be made of asphalte is in the foundations of buildings, as a preservative against damp. The common practice has been, and is still, to lay a course of slates a little above the footing course, as represented in fig. 3. This precaution answers perfectly

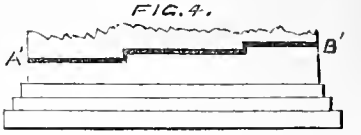
FIG. 3.



well so long as no settlement takes place, but unfortunately there is scarcely an instance upon record of any extensive building where the foundations have not settled to some extent.

We shall now contrast the different behaviour of slate and asphalte under these adverse circumstances. The former splits across directly any settlement occurs, as shown in fig. 4, and the damp, therefore, has

FIG. 4.



every facility afforded to it for rising in the wall, which can be at once perceived by the mortar becoming slightly moistened. The asphalte, on the contrary, owing to its flexible nature, bends with the settlement, adapts itself to the sudden irregularity, and preserves its watertight continuity unimpaired. We should not hesitate in all cases to prefer asphalte in a layer of three-quarters of an inch in thickness to a course of slates in a similar situation, and judging from the numerous instances we have witnessed of its application in this form, it is daily increasing in favour with those interested in building matters. Asphalte is largely employed in footpaths, and also in the formation of the roadway over bridges; but a good deal of care and judgment must be exercised in so using it. There are generally two methods of applying it to footpaths. One consists in actually mixing it with gravel and sand, and applying it *in situ*; and the other in first preparing it, pulverising it, then mixing it with a fifth part of its weight of melted bitumen, and running it in moulds. The cakes or slabs so produced are then laid down in the same manner as flags. This is a favourite method in France. We must reserve for another article the description of the manner in which this useful substance is applied to footpaths and the superstructure of bridges.

THE LIGHTING OF THE NEW ROYAL ACADEMY.

In the new Royal Academy we may expect a suite of rooms and galleries more favourably designed for the exhibition of fine art than those of any other similar institution; and inasmuch as the augmentation of space, as compared with that in Trafalgar-square, will be very considerable, it may be hoped that really meritorious "outsiders" will be spared the heartburnings they have so frequently suffered by the rejection of their works from want of room. The whole of the upper floor will be lighted from the top, with the exception of the sculpture room, and why this room should have been selected for a different treatment it is difficult to understand. With respect to the amount of wall space which may here be assumed as available, it is useless to refer to it in comparison with the rooms in Trafalgar-square, and worse than useless to speak of any of the continental museums, as none of the famous old "galleries" have been built especially for the display of pictures. In the erection of a gallery for fine art the first consideration is light, and this great end must be held in remembrance insomuch as to secure an equal distribution on each set of four walls throughout the building. This principle seems to have been kept steadily in view in the designs for the new Royal Academy.

The building has been in progress now somewhat more than twelve months. Bricks were first laid on May 1 last year, and the rapidity with which the pile has grown up supplies a comment on the pressure of the times in which we live. The academic body is sanguine of celebrating its centenary in its new home, and when we look back and consider the retrospect in relation with the prospect the proposal does not seem extravagant. It has long been settled that for an exhibition room in which all the wall space must be made available, there is no satisfactory means of lighting save by opening the roof. In order, however, to test the sufficiency of the plan in this case, one of the rooms was glazed, and its walls were hung with pictures; and thus, upon the *ex uno* principle, it was predicated of the whole that the effect would be unexceptionable. Many important points were determined only during the progress of erection, and others are yet in abeyance. It is at present understood that the glass coverings to all the rooms will be in the form of a lantern skylight. But to this arrangement the central octagon and the sculpture room will be exceptions, as the former will be lighted by a glass dome, and the latter by a large north window. It is intended that the opening in the roof of each room shall extend to within 6ft. of the wall all round. In rooms of low pitch wherein the upper walls would not be too high for the display of fine art, it would be found that under a vaulting extending 6ft. from the wall, the upper parts of pictures placed high would be obscured. But these rooms are sufficiently lofty to render it unnecessary to raise works within the shade of the vaulting.

For water-colour works there will be provided a long room or gallery, wherein will be distributed drawings in water colours and chalks, and perhaps miniatures, though the latter branch of art is all but extinct. There will be a room set apart for architecture; but, as the best water-colour subject drawings will not be offered to the Academy, the wisdom of competition with the water-colour societies is at best questionable.

On the part of the sculpture committee there seems to have been an objection to light their department from the top; consequently the sculpture room, which occupies the centre of the north front, is lighted by a large window. It can scarcely, however, be believed that the roofing of this room will be permanent; and for the expression of such a conjecture our reasons are threefold. In the first place, there is among the members of the Academy a feeling favourable to a top light. Again, in a room destined for the display of sculpture, and necessarily limited, there should be no preference of place; as regards light every part of the room should be equally lighted with the rest, which, by means of one side light, is impossible. Again, the central octagon with its glass dome is also intended for the reception of sculpture, and the even suffusion of the light in that part of the edifice will present a contrast to the partial lighting of the other room so unfavourable as to suggest reminiscences of the cellar in Trafalgar-square. According to a trite maxim, sculpture should be seen by such a light as shall show it with that proportion of firm marking and shade which should characterise a well-balanced drawing. This effect is procurable rather by an oblique than a vertical light, and, according to such arrangements, the central groups only will be seen by direct light, while the great proportion of the works will be seen by reflection; and hence there will be no improvement on the present sculpture room in Trafalgar-square.

Thus, the main consideration is, whether the Academy shall exhibit its sculpture in such a manner as to leave no cause of complaint on the score of undue preferences; or continue an arrangement which has been the source of infinite dissatisfaction. If there be any valid objections to the exhibition of sculpture by a vertical light they have been overruled in the case of the central octagon; and they should, we think, yield to the voice of the public, which has become fastidiously critical on the merits and demerits of a question in continual ventilation during that period of London life called the season. It cannot be regarded as a fortunate condition that the stately hospitalities of the Academy should necessitate the construction of a grand saloon. But so it is, and the precedent is absolute. There will consequently be a central room sufficiently ample for the entertainment of the very distinguished circle that the Academicians bid to their banquet annually. The large room has always been, and ever will be, the *cour d'honneur* of the Academy, and although members may point to certain of their own works in the smaller rooms still the gems of the collection are generally collected in the large room, and outside contributors consider themselves in some degree slighted on finding their works in the smaller rooms. The remedy for this grievance would have been the abolition of the state room, and such a disposition as would have placed the entire suite on terms of equality.

As in the present building the schools are held in some of the principal rooms, study is suspended during the time of the exhibition. In the new building the necessity for such suspension will be obviated by the allotment of the lower rooms of the north front to the antique school and those of sculpture and painting. But on this side the London University will obstruct the light so greatly as to render necessary the construction of a lean-to running the entire length of the front, by means of which a considerable portion of the interior will be lighted at an angle of 45 deg. To the second school of painting it is proposed to appropriate the south-eastern angle of the building. In an enterprise so important, and especially on a site so valuable as that of Burlington Gardens, some drawbacks must be expected. Thus the arrangements for the schools are not so satisfactory as could have been desired. These, however, could only have been altered by devoting a portion of the upper floor to the students, which would have very seriously encroached upon the space for exhibition. It would appear, therefore, that even sacrifices have been made in order to secure every available foot of space for exhibition, and this, after all, is the spirit in which the design for such an institution should be conceived.

WINDOW LIGHTS.*

SECOND NOTICE.

Some surveyors and builders seem to labour under the impression that one may carry foundations and footings over the strict boundary line of another man's land. We believe some former building acts did, under special circumstances, permit such an encroachment, but the conditions fixed and registered the ownership of the land. You must not now so build. A man's land is his, and all that is over it up to the stars, and all that is under it down to the centre of gravity, with the exception of mineral rights, which are always reserved. Suppose you drove a cellar bay under a man's garden, that would be adding to the size and convenience of your house at your neighbour's prospective expense. But suppose, on the other hand, that, without a knowledge of what you had done, your neighbour wanted hereafter to build also. What do you think would be the result when he opened his trench and found your brickworks there? Why, he need not even ask you to take them away, but peg along and confiscate them as he went on! In addition to this an action for trespass and special damage could be maintained, because you had no more business to interfere with another man's land *under* the surface than over it. We will now resume the original thread of our notice.

The enjoyment of light and air by uninterruption through occupancy time out of mind, formerly established a right by "prescription," and this law was based upon decisions that went beyond the time of "legal" memory, which is a good deal farther back than even that of "the oldest inhabitant." We have often heard persons ask what is "legal memory?" Legal memory, which is so often quoted, may be taken to be any decision or proceedings that can be found in any authenticated legal records. Thus, from an act passed in the reign of one of our Anglo-Saxon kings, Edward the Elder, between the years 900 and 925, came by inference the commencement of the "legal memory," which was ultimately settled to begin in the early part of the reign of Richard I. (1189), "whereunto the memory of man runneth not to the contrary." Mr. Latham has hunted up a case that was tried in the latter part of Elizabeth's reign, and is very interesting. In the thirty-first year of her rule an action was brought respecting the obstruction of light, and a verdict was obtained for the plaintiff. The defendant thereupon moved an arrest of judgment, and a reversal of the verdict, on the ground that the light was not an ancient light within the legal meaning of that term, as the house had been in existence no longer than the time of Mary, the previous sovereign. The house was held to be a recent erection, although more than thirty years old, and the window was consequently held not to be an ancient window, "time out of mind."

To show how closely the law had been followed through many centuries, and that, too, in the long desert-time of both foreign and intestine, political and religious wars, all the judges agreed—"That if two men be owners of two parcels of land adjoining, and one of them doth build a house upon his land, and makes windows and lights looking into the other's lands, and this house and the lights have continued by the space of thirty or forty years, yet the other may upon his own land and soil lawfully erect a house or other thing against the said lights and windows, and the other can have no action, for it was his folly to build his house so near to the other's land, and it was judged accordingly." The harsh operation of this rule produced in 1623 the Statute of Limitations, 21st James I., enacting "that no person

* "A Treatise on the Law of Window Lights." By F. L. Latham, Esq., of the Inner Temple, Barrister at Law. London: Butterworths, Temple Bar, Publishers to the Queen's Most Excellent Majesty.

who has any right or title of entry shall enter but within twenty years next after his right or title shall accrue." This was the first of the twenty years' undisturbed possession law, and, as usual, was twisted and turned into all sorts of shapes but its own, until it gave rise to a great many popular legal errors, some of which have survived to the present day. With the right of the soil went the right of everything belonging to it, and called forth the dictum of a Lord Chief Justice in times gone by—"If my possession of the house cannot be disturbed, shall I be disturbed in my light?"

The judges of more modern times had now something tangible to deal with, and the twenty years' enjoyment of undisturbed window lights came to be an authority at Equity and Common Law, as, theoretically, an agreement between the person using the light and the person over whose land it came. This presumption had not as yet received the stamp of absolute law; that was to come, as settled constitutions are of slow growth. About a century ago Lord Mansfield disturbed the minds of builders and building people, and set the question seething again by a summing up which he gave in an important case then before the court. He said:—"The enjoyment of lights with the defendant's acquiescence for twenty years is such decisive presumption of a right by grant or otherwise that, unless contradicted or explained, the jury ought to believe it; but it is impossible that length of time can be said to be an absolute bar, like a statute of limitation; it is certainly a presumptive bar, which ought to go to a jury. Time immemorial itself is only presumptive evidence."

So troublesome and full of litigation had the question of "time immemorial" attained to in actions of this kind that, on August 1, 1832, the 2nd and 3rd Will. IV., c. 71, commonly known as the Prescription Act, became law. This Act was not for window lights alone, but for every kind of right in which "time immemorial" was the basis upon which such right rested. Juries were to be no longer called upon to settle what "time immemorial" was, for the Act settled all that. Section 3 says:—"When the access and use of light to and for any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage or custom to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing." It must also be borne in mind that when an ancient light is interrupted, the interruption must not be acquiesced in for more than one year, otherwise the right is lost. But here is another point in this law. Suppose a man has enjoyed the use of light and air for a period of nineteen years and a fraction of the twentieth year, however small, and that, during the remainder of the twentieth year, the adjoining owner builds up and shuts out the light, the twenty years' enjoyment not having been completed. The House of Lords has held that the claim of light would be good against the world, because the Act specifies that the obstruction must be for one whole year, and that any portion of a year, however large, will not defeat the claim. Furthermore, no amount of interruption at any time during the twenty years' user will defeat the right unless such interruption has been acquiesced in for one whole year. These terms are set forth in section 4 of the Act.

Before the passing of the Prescription Act there was "the custom of the city of London," by which any citizen could pull down his house and rebuild it as high as he chose, without reference to the air and light of his neighbours. And even now actions are being continually commenced against persons rebuilding who will still persist in the validity of the custom. Of course an interview with a solicitor soon brings matters to an understanding more in accordance with the law. It has happened that for the first time for four hundred years the Recorder of the City of London has appeared in full official robes at the bar of the (then) King's Bench to declare *ore tenus* "from the mouth," the custom of the city with respect to buildings. The previous appearance of such an officer there on such an occasion was in the reign of Henry VI., about the middle of the fifteenth century. A number of cases have been tried with the view of forcing the city out of the Prescription Act, but they have all been unconditionally defeated. Actions have been brought for the obstruction of wind to the sails of a windmill and of air to a timber yard, but they have not been maintained.

Of the acquisition of right by express agreement, Mr. Latham gives us much detail, from which we gather that the subject belongs more to the quality of "easements" than what is before us. We are also cautioned, by a number of cited cases, not to look on unheedingly and allow anyone to expend money upon anything near our land that may damnify us, and then prevent them using what they have thus made. Whenever a trespass or an obstruction is commenced, notice of discontent should be immediately given, and proceedings served. Lord Eldon, in his day, repeatedly refused the protection of the Court of Chancery to persons who applied for it because they acquiesced silently in the construction of what was to produce the trespass. For instance, a man may build a house or workshop on a site, the way to which may be only along a footpath through an adjoining owner's land. If that owner were to stand by and allow money to be laid out without inquiring what the building was intended for, and stating his refusal to permit a road over his land other than the established footway, the Court of Chancery would not help him. Cases are mentioned in which the owner of the adjoining land has allowed matters silently to be completed, and has then put a "stopper" on by refusing a roadway, but the Court has compelled him to allow it in consequence of his own conduct.

A landlord let certain premises on lease with all their ancient lights, in consideration that certain improvements were to be carried out, the opening of new windows being among them. He then bethought him how to turn the "nimble penny," and let an adjoining piece of land to another person to build on, but kept back the fact about the condition of the lease of the neighbouring premises. The second tenant began to build and block up the newly-made windows of the first. A recourse was had to the court, and the sharp landlord was most unpleasantly brought to his senses. The walls of the second tenant had to be pulled down, and the landlord had to settle with him.

With respect to ascertaining the nature of an injury by the stoppage or obstruction of lights, the Court of Chancery have accepted certain dimensions. If a street be 40ft. wide, and the house be 40ft. high, and it is intended to rebuild it to the height of 50ft., then the extra 10ft. must be sloped back so as not to obstruct the light any more than if the street was 50ft. wide. Whatever the height of the house is it must be in the same proportion as the width or an assumed width of the street. In any other arrangement of the question out of court it must be one of compensation. With respect to windows, a mode of estimation has also been fixed. The sky area of a vertical window is 180 deg. horizontally by 90 deg. vertically. That of a horizontal skylight is 180 deg. in every direction, whilst "that of a sloping window is 180 deg. in the direction to which it faces, and vertically the same number of degrees as are contained by its own angle in a base line, or, which is equivalent, 90 deg. in addition to the number of degrees by which its slope exceeds a right angle."

DRAUGHTSMANSHIP.

IN our remarks five weeks since,* on "Recollections of the Drawings of Architectural Works at the Paris Exhibition last year," we took occasion to insist on the mere comparative value of draughtsmanship, considered merely as one of the elements required in the production of architectural works, or as one of the points of excellence in an architect, and specially to urge that, however valuable or indispensable generally, it was not the end or aim of an architect, but solely a means.

Our object is now to warn architects against the seductive influence of mere drawing, and to point in one direction, at least, where we think it has been allowed to usurp too much attention, to the exclusion of bolder and more practical work, and to exert an influence where it ought to be perfectly subordinate and forgotten—that is, on the executed work itself. But some may be ready to enquire what, then, is to be the aim of an architect—what the object of his office studies—why such application to the drawing board—and why so much authoritative tall-talk about the study of the figure, the value of good drawing, the delight and advantage of perspective studies, if after all the chief object be not to draw well or to express architectural ideas in lines and circles, and embody floating fancies of the mind in pencil work on the paper, so that others may see in a gilt frame the same dream which is haunting the architect's imagination? In reply, we will urge a few considerations in support of our point, instancing the fact that French drawing has in too great a measure influenced French design, making it flat, faultless, and finished, whereas the vigorous hand of those accustomed to work in solid materials should affect the drawing, and put nerve and strength into lines and dots, thus producing full and fearless forms, which, though shown indeed by lines, dots, and circles upon paper, are adapted for solid work in stone, brick, iron, wood, and the other materials with which the architect has to deal. But we desire rather to open an enquiry than affirm a judgment, and are as willing for a verdict against, as for, our arguments, if only the matter be brought into court, and the *pros* and *cons* properly considered. Without endorsing the whole of Ruskin's broad statement as to what an architect has to do, we may in the main agree with him when, describing the glorious sculptures adorning some great cathedral doorway—Rheims perhaps—he states that the architect was the man who did *that* (and probably he would "*do*" it best without draughtsmanship at all), for to such a man the designing of the frame of the picture must come easy after executing the picture itself.

To be led astray from right principle by beauty of workmanship is common enough in all the arts, and to award praise for skilful manipulation rather than noble design is rather the rule than the exception, even with those who profess to be able to discriminate and pronounce authoritatively on this or that artist or art workman. But, however objectionable this want of judgment in a critic, such a defect is fatal to the artist himself; and, unfortunately, there are hosts of examples of those who are ever ready to mistake technical skill for high art and draughtsmanship for design. Of late much error of this kind has been eradicated by right-thinking protests in favour of truth, solidity, and good appropriate design, in opposition to the flimsy finish of fanciful forms which so greatly obtained in the no-art period of the last century; but still there is need, perhaps more

* Page 237, April 10.

than ever, for watchfulness and careful criticism, lest such perpetrations as we have seen of late should grow to be considered the effect of real architectural design rather than the result of clever but impracticable draughtmanship, without the great balancing faculty so necessary not only in all the arts, but in every walk of life—viz., judgment. We use this term for want of a better, though it will hardly express all we mean by the word; but what else is it which leads some men to success and noble result, while others, following the same path, come only to grief and mere emptiness, or, perhaps worse, bad result?

Anyone can easily suppose an architect with all the power of draughtsmanship and skill even in colour yet without power of applying them to practical purposes. Such an one would be deficient in judgment, and this might be the case equally if the individual were possessed of considerable constructive skill in addition. For such an architect to be placed in a responsible position with regard to any important public work would be a misfortune, but from this we are usually saved by the necessary training which the world and its competitions exact from all aspirants to fame or positions of authority. Still we are not without examples of absurd and mischievous designs, carried out in a way which shows that the chosen architect, in reality a mere draughtsman, could not have considered how his chamfers and his choppings would look when transferred from the drawing board to the stone, nor understand the effect of wide cornices in dark streets, or the appearance of egg and tongue mouldings when covered deep in soot and dirt among chimney-pots high up aloft. Let us suppose a painter so capable of painting satins and brocades (no impossible case, nor wanting a name as an example at this very time) that, instead of choosing some great and noble idea for his pencil, or some simple or worthy thoughts as the *motif* of his pictures, he chooses rather something wherein he can show his silk and satin skill to advantage. Would not this be even less reprehensible than an architect allowing his mere pencil work to be repeated in stone, simply because he could draw it well on paper? Though in neither case need we suppose the result to be bad, yet a great opportunity may be lost for doing good and noble work. And surely, for example, the large mass of fleeting ornamental detail and frittered finial-working which is now being erected in Belgravia would have been avoided if more consideration had been given to the actual appearance in execution instead of the design on paper, for it seems as if mere technical handiwork had been approved in place of more mature judgment being exercised. Of course we may be mistaken in this view, but at any rate it is a charitable one, for however admirable may be the Grosvenor improvements as a whole, we must be allowed to object to a great deal of the detail as not improved by importation, and not capable of being kept well in the present London atmosphere. We miss in these designs the bold simplicity—which is itself dignity—or the judicious ornamentation which gives that quality to otherwise poor design; or, again, that subdued magnificence of well-chosen richness of detail which prevents the mass from appearing overloaded, and the parts from becoming vulgar by excess of ornamentation. In the Houses of Parliament we have an example of this latter quality, of grandeur by richness, and simplicity by uniform decoration, and breadth by continued cutting up into detail.* But we are wandering from our text, though in returning we may note, with reference to the Houses of Parliament, that the Pugin-Barry controversy seems to have dwindled to a question of draughtsmanship after all; and we are very much inclined to think that here will be found the root of the matter. Though no one would doubt for a moment (or if they would let them look at the existing drawings) that Sir Charles Barry *could* draw with his own hand anything he set himself to do, still one must know that he physically could not do all the original drawings required while attending as architect to all the various details daily demanding his care, not only in this one work, but in many others being carried on at the same time. Sir Charles Barry might not be one whit less the *architect*, the man of comprehensive design, to whose *judgment* all must be subordinate, the one mind to give unity, individuality, and purpose to the conflicting or (say) concordant ideas of many first-rate draughtsmen and men of genius, although he called to his assistance the first-rate powers of all the Pugins of the day.

This one quality of judgment is the mainspring, or rather the encircling chain, of all the other qualities required (whether these qualities lie in one direction or another, or are resident in one man or set of men) to produce a work of high merit, and we can even suppose a great architect carrying out his work with the most complete success deprived by some unfortunate accident of his own hands and arms, and thus dependent upon others for the technical skill of necessary delineation. By this example we feel bound again to our assertion, that draughtsmanship is not all in all—that it is but a means to an end, and not the end itself; that end being simply to build a solid in the empty air, where the sun and moon will gild and decorate his work after he has done his best, and the wind and storm will carve and crumble it away after his most careful efforts to make it last for ever. A man may learn to draw the figure, paint up the finest perspective, or carve the sweetest foliage and the noblest statues for his niches, all in addition to preparing paper plans and elevations; but as an architect he will have severer work, and be required to use, after all, a higher faculty in judging and deciding on the effect of his ideas when permanently executed.

Far be it from us to impute to the French the want of such a faculty; but, as we have been led to these remarks from a comparison of their style of drawing with our own, we may say that if it is not so, they seem deliberately to propose to themselves to set up their drawings in stone, rather than to build from their designs. In much of modern Parisian building at least—and the provinces merely copy the metropolitan fashions—we see such monotony of flatness, such extreme delicacy of line and want of all boldness of projection, that the real lines on the façade seem to bear no greater proportion in depth or width to the whole façade than do the original draughtsman's lines on the drawing board, making allowance for the scale; and just in the same manner as a delicate drawing is always "pretty," so are these *petite* ornamentations of the actual work "pretty," elegant, and full of draughtsmanship, but really with no more pretension to architecture than the lengths of cement strings and cornices which adorn mere builder's work in this country. A new Paris façade is the same in every new street, boulevard, or place, with some little variety in balconies or gateways; but viewed at a short distance, whether of Gothic or Renaissance details, or even with the details of the better style of modern French adaptation of Classic, every house seems of the same design—that is, follows the same leading lines, and, being built in block, is probably, when erected and before the design is ruled out upon it, capable of being as easily finished in one style as in another.

Such we deem to be the result of draughtsmanship carried too far, and when the other qualities necessary for an architect to cultivate are too much ignored. While we thus feel we have justified ourselves in what we have advanced, we would be understood as far from undervaluing any means of realising the ideas which form a design or manner of fixing the forms of the imagination for the purpose of study by the architect himself. We well recollect the late Professor Cockerell's exhortation not to trust to elevations and sections alone, but to study every design in perspective; and not with these even to remain satisfied, but to model it as a whole as well as all the details separately to some large scale. To the practical carrying out of this doctrine in his own case may be attributed that marvellous refinement and delicacy, and yet vigorous handling—breadth with light and shade combined—which the French school and their copyists seem to ignore. No one, we believe, was more faithful to his own principles and precepts than the late Professor of the Royal Academy, or took more pains to form a correct judgment on his own designs, while few such careful or accomplished draughtsmen now exist. We know no name more worthy of reverence, nor anyone whose teachings deserve more respect from every school or style of art.

A. B. C.

* Ruskin says good ornament can never be in excess, but bad ornament is out of place everywhere. In the life of Sir Charles Barry, we see that he was substantially of the same opinion, and held to the most complete and richest decoration, as being the reverse of gaudy or vulgar. He was consequently in the habit of using gold in masses, not for touching in parts.

IMPORTANT TO BUILDERS AND PARTIES BUILDING.

Clerkenwell County Court, May 18.—Before George Francis, Esq., Deputy Judge.—Ewins v. Squires.

THIS was an action brought for recovery of £17 3s. 10d. balance due from the defendant to the plaintiff for bricklayer's work done to a pair of villas in the Mayes-road, Wood Green. Mr. Poncione, of 5, Raymond-buildings, Gray's Inn, and of Wood Green, appeared for the plaintiff, and Mr. Williams for the defendant.

Mr. Poncione, in opening the case, stated that in the month of June last the defendant engaged the plaintiff to build a single house upon a plot of land belonging to the defendant in the Mayes-road, Wood Green, the terms of such arrangement, which was a verbal one, being that the plaintiff was to be paid by time. On the completion of this single house the plaintiff and defendant entered into a written contract for building a pair of villas adjoining the single house, for which the plaintiff was to be paid 48s. per rod reduced brickwork. The plaintiff had almost completed the building of this pair of houses when the defendant refused to pay the plaintiff any more money on the ground, as the defendant alleged, that the three houses were all to be built at the rate of 48s. per rod, and that after measuring the whole of the work and crediting all moneys paid as payments generally on account, the plaintiff had been overpaid. Mr. Poncione contended that the verbal contract for payment by "time" must be kept wholly distinct from the written contract for payment by the rod. With regard to the time contract it had been paid for from week to week on production of the time sheets, and the work had been completed and paid for, and there had been a final settlement of that matter, and as to the work done under the written contract it had been carefully measured by Mr. Henry Girling Bray (the brother and successor to the late Mr. Thomas Girling Bray, of Wood Green, surveyor), who was in court and could prove the amount of work done, but on this point it was thought there would be no question, as Mr. Poncione understood the defendant's surveyor concurred in the correctness of Mr. Bray's measurement.

Mr. Williams stated that he would admit the correctness of Mr. Bray's measurement, his defence being that the work had been paid for.

His Honour here decided that that being so, and the affirmative of the issue as to payment falling upon the defendant, he should proceed with the proof of his defence before the plaintiff's witnesses were called.

Mr. Williams thereupon examined the defendant, who stated that he first employed the plaintiff under a verbal contract to build the single house and afterwards entered into the written agreement with him for building the adjoining pair of villas, which was signed on the 18th of July last, the day of its date. The plaintiff had,

however, commenced the work on the pair of villas before the agreement was signed upon a verbal understanding that its terms were to be reduced to writing. The building of the pair of villas was commenced at least a fortnight before the date of this agreement. All payments made by witness to the plaintiff were made generally on account, and after measuring the whole of the work executed on the three houses, he had overpaid the plaintiff the amount due to him.

Cross-examined by Mr. Poncione.—The plaintiff produced his time account to me from week to week whilst the single house was being built, and I paid him the amount the same as all other builders do.

Mr. Poncione.—What are you, a builder?

Witness.—Yes.

Mr. Poncione.—Now is not this your card (producing one, and reading)? "John Squires, sen., pianoforte maker, 22 and 23, Sutterfont-street, Caledonian-road. Instruments tuned and repaired."

Witness.—Yes; I am a builder of pianofortes, and I have also built some houses (laughter).

Mr. Poncione.—You mean you employ some one to build them for you. I advise you to be careful how you answer when on oath.

Mr. Gylby, examined on the part of the defendant.—I am a surveyor, and from time to time measured the houses built by the plaintiff for the defendant. The building of the pair of houses was commenced at least a fortnight before the date of the written agreement of July 18 last. I produced my book containing the measurements made by me from time to time.

Cross-examined by Mr. Poncione.—The first measurement contained in my book in respect of the pair of villas is July 19 last; all previous measurements contained in my book refer to the single house only.

Mr. Williams stated that this was all the evidence he had to adduce in support of the defeuce.

Mr. Poncione, on the part of the plaintiff, submitted that as the evidence stood the defendant had failed to make out any case to be answered. It was clear from the defendant's own showing, the date of the contract, and that of the first measurement of the defendant's surveyor relating to the pair of villas, that the written agreement of July 18 last was entirely a separate and distinct transaction to the prior verbal agreement relating to the single house, which was to be paid for by time, and the defendant by his own showing had treated it as a separate matter, and in his own book, which he had produced, he there made a separate casting of the sums paid prior to the date of the written agreement. Even if the defendant's version were true (which was, however, emphatically denied) the law would not permit a general payment to be applied to a written contract to be made in future; therefore, all payments made prior to the date of such contract must be applied in respect of the verbal contract then pending, by which the plaintiff was to be paid by time, and such payments have nothing whatever to do with the present claim of the plaintiff under the written contract, by which the plaintiff was to be paid by the rod, but inasmuch as the plaintiff and his witness had sworn that the building of the pair of villas was commenced at least a fortnight before the date of the written contract of July 18 last, and had endeavoured to make payments made during that period apply to the present claim of the plaintiff, witnesses would be called on the plaintiff's behalf who actually commenced the brickwork to the pair of villas, and would distinctly prove that the work was not commenced until Tuesday, July 16, two days only prior to the date of the written agreement, and that being so it could not for one moment be contended that payments made prior thereto could have been made in respect of works which did not actually exist, and in respect of a written contract not then entered into.

Mr. Poncione then shortly examined the plaintiff, who proved that he was first employed to do the brickwork to the single house, and to be paid by time; that he afterwards entered into the written contract to build the pair of villas; that all payments made to him prior to July 18 last, the date of the written contract, were in respect of the contract for time, and all payments made to him subsequently to the date of such contract were in respect of the work done under the written contract, for which he was to be paid 48s. per rod. The building of the pair of houses was not commenced until July 16 last, two days prior to the date and signing of the agreement. After crediting all sums received from defendant on account from time to time in respect of each contract there was a balance due to the plaintiff of £17 3s. 10d.

Henry Botting was then called to corroborate the plaintiff as to the date when the pair of villas was commenced.

Mr. Poncione stated that he had several other witnesses in court, who worked at the commencement of the building of the pair of houses, and could speak to the same facts.

His Honour thought it was unnecessary to call them.

Mr. Williams then replied upon the case.

His Honour, in delivering judgment, stated that it appeared to him clear that there were two distinct transactions between the plaintiff and defendant, and that the payments alleged to have been made by the defendant prior to the date of the written contract could not be treated as having anything whatever to do with such contract, and his Honour came to that conclusion from the evidence of the defendant himself and his own witness—for the defendant had made a separate casting for all sums paid prior to the date of the written contract, and had not the time contract been a separate matter he would not have done so; besides, the defendant's own surveyor, by his book, showed that the first measurement made by him of the pair of villas was on July 19 last, subsequently to the date of the written contract. His Honour, therefore, gave judgment for the plaintiff for the full amount claimed (less £2, which it appeared had not been credited in account), and allowed costs, including all the plaintiff's witnesses who had been called and were in court ready to be examined had it been necessary to examine them.

Mr. Williams then applied for time for payment.

Mr. Poncione.—What, a respectable builder of pianofortes and no end of houses want time? I must oppose such an application.

His Honour ordered immediate payment of debt and costs.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE annual meeting of the members of this society was held on Wednesday week, Mr. T. J. Kilpin, president, in the chair. Mr. H. H. Vale expressed his intention to offer a prize of two guineas for the best essay written by a student member during the recess upon some subject to be suggested by the council and announced at the annual excursion. The President handed to Mr. George Smith and Mr. J. Casson respectively the prizes awarded by the council for the best and second best designs, by student members, for a village church, and to Mr. T. Medcalf and Mr. H. Z. Herrmann for the best and second best specimens of figure drawing. The committee and officers for the ensuing year were elected, Mr. H. P. Horner being unanimously chosen as president, and Messrs. W. Hay and H. H. Vale being appointed vice-presidents.

The President then delivered his closing address. After congratulating the members on the increasing strength and expanding influence of the society—remarking that if Liverpool was subject to the stigma of at present being the only large city in the country that had no annual exhibition of painting and sculpture, and of possessing the ugliest parish church in the empire, it was certainly not the fault of the Architectural and Archæological Society—he alluded to the subject of labourers' dwellings, and said it must be admitted that that subject till of late years had been too much overlooked. Liverpool had, however, made great exertions, and had at length achieved greater success in that direction than any other large community, as a design for labourers' dwellings had been selected, estimated, and contracted for, and was now being carried into execution, which would yield, according to well-grounded calculations, a remunerative return to the corporation on the capital invested. He thought it could not be denied that a large debt of gratitude was owing to the council, and particularly to those members of it on whom had devolved the consideration of the plans. He expressed his regret that at present the fine arts were ignored in Liverpool, there being now no annual exhibition, as in former years, and severely blamed the municipal authorities for their ill-judged economy in withdrawing the slight pecuniary assistance formerly afforded to the Liverpool Academy. Since the commencement of the session, the feeling and opinion that it was not honourable to Liverpool that it should possess no more worthy ecclesiastical edifice than St. Peter's for its parish church had extended itself and had been considered and discussed by the public till it had deepened into a settled conviction. It seemed to be the general opinion that the £5,000 to be paid for the portion of St. Peter's churchyard that had now been added to Church-street, should form a nucleus for a fund for erecting a more suitable building consecrated to Divine worship. Mr. Kilpin closed his address by expressing a sincere wish and fervent hope that while we bid

> New harbours open, public ways extend,

we should soon also see

> A temple worthier of the God ascend.

THE ARBITRATION MOVEMENT.

IT is satisfactory to see that this movement is making progress. The master builders of Birmingham held a meeting on Tuesday last in reference to the strike of the unionist operative stonemasons of that town. In providing rules for the future, they say, in rule 7, that on or before August 1 next, a public meeting of the masters and operative masons of Birmingham shall be held, at which three master builders and three operative masons shall be appointed as trade arbitrators, and an independent gentleman as trade umpire, and if any trade dispute shall arise between master and workman, such dispute shall be settled by the award of the trade arbitrators, or by a majority of them, or in any case where they or a majority of them cannot agree, then by the award of the umpire. Mr. Mundella, of Nottingham, has been to Bradford, and entered into the question, and the result is the formation of an arbitration court in that town. The following are the rules of the new court:—

1. That a board of trade be formed, to be styled the "Board of Arbitration and Conciliation for the Carpenters and Joiners of Bradford and district."
2. That the object of the said board shall be to arbitrate on any question relating to wages, working rules, and any other matters that may be referred to it from time to time by employers and employed, and by conciliatory means to interpose its influence to prevent and settle disputes.
3. That the said board shall consist of eight employers and eight operatives, and that the whole of the deputies shall serve for one year, and be eligible for re-election. The annual election of deputies to take place in March.
4. That the said board shall have full power to settle any disputes that may arise from time to time, and the decision of the said board shall be binding on all parties concerned.
5. That the board shall, at its annual meeting, in April, elect a president, vice president, and two secretaries, who shall continue in office one year and be eligible for re-election.
6. That the president shall preside over all meetings of the board, and in his absence the vice-president. In the absence of both president and vice-president, a chairman shall be elected by the meeting present. The chairman to have a vote, and in case of numbers being equal the chairman to have the casting vote, and that six on each side shall form a quorum; but in all cases an equal number of employers and employed shall only be allowed to vote in any decision.
7. That a sub committee shall be formed to enquire into all cases of disputes, and, if possible, to settle the same; but such settlement to be binding on either party must have the approval of the general council. Such sub-committee shall consist of the two secretaries, two employers, and two operatives, selected by the secretaries from time to time as occasion requires, from the members of the general council.
8. Upon a requisition signed by any three members of the board, the secretaries shall within seven days convene a special meeting of the general council by circular specifying the nature of the business for consideration, provided that such has first been submitted to the sub-committee, and left undecided by them.
9. That there shall be three general meetings of the council in each year; one in the first week of April; one in the first week of October, and one in the first week of February; and at the February meeting the secretaries shall submit a report of the year's transactions.
10. That any expense incurred by this board shall be borne equally by the employers and employed.
11. That no alteration or addition be made to these rules except at one of the half-yearly general meetings in April or October. Notice of any proposed alterations shall be given in writing at the half-yearly meeting previous to its consideration.

For welding iron and steel a composition has lately been patented in Belgium, consisting of iron filings, 1,000 parts; borax, 500; balsam of copaiva, or some other resinous oil, 50; and sal-ammoniac, 75. They are mixed, heated, and pulverised. The process of uniting the iron and steel is as usual. The parts are heated to a cherry red, covered with the preparation, brought together, again heated and welded. Another composition for the same purpose is 15 parts of borax, 2 of sal-ammoniac, and 2 of prussiate of potash. Being dissolved in water, the water should be gradually evaporated at a low temperature.

ARTISANS' AND LABOURERS' DWELLINGS' BILL.

THE Artisans' and Labourers' Dwellings' Bill has at length worked its way through the troubled waters of the Lower House to what its promoters hope to be the safe harbour of the House of Lords. We are sincerely sorry that we cannot join in this hope. We heartily desire the improvement of the people's dwellings; we have not the smallest sympathy with the vested interests which fatten upon disease and immorality; our object is the same as that of the friends of the bill; and we cannot agree with them, for the only reason that we believe they are not taking the most efficient means to attain their object. Before objecting, however, we must give every praise to Mr. Torrens and his friends for their perseverance and their readiness to adopt judicious suggestions. At the first introduction of this bill, in 1866, it consisted of but eighteen clauses. The number has now increased to forty-seven, and the bill has altogether a most complex appearance. This fact of itself proves that legislation upon improved dwellings is by no means the simple process a tyro would imagine. On comparing the bill, as it now stands, with its first state, we are glad to find that many of the proposals made by the joint committee of the Society of Arts and the Social Science Association have been embodied in it, and that it does not, as it did at first, ignore private enterprise altogether. The bill now permits the local authorities, after having acquired property under its provisions, either to assume the functions of builders themselves, or to dispose of the site to a building company, who shall give security to carry out improvements. To judge of the practical effect, let us suppose a case. Deadman's Rents is a fearful back slum, where the fever is never absent, and vice and immorality are always present. Old Deadman, the proprietor, however, has gathered a rich harvest every week there for many years, and when the local authorities have condemned the place, and required him to effect the improvements, he laughs them to scorn, and under the act they compel him to sell it. Despite his name, he proves a lively hand at a bargain, and gets a good round "compensation" price. The authorities burden the property with the expenses of their action, and, electing to sell it rather than turn builders themselves, under the act they are called upon to tie down would-be purchasers to a particular plan of building. They will find that they have bought in a dear market and must sell in a cheap one. We will venture to say that no company whose directors are men of business will give them anything like the price the property will have cost them. The difference will have to be made up out of a twopenny rate, and then—Oh, what a clatter! what denunciations of official jobbery! Old Deadman's Rents have been bought for £2,000 and sold to the Nonshaky Building Company for £1,500, and the ratepayers must provide for the deficiency. We ask the promoters of the bill whether this is not a probable picture of the measure in its practical action. They say, we know that the twopenny rate (it was to have been threepence, but is now reduced to twopence) will not be required. In this no practical man will agree with them. As the bill now stands, the authorities will be subjected to conditions of purchase and resale, or rebuilding, which must entail a very heavy loss, and so surely as the bill passes, so surely will there be an addition to the already overswollen local taxation. We do not think there would be near so much objection to taxation for the purposes of the measure, if it did not empower the authorities to enter upon speculations either in the purchase of sites or the building of houses. Everyone would cheerfully agree in necessary expenses for the clearing away of overcrowded sites, or the lawyer's bill for making old Deadman and his kind put their houses into wholesome condition. What is and always will be objectionable is the taxing ourselves for the sake of buying old Deadman out at the fancy price which a compensation jury will be sale to give him, and then to adopt the alternative of selling our bargain at once at a clear loss, or undertake a work which does not at all come within the proper province of public authorities, of which they are unacquainted with the details, and it is more likely they will manage both inefficiently and expensively than otherwise. If the act stopped at the point where it provides that unwholesome houses may be shut up, and gave the authorities power of purchase only for the sake of clearances, we think it would be both unobjectionable and effective. As it stands it is sure to be unpopular if passed, and likely to prove a dead letter, and this would be an actual calamity to the cause of sanitary improvement in the dwellings of the people.

THE RATEPAYERS' STREET TRAMWAY.

ONE of the greatest obstacles to the introduction of street tramways into London has been the well-founded objection to confer upon a trading company any rights of property or control over the public roads. The vestry of St. George the Martyr, Southwark, are, however, about to lay down in the London-road a double experimental line, which, if successful, will show that this objection need no longer be entertained. The plan they have adopted, and of which we give a diagram, is designed by Mr. John Haworth,

FIG. 1.

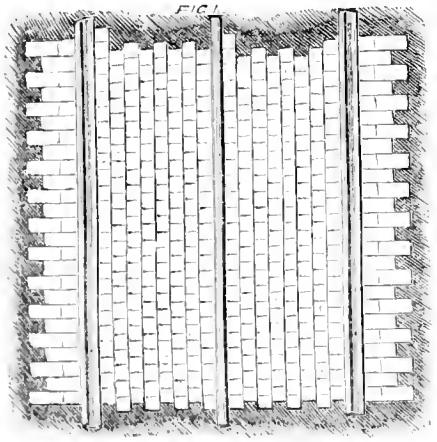


FIG. 2.

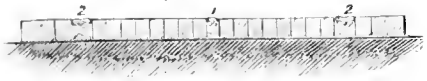
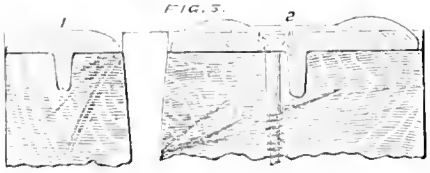


FIG. 3.



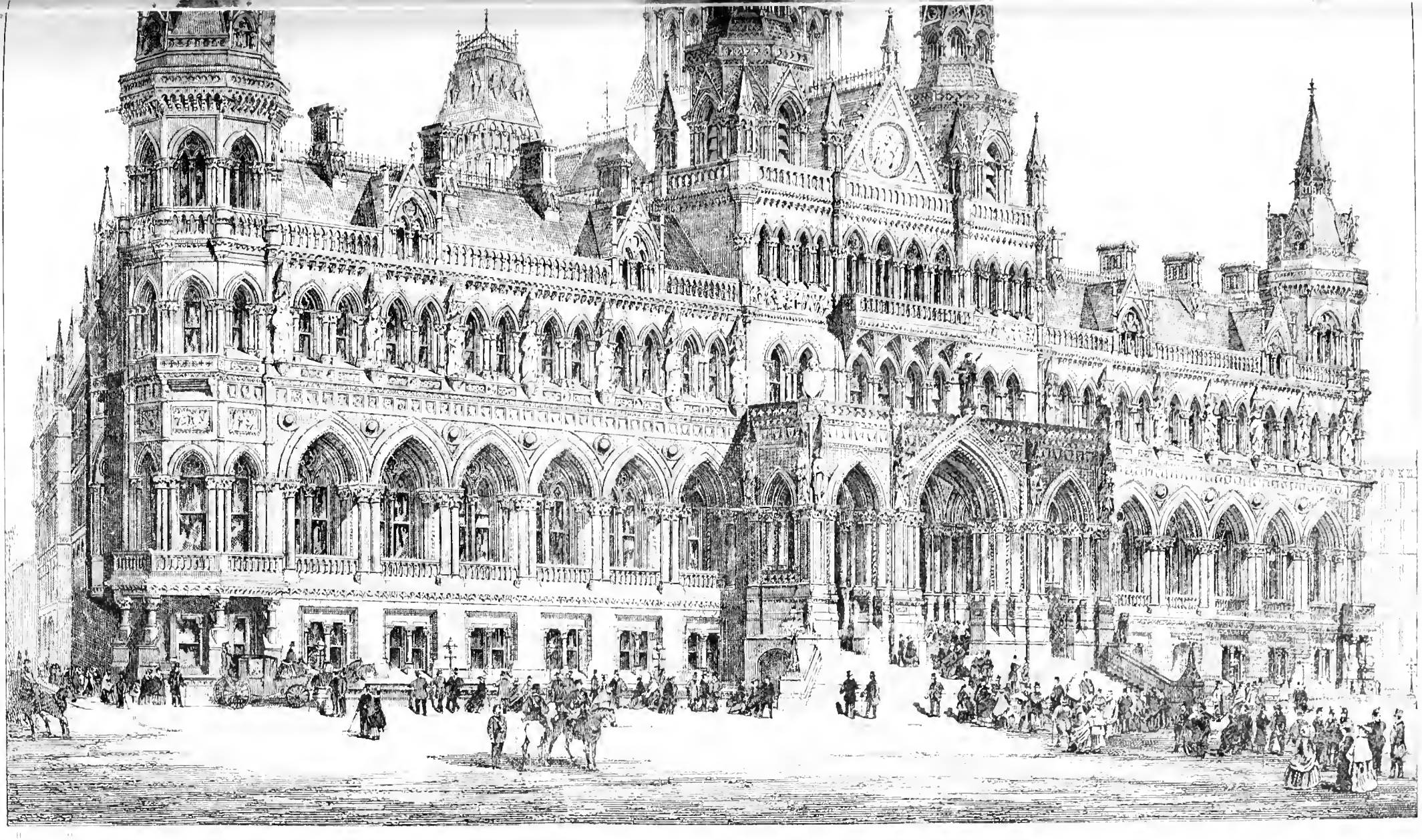
of Manchester, being a modification of that used in Salford with great success for several years. The rails for the wheels are of wrought iron about 8in. wide, and the sides are so very little out of the ordinary level that vehicles can leave the tramway or return to it with the utmost facility at any part of the road. Running midway between each set of rails for the wheels is a plain 3-inch rail, which is intended to serve as a guide for the driver, who will be able to sight the end of the pole with it, and thus keep the track. The up and down sets of rails will be separated by a width of 4ft., and the whole space between will be paved with 4in. by 4in. granite cubes. The plan is recommended for adoption on the score of economy as well as convenience, the estimates for completing the paving of the London-road being as follows:—1. The estimated cost of completing the pitching was £3,994; 2. The estimated cost of taking up the existing paving and paving the whole of the road was £4,405; 3. The estimated cost of completing the pitching with 4in. by 4in. granite cubes and the laying of a double tramway on Mr. Haworth's plan was £3,629; 4. The estimated cost of the tram, but with 9in. by 4in. cubes, was £4,449. It was also stated by a member of the vestry that the town of Salford had realised a saving of 3¾d. per yard in the expense of road keeping, and that in disproof of the supposed danger to horses from the tramways, not a single accident had occurred in Salford through them for three years. From the estimates above given it will be seen that the saving in cost is due to the use of 4in. by 4in. granite cubes, instead of the ordinary 9in. by 4in. cubes. These, however, it is said, will prove quite as durable in every respect.

We congratulate the St. George's Vestry on taking the lead in this matter. The length of road to be laid down is only 450 yards, and can only be regarded as an experiment, but we are sure that tramways of a proper construction only need to be practically known to lead to their extension. Our only wish is that the Manchester or Salford plan could be adopted in its entirety. Upon that plan the centre rail is grooved to receive a small guide wheel or perambulator attached to the vehicle, which can be raised or lowered at the pleasure of the driver. This permits of the whole of the tramway being made quite flush with the roadway, and there is consequently not even the slightest pretence of obstruction to ordinary vehicles crossing it, or the smallest difficulty in keeping upon the line as long as desired, or quitting and rejoining it at any moment. We can understand that one reason why the vestry have not adopted the centre grooved rail, is that no vehicles, with a guide wheel attached, at present run upon the London roads. This is a matter, however, in which they would do well to be in advance. Upon the same line of road we have several omnibuses imitated from those of Manchester in other respects, and, if they had the Manchester road, they would doubtless soon find it answer their purpose to add the guide wheel, which would render their vehicles equal to those of Manchester in all respects. We hope the example of St. George's Vestry will be followed by other parishes, and that the tramway system will be extended over the whole metropolis, and we shall be the more glad to find that it can be done without subjecting ourselves to the incubus of a monopolising company, and that the roads laid down will not be for omnibuses only but for every kind of traffic.

DESIGN FOR THE MANCHESTER NEW TOWNHALL.

WE give this week a double-page illustration of Messrs. Speckman and Charlesworth's design for the Manchester New Townhall. Having so recently given our opinion of the high architectural merits of this design, it is unnecessary that we say any more now. The professional referees gave this design the first place for its architecture.

One of the most important recent acquisitions to the South Kensington Museum is a cast of the whole of a window in the west front of the Church of the Certosa, at Pavia, which convent was founded by G. G. Visconti, Duke of Milan and Lord of Pavia, 1396. The façade of the church, which comprises on the lowest tier of its lights four such windows as that in question, was designed by A. Da Fossano, or Borgognone, and begun in 1473. This artist, being a painter by education, produced what may be called a beautiful picture, or rather collection of small pictorial designs, in terra-cotta, and combined them with good results.

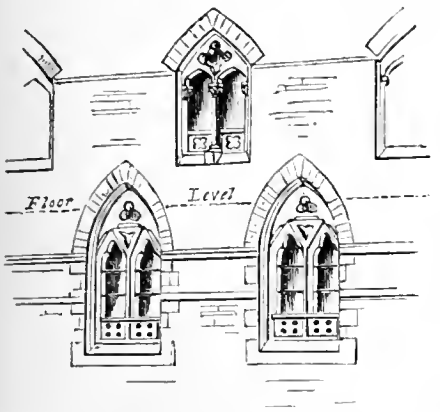


Design for the Manchester New Town Hall. Albert Square & Princes Street Fronts.

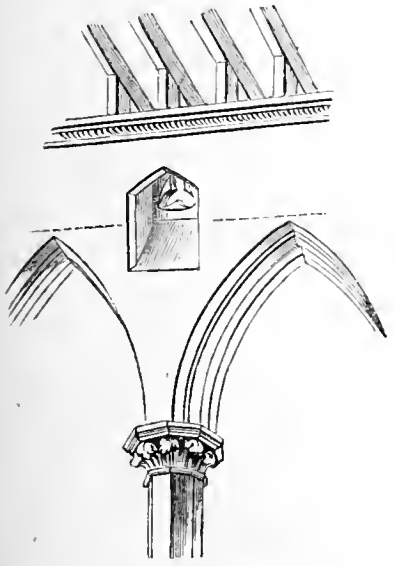
SPEAKMAN & CHARLESWORTH, ARCH.TS

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—XV.

BEFORE leaving that branch of our subject which deals with design as applied to brick and stonework—the widest field for the display of architectural power—I will refer to one or two points in construction that call for remark. The generally admitted

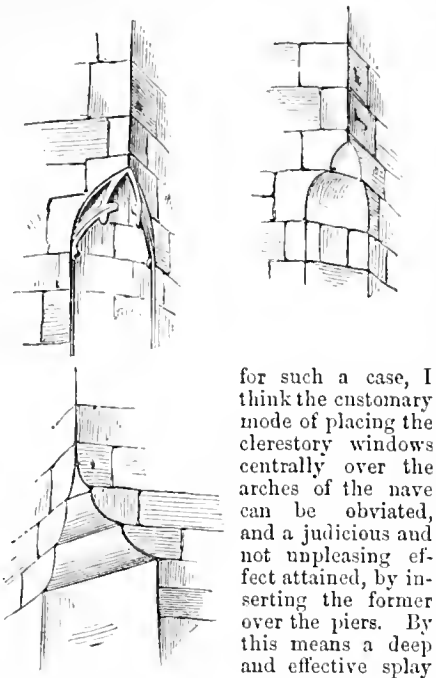


rule in building, that void should come over void, is a safe and correct one in the generality of our compositions. It gives us a verticality of treatment that is absolutely essential in those structures that come within the denomination of Classic or Italian, where it produces a valuable contrast by opposition to the horizontal features; and many modern buildings show how their architects have still further marked the contrast by connecting their windows or openings vertically rather than, as formerly, only horizontally by bands



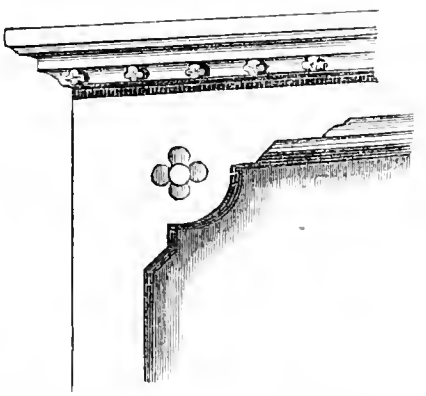
or stringcourses. We find, indeed, this principle of contrast or opposition doing more than any amount of championship or talk in breaking through the distinctions that characterise different styles. Such a disposition of openings, however, is not always to be regarded. In buildings partaking of a pointed character, the second tier or first-floor openings may often be placed over the solids below without interfering with the apparent or structural propriety of the design; and the nature of the pointed arch already considered, namely, the necessity of its being largely loaded at the apex as a condition of its equilibrium, rather concurs in such an arrangement than otherwise. Very often the lofty heads of pointed windows compel the architect to provide greater height for his façade or his apartments than is always desirable, but, by adopting this plan of placing openings, the necessity of great height is obviated, for he may still preserve the pointed arches externally without cramping his windows.

In churches where height needlessly adds to the expense, as in country neighbourhoods, it is often desirable to obtain a clerestory just for the purpose of effect or ventilation. Now,

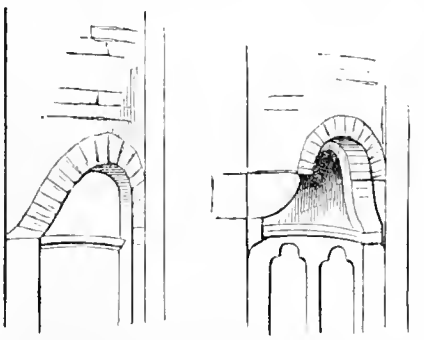


for such a case, I think the customary mode of placing the clerestory windows centrally over the arches of the nave can be obviated, and a judicious and not unpleasing effect attained, by inserting the former over the piers. By this means a deep and effective splay may be got internally, and the openings be made to relieve the spandrels of the arcading, at the same time enabling the roof-springing to be brought down within a comparatively short distance from the points of the arches. The author has seen the arrangement in an old and little known church.

This plan leads me to notice a practice



frequently observed in the design and construction of modern churches that calls for condemnation and correction. It is the cropping-out of clerestory buttresses above the sloping aisle roofs without any real or apparent provision for their support. I have repeatedly seen these adjuncts in designs for churches, but a close inspection of the drawings has failed to discover any foundation for these make-believe supports. Let architects abandon such delusive accompaniments, that only render design an artless sham and themselves its unconscious detractors.



Our sketches show, besides the above constructional suggestions, methods of "corner cutting" or angle splays, that are far better than sharp angles in our corner structures; and a suggestion for correcting the distorted appearance, very often noticed, of a circular arch on a circular plan, a point of construction that cannot be too strongly denounced, giving us a false arch both in reality and appearance.

NEW BATHS AND WASHHOUSES.

ABUNDANTLY and admirably as London is provided with good things that minister in various ways to the comfort and convenience of life, it would be too much to assert that her three millions of inhabitants have no further wants to be provided for. Her sanitary appliances are not the least satisfactory of her arrangements, and yet in the matter of public baths and washhouses the metropolis, it must be confessed, is not so favourably circumstanced as some other large towns, her gigantic population considered. We speak only of baths for the masses—the great body of the people, who, as a rule, have neither the means nor the convenience, admitting they had the inclination, to supply themselves with this very important means to health. There are some things which a public company can do for an individual better than an individual can do for himself. Among these may be reckoned public baths and washhouses. We might point to those at Endell-street, at Lambeth, at Islington, and elsewhere, most excellent establishments of their kind and in their way, and conferring benefits very largely appreciated by the public. Now, there is not enough of such institutions. While some districts offer a plentiful supply of soap and water to their toiling populations at the smallest possible cost, other districts are almost completely destitute of this great promoter of health and auxiliary of godliness. What may be called the soap-and-water movement is spreading, however. The necessity of providing baths for the public is now universally recognised. About three years ago the local authorities of St. Pancras resolved to erect public baths and washhouses for the use more particularly of the inhabitants of that extensive district of the metropolis. The cost of the building was to be paid out of the parish rates. The new baths were begun, and after a lapse of three years they were this week opened to the public. It is not too much to say that they are an immense acquisition to the district. With the single exception perhaps of Endell-street baths, the arrangement and management of which are in every respect most praiseworthy, those now opened in King-street, Camden Town, are vastly superior to anything of the kind in the metropolis. There is no architectural front elevation to speak of, and the unpretending entrance to the baths does not convey any idea of the extensive range of buildings behind. The baths occupy a large space of ground, and the building consists of two storeys besides an underground floor. On the first or ground floor are two fine plunge or swimming baths, each 60ft. long by 20ft. wide, and having a depth of 6ft. 6in. at one end, and 4ft. 6in. at the other. The baths, however, will seldom, if ever, be filled to their utmost capacity. The first class bath will be sixpence, the second twopence. Both baths are paved and lined with tesselated pavement, and ranged round the sides are 54 dressing boxes for the use of the bathers—that is, 27 boxes for either class. The first class boxes are each furnished, or will be furnished, with a looking-glass, comb and brush, bootjack attached to footboard, clothes' pegs, &c., and each set of boxes is provided with water-closet and urinals. The roof is of glass, affording abundant light. At night the baths are lighted by a series of gas jets suspended from the ceiling. The private baths are on the second floor, and number altogether 101. There are 33 first-class baths, of which eight

are for females; the remaining 68 are second class, ten of these being women's baths. The price for a tepid bath is sixpence, for a cold bath threepence, and no one will say that these charges are other than extremely moderate. As in the case of the plunge baths, the first-class private baths are fitted up in a style somewhat superior to the others, and they offer several additional little comforts for the higher price. The whole of the baths, however, present a remarkably clean, comfortable, and commodious appearance. All the working apparatus of the establishment is situated underground. Here are the engine room, containing an engine of 4-horse power, with 4 boilers and 2 cock furnaces for hot air. There are no fewer than 63 iron tubs or sinks for washing clothes, with 43 drying horses, besides wringing machines, and drying horses for bathers' towels. The light and ventilation of the building are excellent, and, altogether, the St. Pancras Baths must be considered a great public boon, and they are well worth a visit. The architects are Messrs. Messenger and Grundy, 1, Robert-street, Adelphi, and the contractors are Messrs. Manly and Rogers, St. George's-road, Regent's Park. The entire cost of the baths will exceed £22,000. We hear that similar baths are about to be erected in the Marylebone district.

CONTRACT AGREEMENTS.

THE Bristol branch of the Master Builders' Association held its monthly meeting last week. The chairman reported that Mr. Yalland and himself had in accordance with the wish of the association seen several of the architects of Bristol with reference to the question of contract agreements, and that they one and all admitted that the present form of contract was objectionable, but they considered that they could not move in the matter unless under the guidance of the Institute. One of the objections raised by the architects was that the quantities should not form a portion of the contract; they (the architects) did not think it reasonable that they should be held responsible for quantities taken out by surveyors. Mr. Yalland thought that that was nothing but fair. It seemed hard that the architects who did not take out quantities should be held responsible for the neglect of surveyors. In reply to a question, and for the information of those who are not posted up in the subject, the chairman stated that the propositions of the builders, which were agreed to some months ago, were:—

1. That the whole of the plans, sections, elevations, and working drawings shall be complete before the quantities are taken out and the contract is entered into.
2. That the specification shall only contain a description of the work to be done, materials to be used, manner and order of proceeding, and other matters connected with the actual performance of the work, and shall not contain any personal or legal conditions.
3. That the quantities of all works shall be taken out by two surveyors, one to be appointed by the proprietor or his architect, and the other by the builders about to tender for the works. That these quantities shall be taken out and abstracted into bills, as far as possible, upon one uniform system; if the quantities be taken by the architect's surveyor only, the employer to guarantee such quantities.
4. That the form of tender shall not contain any personal or legal condition.
5. That the contract agreement shall be perfectly mutual in all its stipulations and provisions; that the whole of the drawings, specifications, bills of quantities, and tender shall form part of the contract, and that there shall be protection for the builder in case of dispute.

The chairman was of opinion that builders had in these propositions asked for nothing that was unfair. No doubt the greater number of architects were straightforward, honest men, but in no condition of life were all men alike, and in the present case it was the system that required alteration.

THE PATENT LAWS.

ON Monday evening a meeting of the Delegates' Invention Right Committee, consisting of delegates from the Inventors' Institute, the Working Men's Technical Education Committee, the Workmen's International Exhibition Committee, the Foremen Engineers' Association, the Metropolitan Working Men's Clubs and Institutes' Union, and the Public Museums and Free Libraries' Association, representing in the aggregate upwards of 200,000 persons, was held at Cockspur-street, to consider the determination recently arrived at by the commissioners of patents to appoint three additional commissioners. Much dissatisfaction was expressed at the constitution of the existing commission, to the inefficient action of which body the chief evils of the present objectionable patent law system were ascribed. The course adopted by the existing commissioners, in now seeking to appoint three additional commissioners was strongly condemned by the speakers as being objectionable and inopportune, especially when it was considered that the whole patent law question must shortly be dealt with by Parliament. The following resolution was unanimously passed, and a copy of it was ordered to be forwarded to the commission:—"That in view of the want of inventiveness alleged to be now manifested in this country, and the pernicious influence thus exercised on manufacture and industrial progress, a thorough reform of our patent laws is a matter of paramount importance; and, pending the legislative revision to which these laws must necessarily be submitted in the first session of the reformed parliament, it is highly undesirable that any additional commissioners of patents should be appointed until not only the constitution of the present patent law commission, but also the whole of the existing patent laws, as they affect the interests both of inventors and the public, be fully discussed and settled upon a just and satisfactory basis."

ARCHITECTURAL SOCIETIES.

THE first meeting of the Architectural and Archæological Society of Northumberland and Durham took place yesterday, when Chester-le-Street and Lumley Castle were successively visited. In the churchyard at Chester-le-Street a paper was read by the Rev. W. Featherstonhaugh on "Roman Chester-le-Street." On the conclusion of the paper the party entered the church, the Rev. W. Greenwell adverting to the mutilated style of architecture carried out in the restoration of the edifice. Within the porchway the same gentleman drew attention to some fragments of early Anglo-Saxon crosses of beautifully refined carving, similar in character to the beautiful cross at Bewcastle, in Cumberland. He also drew attention to some slabs, formerly coffin lids, which bore various devices to denote the persons to whom they had belonged. The president stated that the sign of a sword upon the lids instead of in all cases denoting a soldier, as was generally understood, merely represented the coffin as that of a male, a pair of scissors denoting a woman; in some cases the trade was supplemented, as was seen in one instance where the coffin lid bore a hammer and pincers upon them, showing the owner to have been a blacksmith. Mr. Longstaffe described the various objects of interest within the church. The parties then proceeded to visit Lumley Castle where a paper was read by Mr. Longstaffe describing the building.

An ordinary meeting of the members of the Northern Architectural Association was held on Friday last at Newcastle, Mr. R. J. Johnson presiding. The chairman (Mr. Thomas Oliver) and Mr. F. Charlton were appointed delegates to the Architectural Alliance Meeting, to be held in London, on the 28th inst. Messrs. W. H. Hoskins, Darlington; J. B. Tilby, Sunderland; and George Connell, Newcastle, were elected associates. Mr. Oliver announced that the Northern Association had sent £5 5s. to the association as a donation to the Architectural Museum. The secretary drew attention to the question of concrete houses, as a subject that was attracting considerable attention just now, and an animated discussion ensued on the æsthetic and constructional qualities of concrete, in which the chairman (Mr. R. J. Johnson), Mr. A. M. Dunn, Mr. F. Charlton, and Mr. W. Pearson took part.

ARCHÆOLOGY.

MR. HOLMES, the archæologist to the late Abyssinian expedition, is making a collection of articles of interest to be handed over to the British Museum. Among these are the Abuna's mitre, said to be a fine piece of art, a chalice of solid gold, presented to the sanctuary of Gondar, by King Adam Segud about the middle of the fifteenth century, and several fine specimens of arms and rare manuscripts.

The soil of Rome, ever fertile in archæological treasures, has just yielded a fresh and very complete specimen of ancient mosaic art, being the pavement of a room excavated last week in the Vicolo Sterrato, a lane between the Barberini gardens and the new Constanzi Hotel. The importance and beauty of the pavement now found leads to the inference that the building containing it formed part of Sallust's villa, which, it is known, occupied this locality.

PARLIAMENTARY NOTES.

ON Thursday week Viscount Hamilton inquired upon whom rested the responsibility of the present impeded state of the thoroughfare in Park-lane, and why the works had remained so long unfinished. Colonel Hogg said that on January 31 the contractor was ordered to commence the works; twelve weeks were allowed for their completion, and they ought to have been finished on April 24.

On the same evening Alderman Lawrence drew attention to the narrow and insufficient approaches to the site of the proposed new Courts of Justice. Mr. M. Chambers concurred with the hon. alderman that no time ought to be lost in acquiring the property which it would be necessary to pull down in order to provide better means of access to the new courts. He commented somewhat severely upon the treatment which the competing architects had received from the commission, and expressed a strong opinion that the site upon which it was proposed to erect the Palace of Justice was ill-chosen, and could not to be made sufficiently extensive without pulling down the west side of Chancery-lane as far as Carey-street. This was, at all events, a subject for inquiry, and perhaps it might in the end be found desirable to erect the new building upon the Thames Embankment rather than in the Strand. He thought the Government ought to communicate with the Metropolitan Board upon the subject. He had reason to surmise that if such communication were made they would ascertain that they could get an ample and most convenient site by the side of the river on which a building worthy of the nation might be erected.

Mr. Clive obtained leave to bring in a bill to make better provision for facilitating and regulating the supply of pure water in cities, towns, and districts throughout the United Kingdom of Great Britain and Ireland.

On Friday last the Artisans' and Labourers' Dwellings' Bill was read a third time in the House of Commons. Some opposition is expected in the House of Lords, principally instigated, it is said, by the City of London.

Mr. Denman begged leave to ask what was the cause of the delay in completing the arrangements for the erection of the new courts and offices of justice, and what was the opinion of the law officers of the Crown upon the questions submitted to them relating to the legality of the choice of a design for such courts and offices.—The Chancellor of the Exchequer said that the delay had been caused by the length of time necessary for the Attorney-General to prepare his opinion. That opinion had just been received by the Treasury, but he had not yet seen it and did not know what course the Government intended taking in the matter.—Mr. Gladstone might be permitted to say a few words on this subject, as he was one of those who might be said to be in some sense responsible for the delay that had occurred. It appeared that none of the plans sent in combined all the requisites mentioned in the instructions, and the judges had asked to be permitted to make, not an award, but a suggestion, in order that the result might not be absolutely null. He would suggest that it was desirable for the Government to proceed without delay to determine who should be the architect, and that then the architect should take time to consider the plans in all their bearings.—Lord J. Manners said the expression of opinion by the Attorney-General had only just been received at the Treasury, and the Government had not yet had an opportunity of considering it. All he could say was that the subject should be at once considered in conjunction with the suggestion that had just been made.

On Tuesday evening Mr. B. Cochrane gave notice that on going into committee of supply he should call attention to the site of the new courts of law, and move that it is inexpedient to commence the building until further opinion has been taken as to the most desirable site for the purpose.

A meeting of the inhabitants of Tooting is about to be held for the purpose of resisting the attempt made to enclose the common.

WATER SUPPLY AND SANITARY MATTERS.

HAVING on Friday completed their inspection of the system of sewerage and other sanitary arrangements of Liverpool, the members of the Rivers Pollution Commission visited Birkenhead and the neighbourhood on Saturday last. The commissioners consisted of Colonel Sir William Denison, K.C.B., R.E., Dr. Edward Frankland, F.R.S., and Mr. John Chalmers Morton; Mr. J. S. Smith being their secretary. Yesterday they visited Tranmere to examine the waterworks, the sewer outlets, and other sanitary arrangements of that township.

The Tottenham Board of Health have been making experiments in the way of deodorising the sewage water of the district, and are hopeful with regard to the River Lea Conservancy Bill. The experiments consist of the application of a patented composition to the sewage water, which is said to precipitate the animal and vegetable matter held therein to the bottom.

The Inspector of Nuisances to the St. George's Vestry, Southwark, appeared before the magistrate a day or two since for an order to remove several poor persons attacked with fever from their lodgings in Brent's-court, High-street, to the workhouse. Applicant stated that a few days ago fever broke out in Brent's-court, which consists of a number of small houses densely populated with Irish families, there being as many as six and seven persons in each room. About a week ago one of them died in the Fever Hospital, and the relatives had the corpse brought back to No. 19, Brent's-court, for the "wake" to take place. It was kept there some days, and visited by scores of Irish, the result of which was an alarming spread of fever in the locality. Several were in a very bad state, and unless removed at once the calamity would be very serious. The magistrate granted the removal of the poor people, not, however, to the workhouse, but to the Fever Hospital.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone has been laid of a new Presbyterian Chapel at Carnone, Derry.

The foundation stone of a new church was laid last week at Cleadon, near Sunderland. It will be erected in the Early English style, and will consist of a chancel apsidal at the east end, nave, and vestry on the north side of the chancel. Mr. Johnson, of the firm of Austin and Johnson, Newcastle, is the architect, and Mr. Allison, of Whitburn, is the contractor.

The new parish church of Coxhoe, Durham, was consecrated last week by the bishop of the diocese. The style is Geometrical Decorated, and the building consists of a chancel, nave, vestry, and south porch. The materials used are Cassop stone and Whitby stone dressings externally, and Bath stone internally. The nave is 82ft. long by 28ft. in breadth; chancel, 28ft. by 24ft.; the nave walls being 20ft. high, and those of the chancel 18ft., while the pitch of the nave roof is 42ft. high. There is sitting accommodation for 458 persons. Mr. Withers, of London, is the architect, and Messrs. Dodgson and Simpson, of Stockton, were the contractors.

The foundation stone of a new Roman Catholic Church at Longton was laid on Tuesday week, by the Rev. Bishop Ullathorne. The building, which is designed by Mr. E. W. Pugin, is in the Early French Decorated style, and will be a parallelogram in form, consisting of a nave 138ft. long and 36ft. wide, and two aisles 110ft. by 14ft. The nave, which will terminate in a pentagonal apse, will be divided from the aisles by nine equilateral arches, rising on columns 17ft. high, and formed of red Mansfield and Painswick stone. The building will be of Staffordshire red brick, with Bath and Hollington stone dressings. The interior accommodation will be for 1,000 worshippers. Mr. G. Heveningham, of Wolverhampton, is the contractor. The total cost of the church when finished is expected to be between £8,000 and £9,000.

Bishop's Waltham Church was reopened last week, after restoration. The roof has been stripped of plaster, and the church has been repewed throughout. No architect was employed, the churchwardens superintending all the work.

A new church, dedicated to All Saints, was consecrated recently at Huddersfield, by the Bishop of Chester. The style of the building is Early Decorated. The plan is cruciform, with a tower 120ft. high at the south-west corner. The church consists of nave, transepts, organ chamber, chancel, and west porch. All the masonry is of local stone, with dressings of white ashlar from Stourton quarries. Sittings are provided for 460 persons. The cost of the building, exclusive of site, is £8,500. The architects were Messrs. Kirk and Sons, of Huddersfield and Dewsbury, and the contractors Messrs. Moorhouse, Bramley, and Co. Mr. B. Stocks, of Huddersfield, was the clerk of the works.

The Tabernacle at Bristol, founded in 1753 by George Whitfield, was reopened on Sunday last, after restoration, at a cost of £500. The building work was executed by Messrs. Foster, and the decoration by Mr. L. S. Allen, both of Bristol.

St. Mary's Church, Cowes, will be opened on Thursday, the 28th inst., having been almost entirely rebuilt. The style is Gothic, and the building was designed by Mr. Cates. It is built of white Swanage stone, with Bath stone window dressings and columns; the interior is of red, white, and black bricks harmoniously intermingled. The columns supporting the roof are of Portland stone. The cost of the work is about £5,000. Mr. George Wheeler, of Cowes, was the contractor.

A new United Presbyterian Church has been opened at Wooler, N.B. The style of architecture is the Early English or Decorated. The building is designed to accommodate 450 adults. The estimated cost is £1,200. The church was designed by Mr. William Grey, Berwick.

Arrangements are nearly completed for the restoration of the old High Church of Stirling. It is intended to restore the whole fabric according to the style and character of the restorations so successfully effected in the cases of Glasgow Cathedral and Paisley Abbey.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting (the last but two for the present session) on Monday, the Right Hon. the Earl of Romney in the chair. Grants of money amounting to £1,270 were made in aid of building new churches. A special jubilee choral festival service was held in the nave of Westminster Abbey on Ascension-day, when a sermon was preached by the Very Rev. the Dean of Westminster in aid of the society's funds.

The foundation stone of a new United Presbyterian Church was laid at Dublin on the 6th inst. The style of the building is Geometrical Gothic, and it will be built of granite, with dressings of limestone and freestone, at a cost of £4,500. The building consists of nave 70ft. by 28ft. clear, and two side aisles. A tower and spire 110ft. high will rise at the north-west angle. Mr. W. Fogerty, of Dublin, is the architect, and Messrs. Crowe and Sons the builders.

The foundation stone of a new small Independent Chapel was laid at Scaldwell. The style is Gothic, and it will be built of brick with Bath stone dressings. Mr. Holt, of Cottesbrooke, is the architect, and Messrs. Keighley and Everard the builders.

The Bishop of Peterborough consecrated a new church at Wellingborough on Friday, the erection of which had been considerably delayed in consequence of the falling in of the south arcade in May last, whilst in the course of being built. The church, which is severe Early English, cost £4,000, and consists of a nave with north and south aisles, an apsidal chancel, and a south chancel aisle containing the vestry and an organ-chamber. The seats are open and afford accommodation for 500 persons. The architect is Mr. C. Buckeridge.

On Thursday week the ceremony of laying a memorial stone for a chapel for the New Connexion Methodists in Stockton took place. The building will be of red brick, and the cost about £1,500. The architect is Mr. W. Hill, of Leeds, and the contractor Mr. John Craggs, of Stockton.

BUILDINGS.

It is intended to erect a new workhouse for the Huddersfield district.

We see that it is intended to build new warehouses and offices opposite the railway station, Huddersfield, and that Mr. W. H. Crossland, of Leeds, has been selected; Mr. J. W. Ramsden is the architect, who has invited tenders.

The following resolution has been passed by the Halifax Town Council:—"That it be an instruction to the Finance Committee to obtain a design and estimates for reconstructing the tower of the Townhall in accordance with the original intention of Sir Charles Barry." Mr. F. A. Leyland has written to the *Halifax Courier* on the subject, and strongly criticises and condemns Sir C. Barry's design, or rather designs.

It is intended to erect a new hotel in Belfast, which is to cost £25,000. It is to be done by a company called the Ulster Hotel Company (limited).

The works of the new station at the junction of the London and South-Western with the Charing Cross line have been commenced. This station will be erected by the South-Eastern Company, and is designed for the accommodation of the South-Western travellers and the population of the Lambeth district. The station will have three platforms available for passengers desiring to proceed to Charing Cross or Cannon-street. They will be nearly 500ft. long and ample in width.

On Monday the London and North-Western Railway Company opened their new goods station at Broad-street, and thus made an important addition to the means of transport for the enormous local trade of the City. There are four entrances to the new station, and the route promises to be a great convenience to the numerous houses having connections on the London and North-Western system of railways.

The Vestry of St. Mary, Islington, accepted tenders for the alteration to the bridge over the Regent's Canal, Caledonian-road, last Friday, and decided in favour of Mr. William Jay, who tendered to do the whole work for £2,429. The new bridge is to be 40ft. span, with a wrought-iron top with 14in. parapet walls resting on the outside girders. The new width of roadway will be 30ft., with 7ft. footways on each side, thus giving a clear width, wall to wall, of 44ft., being 11ft. 9in. more than the old width. Mr. John A. Clements, C.E., who is also the surveyor to the western district, is the engineer.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—J. G. B.—J. W. W.—J. M.—E. S., with photographs.—W. R. S., with photographs of plans of Manchester New Townhall.—G. T. R.—E. W. P.—T. A.—T. W.—E. W. G.—I. C.—I. R.—G. T. R.—R. P. E.—I. H.—W. H. W.—T. J. V.—A. G. H.—E. S.—I. R. B.—E. C.—C. S. M.—W. S.—W. P.—P. B.—C. F.—E. B.—J. B.—N. M'C.—D. H. and J. N.—JOHN JACKSON, advertise.

J. R. T.—Kentish rag, though used extensively in London and elsewhere, is not used internally, because it sweats; or, in other words, it does not absorb condensed moisture.

J. M.—The illustrations spoken of did not appear in the BUILDING NEWS.

ENQUIRER.—See reply 855 in present impression.

Correspondence.

UTILISATION OF WASTE HEAT.

TO THE EDITOR OF THE "BUILDING NEWS."

SIR,—I have been very much surprised to observe by the BUILDING NEWS that Mr. Mathews, honorary secretary to the Architectural Association, has, on two occasions within the last few weeks, brought before the members certain suggestions which had "occurred to him" for utilising the waste heat from a kitchen fireplace for the purpose of warming upper rooms. I beg leave to ask Mr. Mathews by what right he brings forward as a scheme of his own a proposition suggested by me four years ago in my first publication, and fully discussed in my last book, "Ventilation and Heat." I am bound to suppose that Mr. Mathews was acquainted with my propositions. They were described by you in your notice of my book, January 3, 1868. I sent a copy of my book to the Architectural Association, which was acknowledged by Mr. Mathews on the 20th of the same month, and three weeks later he brought forward my leading proposition as if it emanated from himself, and, in the discussion reported last week, it was not to him but to the president that I was indebted for a mention of my publication. Such conduct is ungracious and unjust. It does not appear, from the discussion, that either of the

speakers was familiar with the indispensable conditions requisite for giving the system whatever success it might be susceptible of. That the system could be made a success, and a very decided one, there can, I believe, be no doubt whatever. If gross mistakes were made, there would of course be an entire failure. I have described many of the conditions, and hope I may have some opportunity to carry out the system on a considerable scale. I will then take the most suitable means of giving full publicity to the results, and the means of obtaining them.—I am, &c.,

FRED. EDWARDS, Jun.

Great Marlborough-street.

Intercommunication.

QUESTIONS.

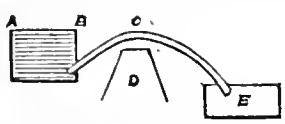
[862.]—GLUE.—Can anyone inform me if there is any glue used for woodwork that will withstand damp? In your article on "Continental Joinery," some time ago, you speak of Messrs. Ekman, of Stockholm, employing fish glue for their door panels, and which, when immersed for several hours in water, did not break at the joint. Is this ordinary fish glue, obtainable in shops at 10d. per lb.? Perhaps you know the mode of preparation.—G. F.

[863.]—COLOURING PERSPECTIVES.—Can anyone inform me where I can receive lessons in colouring perspectives at moderate terms in London?—DRAUGHTSMAN.

[864.]—POLISHED GRANITE.—Will any of your readers inform me of the best method of getting the best polish on red Scotch granite?—HARD STONE.

[865.]—THEORY OF PUMPS.—Will the gentleman writing the above-named article give me his idea how high water can be raised from a river by means of a 3in. syphon, and the best method of applying it to filling a tank.—M.

[It must be borne in mind that water cannot be raised by means of a syphon unless the level of the source of supply is higher than the top of the bend of the syphon, as represented in the annexed sketch. Let A B be the level of the source



of supply, and D an embankment over which it is required to raise the water into any place E. The condition of the proper acting of the syphon is that the level of the water A B shall be always about 2ft. higher than C. If the task mentioned by "M." be higher than the surface of the river he proposes to get his water from, the syphon can do nothing for him.—THE WRITER OF THE ARTICLE.]

[866.]—FLINT WALLS.—I have recently built a flint wall, and find, to my sorrow, that it is already so bulged that I must take it down. Possibly, I have left something undone which I should have done. A hint or two from an experienced hand on the best mode of building flint walls would be thankfully received by—J. R. B.

[867.]—SCHOOL OF DESIGN.—Could you or any of your readers inform me where the best school of design is situated, either in the E.C. district or nearest to it; of the terms of attendance in the evenings; and upon what evenings the school is open for instruction?—WANSTEAD

[868.]—ENTASIS OF COLUMNS.—Can any of your readers kindly supply the proper method of finding and setting out the entasis of the shafts of columns? Or can anyone inform me of the best work upon the practice of the five orders?—J. P. O.

REPLIES.

[839.]—CONSTANT FOR GIRDERS.—The proper constants for girders will depend upon the description to which they belong. When the section is the solid rolled one mentioned by "J," and shown in fig. 1, the constant may

FIG. 1.

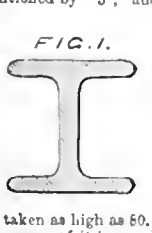


FIG. 2.

be taken as high as 80. This value is given to it because by reason of it being all in one piece, it is supposed to be secured against weakness by lateral deflection, or yielding of the middle part or "web," as it is technically termed. If we now consider what is known as a "built up" girder, that is, one made of a vertical plate or rib joined to a couple of horizontal upper and lower plates by two pairs of connecting angle irons, and represented in fig. 2, the constant cannot be taken higher than 75, as the thin wrought iron rib in a girder of a depth exceeding 3ft. requires to be secured against lateral weakness by stiffening irons or longitudinal stripe of angle or T iron riveted on to it. Should the "web" be of open or lattice bars instead of a solid plate, the constant should not be taken higher than 72, unless by one well experienced in designing girders, and who is able to compensate by skilful bracing for the comparative absence of partial rigidity.—DESIGN.

[840.]—STONE PIPES AND FROST.—Allow me to inform your correspondent that if his pipe were to be quite full of water, and the water were to freeze, it would certainly burst; but, as this could hardly happen, the water in a down pipe always being in motion, there is no fear of such a contingency. I should be inclined to omit the leaden lining, the more especially as leaden pipes are those which burst oftenest during a severe winter.—I. P. D.

[842.]—DRAIN TRAPS.—Having taken the greater part in producing Antill's Improved Stench Traps, I am naturally interested in their success, and beg to offer one or two remarks in answer to "Mr. Kirkby" and "A. W." in your last impression. That they are a modification of the D trap there can be no question, and well adapted to replace the bell and all others in places where room is limited; but whether they are as effectual as can be desired must be left to time and experience. It has been an anxious question in fixing the prices; and they have been submitted to architects, builders, and plumbers, and the general answer has been that they are not too high. Anyone acquainted with the price of metals and cost of workmanship knows full well their value, and that many thousands must be sold before any return can cover our preliminary expenses. I would here remark that, although the principle of the traps is simple, it is not so to make. No doubt the difficulties may be simplified in time to come. Should the experiments in iron be successful, they will then be at such a price as will bring them into use in all classes of buildings.—R. ANTILL.

[848.]—THEODOLITE.—For a beginner to learn the adjustments and the general use of the theodolite, there is not a better little work than the number in Weale's Series, "Mathematical Instruments," by Mr. Heather. I imagine, however, that "E. M. S." refers to the use of the theodolite in connection with surveying, setting out work, &c. He will find abundant information in "Baker's Surveying and Levelling," also one of Weale's Series; "Williams's Practical Geodesy," a most excellent work; "Mr. Haskoll's Land and Marine Surveying," reviewed in our columns of the 15th inst.; and, in fact, in almost every modern work upon surveying and civil engineering.—ASSISTANT ENGINEER.

[849.]—IRON AND WOOD GIRDERS.—There is no such work to which your correspondent alludes, but he will find everything required to be known about wood girders in "Barlow's Strength of Materials;" about cast-iron girders in Mr. Hodgkinson's work; and about wrought-iron ones in Mr. Fairbairn's "Application of Cast and Wrought Iron to the Purposes of Construction."—S. S.

[853.]—GOLD LETTERING ON MARBLE.—"A. A." will find the following a useful mixture for his purpose:—In half a pint of hot turpentine dissolve 2½oz. of gum dama and 1½oz. of best white wax; when cold, give the letters one or two coats of this, allowing a day between each coat to dry; then gild with double thickness gold leaf in the usual manner. It will not crack either indoors or exposed to the weather.—T. K.

[855.]—DAMP BRICKWORK.—If A. B. C. D. will apply two good coats of Ransome's Patent Liquid Glass to surface of his brickwork he will find it do all he wants. It is most effective in preventing the damp from penetrating through the wall, and will not discolour the bricks.—E. HONEY, 22, Trinity-street, Bristol.

[855.]—To make brick or stone walls impervious to wet, wash the walls with a hot solution of ¼lb. of mottled or soft soap in a gallon of water, laid evenly with a brush. As soon as this is dry, another coat, composed of ½lb. of alum thoroughly dissolved in three gallons of water. Fair weather should be selected for the work. Porous bricks have been effectively weathered by this process.—W. R. A.

[856.]—CORROSION OF LEAD PIPES.—If the lead pipes are laid in common drain pipes the latter will protect the lead pipes from being eaten away by the action of the earth. I presume your correspondent is correct in stating that the cause is not the chemical action of the water.—W. R. A.

[857.]—TO CLEANSE OLD STONEWORK.—Old whitewash may be readily cleaned off walls by scrubbing with water and sand, being previously acidulated with .04 of hydrochloric acid. The commonest acid will do, sold at about 2d. per pound.—W. R. ATKINSON, Uckfield.

WAGES MOVEMENT.

The stonemasons' strike at Birmingham still continues, and there is no probability of any satisfactory settlement of the dispute at present. The masters are equally determined with the men not to yield, and in order to enable them to proceed with their work, they will endeavour to obtain the services of men from other towns.

The bricklayers' strike at Liverpool is still going on. Some men have been obtained from London, and active steps are being taken with the view of getting more.

The masons of Coventry have demanded an increase of wages and the Saturday half-holiday. Steps are being taken to call a meeting of the masters to consider the matter as early as convenient.

STATUES, MEMORIALS, ETC.

The Common Council of London propose to erect a statue to Mr. Peabody, near the Royal Exchange.

About a year ago the New York exec[illegible] committee of the Shakespeare Monument Fund selected a design out of several models which had been submitted to them. It is now completed, and is to be subjected to the approval of the general committee on the 25th inst. The statue is expected to be finished and erected in Central Park, upon the foundation, where its corner stone was laid four years since, on the 23d of April, 1869.

The memorial statue of Sir Peter Fairbairn was inaugurated on Thursday week at Leeds. The statue has been erected by public subscription, and was executed by Mr Noble, at a cost of £1,000. It is of bronze, about 8ft. 6in. in height, and rests upon a 10ft. pedestal of Peterhead granite.

Dr. Kinglake, the donor of the Taunton High Cross, has decided to place statues in the six vacant niches.

On Wednesday week the Bishop of Sodor and Man, acting for the Bishop of Salisbury, consecrated the church of Pukeswell, near Weymouth, which has been rebuilt. It consists of an Early English chancel, nave with north and south transepts, circular tower with spire at the west end, porch on the north of the nave, and vestry on the south of the chancel; and the dimensions are, measuring within the walls, 86ft. from east to west, and 51½ft. from north to south; while the spire reaches an altitude of 90ft., the roof of the chancel and nave, which are of the same height, 40ft. The east window is by Clayton and Bell, and there is also a painted window over the font, which is in the tower. The architect is Mr. G. Evans.

BUILDING AND LAND SOCIETIES.

The seventeenth annual meeting of the Oxford and Abingdon Building Society was recently held at Oxford, Mr. Alderman Hughes in the chair. The report, which was adopted, proved that a larger amount of business had been transacted than in any previous year, and all of the most satisfactory character. A bonus of £25 was recommended on all shares arriving at maturity between March 31, 1868, and March 31, 1869. Certain alterations were made in the rules of the society, and the retiring directors having been re elected the meeting closed.

LEGAL INTELLIGENCE.

IMPORTANT DECISION.—Some time ago, says the *Scotsman*, the road trustees for the county of Berkshire contracted with Mr. John Dickson, Galashiels, for the building of a bridge over Bowmont Water, near Yetholm. It was a condition that the contractor was bound to uphold the bridge for one year. When finished the work was taken off Dickson's hands by the trustees' inspector as finished in terms of the contract. In a few days afterwards the bridge was carried away by a flood, and the trustees sued the builder for its re-erection. Proof was laid before the sheriff by both parties, and it was contended for the builder that the plan was faulty, and that he was not to blame. The sheriff has given effect to this plea.

SURVEYORS' CLAIMS.—OWEN *v.* REVEL.—The plaintiff is a surveyor at Bournemouth, and the defendant was lately inspector of nuisances at Bournemouth, at which time some houses were built by him. The claim was in the Christchurch County Court for £20 9s. 11d., of which defendant admitted £11 10s. 11d., and disputed £9, made up of two items, one of £5 and the other of £4, for superintendence of work, and for measuring out two sets of cottages. Defendant admitted the order for measuring, but still disputed the superintendence, and the matter then in dispute was £6.—Evidence was called by the defendant, after plaintiff had stated his case, to prove that no superintendence by plaintiff had taken place while the work was in progress, and his Honour gave judgment for plaintiff for £14 19s. 11d., and ordered payment forthwith.

NOTICES OF PUBLICATIONS.

TERRA-COTTA.—Parts 3 and 4. By J. M. BLASHFIELD. Stamford.

MR. BLASHFIELD has issued two other parts of his work on terra-cotta. Parts 3 and 4 illustrate a great variety of uses for this material in connection with brick domestic architecture, including doorways, windows, balconies, consoles, copings, plinths, monograms, panels, &c. "For this class of work," says the author, "terra-cotta is not always cheaper than Bath stone or other easily wrought oolites, but for such purposes it is far cleaner and more durable than stone."

GLEANINGS FROM FRENCH GARDENS. By W. ROBINSON, F.L.S. London: Warne and Co. 1868.

THIS is a work on French horticulture and gardening. The author went to France in 1867 with a view to study the horticulture of the country as far as possible while continuing his connection with the horticultural press in this country. A correspondence having resulted, the author was induced to write this book. It contains many illustrations, and will be found to be a useful book to all interested in horticultural pursuits.

A CATALOGUE OF THE BOOKS, MANUSCRIPTS, WORKS OF ART, ANTIQUITIES, AND RELICS ILLUSTRATIVE OF THE LIFE OF SHAKSPEARE. London. 1868.

THE Shakspeare Fund was established in 1861, and among the objects contemplated was the erection and endowment of a public library and museum at Stratford-on-Avon, the contents of which are described in this catalogue. The permanency of this important collection has been carefully secured. The library and museum have been conveyed to the corporation of Stratford-on-Avon upon trust to place their management under the control of a board. The catalogue has been

compiled by Mr. Clarence Hopper. All who are interested in the life and labours of the great poet, and their name is legion, will find much to amuse and instruct in this museum.

THE SOCIAL CONDITION OF THE WORKING CLASSES. By the Author of "The Autobiography of a Beggar Boy." London: Heywood and Co.

THIS book glances at the history of social and political progress for the last fifty years. It is evidently written by one who joined in the struggles for political and social freedom. It treats in the ordinary cheap newspaper style of strikes, and condemns them emphatically. It shows that no combination of men can keep up the value of labour beyond its power to remunerate the capitalist. The author gives a good deal of healthy advice to working men. But it will be found in the long run that working men, like other people, will only buy wisdom by experience. When they find that strikes do not and cannot permanently better their condition, strikes will be abandoned.

MEETINGS FOR THE ENSUING WEEK.

TUES.—Institution of Civil Engineers.—The annual Conversazione, 9.

SAT.—Associated Arts Institute.—Exhibition of sketches—subject, "Signs of the Times"

Our Office Table.

The committee of the Working Men's Club and Institute Union has completed arrangements for the delivery of two courses of lectures on the value of science in relation to industrial pursuits, at the London Mechanics' Institution, Southampton-buildings. Professor Kerr, F.R.I.B.A. (of King's College), opens the first series to-day, and he will be followed on Tuesdays and Fridays by Mr. James Robertson, Dr. J. H. Gladstone, F.R.S., F.C.S., Dr. F. Crace Calvert, F.R.S., Dr. W. B. Carpenter, F.R.S., Mr. E. J. Reed (Chief Constructor of the Navy), Professor Warrington Smyth, and Dr. E. Lankester, F.R.S.

At the closing business meeting for the present session of the Institution of Civil Engineers, held on Tuesday last, Mr. Charles Hutton Gregory, President, in the chair, nine candidates were balloted for and duly elected, including, as Members:—Mr. Thomas Login, F.R.S.E., Executive Engineer of the 1st Class in the P.W.D. of the Government of India; Mr. William Teasdel, Resident Engineer, Great Yarmouth Port and Haven; and Mr. Edward Williams, General Manager of the Mines, Collieries, and Iron Works of Messrs. Bolckow, Vaughan, and Co., Middlesborough; and as Associates—Mr. Henry Samuel Ellis, Exeter; Mr. Charles Higgins, surveyor, Islington; Mr. William Hurst, Paddington; Mr. Samuel Joseph Mackie, Bayswater; Mr. John Palmer Smythies, assistant engineer, Furness and Midland Railway; and Mr. Arthur John Whalley, Montevideo. It was announced that Mr. Nicholas Charles Szerelmey had been admitted a student.

The First Commissioner of Works having removed the pump in Park-lane, opposite Pitt's Head Mews, the Vestry of St. George's have unanimously passed a resolution requesting him to restore it.

Mr. Abbott's plan for the drainage of Regent-street has been adopted to the exclusion of plans submitted by Mr. Bazalgette and Mr. Howell.

A correspondent wants to know why private carriages are not allowed to drive up Constitution-hill; and he asks, Is there a capital in Europe where the use of such a thoroughfare should be restricted to a small number of favoured courtiers, who have the exclusive right to drive there?

The demand for houses in the new undertaking of the United Land Company has been already so great that the directors have fixed the early date of June 6 for the receipt of applications for shares. This success of the company is naturally to be ascribed to its co-operation with the long-existing and prosperous Conservative Land Society, and to the fact that the executive committee and officials, with some additions to the company, are nearly all the same as those who originally commenced operations in the purchase of estates in the gross, and the sale of them in plots in detail in 1852.

At the meeting of the Metropolitan Board of Works on Friday last, a report was presented on the proposals of the Metropolitan District Railway as to the construction of a solid embankment between the Temple and Blackfriars Bridge. A provisional agreement had been entered into for the construction of a solid embankment with a 100ft. roadway thereon from the Temple Gardens to Blackfriars Bridge, and the company to construct their railway within the embankment; the railway company to commence their works for the construction of the railway on the embankment from Westminster Bridge to the Temple on July 1 next, and the other works to be carried on simultaneously with the works of the Board. The railway company to deposit £40,000 on July 1 next; the payment of the £200,000 to be paid to the Board to be spread over three years. The report was adopted, and fresh tenders will be advertised for.

Mr. F. T. Palgrave, in a lecture before the Royal Institution a fortnight since on "Good Taste in Art," said that independently of the individual artiality of every observer for particular works of art, there is such a thing as good taste, governed by fixed laws, and dependent upon accurate knowledge. Among the things which ordinary observers and inferior artists often overlook were "the laws of material." In sculpture, for instance, he said that marble is only suited for works of repose, whilst bronze, being a lighter material, and of more tenacity, is suitable for works of activity.

A process for gilding is published in the Bulletin of the Société d'Encouragement. The articles are first electro-gilded in the ordinary way. An alloy of gold and quicksilver is afterwards deposited from a solution of the cyanides of the two metals. When this coating is sufficiently thick, it is done over with a paste formed of borax, with some additional boracic acid and sal-ammoniac. It is then placed in a fire until the paste is calcined, and afterwards in a bath of acidulated water. By this process a surface of gold is obtained in just the same state as by the old water-gilding process, without any risk to the health of the workmen, and it may be burnished or left dull as desired.

There is no doubt that some effort should be made to introduce an improved lamp for the streets. As a move in this direction, the St. George's vestry, Hanover-square, desirous of obtaining a more ornamental lamp, invited specimens to be sent them, but they were too dear for use. The surveyor, however, was ordered to advertise for designs and specimens.

In a paper lately read before the Birmingham Architectural Society by Mr. J. R. Veall, architect, of Wolverhampton, on "The Village Church," the following occurs:—I must, however, mention an ancient office which still exists, *i.e.*, the dog whipper, whom in some village churches it used to be necessary to appoint. At Trysull, near Wolverhampton, John Rudge, by his will, gave 5s. a quarter to a poor man to go about the parish church during sermon to keep people awake (rather a poor compliment to the clergyman) and keep dogs out of church. The sum is still paid for that purpose. Richard Dovey, of Farncote, Shropshire, in the year 1659, left 8s. per annum to some poor man of the parish of Claverley who should undertake to awaken sleepers and whip dogs from the church; 10s. per annum is still paid for that purpose. In one of the Lincolnshire village churches, a short time since, I counted no fewer than five sheep dogs present during Divine service. I could not ascertain, however, that a dog whipper had ever held office.

It appears that St. Bartholomew's Hospital possesses a farm, and that a slice of it is about to be sold to a railway company. This portion of the farm now yields the hospital about £100 a year, and Mr. Foster White stated, on Saturday last, that the railway company will give £45,000 for the said slice.

Our attention has been called to the plans submitted for the Manchester New Townhall, by Corson and Aitken, of Manchester, and we must say they very closely resemble the plans of Mr. Waterhouse. As Mr. Waterhouse's plans have been very justly praised the question very naturally arises, how is it that other plans so much like them were not admitted into the privileged circle of eight by the referee and the committee. We ask this without for a moment wishing to impugn the final verdict.

The guardians of the Holborn Union have been making an experiment on the relative economical merits of stone breaking and oakum picking. After spending £50 in stone and £5 in hammers, they cannot find purchasers for the stone. For picked oakum they found a ready sale at 2s. 6d. per cwt. We cannot imagine, however, why there should not be a demand for broken stone in London, where so much is consumed.

The President of the Royal Academy has announced that the next exhibition of the Academy will be held in its new home, and though all the space at their disposal would not then be accessible, still they would have room for 1,500 pictures, whereas now they had only room for 900.

The Rev. W. Morley Punshon, in a letter from the United States, describes the opening of a new Methodist Episcopal church in Williamsburg, a suburb of New York, on the Brooklyn side. There were several features in the building which struck him as novelties. Immediately in front was a table for the reporter; to the right of the tribune a pedestal, on which was a very beautiful bouquet of flowers. The church was lighted like the British House of Commons, and the rays, streaming through coloured glass, fell with a softened lustre which was cheerful without being dazzling. The total cost of the church was 200,000 dollars, or about £40,000. On the basement is a large, cheerful room, superbly furnished with carpets, mirrors, piano, &c., which is called "the church parlour," and which is the common property of the members. This "church parlour" appears to be fast becoming one of the institutions of American Methodism. Surely somebody might introduce something similar into our City churches. It would be a capital place to adjourn to during the sermon.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3047 W. BISHOP AND B. BURNINGHAM. IMPROVEMENTS IN APPARATUS FOR PREVENTING EFFLUVIA ENTERING TANKS OR CISTERNS FROM THE WASTE-PIPE. Dated October 29, 1867.

This invention relates to a means of preventing the admission of effluvia from drains entering cisterns by the waste-pipe, as is commonly the case, and consists in the application of a lift-valve fitting in a socket let into the bottom of the cistern or tank, which socket communicates with a pipe for carrying away the surplus water to the closet or drain. The valve stem passes up through a bridge-piece and guide attached to the socket, a tube being fixed on the neck of this guide supporting a float at the height to which the water is to rise. This float is connected to the valve stem by means of a rod or chain passing down through the said tube, the length of the rod or chain being regulated as desired by means of a nut and screw passing through the float.—Patent completed.

Trade News.

TENDERS.

The Bethnal Green Board of Guardians have accepted the tender of Mr. Whitford, for the erection of an iron house at Leytonstone, for the temporary accommodation of the children shortly to be removed from Hanwell School. Amount, £1,176.

AYLSHAM.—Mr. Editor,—The following are specimens of estimates given for the erection of a Primitive Methodist Chapel at Burgh, near Aylsham, Norfolk. What think you of the differences? The chapel to seat 150; bricks and lime supplied; plans and specification provided by committee.—Yours, &c., A CONSTANT READER.

Saul	£255
Wilson	161
Burrell and Tuddenham	157
Bartram	146
Thace	130
Gaze	123
Buck	98
Hewits	79

BOUND'S GREEN.—For house at Bound's Green, for C. F. Francis, Esq. A Rowland Barker, architect:—

Brown	£1110
Linzell	995
Stringer	986
Pocock	845
Scrivener and Co.	824

HAMMERSMITH.—For the erection of five cottages near the Cornwall road. Mr. John G. Hall, 6, Cornwall road, architect. Quantities not supplied:—

			For drain to Cornwall Road.		Extra for wheeling down lane.		Total.	
	£	s.	£		£		£	s.
J. Beagley	1049	0	41		10		1100	0
Chamberlen Bros.	1025	0	30		10		1065	0
J. & F. Raynham	875	10	24		25		924	10

CRANFORD.—For sewerage works at Cranford, Middlesex. Mr. Charles Innes, architect. Second contract:—

Thirsk and Co.	£777
Lodge	760
Mann	745
Crockett	724
Adamson and Sons	629

EGHAM.—For the erection of boys' and girls' schools and teachers' residences at Egham, in the county of Surrey, for the trustees of the Poor Allotments Fund. C. H. Howell, architect, 3, Lancaster-place, W. C. Quantities not supplied:—

Reveall, Windsor	£1865	Approach	£120
Simpson, Egham	1540	,,	80
Oades	1399	,,	48

FULHAM.—For Sir John Powell's almshouses. Mr. J. P. Seddon, architect:—

Belham	£7200
Hall	5948
Grover	4359
Williams and Co.	4126
Muspratt	4106
Pitts and Son	4060
Aviss and Son	3950
Perkins	3640
Henderson	3618
Wigmore (accepted)	3368
Lacey and Co.	2490

LONDON.—For four warehouses, Monkwell-street, Wood-street, E.C. Herbert Ford, architect. Quantities supplied by Messrs. Hovenden and Heath:—

Asbby and Sons	£10,655
Conder and Sons	10,632
Lawrence and Sons	10,532
Piper and Wheeler	10,500
Turner and Sons	10,470
Myers and Son	10,443
King and Sons	10,360
Crabb and Vaughan	10,296
Mann	10,175
Pritchard	10,154
Henshaw	9,985
Browne and Robinson	9,879
Brass	9,747
Webb and Sons	9,684

LONDON.—For alterations and repairs at the "Prince of Brunswick Inn," Brunswick street, Blackfriars, for Mr. H. G. Stranger. Mr. D. Haylock, architect, Wandsworth:—

Mills	£546
Winterton	545
Stone	522
Harrington	516
Langmead and Way (accepted)	498

LONDON.—For the erection of five warehouses, Finsbury-street, E.C. Mr. Wimble, architect:—

Patman and Fotheringham	£9985
Keeble	9823
Hart	9650
Wills	9549
Newman and Mann	9486
Turner and Sons	9469
Webb and Sons	9466
A. Killby	9330
Kelly Brothers	9271
Abraham	8987
Perry	8987
Scrivener and White	8910
Henshaw	8560
Mortar	8123

LONDON.—For rebuilding Her Majesty's Theatre, in the Haymarket. The quantities were furnished:—

Smith and Taylor	£35,674
Cubitt	35,318
Myers	31,586
T'Anson	29,960
Piper and Wheeler	29,500
Holland and Hannen	28,439
Trollope	27,767
Foster	26,770*

The above do not include the stage, machinery, fittings, fixtures, gas-fittings, fire mains, warming, and decorations; but they include all iron work.

* We believe the above is not a complete list of the tenders.

NORTHAMPTON.—For new schoolrooms, vestries, &c., Commercial street Chapel, Northampton. Mr. T. Heygate Vernon, architect. Quantities supplied by Messrs. Mann and Saunders:—

Berrill	£1399
Redshaw	1384
Marsh	1350
Watkins	1200
Hall	1124
Smith Brothers	1116
Clarke and Heap	1000
Cosford and Emery (accepted)	1090
Chappell	974

SHEPHERD'S BUSH.—For residence at Shepherd's Bush, for Thomas Elborough, Esq. Mr. Charles Bradley, architect, 24, Nottingham-street, St. Marylebone:—

Haward Brothers	£2215
Tubb	1845
Longwire and Burge (accepted)	1697

SOUTHSEA.—For finishing two houses in Granada road, Southsea. Archibald D. Dawnay, architect:—

	With pointed fronts.	With bay windows.	Outbuildings.
	£	£	£ s. d.
Ward & Son, Portsmouth	472	632	57 11 4
Backhurst, Portsmouth	455	579	50 0 0
Morey, Southsea	445	553	49 10 0
Burbidge, Southsea	390	500	48 10 0
Blackburn, London	—	540	30 0 0
Bailey, Southampton	—	410	—

SYDENHAM.—For the erection of a pair of semi-detached villas at Sydenham, for Mr. W. A. Little. William Powell, architect:—

Jacobs	£2080
Gorrum	1950
Capps	1900
Waterson	1750
Storey	1672

SYDENHAM.—For the first portion of road and drains on the Bellevue Estate, Sydenham, for Mr. W. A Little. William Powell, surveyor:—

James	£743 0 0
Capps	318 10 0
Pearce and Co.	285 0 0
Colson	280 0 0
Green	269 0 0
W. Lawrence	236 16 0
Clark	234 0 0
Benthall	223 0 0
Drummond (accepted)	223 8 6
Harrison	210 0 0
Cole	199 10 0
Porter	195 0 0
T. Lawrence	186 0 0
Beales	176 0 0

WALTHAMSTOW (ESSEX).—For a house for Mr. D. T. Morgan. Mr. John T. Bressey, architect:—

Arber	£2478
Rivett	2293
Mundy and Hutchinson	2266
Piper and Wheeler	2190
Perry and Co	2135
Reed	1941

PROPERTY SALES.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold plot of building land fronting Clarendon-road, Watford, Herts—sold for £450.

Life interest of a person aged 57 years, in a freehold and leasehold property known as Goose Rye Farm, Guildford, Surrey, consisting of two cottages, buildings, and 23 acres of land, let at £42 per annum—£150.

Freehold warehouse, No. 4, Elm-street, Gray's Inn-road, let on lease at £80 per annum—£1,770.

Freehold house, No. 45, Hyde road, Hoxton, let at £22 per annum—£340.

Freehold house, No. 47, Hyde-road, Hoxton, let at £20 per annum—£450

Freehold building estate, containing about 31 acres, situate in the parishes of Tooting and Streatham, in 16 lots, viz.:—Lot 1, £600; lot 2, £600; lot 3, £520; lot 4, £430; lot 5, £460; lot 6, £460; lot 7, £460; lot 8, £370; lot 9, £510; lot 10, £1,050; lot 11, £850; lot 12, £800; lot 13, £840; lot 14, £500; lot 15, £1,350; lot 16, £2,500.

By Mr. Robert Reid.—Leasehold residence, No. 148, Camden-street, Camden Town, let at £49 per annum, term 42 years unexpired at £7 9s. per annum—£500.

Leasehold improved ground rents, amounting to £108 14s. per annum, for 53¾ years, secured upon premises at Camden Town, in 11 lots, as follows:—Lot 1, ground rent of £10 10s. per annum, £170; lot 2, ground rent of £12 12s., £220; lot 3, ground rent of £10 10s., £190; lot 4, ground rent of £10 10s., £190; lot 5, ground rent of £10 10s., £170; lot 6, ground rent of £12, £215; lot 7, ground rent of £11 18s., £200; lot 8, ground rent of £8, £135; lot 9, ground rent of £4 4s., £95; lot 10, ground rent of £5, £115; lot 11 ground rent of £10, £170.

Leasehold three houses, Nos. 22 to 24, Union-street, Lambeth, producing £88 per annum, and a ground rent of £5 per annum, secured on No 21, Union-street, term eight years unexpired at £18 18s. per annum—£225.

Leasehold four houses (two with shops), Nos. 16 to 18, and 18A, Victoria-terrace, St. John's-wood, and a ground rent secured on No. 15, producing £161 per annum, term 47 years unexpired at £20 per annum—£1,375.

Leasehold stabling, granary, counting-house, dwelling, and premises, No. 24, Little Chester-street, Grosvenor-place, annual value £120, term 39 years unexpired at £45 per annum—£800.

Leasehold house, No. 34, Bayham-street, Camden Town, term 21½ years unexpired, at a peppercorn—£405.

By Mr. Frank Lewis.—Absolute reversion to two fifth shares of £2,723 13s. 10d. three per cent. consols; also of £400 secured by mortgage of a house at Portsea, receivable on the death of a gentleman aged 59 years—£530.

Leasehold residence, known as Kent Villa, Grange road, Dalston, let at £35 per annum, term 90 years from 1856, at £5 per annum—£350.

May 11.

By Mr. Whittingham.—Freehold mansion, known as Bromley House, High street, Bromley, with stabling, outbuildings, and land, 1a. 1r. 32p.—£3,300.

Freehold building land, situate in High-street, Bromley, in 24 lots.—Lot 2, £230; lot 3, £185; lot 4, £185; lot 5, £185; lot 6, £190; lot 7, £265; lot 8, £110; lot 9, £110; lot 10, £110; lot 11, £110; lot 12, £110; lot 13, £110; lot 14, £100; lot 15, £100; lots 17 to 25, £100 each.

Freehold building land, situate in the Moffat road, Beulah Spa, Norwood, in 48 lots, as follows:—Lots 1 to 163 comprised previous sales; lot 164, £72; lots 165 to 170, £40 each; lots 172 to 175, £37 each; lot 177, £35; lots 178 and 179, £34 each; lots 184 to 186, £37 each; lot 187, £85; lot 188, £86; lots 189 to 192, £32 each; lots 193 to 199, £31 each; lots 203 to 206, £30 each; lots 209 to 210, £41 each; lot 211, £100.

By Mr. G. R. Noble.—Copyhold 3a. 2r. 21p. of land, situate at Woodford, Essex—£735.

Freehold two houses, with shops, and twelve cottages, situate as above—£900.

May 12.

By Messrs. Farebrother, Clarke, and Co.—Freehold residence with stabling, pleasure grounds, and paddock of 4a. 2r. 32p., known as the "Chestnuts," Walton-on-Thames, Surrey, let on lease at £75 per annum—£2,550.

Freehold residence, with stabling, outbuildings, small farmery, pleasure grounds, and park like lands, containing 17a. 2r. 35p., known as Elm Grove, Walton-on-Thames—£7,230.

Freehold 8a. 3r. 8sp. of building land, situate as above—£4,000.

Freehold two cottages let at £13 per annum, situate as above—£400.

Freehold two cottages, let at £13 per annum, situate as above—£520.

Freehold cottage, let at £12 per annum, situate as above—£440.

Freehold estate, situate at Walton-on Thames, known as the Tithe Farm, comprising 64a. 3r. 35p., let at £80 per annum—£5,330.

Freehold estate, situate in the parish of Walton, Surrey, being part of the Tithe Farm, comprising farmhouse, buildings, and land 9a 3r. 9p., let at £30 per annum—£2,750.

Freehold residence, with stabling, orchard, and ground of 2a. 0r. 33p., known as Hersham House, Hersham, Surrey, let on lease at £40 per annum—£1,340.

By Messrs. Ventom, Clarke, and Bull.—Leasehold shop and premises, No. 2, Warwick place, Peckham Rye, term 34½ years unexpired, at £60 per annum—£355.

By Messrs. Debenham, Tewson, and Farmer.—Freehold four cottages, with outbuildings, orchard and meadow land comprising 1a. 2r. 30p. situate in the parish of Barkway, Hertfordshire—£380.

Freehold tenement, No. 5, Bull court, Tooley street, Southwark—£150.

By Mr. Murrell.—Freehold residence, with garden, shed, and outhouse, situate at Walthamstow, Essex—£510.

Freehold business premises, situate as above—£405.

Freehold four houses and shops, situate as above, producing £41 16s. per annum—£500.

Freehold four cottages, situate as above, producing £56 11s. per annum—£400.

Leasehold four houses, Nos. 28, 30, and 32, Halton road, and 9, Pleasant place, Islington, producing £88 per annum, term 51½ years from 1824, at £16 16s. per annum—£225.

Leasehold house, No. 86, White Lion street, Islington, let at £26 per annum, term 22 years from 1855, at £16 per annum—£52.

By Mr. Ward.—Leasehold residence, No. 8, Gresham-road, Angell Park, Brixton, annual value £65, term 97½ years unexpired, at £1 per annum—£840.

Leasehold residence, known as Bath villa, Park road, Battersea, let at £38 per annum, term 99 years from 1865, at £6 per annum—£270.

Leasehold residence, known as Park Villa, Park road, rental, term, and ground rent similar to above—£270.

Leasehold two houses and shops, Nos. 3A and 4, Park road, producing £70 per annum, term similar to above, at £6 each per annum—£490.

May 13.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residence and stabling, situate at Westhill, Wandsworth, let at £65 per annum—£1,150.

Freehold two houses, Nos. 5 and 6, Love-lane, Wandsworth, producing £40 16s per annum—£500.

Freehold two houses, with stonemason's yard, situate in Love-lane, Wandsworth, let on lease at £60 per annum—£1,000.

Freehold two cottages, situate in Elizabeth place, Love-lane, Wandsworth, producing £22 2s. per annum—£300.

By Messrs. Dent and Son.—Freehold house and shop, No. 57, Leather-lane, Holborn, let on lease at £50 per annum—£1,020.

Freehold house and shop, No. 58, Leather-lane, let on lease at £60 per annum—£1,300.

Freehold cottage, shop, garden, and outbuildings, and an enclosure of meadow land, containing 1a. 1r. 19p., situate at Edlesborough, Buckingham—£290.

May 14.

By Messrs. Prickett and Son.—Freehold residence, No. 4, Hornsey-lane, Highgate, annual value £120—£1,900.

By Mr T. C. Haworth.—Freehold two houses, with shop and yard, situate in High-street, Eltham—£890.

Leasehold shop adjoining above, term 70 years from 1813, at £5 per annum—£200.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Marsh.—Freehold residence, No. 3, Finsbury circus—£5,000.

Freehold house and shop, No. 76, Farringdon-street—£3,150.

Freehold three houses, Nos. 9 to 11, Wood's-wharf, Greenwich, producing £89 14s. per annum—£560.

Leasehold residence, known as Cupola-house, Church street, Chelsea, annual value £120, term 99 years from 1854, at £9 per annum—£1,360.

Leasehold improved rental of £139 12s. per annum, for 14 years, arising from No. 29, Cadogan-place, Sloane-street Belgravia—£1,250.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Francis Holman Greeo, Meyrick road, Battersea, builder June 15, at 12.—Frederick Hall, Edward street, Stepney carpenter, June 8, at 11.—George Hudson, Cambridge road Mile End, builder, June 8, at 11.—Pettit Millican, Stanton Suffolk, builder, June 4, at 12.—Richard Asheden, Thame street, Rotherhithe, bricklayer, June 4, at 1.—Rober Morris and James Meagher Field, Hanover street, Long Acre, sanitary engineers, June 4, at 1.—John Joseph Sibley York grove, Peckham, surveyor, June 4, at 1.

TO SURRENDER IN THE COUNTRY.

Thomas Brooksbank, Stanningley, near Pudsey, stone mason, June 9.—William Dungay, Denver, carpenter, May 25, at 10.—John Griffiths, Liverpool, slater, May 26, at 3.—George Robert Temple Heald, Sheffield, painter, May 27 at 1.—Henry William Hemmingway, Leeds, painter, May 25, at 11.—James Jutten, Brighton, carpenter, May 27, at 11.—William Hubbard Campling, Lowestoft, plumber and glazier, June 1.—John Grace, Shanbonro, near Winslow bricklayer, June 3, at 2.—William Hartland Haynes, Aston juxta-Birmingham, builder, June 3.—Evan Marpole Lanidloes, painter, May 30, at 12.—Benjamin Owen, Manchester, stone merchant, June 9, at 11.—John Pickup Nelson, Lancashire, plumber, June 10, at 11.—Thomas Wilson, Bishop Wearmouth, painter, June 5, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 12. J. Stevens, Hammersmith, buildor.—June 12, I Ryley, Greenwich, engineer.—June 19, E. Steddy, Howard road, Stoke Newington, builder.—June 3, J. Wetmall Battersea Park, builder.—May 29, J. Costin, High street Hoxton, plumber.—June 5, W. H. Izant, Grosvenor row Pimlico, electric engineer.—June 8, A. Kempton, Par street, Victoria Park road, carpenter and joiner.—June 1 A. J. Cohen, Gloucester street, St. John street road, timbe dealer.—June 12, J. Batty and S. Wake, Middlesborough builders.—June 4, W. Bradshaw, Waterloo, near Liverpoo joiner.—June 12, W. Johnson, Treorchi, stone mason.—June 22, J. Whittle, Peterborough, builder.—June 9, S. James, Truro, painter.—June 9, J. Stantan, Portscath Cornwall, builder.—June 12, J. H. Stothard, Morton, ne North Shields joiner.—June 16, J. M. Davis, Wolverhampton, engineer.—June 3, T. George, Swansea, painter.—June 5, J. H. Matthews, Newton Abbot, carpenter.—June 9, Fenner, St. Lawrence, Isle of Thanet, carpenter.

DIVIDENDS.

May 30, J. Jennings, Ventnor, painter and glazier.

PARTNERSHIPS DISSOLVED.

Tomlinson and Kitchin, Manchester, builders.—Wilson Brothers, Holbeck, builders.—Molloy and Mannion, Manchester, plasterers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£12	0	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	11	0	12 0
,, yellow pine..	2	13	4	5	Finland	7	0	8 0
St. John N.B. yellow	0	0	0	0	Memel	0	0	0 0
Quebec Oak, white..	5	5	5	10	Gothenburg, yellow	8	0	9 10
,, birch.....	3	10	4	10	,, white	8	0	9 0
,, elm	3	10	5	0	Gefle, yellow.....	10	0	10 10
Dantzic oak	4	0	5	0	Soderham	9	0	10 10
,, fir	2	5	3	5	Christiania, per C., 12 ft. by 3 by 9 in.			
,, Memel fir	3	0	3	15	yellow	11	0	13 0
Riga.....	3	0	3	3	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1 3
Swedish	1	17	2	8	Pumice Stone pr ton	6	0	8 0
Masts, Quebec red pine	5	0	5	10	Oils, &c.			
,, yellow pine..	5	0	6	0	Seal, pale....per tun	28	0	0 0
Lathwood, Dantzic, fm	6	10	7	10	Sperm body	100	0	0 0
,, St. Petersburg	8	10	9	10	Cod	38	0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Whale, Sth. Sea, pale	36	0	0 0
Quebec, white spruce	13	0	20	0	Olive, Gallipoli.....	73	0	73 0
St. John, white spruce	13	10	16	10	Cocoanut, Cochin, ton	53	10	55 0
Yellow pine, per reduced C.					Palm, One	40	0	40 0
Canada, 1st quality.	17	0	18	10	Linseed	33	10	34 0
2nd do.....	11	0	12	0	Rapeseed, Eng. pale..	36	0	0 0
					Cottonseed.....	31	0	38 0

METALS.

IRON:—

Welsh Bars in London ....per ton							0	3	
Nail Rod	do	7	5	0	7	12	8		
Hoops.	do	8	5	0	9	0	0		2½
Hoops, Single	do	8	0	0	9	0	0		
Staffordshire Bars...	do	7	5	0	7	15	0		
Bar, in Wales	do	6	10	0	6	0	0	3	
Railroads	do	7	5	0	7	12	6	2½	
Foundry Pigs, at Glasg. No 1 ..	do	2	12	6	2	14	0	net t.	
Swedish Bars	do	10	0	9	10	10	0	2½	

STEEL:—

Swedish Keg, hammered .....per ton	15	0	0	15	5	0	2½	
Swedish Faggot ..... do	0	0	0	0	0	0		

COPPER:—

Sheet & Sheathing, & Bolts ....per ton	£5	0	0			0		
Hammered Bottoms ..... do	97	0	0	0	0	0		
Flat Bottoms, not Hammered .. do	92	0	0			0		
Cake and Tough Ingot ..... do	81	0	0	83	0	0		3
Best Selected ..... do	84	0	0			0		
Australian ..... do	83	10	0	90	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7	0	0	7½		

LEAD:—

Pig, English .....per ton	21	5	0	0	0	0		
,, Spanish Soft ..... do	18	12½	6	0	0	0		2½
Shot, Patent ..... do	22	10	0	0	0	0		5
Sheet ..... do	20	0	0	20	15	0		
White ..... do	27	0	0	30	0	0		

REGULUS OF ANTIMONY

French ..... ton	43	0	0	0	0	0		

ZINC:—

English Sheet .....per ton	26	0	0	£26	10	0	2½	
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0		

* And 6 per cent. discount if laid upon the new system

SPELTER:—

On the Spot .....per ton	20	0	0	0	0	0	nett	
QUICKSILVER .....per btl	6	17	0	0	0	8		

TIN:—

English Block .....per ton	97	0	0	98	0	0		
do Bar ..... do	98	0	0	99	0	0		2½
do Refined ..... do	100	0	0	0	0	0		
Banca . . .. do	95	10	0	97	0	0		one
Straits ..... do	93	0	0	0	0	0		

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 29, 1868

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

MR. SCOTT'S new hospital, which has been so long in building, and which has become stranded in the mire of debt, is at this present a most unusual spectacle, and, instead of halt, maimed, and suffering poor, its inmates are the wealthy and joyous, in place of the softened hum of low words of consolation and kindness, and the still tread of silent nurses moving on their missions of charity, we have a very Vanity Fair with its sibilant babble of silks and voices. Fair dames, and fairer demoiselles, wander gaily in sick wards, and wounds are the rather given here than cured. What shortly was an open quadrangle is now a conservatory of plants, and music and Yorkshire worthies living and dead crowd all its corridors. The antitheses around us are all so strong that we feel bewildered; instead of bare walls and the painful neatness of a hospital ward, we find the choicest gems of ancient and modern art surrounding us; in place of lint, the rarest lace; and in lieu of the hospital kitchen, a *batterie de cuisine* with a *chef* in command, who has daily to feed his thousands. Nor is the building less a contrast to all preconceived ideas than its contents, and in lieu of our ordinary English solid block of suffering and disease, we have here a hospital arranged on the "Pavilion" system, which justly obtains preference on the continent—wards not piled on wards and packed closely together, but only two storeys high, and detached from their neighbours, giving free access of light and air to all its inmates, and ensuring thorough ventilation and consequent health. Ventilation is indeed rather overdone, and in too many instances becomes a draught; but this may easily be remedied. The building, which is just now the casket of such gems, is of costly and eccentric character, too much ornamented to be handsome, and cut up into too many little bits to be dignified. The money lost in littleness would have made grandeur if it had been better husbanded. The site on which it is situated is a very awkward one, and much ingenuity has been displayed in overcoming the difficulty thus occasioned; but the exterior has been allowed to blossom rather wildly, and consequently the fruit is weak. We have a centre pavilion fronted by an arcaded porch and flanked by low buildings on either side of one stage only, and uniting the centre with the main range of wards. These are semi-octagonal at their ends, internally having square projections jutting out from their canted faces, and which are very badly managed in the exterior, breaking up the ends into little fragments or rather splinters, and showing that they have cost much more money than thought. Everywhere we see that same painful littleness of detail Mr. Scott has vexed the world with so much of late; the same little balustraded parapets, even when no parapets are needed; the same long and lanky little shafts supporting the same attenuated mouldings we have so often regretted. We wish Mr. Scott would impart to his work some of his own cheery robustness, and show some Yorkshire daring in this work of his at Leeds. The great talent of Mr. Scott and the splendid opportunity he has of exhibiting it should induce some nobler efforts, and foster the desire to do something worthy of both. At present, however, it is the contents rather than the building which holds them to which public opinion is attracted, and entering by the main or southern entrance, passing along a wide corridor, and ascending a few steps, we find ourselves on the level of the main floor, overlooking its intended open quadrangle but now central hall, and which, we believe, is to be retained as a winter garden for convalescent patients, but which we fear may in this case destroy the perfect isolation of the wards which form the chief feature of the pavilion system here adopted.

The roofing of this courtyard is of iron and glass, and the hall thus formed is divided into nave and side aisles by iron columns united by arches, having openwork spandrels, and which at present, with its gay company, its crimson cloth, and its natural and artificial greenery, forms a very charming concert-hall, where Hallé and his orchestra discourse sweet dulcet music to a very inattentive audience, whose chattering forms not a pleasant variation on the sweet themes of Haydn or the dream-like strains of Beethoven and Mendelssohn. If the dear creatures must talk, why will they not wait for Verdi? They would then be sure that their neighbours on the opposite side of the hall were not unwittingly taken into their inmost confidence. Traversing the corridor, lined with the portraits of worthy Yorkshire men—which category, by the way, seems to embrace all good Englishmen—we reach the Gallery A, which contains, together with the ward over it (Gallery B), a collection of Italian, Spanish, and French paintings in oil by the old masters. This collection, it is greatly to be regretted, is very incomplete. Of early art we have hardly anything before the fifteenth century, and the names of Cimabue, Giotto, Taddeo, Gaddi, Memmi, and, in fact, all the early Tuscan painters, are absent. The earliest example here is a small specimen of Orcagna—the upper portion of some altar-piece of very excellent character, to which we shall revert when we can more particularly examine its great merits. Here, too, we find a couple of Fra Angelico's works, and some very fine Crivellis, with five interesting *cassoni*, said to be by Pinturicchio, but of very doubtful parentage, three of them interesting, however, as containing the history of that much celebrated but little known lady, the patient Griselda. Ghirlandajo, Fra Bartolommeo, Filippino (the son of the naughty Fra Filippo Lippi), Andrea Mantegna (the foster-parent of the art of engraving), Antonello da Messina (the stealer of Van Eyck's secret of painting in oil), and other teachers of the early history of the art of painting, are here represented, whilst Pietro Perugino, Da Vinci, Raphael, and Michael Angelo hand down its records from the fifteenth to the sixteenth centuries, whence a host of well-known names bring it forward, till the "old" masters merge themselves into the fathers of modern art. Of the Spanish school we have some fine works of Morales el Divino, Cano, and other early painters, followed by the riper works of Velasquez and Murillo, whilst the history of the art in France is illustrated by the works of Nicholas Poussin and his pupil Gaspar Dughet, who sought to emulate his master's fame by adding the name of Poussin to the one he originally bore. Lenain, Rosseau, Claude Vernet, are also here to bear up the standard of the lilies, and their rank is closed with the graceful labours of Watteau and Bouchet.

Crossing an upper terrace over the corridor surrounding the central hall, we arrive at the Gallery C, devoted to the exposition of the old masters of Germany, Flanders, and the Netherlands, forming the finest collection of this character ever before brought together. Van Eyck, Hans Memling, Nolgemuth, and his more celebrated pupil Albert Durer, form bright links in the beginning of a chain of glorious pictures, to which follow those of Lucas van Leyden and the industrious Holbein, and, bursting forth into riper fruit, we find the luscious brush of the ambassador artist, Sir Peter Paul Rubens, giving us his own peerless portrait and other wondrous works, varying from a slight sketch to the highly finished piece of flower painting. Vandyck, who we may almost claim as our own, and his rival for English patronage and pay, Cornelius Jansen, Van Huysum, Van Os, and a long train of other Vans, bid us halt each step, and the architecture of Peter Neess, with its wonderful perspective, takes us a long way from Leeds. Our intention is to first gain a general view of the whole of the contents of the building, so, resisting the desire to pause, we hurry on and reach Gallery D, devoted, as we find by the catalogue, to "British deceased painters in oil," but where, strangely, we find the names of Zuccarelli, Jansen, Mytens, Gerbier, and his pupil Sir Peter Lely, old Sir Godfrey Keller, Loutherbourg (the strange scene painter), the unfortunate Angelica Kauffman, and Zoffany, not one of whom was British by birth or education, and few of whom died here. Why Holbein, Rubens, and Vandyck are not claimed as "British deceased painters in oil" we do not know, as they equally with those others have the right to such an appellation. Of Hogarth we find little here that is good. Gainsborough, Romney, and Reynolds are represented, the latter by one of his three "Strawberry Girls;" and we find fine specimens of Morland, Stothard, Wilkie, and Etty; and in Gallery E the chain of British art in oil painting is brought down to our own day. Passing on to Gallery F we find a fair collection of modern works by foreign artists, many of which are familiar to us from our own French Gallery and their exposition in the Beaux Arts or the late International Exhibition at Paris. Observing the maxim *place aux dames*, we notice, first, the solidly painted head of a monk of the Brotherhood of Charitable Instructors, by Madame Henriette Brown, whose works now find so constant a home in England. Rosa Bonheur sends some new studies from the high bluffs of Fontainebleau, where now her home is, and her brother Auguste is represented by the best bit of colour we have seen from his easel. Of Ary Scheffer we have examples of his early and later manner. Duverger and Edouard Frere send their charming home idylls, and Messonier is represented by one of his most marvellous bits. Gerome has here his Phryne, and the collection of modern French art is very satisfactory. Belgium is represented by the works of the Baron Leys and his favourite pupil and almost namesake, Lies. Serrure, Verboekhoven, Bossuet, and, above all, Galliat sustain the reputation of the Belgian school and the "Art and Liberty" of the latter artist is the most striking work in the gallery. Van Schendel illumines the modern Dutch school by his perpetual candle, but the true light is shed by the works of Ten Kate and the beautiful classic studies of Alma Tadema. Tidemand shows well the peculiarities of Norwegian art, and from Germany none are more graceful than the works of Lehmann.

The Water Colour Gallery contains a short history of this very pleasant phase of art, commencing as it does with the early efforts of Paul Sandby, and, running through the works of Barret, Varley, David Cox, Copley, Fielding, Prout, and Turner, lands us amongst the works of our best living authors.

In Gallery H is a fine and highly interesting collection of drawings of early masters, and a fair exposition of the history of line engraving, but the art of engraving on wood is very poorly represented. Mrs. Hailstone's collection of old lace and a whole museum of Mediæval and Renaissance decorative art await us; but we can only walk through the galleries to see what to note for further examination, and, following the corridor of Yorkshire worthies, we come to two small rooms filled with *chef d'œuvres* of Indian and Oriental workmanship, leaving which we come to the head of the principal staircase, where we find a small but exceedingly choice collection of paintings from the Earl of Dudley's Gallery, embracing a marvellously fine Fra Angelico, some exquisite Peruginos, and three

fine Murillos, all of which are worthy of close study.

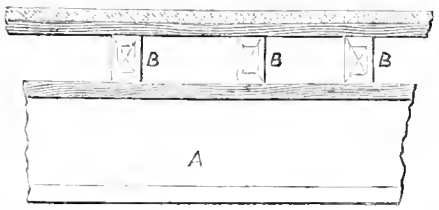
Having thus completed the circuit of the building we take our departure and defer till our next a more critical notice of the chiefest of the excellent works of art here brought together, urging, however, all who can spare a Whitsuntide holiday to visit this, the commercial metropolis of Yorkshire and enjoy the treat for themselves.

USE OF ASPHALTE IN CONSTRUCTION.—II.

At the close of our last article upon this subject we introduced the question of the construction of roadways and footpaths by means of asphalte, or, as it may be correctly termed, asphalte concrete, since it consists of the former material mixed with certain proportions of sand and gravel. Its application for this purpose is on a very extensive scale, as it embraces not merely the case of ordinary footpaths, but those including the platforms of stations, bridges, and viaducts. To begin with the first, of which there are abundant examples in and about London, unfortunately it must be confessed that for one really good asphalted footpath we meet with a dozen bad ones at least. For one that affords a perfectly smooth, even surface, there are ten that are full of hollows and inequalities, which in wet weather become so many pools of water. The road frequently offers a better place to walk upon than some asphalted footpaths. To what is this to be attributed? Is it the fault of the material itself, or of the manner in which the path is formed? The latter, unquestionably. There is not the slightest use in laying down asphalte concrete with any hope of making a good job of it, unless the immediate substratum or foundation be solid and unyielding. The reverse is nearly invariably the case with ordinary footpaths. They are generally raised about six or seven inches higher than the adjoining roadway, and the difference of level is made up with any stuff that may be at hand. This is rarely or ever rammed or well punned so as to consolidate it, but is roughly brought to a tolerable uniformity of surface, and the asphalte concrete laid on top of it. Sometimes a kerbstone is added, but just as often not, and then the job is considered complete, and the path is left, literally speaking, to sink or swim. From such a *modus operandi*, what can be expected? All newly made earth has a tendency, particularly after rain, to sink, which takes place more or less in newly raised footpaths, and the consequence is that the plastic asphalted layer follows the sudden and abrupt descents of its foundation, and the surface presents an appearance totally the reverse of what was anticipated. Were the same attention paid to the formation of the substratum of the footpath as is given to that of the road; were the foundation properly and truly laid, and a layer of coarse metalling packed closely over the whole area, there would be no inequalities in its surface, and although the asphalte concrete would wear away after a time, and need renewal, yet the wear would be uniform, and not give rise to holes and asperities under foot.

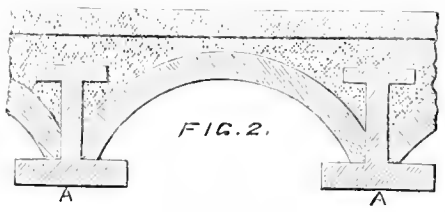
Those who have remarked the different appearance of asphalted platforms at the various railway stations will at once perceive that they afford a complete corroboration of our previous statement. Some of them are even perfectly uniform in surface, and, with the exception of a slight softness or elasticity to the tread, do not differ from a regular concreted surface. Others, on the contrary, are cracked in all directions, and it would be scarcely possible to discover a single square foot of uniform appearance or consistency. If we investigate a little how these two descriptions of platforms are made we shall at once find the cause of their difference. The former are universally laid upon either solid or carefully made ground properly prepared by ramming and consolidation for the reception of the concrete. The latter are laid upon planking, which fails to afford that rigid unyielding foundation which is indispensable to the formation of a good asphalted surface. In fig. 1 is represented the

FIG. 1.

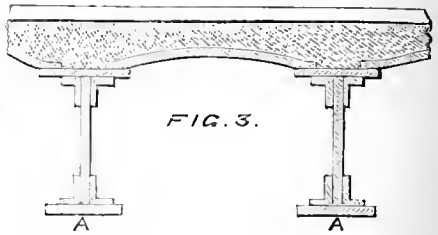


foundation of a common construction of a platform of a small railway station. A is a dwarf wall carrying the transverse joists B B, upon which is laid the sheeting or planking, and over that the asphalte, as shown. Both the joists and planking are sure to yield or "give" a little, which is quite sufficient to cause irregularities in the top layer, more particularly when it is borne in mind that heavy weights are constantly run over it at speeds high enough to cause considerable vibration and deflection in the sheeting. It may be accepted as a rule that it will not do to lay down asphalted concrete upon a timber foundation, unless it be of a very massive or solid description, which would only occur in places where it would not be desirable to use asphalte at all in the sense here understood. Occasionally in hot weather it happens that an asphalted surface becomes sticky and adhesive to the foot, but this is simply the result of either want of care or want of skill and experience in the preparation of the concrete. It may also result from an improper selection of the material, for in our last article we pointed out, in referring to the origin of bitumen, that temperature has a good deal to do with its formation. If therefore a bitumen be chosen which melts too readily, and which is not therefore the best adapted for the purpose, there is no difficulty in accounting for the excessive plasticity that is imparted to the concrete.

Asphalte is employed in forming the roadway of bridges in two conditions. It is mixed in the ordinary manner, as just described, and it is also composed of bitumen mixed with cork instead of gravel. The great advantage of the cork composition is its lightness. It is, of course, not suited for the same situation as the concrete, but forms an excellent method of filling in the haunches of small arches turned between the main girders or cross beams of a bridge. A very common, but at the same time somewhat obsolete type of constructing the roadway of bridges is represented in fig. 2. The main girders are



of cast iron A A, and are of the usual flanged shape, demonstrated by the late Mr. Hodgkinson to be that best adapted to give the maximum strength with the minimum expenditure of material. From the inside of the lower flanges spring small brick arches, the haunches and level up to the surface of the road being filled in with concrete, ballast, or any good dry suitable stuff. One great objection to this arrangement is the weight of the whole superstructure, which necessitates heavier girders than would be the case if a different arrangement were adopted and a lighter description of concrete filling employed. Contrast fig. 2 with fig. 3, in which the heavy cast-iron girders are replaced by two light wrought-iron ones A A; the brick arches are done away with, and thin wrought-iron plates arched to the proper camber substituted in their stead. The



filling-in for the substratum immediately below the road metalling is composed of cork and bitumen, which effects an immense saving in dead weight, an item of considerable value in the designing of bridges, and proportioning the sectional area of the girders and other parts of the structure. Moreover an advantage attends the use of this light concrete in many respects similar to the one we drew attention to when treating of the employment of asphalte instead of slates in the foundations of houses. Frequently it occurs that the layer of cork and bitumen does not exceed a couple of inches. Were ordinary lime and gravel concrete used in a layer so thin and in a similar position it would be almost sure to crack, and would subsequently become reduced to a state of complete pulverisation. In this condition it would be little better than loose dust, would be deranged by the traffic going over the bridge, would let in the wet under the roadway, and in a very short time become perfectly useless for the purpose for which it was originally intended. Asphalte concrete prepared with bitumen and cork was adopted somewhat in the manner we have described by Mr. Page in the construction of his handsome bridge over the Thames at Chelsea, a structure which, together with his *chef d'œuvre* at Westminster, constitutes one of the few architectural beauties of our metropolitan river. In addition to the many uses of this valuable material, it is also gradually gaining ground as a partial substitute for paint. The girders and plates of the bridge in question were coated with a layer of asphalte previously to being covered up with the superstructure. There is one general principle to be carefully attended to in applying asphalte paint, or any protecting layer to ironwork of any kind, whether cast or wrought. It is to be sure that the surface of the iron is perfectly clean, and free from rust and spots. There is not the slightest use in painting or coating rusty iron with asphalte. However well it may appear to adhere when first laid on, after a short time it will inevitably excoriate and rapidly scale off, leaving fresh surfaces to be acted upon and deteriorated by the injurious influences of air and moisture. That asphalte is a stronger protective agent against damp than paint, is highly probable, not only on account of its possessing a denser consistency, but also because *per se* it contains elements that are themselves anti-corrosive, and naturally calculated to counteract the effects of climate and humidity.

We must reserve for a concluding article the subject of the application of asphalte to roofing, which has been very successfully accomplished by the use of the Seyssel asphalte.

THE COMMON LODGING-HOUSES OF LONDON COMPARED WITH THE PRISON AND WORKHOUSE.

At the base of modern society, particularly in London, is a great mass of fluctuating atoms sometimes occupying the common lodging-house, sometimes the workhouse, more frequently the gaol or the house of correction. With the moral state of these beings we do not propose to deal; but their

physical condition, involving as it does some important social problems, is not unworthy of attention. Between the great criminal mass of the country and the really honest poor, exists a certain number who live how they can—be it honestly or dishonestly, either is the same to them. Many of these are verging downward, and their haunts and associations are too frequently the means of effecting their final declension from well-doing.

By common lodging-houses the law understands any dwelling containing rooms inhabited by four or more individuals not being members of the same family, and their inspection and regulation constitute an important part of the functions of the police. Engaged in this work, the metropolitan police have a body of five-and-twenty men, under the charge of Chief Inspector Roberts, to whom is entrusted the duty of looking after all common lodging-houses within their district, no very light task, extending as it does so many miles beyond London proper. We do not now propose to discuss the whole subject or to describe the condition of each lodging-house, or even group of these, for they are generally found associated; but shall limit ourselves to a notice of perhaps the most typical group of all, that lying between Commercial-street and Brick-lane, in the east of London, and extending from Whitechapel through Spitalfields towards Shoreditch. Without doubt, the head-quarters of "cadgerdom" is to be found in Flower and Dean-street, which lies between the two above-named thoroughfares, and in it or its neighbourhood every variety of the common lodging-house, from the best to the worst, may be met with. Besides the professional thieves and beggars who there abound, there is in this part of London a large floating population of unskilled labourers, chiefly attracted by the labour to be obtained about the docks. In some of the lodging-houses labouring men are alone to be found. Now and then a rogue may creep in, but he is got rid of as soon as discovered. This is the best class of lodging-house, and in some of them men have stayed for years, until they have almost become fixtures in the establishment. This class are entirely occupied by unmarried men, who pay fourpence a night or two shillings (in one instance two and fourpence) a week. One of these establishments is calculated to accommodate nearly three hundred guests, and most receive more than a hundred. The kitchens are ample and well arranged. In the large one to which we refer the lavatory is convenient, cooking apparatus is supplied, and each man may have a small locker set aside for his use. There are besides, in this as in others, rooms cut up into boxes, as in a coffee-house, where the men may meet to chat and smoke. In one or two there is also a reading-room, which does not unfortunately seem to be in very great demand. To accommodate such a mass of humanity under one roof sleeping space is utilised to the uttermost; the staircases, passages, and doorways (for there are seldom doors) are as narrow as possible. Not, however, that any number of beds may be accumulated in one room, each is surveyed by a Government official, and in each room is suspended a card marked with the number the room is licensed to receive. Still the cubic space allotted to each individual is small, not exceeding 300 cubic feet; ventilation is effected by doors, windows, and orifices in the walls. In the swell (two and fourpenny) establishment, and in those in which married people are received, the large rooms are cut up into small compartments containing two single beds or one double one. These wooden compartments do not, however, reach either to the roof or to the floor, for the sake of ventilation, and they are not of uniform size, the whole room being surveyed for the number of inmates, but the compartments being erected at haphazard. Some containing a window are not so badly off, but others, for example, in dark corners are extremely close and stuffy. The price of the double bed in most houses is sixpence a night. Greatly inferior is the accommodation at threepence a night; still in some, particularly in one house, mostly frequented by boys, it is not to be despised. In one large room in this house there are beds for forty persons. These beds are partly wooden, partly of iron; they are supplied with two sheets, one being changed every week. The walls are kept whitewashed, and the bedsteads are regularly taken to pieces and saturated with naphtha to destroy vermin. All lodging-house keepers are not equally particular, some making no pretence of separating sheep from goats, and making no inquiry as to the callings of their guests, provided the money is forthcoming. In those regularly frequented by thieves and other blackguards the accommodation is deficient; still the vigilance of the police secures a certain degree of attention to decency and cleanliness. The communications between the bed-rooms, and from them with the ground, are exceedingly devious; to trace them would be no very easy matter to one unaccustomed to the premises. In these also the cooking arrangements are greatly inferior to those in the place we have described, but then the thief has the solace of congenial society and accurate intelligence, which is to him no light matter. Swell thieves do not frequent such localities; they generally live a little way in the country with great outward respectability and decorum. The grand evil, apart from all moral considerations, is the defective ventilation. In summer the dormitories are hot and stifling; in winter men cannot be prevented from filling up every crack and cranny, when the air speedily becomes foul and unwholesome. Still it must be borne in mind that these sleeping rooms are only occupied during the night. Every morning they are cleared out by ten o'clock, and the places, as far as possible, cleaned and ventilated. Most of the houses are held by deputy, the landlord to whom they are licensed frequently occupying three or four, and generally living in the best and quietest; the deputy in the others is entrusted with the management of the whole concern. It must not be forgotten that the places we have been describing are not philanthropic institutions, but real *bonâ fide* investments, whereby the proprietor expects to live, reaping a goodly harvest in winter, when all hasten to town and sleeping in the park won't do, faring less sumptuously in summer, when all who can go are off to the country to hop picking, market-gardening, brick-making, and such like employments.

But let us trace the history a little further. The thief gets into trouble and goes to prison; the times are bad, the poor labouring man is out of work and goes to the union. Upon the whole, the thief has the better of it as far as food is concerned, that is to say, should his sentence exceed four months, but his work in a well-organised prison is very hard. As to his lodging he is better off; instead of having only 300 cubic feet he has in most prisons nearly 900, that being the cubic contents of each cell. But there are the hard work, the hard fare, and the restricted liberty as counterbalancing agencies. None of them like prison. When the times are bad the poor man has his choice of the workhouse or the prison; if honest, he chooses the former, which he can leave when he pleases. Should it be so, his condition is also altered for the better in certain respects. Now of late there has gone abroad a cry for increased cubic space in workhouses, a cry taken up, we fear, too heedlessly by many. We have seen that the ordinary amount allowed in these lodging houses is 300 cubic feet; this is the breathing space to which each man has been accustomed, but a number of would-be philanthropists insist on increased workhouse accommodation to the extent of 1,000 cubic feet for each individual. This we may safely hold is not necessary for people in health; for those who are inmates of an infirmary we should not think of anything under 1,000, or even 1,400 or 1,500 cubic feet, but then these wards are occupied night and day. Where day rooms and dormitories exist 500 cubic feet in the sleeping rooms, provided the ventilation be good, will suffice for all practical purposes with healthy men. The inmates have seldom been accustomed to so much. It must be remembered that the palatial edifices contemplated by some have to be paid out of the poor rates, and that these are exacted from all, even from a class but a step removed from the pauper. The consequence of an increase in the rates would be to decidedly increase the latter class, which is sincerely to be deprecated. One effect of the poor laws has already become sufficiently unpleasantly prominent; the providence of the working classes, as well as their frugality, has thereby been greatly impaired. If the scheme for erecting palatial workhouses be carried into effect, these unsatisfactory tendencies cannot fail to become more marked. The actual condition of the class immediately above the pauper must be understood and borne in mind when dealing with the class they may any day and on the slightest inducement be led to augment. Thus we think it good to compare the common lodging-house, the prison, and the workhouse as they are seen in London.

ART PRACTICE *VERSUS* KNOWLEDGE.

THERE are so many points of difference between the old and modern art, or rather between the old and past system of art production and the mode of production now in such active operation, that it is extremely difficult—perhaps, on the whole, impossible—to find two words which shall express generally and intelligibly this difference. It is, however, so important, for the sake of clearness, that this should be at least attempted that I venture to adopt the two most expressive and generally descriptive and explanatory I can hit on, namely—Practice and Knowledge. *Practice* was the secret that enabled the old artists and workmen to accomplish the wonders they did, every artist being his own workman. *Knowledge* it is now thought is the one thing needed. Why, it is asked—for the world has just got to this question,—does not the modern art work of to-day produce the same sort of impression on the minds of men as the work left us from the past, and from the hands of the old artists and workmen? The answer always is, from all quarters, that both artist and workmen—especially the workmen—want *educating* or cramming with more and more knowledge. This is so vital an error, as it seems to me, that I think a few passing thoughts on it may help to serve a good purpose; for while such an idea as this on the very threshold lasts, no change for the better can well be hoped for.

That such an error, if it be one, is vital, will be at once evident to everyone when it is considered that all the encouragement, and, what is more, material help now held out to executive artists and workmen, consists in putting in their way, and indeed insisting on their taking advantage of, every possible means of adding to their stores of art knowledge, and of everything else which it is thought can possibly bear on it. If the student is versed in one style of art, he is recommended to apply himself steadily to another, and to make all haste to acquire a knowledge, more or less complete, of it, and then to go on to another. Lectures, books, and treatises without number are always at hand to urge and help him on, and in the end prizes to reward him, should he luckily be able to pass some dull examination by mere effort of memory on them. Not only this—and it is worth noting—there is now in course of compilation a huge catalogue of art

books, which is to cost many thousand pounds, for the purpose of reference, and to show how many volumes and treatises there are on the one subject of art. It is quite certain that no student life, however long, would be long enough to read through the prefaces or perhaps even the title pages of these multitude of volumes! What good are they, and what artistic use could be made of them, even if all were read through? Everybody who knows anything of architectural books knows well that nine out of ten of them are worthless, for the illustrative plates are manufactured in snug rooms miles away from the buildings they profess to represent. Of the theoretical books simply nothing need be said; yet are thousands of pounds being now spent in making a mere list of them.

All this is lamentable enough, but it is not the worst that needs to be said on the present system of art action through the medium of books and educational apparatus, for be it remembered that of the two most noteworthy books about art given to this generation, "Pugin's Principles" and "Ruskin's Modern Painters," next to nothing *practically* has resulted; indeed, it would almost seem as if no one living had ever read them. Pugin's main argument was "build in Gothic and let the natural material show itself fairly." But where are the *Gothic* buildings forming the new parts of towns, and where is the natural colour of the materials in new buildings allowed to show itself? We oil-paint everything. Ruskin endeavoured to show, in many elaborate volumes, that it was well worth the painter student's while to go into the lanes and byeways of unfashionable places away from towns, and bring back remembrances of what can be seen and painted for nothing: but if we go into the Royal Academy Exhibition it will very soon be evident that such advice, whether good or bad, has not been followed. Perhaps Mr. Ruskin's books are already forgotten, and rest only to be catalogued. May we not fairly ask here, of what use is it educating people if books giving such advice and guidance be left to the dust and silence of the upper shelf, no man remembering them? These are facts, and deplorable enough.

I have no wish to travel beyond the immediate subject of this communication, viz., education as it concerns the practical artworkman, but a word may perhaps be permitted me on the very strange course education has taken and is taking. When Lord Brougham sent the schoolmaster abroad did he ever dream of the main effect it would have on the literary pursuits of the working and middle classes? The reading of these worthy and educated people now in the main consists of "stories" by the dozen a week, all on the move at the same time. They are sometimes said to be bad and very wicked; they are neither. Nothingness, dulness, and repetition are the main elements in them all, and the real wonder and mystery is, not at the fact of anyone imbibing so much of wickedness, but how it is that after having read *one* of these tales anyone, however determined, can be induced to tackle a second, much less ten or a dozen. But this is the improved working man's reading. The clergy may, I suppose, take rank as the most highly educated class in this great country, and compose the top of the educational system as the better sort of workmen form the bottom of it, but any person of ordinary intelligence listening to a sermon in St. Paul's or Westminster (the sermons are the results of all the education be it remembered) would never for a moment suppose that modern advanced science had any existence. The "ologies" to these learned men have no reality; bodily they live in the present nineteenth century, but mentally and spiritually they are in the tenth. Such is education, practical education. The clergy are *technically* educated, but they cannot *read*. But this in parentheses; what I want to show now is that our modern idea, that by educating a man, *i.e.*, by adding continually to his stores of information—for it intends nothing beyond this—you are adding to his powers, his artistic powers, is a delusion. It is, I consider, a fatal mistake to suppose that an ordinary workman or artist found to be more or less incapable is to be best helped and rendered capable by filling his head with the history of even his own art, or with dates and biographies, or fragments of science, or putting into his head receipt books and rules, or, in short, by beginning with his *head* at all. It will be found on attentive examination that a stupid incapable workman, unskilful in the art he lives by, if he be naturally fit for such art, is either out of practice or has not had enough. His hand is at fault; he needs improvement, but his hand *must lead his mind* and ask for guidance. There is no other way in which artistic skill can ever be acquired, and all attempts, such as those now in fashion, by additional education or *mental* cramming, must end in failure. This is a subject of very great interest and has never, I believe, been made the subject of professional and artistic inquiry, and it is to be feared will possess but small interest now, as the whole art power in artists and workmen in these days is lost in mere manufacture, so that no public interest is felt in *individual* artistic skill. The powers of the human mind are wonderful enough, but those of the hand as guided by the mind are not a whit the less so. Indeed, what can be more strange than the different effects produced by a number of hands in the mere copying of some object in common lead pencil in outline, so different is the touch, the method of handling, the coarseness or smoothness of the pencil lines, and the feeling, as it is called, displayed, that the object becomes different and new under each individual hand. Well has it been observed by some cunning philosopher that without the hand the mind of man would have availed him nothing. It is thus that practice in the artist and workman becomes the one thing needful—the hand first and then the head, directly reversing the present system of art education.

From this principle again it will become evident that the great object to be aimed at in the future of art action will be to obtain from each artist and workman, however humble their powers may be, examples and evidences of each man's individual power and skill, whether he be painter, sculptor, architect, or subordinate workman, and it will then be seen by those who have taken on themselves the office of guides and instructors that what is called bad work, even when genuine, is not the result of lack of knowledge in the executive artist, but of deficiency of executive power and manual skill. This may sound a little strange to very many, but no one can, I think, witness the efforts of unlettered workmen, and look closely into the character of the rude work of savage and barbarous tribes, as that of the New Zealanders [on a mental level with our workmen as artists], without speedily coming to the conclusion that artistic skill in cutting a leaf out of stone is and must be the result of joint natural capacity for the work and hand dexterity and practice, daily practice. No learned amount of "botany" can help a carver to cut a leaf, but without practice what can he do? It will not therefore be out of place or useless, considering the importance of the subject to the artist and workman, particularly the last, to instance in detail, as shortly as may be, one or two familiar instances wherein it will be seen how far this principle of practice in art must always precede knowledge, how useless knowledge is by itself, and that accumulated stores of art learning must be at best but amusing and entertaining curiosities, but of no practical application or benefit. Whether the public can be interested in this practice of individual artistic action has to be seen; if they are, then the whole of the system of art employers and manufacturers in the production of art must in time cease to exist.

C. B. A.

GOSSIP FROM GLASGOW.

(From our Correspondent.)

It is stated in the local newspapers that there is a likelihood of the Liberal students nominating Mr. Ruskin for the honorary office of Lord Rector of the University. In the event of the great art-critic being elected, it would be a graceful act on the part of the Architectural Society and the Institute of Fine Arts to recognise him in some way worthy of his reputation. Some of our citizens are in hopes that Her Majesty may be induced to return from Balmoral *via* Glasgow, for the purpose of laying the foundation stone of the new buildings being erected for the University, and that this, failing other causes, may lead a few non-subscribers to supplement the handsome sum that has just been voted by Parliament.

I observe a good deal of correspondence in your columns about the "earth-closet" system. A patent for an earth-closet was taken several years ago by Mr. Carrick, of the Royal Hotel, brother of the city architect and master of works, which closet has been extensively made in cast iron by George Smith and Company, of the Sun Foundry.

In rapidly growing cities bits of civic scenery are doomed to be suddenly shut out by the new necessities. There was no finer picture of the Cathedral—grouped with, on the one side, the dome-covered Infirmary, and on the other with the Fir Park Necropolis crowned with Knox's Monument, and with its pretty foreground of tile-covered cottages—than that facing the west, and seen from Mason-street, but it has been wholly shut out from sight by the new building erected for the Barony Free Kirk. And, in like manner, the new warehouses recently built in Sanchiehall-street interrupt a prospect to the west, in which were grouped the ridge of Garnet hill, the towers of Park Church and the Free Kirk College, and a few magnificent old trees, over which streamed, as nowhere else in Glasgow, such glorious sunsets as Turner wantoned with and Sam Baugh paints. The scenes in both cases are remarkable buildings, the Barony Free Kirk being a noble Gothic pile by Mr. Honeyman, and the warehouses, those Greek buildings by Mr. Thompson which I recently described; but I fear that in neither will be found adequate compensation by the lover of the picturesque.

A church, to be called "The Robertson Memorial Church," is about to be built from designs by Mr. Barclay at the corner of Taylor-street and Rotten-row, an ancient and decayed part of the city in the neighbourhood of the Cathedral, but wherein at one time dwelt civil and ecclesiastical nobles.

The Cathedral, that has for some years been a picture-gallery, is now also a concert-room, the Choral Union giving occasionally within it "promenade concerts."

On the afternoon of May 19 the foundation stone was laid of the Free High Kirk, Patrick. The design is by Mr. Honeyman, of Glasgow, an architect who worthily enjoys a most extensive practice in ecclesiastical architecture. The style is Early Geometric. The accommodation will be for a congregation of about 720, and the estimate is £4,600.

He who would make a pun would pick a pocket. So said Samuel Johnson, and such punsters as Thomas Hood, Douglas Jerrold, and Theodore Hook have, I am happy to say, picked mine of a good many current coins of the realm. But he made something more than a pun who said that the daguerreotype was *a-foe-to-graphic-art*. Not only has it imitated humanity as abominably as have some of nature's journeymen, but to the art of architecture also it has been a positive nuisance. In all our best streets it sets up its inartistic temples on the housetops, disturbing whatever sky-line the architect may have contemplated for either his especial design or the general effect. This might perhaps be tolerated on the commonplace house—the stereotyped "box"—but when it usurps a place upon buildings with really some architectural pretensions, it becomes an insufferable eyesore. Something of this kind is just now being done on the roof of a fine old Italian mansion-house in Argyle-street. Of course as property has its privileges as well as its duties, I suppose we can only solace ourselves with the philosophy of the maiden in Rasselas, that what cannot be repaired is not to be regretted.

Byron awoke one morning and found himself famous, and the suburb of Paisley has found itself about as suddenly famous for great Coats as

it has been erstwhile for starch, shawls, corn-flour, and muslin. A Mr. Thomas Coats has gifted to the town a public park, engirdled it with a railing, and erected within it a fountain. The fountain is of iron, and with the railing has cost between £8,000 and £9,000. The total value of the gift is estimated at £20,000. On Tuesday Mr. Coats handed over the title-deeds to the town council as the representatives of the inhabitants, and the park was declared open to the public.

The new premises for the Deaf and Dumb Institution were formally opened on Friday by Lord-Provost Lumsden, the foundation stone having been laid nineteen months ago by Lord-Provost Blackie. This building not only occupies one of the most beautiful of situations in the new neighbourhood of Glasgow, but its position towards the park of the South-side is somewhat analogous to that of the University towards the park of the West-end; and the architects, Messrs. Salmon, Son, and Ritchie, seem to have well considered these circumstances in studying their design. The building is good to be looked at and looked from—two most important properties for those whose information and enjoyment are received chiefly by the sight. The style of architecture is foreign Gothic, and the principal materials that give it form and colour are white and red sandstone and blue and grey slate. The principal elevation is towards the west, and is 240ft. in length. It is in three compartments, the centre of which is three storeys high, and each of the wings two storeys. On the ground floor of the central compartment are the vestibule, the directors' and reception rooms, also a parlour and dining rooms for the parlour boarders and the staff of the institution. Off the corridor, towards the left, are the apartments for the headmaster and the boys' recreation hall and lavatory, also a suite of bedrooms for the male parlour boarders. Towards the right are the matron's apartments, and similar accommodation for the females. Behind the principal staircase is the dining-hall, measuring 47ft. by 28ft.; and adjoining are the kitchen, laundry, washing-house, drying-closet, servants' sleeping-rooms, &c. The first room come to after ascending the staircase is that in which the girls are taught sewing and knitting, and is 36ft. by 18ft. Right and left of this room are placed stores, wardrobes, bath-rooms, lavatories, assistants' rooms, and sleeping wards. To the east, with separate stairs to it from both boys' and girls' departments, is the school-room, 70ft. by 35ft., with an ornamental ceiling of timber. Entering from the school-room are the stationery-room, library, and museum. In the third storey are the nurses' rooms, spare bedrooms, and the convalescent hall. The roof of the central division is a platform 23ft. by 19ft., and from this is commanded as a centre the magnificent prospect that I have faintly indicated. The building is well fitted for its purpose, and is in all respects a remarkable contrast to that which has been occupied by the institution for the last forty years. On the right of the principal gateway is a lodge for the janitor. Spacious recreation and ornamental grounds are being laid out by Mr. M'Lellan, the city's superintendent of public parks, who gives his services gratuitously to the institution.

BUILDWAS ABBEY.

THE following description of this ruin is from a paper read before the Liverpool Architectural and Archæological Society, entitled "Abbey Ruins of the Severn Valley," by Henry H. Vale, F.R.I.B.A.:—At Buildwas the proximity of one of the first iron bridges to one of the earliest religious houses in England affords a striking contrast of ideas; and at Conway we find the old castle of Edward I. and Stephenson's tube in a similar relationship. This first iron bridge of Telford's, at Buildwas, is by no means an elegant structure: it is quite evident that the true theory of the application of engineering forms to this material had not become developed in this early stage of iron bridge building. The supporting framework seems to have been modelled upon the idea of timber centreing, and the minute parts, such as panels and parapets, have a thin wooden appearance; but we can readily understand how difficult it must have been to obtain anything superior before the engineers and iron-workers had felt the importance of the material, and foreseen its almost universal application to the mechanical requirements of the age. Skilled hands had to be trained, careful and expensive patterns made, before iron took its proper place in the manufactories and worksh ps of England. Buildwas Abbey stands upon a secluded site. The masonry is grey and time-worn, with the matted ivy clustering upon it, and the rich lichens dappling it with varied tints, like a painter's palette; and here the river also, with its grey pebbly shores and green banks beyond, presents a similar effect of colour to the eye; in fact, the ruins of the abbey seem to have become a portion of the fair landscape, to have grown into it, and have become absorbed by it. It is backed by a bluff of yellow corn land, two well-wooded hills, some ancient cedar trees in the foreground, and comfortable-looking farmsteads beyond.

After visiting larger and finer ruins, Buildwas Abbey at first disappoints us; it possesses, moreover, none of those beautifully delicate details and exquisite ornaments which we find at Tintern and Haughmond Abbeys, and hope to find, in even greater profusion, at Wenlock. Here at Buildwas the style adopted is severe in the extreme: it belongs to the period when our ecclesiastical builders, after having long run riot in the luxuries of florid Norman, with its chevrons and billets and cables and beakheads, its deeply recessed doorways, with their sculptured tympanæ and ornate pediments and enriched capitals, sought repose and quiet in the flat surfaces and depressed arches and massive piers with serrated capitals, such as we find in this sequestered little abbey of Buildwas. The religious order inhabiting the house asked neither for the adornments of the carver's chisel nor the graces of the painter's easel; a stern asceticism broods over the place; and those who live mainly in the regions of fancy and imagination will find little of either interest or beauty to detain them here. There are, however, many who can enjoy the aspect that Buildwas Abbey presents: ever and anon men will be found who, having turned away their eyes from the more resplendent styles, will be led to adopt similar principles in treating the architecture of our own day. We observe this around us on every hand: a particular style or period being adopted by some religious order, brotherhood, denomination, or sect, those whose tenets run in a contrary groove will immediately take up and work to an issue some phase of architecture as different as they can, by the exercise of all their ingenuity, detect, invent, or discover. It was doubtless no different sentiment which induced the Cistercian brotherhood to erect at Buildwas this severe little abbey.

No smiling graces here to keep alive the tender associations of sunny childhood in the breasts of men! No touches of poetry here to instil a feminine gentleness into the rugged souls of the solitary and world-forsaken! No living stone-books filled with rebus and charade and fairy fable here to arouse the curiosity and stimulate the fancy of the lonely dwellers in this solemn little hospice! No touches as of a Dickens, a Jerrold, or a Thackeray, done into stone, to make the reader pause and consider that there existed the greater brotherhood of the universe beyond these narrow walls, for whose woes, and joys, and griefs, a tear, a sigh, a smile, or a "Well done, brother," never entered save as an intruder here.

The remains of the abbey of Buildwas, dedicated to Saint Mary, consist of a nave of seven bays, 105ft. long by 50ft. broad; transepts 84ft. long; four eastern chapels, and a choir with a square east wall; the arches of the nave are of unequal span, very slightly pointed, as also those of the tower; the two west windows, the three east choir windows, and those of the nave clerestory are round-headed; there is neither western doorway nor triforium.

The choir is brought one bay into the nave, on the south wall of which are three stone sedilia and a water drain. The cloister court measures 91ft. by 87ft. Beneath the north transept is a crypt; and on the north-west angle the fragments of a turret stair, which led to the dormitory over the vaulted chapter house, the latter measuring 41ft. by 31ft.; adjoining are two groined passages, one leading to the cemetery and the other to the abbot's house.

In the descriptions of this abbey given by the old topographers, mention is made of a subterranean passage near the abbey, but almost all the recent writers upon the subject have discredited this tradition, and even the local antiquaries seem to be totally ignorant of the existence of such an underground passage at this place; they may now, however, satisfy themselves about the matter by a personal examination upon the spot, as we ourselves did. It would appear that recently a heavily laden cart or waggon, on passing over the court adjoining the abbot's house, by its weight, caused the arch which covered this passage to give way; on removing the débris it was discovered that a considerable length of this so-called fabulous subway could be actually traced. On expressing a desire to see it to one of the workmen engaged upon some repairs at the abbot's house, he procured a ladder and candle, and on following him through a trap-door, after going about 15ft. down a vertical brick shaft, we found ourselves in this veritable tunnel. It appeared to be about 10ft. in height, and 4ft. in width, formed of excellent squared masonry, with a semi-circular arched covering of well keyed ashlar. We followed it for about fifty yards, our further progress being impeded by soil and the débris of fallen stonework. We noticed one rather puzzling feature, viz., the existence of a bold jutting stone corbel, at about 6ft. from the floor level—the only practical purpose which it could have here served, as it appeared to us, being that of a bracket, for holding a lamp to light the passage.

Buildwas Abbey was founded by Roger de Clinton, bishop of Chester, in 1135. It appears to have been dedicated to St. Mary and St. Chad, for monks who were afterwards united to the Cistercian order. King Stephen confirmed the foundation.

Camden mentions "Bildewas" as the burial place of the Burnell family; and Leland says that "Matilda de Bohun, wife of Sir Robert de Burnell, was founder of Bildevais Abbey, though some for the gift of the site of the house take the Bishop of Chester for founder." At the dissolution, the site and all lands belonging to this house were granted to Edward Powis. "Here were twelve monks," says Grose, "endowed with £129 per annum." Those monks had scenery around them of surpassing beauty, with the lordly Wrekin in full view.

The abbot's house, as before stated, was at the time of our visit under repairs, and we were interested in examining the remains of some spirited water-frescoes, or rather stencillings on the walls, of Elizabethan type, which had been covered over by several layers of papering during the last fifty years. The pattern had been laid on the wall in a kind of neutral tint, showing the white plaster through it for relief, and represented animals and grotesque heads; it had been, unfortunately, too much injured for restoration. Let us hope that the architect of the present repairs will cause these remains to be carefully copied, to serve as illustrations to some future history of the architecture of the Severn valley.

On leaving Buildwas we felt that we had been amply repaid for a somewhat tedious drive by this opportunity of verifying the tradition of the subterranean passage, and pointing out to the workmen these curious frescoes on the plaster, which, as they assured us, we had been the first to discover.

SCHOOL OF ART.

THE annual meeting of the Birkenhead Government School of Art was held on Monday evening. From the report, which was read by Mr. Hinde, the secretary and treasurer, and adopted by the meeting, it appeared that the institution, although worked under many disadvantages, had been eminently successful, and had fully contributed its quota to art education. Of the students who had attended the schools during the five years ending December, 1867, 259 had been workers in iron, 109 workers in wood, 77 bricklayers, masons, and plasterers, 44 plumbers and house painters, 52 architects' and surveyors' apprentices, schoolmasters, and governesses, 41 of sundry trades, and 53 school boys and girls, making a total of 659. Thirty different branches of trade had thus been benefited. The students had received 448 prizes of different grades, including five Queen's prizes and 105 medals from the Science and Art Department. The treasurer's statement showed that the working expenses were far in excess of the subscriptions. It had been suggested that the fees for attendance at the evening schools should be raised, but this step would, in the opinion of the committee, close the doors of the school against many who were making sacrifices to pay the present charges of 6s. and 10s. 6d. a quarter, rates sufficiently high when it was stated that of the 104 students attending the evening classes during 1867, 101 were apprentices in receipt of merely nominal wages, and in most instances the sons of working men.

PARISH CHURCH COMPETITION, SLOUGH.

In the early part of March a limited number of architects were invited to send in designs for a new parish church at Slough. Their names are as follows:—Mr. A. Bedborough, Southampton; Mr. R. Brandon, London; Mr. Bignoll, London; Mr. Conybeare, Westminster; Mr. Edgington, Windsor; Mr. Francis, London; Mr. Fowler, Louth; Mr. James, London; Mr. Seddon, Westminster. The drawings have been on exhibition for about a week in the town, and we believe that the committee will come to some conclusion this week.

The first premium is £50, and the second £25. The instructions require that the cost shall not exceed £10,000; the stone to be Heath stone for exterior, and ashlar or compost for the interior. A right-angled chancel is insisted on, and although the style is not absolutely limited, the transition between Early English and Decorated is recommended. Seating is required for about 1,200, including school children. In one particular the designs display remarkable uniformity, the flanks being for the most part plain even to bareness, while the east and west ends are of a very decorated character. The design bearing the motto "In cruce spes" exhibits this in a marked degree, the nave and transept being very Early Pointed, with the faintest trace of cusping in the window-heads, while the west front displays a rose window of very elaborate pattern, though not of very good design. The tower and chancel are also of later date than the body of the church. For some occult reason the roof of the chancel is of a much sharper pitch than the main roof, and the effect is decidedly bad, and the roof timbers seem in the perspective view to be of excessive weight. The roof is covered with tiles. "Polyanthos" is the title of a very fair design. The style is plain Early English, bordering on the transitional. The tower is at the south side of the chancel. The roof, which is tiled, is simple. The architect appears to have kept the limit of the funds in his mind throughout, as, though without meagreness, the building is far from having ornament to spare. "Bucks" is the motto of a rather gay affair for £10,000, in the Early Decorated style. The roofs are of good pitch. The tower, which is to the east at the side of the chancel, is really handsome, and there is a great deal of variety on the plan. It is a pity that no interior perspective is given, as we are sure the effect would be uncommonly good. In deference to the requirements of the Church Building Society the seats in the transepts face to the east, though in most of the other designs they face to the north and south like choir stalls. "Square and Compass" has a roof forming a right angle, than which there can scarcely be a more disagreeable pitch. The general style of the church is Geometrical, but a hammer-beam roof is introduced. It would appear as though the original roof had been destroyed and another substituted at a later period. The roof is covered with slate. The tower is a fine feature, but it would be improved by the omission of a few of the gablets. "Square and Compass in a circle" is a curious production of more originality than merit. The tower, which is in the centre of the west front, is flanked by two indescribable edifices, each apparently of two storeys, and rising nearly to the height of the main roof, the cornices being on the same level. The lower portions contain the porches, but to what purpose the upper part can be applied we have no notion, unless it be to form a porch of extreme height, which will be something like a well. As it appears in geometrical elevation it is as comical a thing as can well be conceived. The style is Early Decorated, with a waggon-headed ceiling. The effect of the interior is pleasing. "Sursum corda" is the motto given to a very ambitious design, as peculiar in plan as in elevation. It has a nave about 40ft. in width, which practically contains all the seats. At each side of the nave is a narrow passage called an ambulatorium, exactly 6ft. wide in the bays and 4ft. in the arches. In each bay is a bench, as there is no room for a seat with a front. These ambulatories lead to the vestry on one side and the organ chamber on the other, and excepting as corridors are useless. At the western end are two small towers or turrets and a hideous pent-house porch extending the entire length of that front. The entire west end of nave, a space some 30ft. in width, is filled by a rose window and an arcade of seven single-light windows: the very spandrels are pierced. It is as ornate as the style will allow, indeed much too fine. The ceiling, which is arched and boarded, is the best part of the design. The chancel, being apsidal, defies the instructions, and is too short. It has three rows of choir seats. This design is exceedingly monotonous, full of glass, and very expensive. The perspective views are effective, and we are far from saying that the architect could not do a really good thing, though in this case he has failed, as, with all his ambulatories and apsidal arrangements, the external appearance of the building is like anything but a fane of the Established Church. "Ad majorem Dei gloriam" is by the same hand, as is also "Bid temples worthier of the faith ascend." The former is a very good motto tacked to a very bad design. The sides are plain beyond measure, while the east and west fronts are gorgeous to a degree, the spandrels of the roof being filled in with tracery approaching the Flamboyant in style. In his report the architect lays the blame on Salisbury Cathedral, "where geometrical tracery was coming into use for the larger windows at east and west ends." In our opinion the tower, for want of sufficient buttress, would not stand. The third, "Bid temples, &c.," is the most extraordinary design we ever saw. It consists of nave and aisles of nearly the same height, the difference being only three feet. The building is nearly square on plan and elevation. Being vaulted there are five gables on the north side, six on south, and, if the apsidal plan of chancel prevails, five on the east. The style is Transitional. The architect talks about a "narthex" or western porch. This narthex takes the form of a pent-house cut into by a gabled porch opposite the nave and aisles, altogether a most notable device. "Triangles intersecting." This is a plain Early English design, solid of wall and showing value for the money it would cost. The tower is as handsome as any we have seen, and the entire church has a thorough old look, though no old church of this size was ever completed in one style, building being anciently so slow that a generation would pass away before a church of even moderate pretensions would be completed. It is impossible to describe this church so as to say wherein its especial charm lies, unless it be in the even distribution of its moderate amount of ornament. The interior is as good as the exterior, and both are excellent. "Floret qui laborat." This design does not require any extended notice. However much the architect may have laboured at his architecture he certainly does not flourish in it. The interior perspective view is one of the very worst that we have seen. The style, if anything, is Decorated, and the decoration is rather in excess of the style. The metal cresting to the roofs is objectionable, and the roofs are of too low a pitch. The plan is not a bad one. "In domine confido" is the title of the last in the collection. It has no feature of interest, being just like any other church in the same style which does not from especial cause rise above mediocrity. The archæology is right enough and propriety pervades it. There are worse designs in the competition and few better. Our own selection would be "Triangles intersecting," for the first, and "Polyanthos," for the second premiums.

DESIGN FOR THE MANCHESTER NEW TOWNHALL.

Our lithographic illustrations this week show two views of the admirable design submitted by Mr. Worthington, of Manchester, for the Manchester New Townhall. In the Building News for the 17th of April (No. 693), we gave an analytical notice of this meritorious work. A glance at the two views given will, we think, justify what we then said.

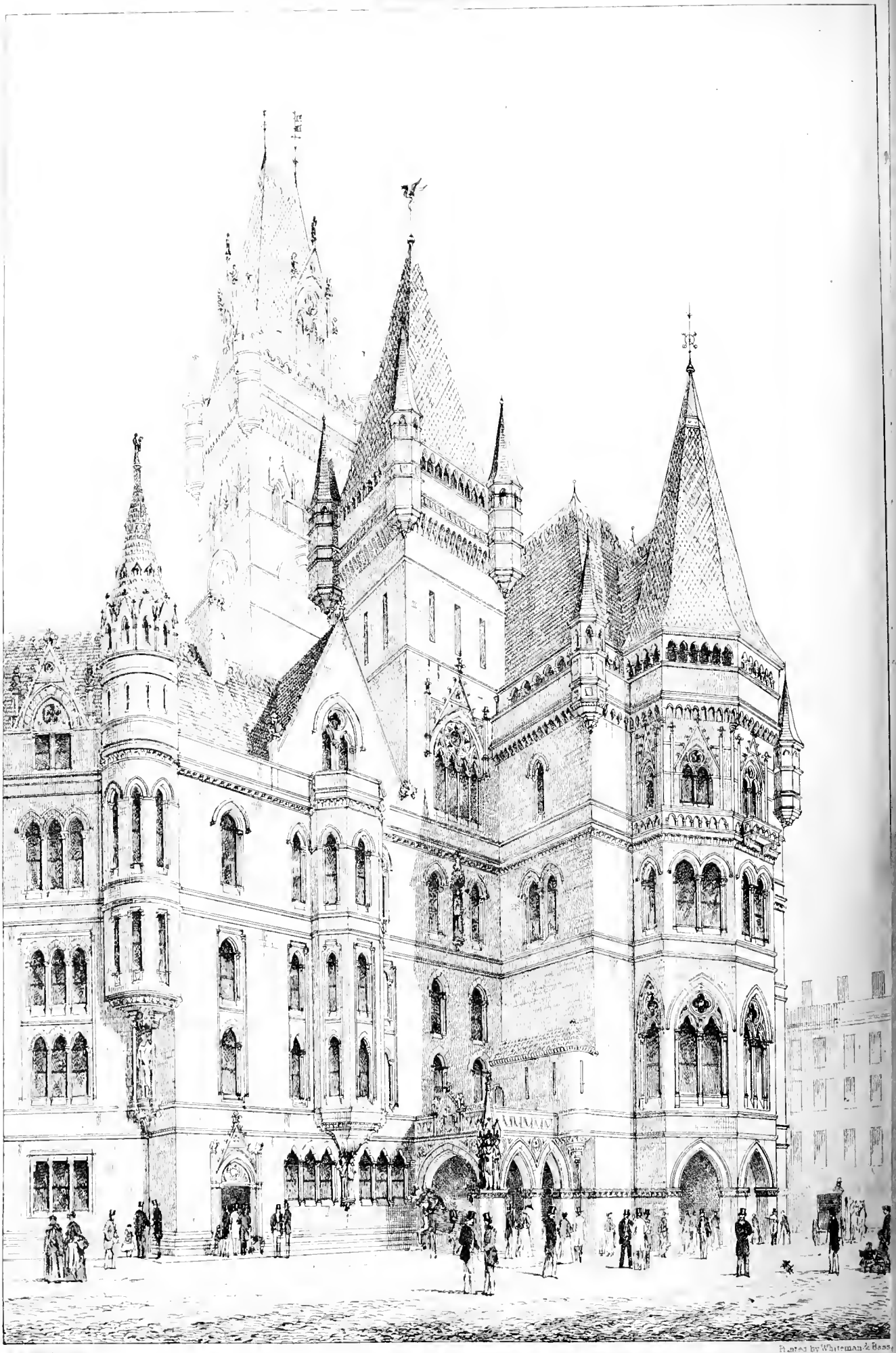
CHANGES.

The whirligig of time brings many changes, not only in the opinions of men, but in the purposes to which buildings and building sites are appropriated. Many a pagan fane has become a christian temple, and sometimes a christian temple is turned to unchristian uses. We remember some years since there was no small stir made in a portion of the religious world because the cellarage of the Wesleyan Centenary Hall, in Aldersgate-street, was used as a large wine vault. Percy-street Chapel, Fitzroy square, was at one time, and within the last twenty years, filled to overflowing, Sunday after Sunday, by a fashionable West-end audience. This was during the ministrations of the Rev. Haldene Stewart and his successor, the Rev. Robert Montgomery. The last-named gentleman was not only celebrated as a preacher, but famous as a poet. After his death, in 1855, the congregation diminished. Several ministers were tried, and after many strenuous efforts were made and many clergymen lost time and money in the struggle the chapel had to be closed. On the site of the once famous chapel have just been erected extensive premises for carrying on the wine trade. Possibly a teetotaller would say—To what base uses must we come at last.

THE STONEMASONS AND MR. GLADSTONE.

It will be remembered that when Mr. Gladstone had an interview or conference with the representatives of the trades' unions, he condemned in strong language a rule which he understood existed among masons, to the effect that stone which is quarried may not be dressed in the quarry, but must be taken to the place where it is put into the building. Mr. Gladstone went on to say that "such a rule was worthy of savages," as it was a waste of human labour. Mr. Gladstone said, "It is refusing to make God's gifts go as far as he intended them to go, when you require labour to be done by such a useless regulation." Some of the representatives present, including Mr. George Potter, said that such was not a trade unionist regulation, and Mr. Gladstone said he was glad to have his mind disabused. It turns out, however, that such a rule does exist, and that it is sanctioned by the Stonemasons' Union. The stonemasons of Birmingham are at present on strike to compel the master builders to adopt a code of rules, including the following:—"No worked stone to be allowed to come into Birmingham, with the exception of tooled York flags, common tooled steps, and the like." This strike has now existed for nearly a month, causing, as a matter of course, loss and social irritation. That the local strike is sanctioned by the Stonemasons' Society is too evident. On Friday last, at the Birmingham Police Court, John Ellis, late secretary to the Birmingham Stonemasons' Society, was charged with absconding with £50, which was sent to him by Mr. Richard Harnett, secretary of the Operative Stonemasons' Society, Bolton. This money was sent to sustain the Birmingham masons on strike, and it cannot be denied that one reason which induced them to strike was to enforce an obnoxious rule—a rule, as Mr. Gladstone says, "worthy of savages." There are other points in dispute between the stonemasons and master builders of Birmingham—points which are legitimately subject to local arrangement. But the rule above alluded to runs counter not only to the teachings of political economy, but to our ordinary conceptions of justice, and the sooner it is abandoned by the masons of Birmingham, and repudiated by the Operative Stonemasons' Society of Bolton, the better for all.

The office of surveyor to the Hon. Society of Gray's Inn is now vacant.



Printed by Whiteman & Bass

Design for the Manchester New Town Hall. Mr WORTHINGTON ARCHT

MAYOR'S PORCH & CORNER OF PRINCESS ST

Design for the Manchester New Town Hall. Mr WORTHINGTON ARCHT

COOPER ST END

THE COST OF LABOURERS' DWELLINGS.

ON the 20th inst. Mr. Bailey Denton read before the Society of Arts a paper "On the Condition of the Agricultural Labourer." The question is a wide one, and Mr. Denton threw considerable light on it. He spoke of wages, education, beershops, provident societies, bakeries, garden allotments, labourers' homes, and other matters appertaining to the daily habits and life of the agricultural labourer. It is not our province to enter into the merits of any of these questions at the present time, but we feel bound to correct some misstatements which were made on the occasion in reference to the prices at which houses for agricultural labourers can be built, and particularly by some of the gentlemen who took a part in the discussion. Mr. J. K. Fowler, of the Prebendal Farms, Aylesbury, said "it was impossible for an agricultural labourer to pay, as rent, interest on £140. He, Mr. Fowler, had, through his landlord, to build one or two cottages, and he found they cost from £130 to £140 each." And Mr. William Hawes, the chairman, said "that the Society of Arts had again and again considered the question of improved dwellings. They had plans prepared and every scheme suggested for reducing the cost, but they could not bring it within £130. They could build a hovel for a good deal less, but not a cottage fit for a labouring man to live in." We give full credit to the society for what it has done in this direction, and at the same time venture to say that it has not exhausted every scheme for building cottages, if £130 is the minimum cost. We beg to call Mr. Fowler and Mr. Hawes' attention to a few instances which contradict their experience. Some time since the Central Cottage Improvement Society offered a prize for the best plan of a cottage, consisting of a good living room, scullery, and pantry, with three bedrooms. The prize was won by Mr. Smith, and since then Mr. Hill, of George-lane, Snaresbrook, has built a cottage on the plan for £105, and is prepared to build as many as may be required in the same way for the same money per cottage. If the cottages are built double they can be produced at a cheaper cost. Mr. Thomas Kibble, of Greentrees, near Tonbridge, a gentleman who has paid considerable attention to the question of economy in building cottages, has recently erected some double cottages, each cottage consisting of living room, scullery, and pantry, and three bedrooms, and these double cottages have been erected for £175 each. Mr. Nichol, of Regent's Circus, another gentleman who has studied this question, has recently erected a triple cottage at Hampton for £250. This plan was illustrated in the BUILDING NEWS, No. 602. Mr. Nichol is now putting up sixteen similar cottages at a similar rate at Twickenham. Mr. Nichol has a system of his own. He builds with slabs instead of bricks, and competent authorities have stated that cottages built on this system are as strong and even stronger than if built with ordinary bricks. We shall have more to say on Mr. Nichol's plan of building soon. The Rev. Hales Tooke, of Washbrook, near Ipswich, has built triple cottages, of good brickwork, and on a similar plan at £225 each. It should, however, be borne in mind that Suffolk is a cheap county both for labour and material. We give these facts to show that the gentlemen who offered observations on this important question of providing better house accommodation for labourers at the Society of Arts were misinformed. It is, we think, sufficiently demonstrated that good substantial cottages can be built for £100 per cottage; if built in a double form they can be produced cheaper, and if in a triple form, at a much cheaper rate.

THE METROPOLITAN BOARD OF WORKS IN BAD ODOUR.

THE Metropolitan Board of Works, whose enemies, says the *Daily News*, seem to increase every year, is getting into peculiarly "bad odour" in Essex, and may find itself involved in serious Chancery proceedings for its doings in certain portions of that county which lie on the margin of the Thames. From a petition to the Home Secretary which has been signed by the vicar, the churchwardens, the medical men, and, indeed, by all the inhabitants of Barking, we learn that the place is being made positively uninhabitable by the operations of the Board. The public has heard something like this before. Last November, the Vice-President of the Board of Trade stated in Parliament that owing to the continuous silting up of the river by the deposition of sewage mud from the outfall sewers of the Board, a bank had been formed in the channel of the river upon which one vessel had been stranded. It now appears that the depth of water in the channel has been diminished from 21ft. to 10ft. at ebb tide, or, in other words, 11ft. of water have been lost. These Barking memorialists, however, do not complain in the character of navigators, but as residents desiring to live unmolested in their houses. The filth and refuse of the largest city in the world is deposited at their doors. There are banks within a few hundred yards of their houses composed of solid sewage, six, eight, and ten feet deep. Foreshores which were formerly hard shingle are now pestilential mud, and what were formerly valuable fishing grounds are now spawning beds of fever and cholera. All this has happened since the discharge from the high and middle level sewers of the metropolis began, and the evils will be exaggerated when the low level sewer is in operation. It seems strange that after all the cant about sanitary reforms with which the public has been bored for years, we should have to record such facts as these. The act under which the Metropolitan Board has been working, and under which its members justify their proceedings, is one for the purification, not the pollution, of the Thames. It does not prescribe or sanction any particular plan, but leaves the Board under full responsibility to those it may injure, even empowering the Home Secretary to proceed against them if they create a nuisance, and this the Barking memorialists entreat Mr. Hardy to do. We wish them well out of their troubles, without, however, seeing how either the Home Office or the Court of Chancery can help them.

A NEW WATERCART.

A NUMBER of improved watercarts are being built for the City of London, by Messrs. Bayley and Rawsthorne, of Newington Causeway. The principal improvement is the better regulation of the flow of the water by means of a simple and ingenious arrangement. There are two distributing pipes, into either of which water is admitted by means of a valve. The upper distributing pipe has double the number of holes that are in the lower one, and consequently can be used to deliver a larger amount of water on new roads, and where else needed. Springs also are introduced to support the cart, preserving it to a great extent from the effect of blows and concussions. The body of the cart is galvanized and so oxidation is prevented. The general construction of the cart is considerably improved. It is hung on a crank axle which brings it very near the ground, so that the flow of water lays the dust better than if thrown from a greater height. The valve regulating the slow or quick flow of the water is set before starting, as required. Altogether the cart is a decided advance upon the primitively constructed watercarts at present in use.

THE POLLUTION OF RIVERS.

THE *Engineer*, in an article on this subject, says that viewing the exclusion of sewage matter alone from our running streams and brooks as a half measure, and not calculated materially to increase their purity, the remaining step to be taken by the Legislature is to forbid anything except storm waters and surface drainage to be added to their contents. The true value of the prohibition to run sewage matter into rivers is not to be sought for in the diminution of their pollution, but in the necessity it creates for the utilisation of a valuable manure. Strictly speaking, no drainage of any kind can do otherwise than impair the purity of a stream; and the surface water flowing into rivers from farm lands and farm-yards contributes materially to discolour and contaminate them. The law with respect to discharging refuse or material of any kind into streams appears to rest upon the somewhat extraordinary foundation, that although one's next door neighbour may send tons upon tons of pollution into them, the same privilege does not extend to one's self. That one party should have a right to pollute a river until it is nearly as filthy as the Augean stable, and that another should not be able to discharge a drop of contamination into it, is a state of the law as anomalous as unjust. It will scarcely be credited that such a thing exists as a "prescriptive right to befoul a river." Yet it is so, unquestionably. Last session in the Vice-Chancellor's Court two cases of river pollution were heard, in which the fact was clearly established. Consequently our rivers may be treated as sewers by some, but not by others. Twenty years of uninterrupted passage, we believe, give a right of way in the case of land; we have yet to learn how many give a right to pollution with respect to streams. The evil being grave and palpable, the remedy must be stringent and conclusive. In common fairness, two courses appear to be open. One is to abolish all prescriptive rights and allow the river sewers to be free to all proprietors of manufacturing and industrial establishments; the other to forbid them in like manner to all, whether they have recently set up works or have been proprietors since the time of the Conquest. It is needless to say of the first course that it is not desirable that our rivers and streams should be rendered public sewers. There remains, therefore, no other but the second. To put into peremptory execution an alternative of this character would be fraught with manifest injustice to the possessors of manufacturing premises. Corporations consider it bad enough to be compelled to find a different outlet for their sewage than what they have been accustomed to, but still sewage can be utilised—it is indisputably a fecundatory medium, and should be treated as such. The case is otherwise with the refuse of manufactories. There is no doubt but that it might be all utilised, but neither the knowledge nor the means of doing so are at present before us, and to force such a conclusion as an ultimatum upon the present proprietors would be a harsh and unwarrantable exercise of authority, and would inevitably be followed by the closing of many large premises, which afford employment and maintenance to the inhabitants of the surrounding districts. In precisely the same manner in which the sources of the beautiful aniline dyes were formerly disregarded and thrown aside as rubbish, as a thing to be got rid of, so are tons of material allowed to flow away and to ultimately reach the sea, which never restores the treasures once committed to its depths.

DOBROYD CASTLE.

ON Saturday last was celebrated by a dinner the finishing of Dobroyd Castle, which has been erected near Todmorden by Mr. John Fielden. A large number of ladies and gentlemen were present. Mr. Fielden, as on the occasion of laying the foundation stone, provided the dinner, which was heartily enjoyed by all the men who had co-operated in rearing the castle. Two presentations were made during the evening, one to Mr. W. Glover, clerk of the works, and another to Mr. Edwin Long, foreman of the masons. The chair was taken by Mr. William Glover, who said in his opening speech:—"It is now a year and seven months since we met to partake of the kind hospitality of John Fielden, Esq., to commemorate the laying of the foundation stone of Dobroyd Castle. We now meet under the same auspices to celebrate the roofing of a building which will immortalise the name of Fielden,—be a monument of art to one of the greatest architects of the nineteenth century, an honour to the contractor, a credit to the foremen and workmen, and of the superintendence of which the clerk of works may feel proud. It is a structure the exterior of which has been raised from the native sandstone rocks, and lined with bricks made from the native clay, and, like the parent rock of the castle, it will resist the action of time, and speak to a future age of a name dear to the sons of toil, and of the triumph of building art in the present century. Two years have now

passed since the first sod was turned. During that time 35,000 cubic yards of excavation have been completed for the castle and roads connected therewith: upwards of 6,000ft. of drain pipes have been laid, and more than 1,000,000 bricks have been made and used. Two quarries have been opened, 120,000 cubic feet of stone has been taken from the beds of these quarries, besides 33,000ft. for 'metalling' roads; 8,000ft. of timber, 33 tons of iron, and 8,000ft. of Bath stone have been used in and upon the castle. It is an interesting fact, in connection with these works, that no accident of any moment has occurred in the whole period."

The evening was spent most agreeably. The erection of this castle reflects credit on all concerned. There appears to have been harmony between the architect, the clerk of works, the foremen, and the men, and that from the beginning they have worked with energy and satisfaction. Mr. John Gibson is the architect.

LABOURERS' DWELLINGS.

A PAPER was read before the Society of Arts, on Wednesday evening, by J. Bailey Denton, on "The Condition of the Agricultural Labourer." After reviewing the wages and social position of the labourer, the lecturer concluded with the following remarks:—

Thus far I have spoken of those means of improving the condition of the agricultural labourer which will depend on himself and the force of education gained at school and on the farm. There are other means, however, by which the higher and middle classes in rural parishes may render material aid while the seeds of education are taking effect. I have said *may* render aid, because all Englishmen resist compulsion; but I feel those words are hardly strong enough when applied to some objects. I would rather say, will be induced to render aid by the influence of public opinion. I refer to four principal objects—first, to a more general substitution of good cottages for bad ones—cottages which will secure health and comfort in the ordinary living department, and provide separate bedrooms for the parents and children of different sexes, so as to secure comfort and decency, which have hitherto been incompatible with the dwelling of the farm labourer; second, the provision of a proper means for the drainage of villages and cottages, and the utilisation of the refuse which may be discharged from them. This is a matter upon which little has yet been done. We have drained large towns, and discharged their sewage into the rivers, a practice which the country has determined shall not be continued. At present we have not entered upon a mode of dealing with the sewage of villages and small communities; and whether it will be by the introduction of the dry earth system (Mr. Moule's), or by any other process of utilisation, yet remains to be determined. The dry earth system commends itself to the minds of many as the most suitable for villages, because each resident may preserve the refuse of his own cottage for the benefit of his garden without injuriously affecting his neighbour; and this being a very desirable object, the problem has to be solved how, by combined action, all the residents of a village may be brought into one common system of proceeding. As the wage-paid labourer cannot of himself do this, it would appear positively necessary that the owners of village property should take the initiative. Third, the supply of pure wholesome water in quantity sufficient to secure cleanliness and comfort to villages and cottages. I have already addressed the society upon this important object, and will abstain from repetition. The supply to large towns is an easy matter, compared to the provision of villages and small communities. But with our whole water supply undergoing change from causes we cannot control, and our village cottagers called upon to pay as much as a penny per pail for water, the subject must soon receive attention. And, fourth, the provision of ground for the recreation of those children which it is by common consent determined should be educated.

I will address myself to those objects in which the upper and middle classes of rural parishes may voluntarily assist the lower class. Foremost amongst them are benefit societies. Of all things which the labouring man most dreads is his condition in his last days. By subscription to local societies (if well managed) a labourer may, under the present state of things, contrive to obtain the means of support if sickness overtakes him, but a provision for old age is an object which very few agricultural labourers secure. If the earnest interest of the superior classes in a parish could be manifested by taking a part in the management of benefit societies, very great good would attend them, and it would no longer be said that out of the 23,000 friendly societies which exist in England and Wales there are not 20 solvent.

Some few existing societies are excellent precedents for the establishment of others. The Essex Provident Society has enrolled between 9,000 and 10,000 members, and has a capital of between £70,000 and £80,000; and the Hampshire Friendly Society has upwards of 3,000 members and a capital of £35,000. The Hitchen Friendly Institution, established in 1828, is, perhaps, based on as good a foundation as any in the country, as every member who insures against sickness is also compelled to insure for a pension in old age, an object declared by Mr. Hawkins, its founder and great supporter, to be of "vital importance if the wage-paid classes are to be taught the advantage of respectability in providing for themselves when past work without application to the parish."

The next object in which the higher classes can help the lower is in establishing and maintaining garden allotments under a provident system of management, by which a labourer having allotted to him a rood of land may pay during his active life a rent more than sufficient to satisfy the landowner, but which it is quite worth his while to pay to secure the profit which the gardening of a rood of land will give. In the majority of cases a landowner who would not let a single rood of land to the labourer would let a plot of many acres to the parish authorities, and would be quite satisfied in receiving say £2 an acre, tithe free, which is equal to 3d. a pole or 10s. a rood. If the labourer paid 6d. a pole, or £1 a rood, tithe and rate free, he would be paying double the acreage rent that would satisfy the landowner, and if the surplus was invested through the same agency as that of the "Post-office Benefit Societies," it would accumulate so as to provide the rent of the land after a certain number of years, whereby the labourer in his latter days would hold the land rent free. Thus he would ensure one means of support. But such an advantage can only be gained by the combination of the more wealthy parishioners, who together might become security to the landowner for the principal rent. Again, village hospitals and infirmaries, enabling the labouring class who have lived a worthy life to gain proper medical advice and nursing at home, are working well where properly managed, and are fit objects for benevolent co-operation. But besides these there is still another, in which the upper classes may do much good. We have recently heard much of co-operative societies for reducing the cost of provisions and preventing extortion on the part of London tradesmen. Without entering upon the question of whether such societies are desirable or beneficial for those they were originally intended to assist, it is quite certain that a modification of them may, with great advantage, be carried out in villages for the supply of food and clothing to the labouring population in rural districts. At present there has been very little experience in co-operative stores in villages. There is no doubt, however, that the small wages of the agricultural labourer are much reduced by tribute to the local tradesmen; and with so little to spend as the labourer has, it is indeed desirable that that little should purchase as much as it can be made to do. One condition would be paramount, and that would be, that ready money should be the only means of purchase, but as this requirement would produce provident and careful habits it could not eventually militate against success.

ARCHITECTURAL SOCIETIES.

A MEETING of the Oxford Architectural and Historical Society was held on Wednesday, May 20. A lecture on "Monasticism" was given by Charles Appleton, Esq., M.A., St. John's College, who traced its history and described the various forms which it had assumed at different ages, and discussed the views which had been held by recent historical writers and philosophers on the subject. The lecture was followed by some remarks on "The Recent Discovery of Wall-paintings on the Apse of Checkendon Church," by E. G. Bruton, Esq. The church is one of those rare examples of an original apsidal eastern end, and it was probably built early in the twelfth century. Mr. Bruton described the steps by which the paintings were discovered, and his reasons for thinking they were painted shortly after the erection of the church. When complete, they consisted of the twelve apostles, equally divided, and ranged on either side of the walls, north and south of the east window; but the southern half had been reduced to three or part of four figures in the fifteenth century, by the insertion of a window. Some parts of the figure of our Saviour, seated on a throne, with both hands raised in the act of benediction, were discovered on the vault, immediately over the east window. The figures of St. Peter and St. Paul were arranged north and south of the east window, and were distinguished by being placed in panels or niches, while the others were not so separated; and to these saints the church is dedicated. A curious ivory carving of the eleventh century was exhibited by Mr. Borlase, on which Professor Westwood made some interesting remarks.

PARLIAMENTARY NOTES.

On Thursday week the City of London Gas Bill was read a third time in the House of Commons and passed.

On Monday night Mr. Henderson asked the Secretary to the Treasury why so much time had been wasted, and the best season of the year for building purposes allowed to pass away, without any progress having been made towards the erection of the new county courts in the city of Durham, Government having purchased and had possession of a site for that purpose several months, and the house where the present courts were held being most inconvenient and entirely unfit for the conduct of public business. Mr. Sclater-Booth explained that the purchase of the premises was not for the purpose of building county courts. The reason why the new buildings were not proceeded with was, that the estimates were very large, and that the accommodation could be provided in a much better manner elsewhere.

LABOURERS' DWELLINGS' BILL.

In the House of Lords on Tuesday night, Lord Chelmsford moved the second reading of the Artisans' and Labourers' Dwellings' Bill. His lordship expressed himself anxious that the measure should become law this session for the reason that it would tend so greatly to promote the health and comfort of the labouring classes. He referred to the reports of the medical officers of Liverpool and Manchester to prove that the effect of overcrowding in our large towns was something terrible, and thought that the House would agree with him that it would be a reproach to the legislature if this great and growing evil was not remedied. Former measures of a similar character have proved abortive, first, because they were merely permissive and next because local authorities from various motives shrunk from using the powers entrusted to them. On the whole, therefore, he felt that it would be infinitely better to entrust the execution of the act to the Board of Works. Then as to the objection of local taxation. The property that would be destroyed consisted chiefly of two storeyed houses, and by replacing them with buildings four or five storeys high accommodation would be provided for an immensely increased number of tenants. There would thus never be any burden on the rates, and if the new houses were sold the debt incurred in building them might be at once extinguished. He hoped therefore that their lordships would give a second reading to a bill which would bring comfort and health, and he might add decency, to thousands upon thousands of families to which all were alike strangers. He regretted that Lord Portman should have suggested its reference to a select committee; but feeling that it would be useless to struggle against such a proposal, he would reluctantly assent to it. He should, however, himself attend the committee, and he was happy to add that he had secured the services of a noble and learned lord opposite. The Earl of Shaftesbury thoroughly approved of the measure and expressed himself most anxious for the second reading of the bill. The Bishop of London said one point of some importance was the difficulty which was often experienced in obtaining good titles for land on which it would otherwise be desirable to erect improved cottages. An instance of this had occurred in the very heart of St. James's, and he hoped that care would be taken

in the more complete framing of this measure that this difficulty should as far as possible be obviated. He hoped the bill would be so dealt with by the select committee that it would prove an effective measure, in which case he was sure it would be of incalculable advantage to the metropolis and elsewhere. Lord Portman said, as the owner of a considerable amount of house property, he was prepared, notwithstanding the remarks made in the newspaper referred to by the noble and learned lord who had moved the second reading of the bill, to oppose in its present form a great deal of the bill, and to take upon himself the peril with which he and others who might take a similar course were threatened. He should do his utmost to make the bill a good one, instead of leaving it, as it was at present, the most crude and dangerous piece of legislation that for a long period had come up from the other house of parliament. He wished to point out that it was impossible, even with the assistance of trades unions, or in any other way, that the expense of the buildings it was intended to erect could be repaid within seven years. One fault in the bill was that it did not require specifically the erection of dwellings for artisans and labourers; it simply provided for the erection of dwellings fit for human habitation, and of course under such a generalisation it was quite possible to erect dwellings suitable for their lordships. He desired to point out as an omission he had noticed in the present bill that no provision had been made to meet the case of tenants for life; and, again, he thought there ought to be a better definition of the term owner than was given in the bill. The Duke of Marlborough and the Earl of Derby each cordially supported the second reading. The latter nobleman thought that the bill failed to touch one serious evil—the overcrowding of cottage property. Another point he hoped the committee would bear in mind was the better definition of the term "owner." He trusted that an arrangement would be made that should bring about an equal distribution of the burdens upon property, and that the responsibility of owners would be carefully considered by the committee. The bill was then read a second time, and ordered to be referred to a select committee.

WATER SUPPLY AND SANITARY MATTERS.

The inhabitants of the little Scotch town of Leven experienced considerable loss last summer in consequence of the presence of very few visitors, many being doubtless kept away by the knowledge that the sanitary condition of the place was anything but satisfactory, and that a severe outbreak of cholera had occurred in 1866. The townspeople accordingly adopted the Police Act, and established a Board of Commissioners, who have procured for the town a good water supply, a system of drainage, and a great improvement in the condition of the streets. The engineer's estimate for the works was as follows:—Water-works, £1,204 15s.; drainage, £1,227 12s.; street improvements, £1,321 14s.—total, £3,754 1s. The plans of the waterworks were originally furnished by Mr. Sang, Kircaldy, but were afterwards altered and considerably extended by Mr. Andrew Paterson, architect and surveyor, Leven. The whole of the drainage works have been carried out in accordance with designs prepared by Mr. Paterson, and under his superintendence; and the contracts have been executed by Messrs. Arthur and Co., contractors, Meigle.

Colonel Sir W. Denison, Dr. Frankland, and Mr. John C. Morton, the commissioners appointed to inquire into the pollution of rivers, held a preliminary investigation at St. Helens, on Saturday, into the pollution of the Sankey Brook and the St. Helens Canal, which receive the refuse of a large number of chemical and copper smelting works. The Sankey Brook previous to the erection of these manufactories, was a clear stream; but it is now so polluted that in some parts of the borough it emits an exceedingly unpleasant odour. Fish have entirely disappeared from its waters. The Commissioners purpose to forward a number of queries to the witnesses whose names they have obtained, and afterwards to hold a further investigation.

A bill has been brought in by Mr. Clive, Mr. Goldney, Mr. Neate, and Mr. Wyld, to make better provision for facilitating and regulating the supply of pure water in cities, towns, and districts throughout the United Kingdom of Great Britain and Ireland.

Building Intelligence.

CHURCHES AND CHAPELS.

The chief stone of a new Wesleyan Chapel has been laid at Swindon. The style is Decorated Gothic. Accommodation is provided for nearly 1,100 persons. The chapel is 69ft. 6in. wide, 88ft. long, and 20ft. high from floor to ceiling. Mr. T. S. Lansdowne, of Swindon, is the architect, and Mr. T. Barrett, of the same place, the contractor.

On Thursday week the foundation stone was laid of a new church for the parish of Mordington, near Berwick. The style is Decorated Gothic, and the church is to accommodate 170 persons, at a cost of about £1,200.

Holy Trinity Church, Barnstaple, which was only completed in 1847, at a cost of nearly £10,000, has been declared to be in a state of complete dilapidation. It has been, therefore, resolved to almost entirely rebuild it at a cost of about £2,000. The architect of the restoration is Mr. W. White, F.S.A.; the contractors are Mr. J. Pulsford (stonemason), Mr. J. Cocks (builder), Mr. John Hartnoll (carpenter). On the corner stone, at the east end, which might be moved by a push, is inscribed "Built upon the foundation of the apostles and prophets, Jesus Christ himself being the chief corner stone." It seems a pity that the builder did not depend a little more on the strength of his material foundations.

Willesborough Parish Church was reopened on Sunday last, after complete restoration and enlargement, under the superintendence of Mr. I. Pearson.

On Saturday last the corner stone of a new Baptist Chapel and Schools was laid at West Vale, near Halifax. The total cost will be about £2,000.

The parish church at Moulton, in the county of Lincoln, has just been reopened by the Lord Bishop of the diocese, after having undergone considerable repairs and restoration. It is one of those large churches for which the county is so famous, and consists of an Early Pointed nave with north and south aisles 92ft. by 51ft., a Perpendicular chancel 48ft. by 20ft., and western tower and spire about 170ft. in height. A new south porch takes the place of a comparatively modern one of poor design, and a vestry with organ chamber has been added at the east end of the north aisle. The new seats and doors are of English oak, the walls and windows have been restored, and the roofs repaired and re-covered with lead. The cost of the work has been upwards of £3,000, and to meet this outlay the parish have agreed to borrow £2,000, the remainder being raised by subscriptions. The whole of the works have been executed by Mr. W. Brown, of Lynn, under the direction of the architect, Mr. William Smith, of John-street, Adelphi.

On Tuesday, May 19, a new church was opened at Melton, near Woodbridge. The style is Decorated English, and the architect, F. Barnes, F.R.I.B.A., of Ipswich. The church consists of nave, chancel, and north aisle; the entire length is 106ft., and the width of nave and aisle 60ft. The building is of Kentish rag with Bath stone quoins and dressings; on the south side is the tower and spire rising to a height of 90ft. The lower part is used as a porch, above which is placed the clock, the gift of J. Packe, Esq., of Melton Lodge. The internal fittings are all of oak, without oil or varnish of any kind. The benches in the nave are quite plain, those in the chancel have carved poppy heads. The entire building has been erected at a cost of about £4,000, which has been raised by voluntary contribution. The whole of the work has been executed by Mr. Henry Luff, of Ipswich, under the superintendence of the architect.

The foundation stone of a new Episcopal Church was laid at Kelso on Monday. The church, which is to cost £3,500, consists in plan of nave, north and south aisles, and chancel, with organ chamber on north side, and vestry. The nave and aisles are seated for a congregation of about 350, and the chancel is stalled for priests and choir. The style adopted is Early Geometric Gothic. Mr. R. Anderson, of Edinburgh, is the architect.

Another, and the last but one, of a series of carved panels illustrating Old Testament history, has been placed in the canopies of the choir stalls in Ely Cathedral. The work of renovating the defective portion of the south walls and buttresses of the choir is proceeding satisfactorily.

On Holy Thursday the foundation stone of a new church, dedicated to All Saints, was laid at Burton in Lonsdale, Yorkshire. The building will be in the Early English style of architecture, and will comprise a nave, north aisle, chancel, north porch, with tower and organ chamber on the south side, and a vestry on the north. A tower, with spire, will rise to the height of 130ft. Accommodation will be provided for 350 persons, at an estimated cost of between £7,000 and £8,000. Mr. Paley, of Lancaster, is the architect.

A new Wesleyan Chapel at Hendon was opened on the 15th inst. Mr. John Tillman, of Sunderland, was the architect, and Mr. J. C. Tone the contractor. The chapel, with its vestries, adjacent schools, and playgrounds, occupies a plot of ground 80ft in breadth by 176ft. in length. It is built of freestone, in regular courses, the outer surface of the stone being left rough. The chapel will accommodate from 800 to 1,000 people.

BUILDINGS.

The Commercial Bank of Scotland have just completed a new bank at Galashiels. It is in the Italian style of architecture, three storeys in height, and relieved by elaborately carved bands, cornices, pilasters, floral tresses and lion's heads. Mr. David Rhynd is the architect.

The latest addition to the attractions of New Brighton, an improving watering place on the Cheshire side of the Mersey, is the erection of a promenade pier. It is in connection with the landing-stage, but occupies a considerably higher level, and consists of an embayed platform, resting on iron pillars sunk into the rock. It is 551ft. in length, and varies in breadth from 70ft. to 130ft. Two pagodas have been erected on the promenade, which are used as bazaars.

Within a fortnight the erection of a block of buildings will be commenced at Hanging Water, Sheffield, for the accommodation of forty-eight poor people. The buildings will consist of thirty-six almshouses, the cost of which, about £24,000, will be borne by Mr. Mark Firth, the master cutler. Mr. Firth will provide for the allowance of 7s. a week each to the single and 10s. a week to the married occupants. The site will cover two acres of land.

The people of New South Wales have resolved to erect an hospital as a mark of their thankfulness for the escape of Prince Alfred from assassination. The hospital is to bear his name. Upwards of £4,000 has been already subscribed.

A new bank for Lloyd's Banking Company is about to be erected at Longton, Staffordshire. The building will be a plain substantial erection, consisting of bank and suitable premises with manager's residence, erected from the plans of Mr. J. Burrell, architect, and built of red brick, with stone dressings. The tender of Mr. Barlow, of Stoke-upon-Trent, was accepted, subject to certain conditions. The building is expected to be finished by the end of the year.

A new boys' school has been opened at Ledbury, by the liberality of a townsman. The building includes a school, class rooms, and a master's house, and has been erected at a cost of £1 629 17s. from the designs of Mr. Kempson, architect, of Hereford.

On Tuesday the foundation stone of Holy Trinity Ragged Schools was laid at Toxteth-park, near Liverpool. The estimated cost will be about £1,600. The building, which will be of brick with stone dressings, is intended to accommodate between 300 and 400 children, there being two principal rooms, one of which is to be used as a lecture room, besides a class room. Mr. George Williams is the architect, and Mr. Andrew Muir the contractor.

A building, for the use of the Royal Geographical Society, is to be built facing the Thames Embankment, the site having been promised by the Commissioners of Crown Lands.

The directors of the Agricultural Hall Company are about to build a new musical and theatrical structure, and have called for tenders. Builders wishing to tender may apply to the architect, Mr. Frederick Peck, 15, Furnival's Inn, E.C. The company offered premiums for designs, and, after awarding the first to Mr. Knightley, and the second to Mr. Giles, finally determined, under certain conditions, to entrust the execution of the work to their own architect, and they have done so.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, FAYISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—H. R. M.—I. R. T.—I. H. C.—B. W. W.—W. J. B.—F. C. I.—A. S.—C. B. A.—W. H. D.—W. L.—I. R. I. A. H.—I. B. N.—I. and T. H.—I. M. S.—A. H. D.—H. H. S.—T. G.—"Not for Joseph."—C. B. A.—R. M. and Son.—P. A.—W. B. C., with photographs of designs of Manchester new Townhall.—R. M. and Son.—I. R. T.—P. F. W. R.

ERRATUM.—A mistake occurred in our announcement last week in reference to the new warehouses about to be erected in Huddersfield. It should have been stated that the warehouses were to be erected on the estate of Sir J. W. Ramsden, and that the architect selected was Mr. W. H. Crossland

Correspondence.

MR. MOORE'S DECORATIONS.

To the Editor of the BUILDING NEWS.

SIR,—In a prominent position on a screen at the Architectural Exhibition is a coloured section of the new Queen's Theatre, showing a certain scheme of decoration, as "suggested by Mr. Albert Moore." Appreciating as I do Mr. Moore's painting, his harmonies of colour, and the Greek refinement which he always manages to infuse into his work, be it mere chalk sketch or finished painting, I am at a loss to understand how such an artist could have introduced such colours as those we see in this section. If we are to accept this drawing as an indication of Mr. Moore's capability to deal with the whole question of internal decoration, I am afraid Mr. Moore's chances of commissions for this sort of work are but poor. I do not deny the admirable treatment, simplicity, and harmony of the ornament, and the colour of the detail is in many respects excellent, and such as we should expect from this artist; but the general tone of colour upon pit, wall, and fittings is quite enough to prevent this design from ever being carried out. It is hardly credible that the painter of "Azalias" could have been guilty of suggesting such a drawing, and yet we are bound to conclude so, seeing that the only alternative would be to suppose that some one had altered Mr. Moore's suggestions or drawing, a course so impertinent that it is impossible to suppose anyone could be guilty of it.—I am, &c., A. Z.

TERRA-COTTA WINDOW—CERTOSA.

SIR,—You allude in your last issue to the magnificent cast of the lower window of the Certosa, near Pavia, which has been lately acquired by the South Kensington Museum. I venture to point out a slight inaccuracy in the description—namely, with respect to the material in which this window is executed. Terra-cotta of the deep red colour prevalent in the north of Italy is largely employed in the decoration of the other fronts of the building, and in the cloisters, but the west front, which contains the window in question, and which is perhaps the most richly decorated façade in Europe, is entirely of marble. The character of the design would naturally lead anyone unacquainted with the actual building to infer that terra-cotta must have been employed, but probably from the wish to bestow on the principal front a more costly and valued material, marble has been made use of here, as was frequently the case in brick buildings of this period in Italy. The marble chosen seems to have been impregnated largely with veins of iron and other impurities, and in the lapse of ages varied and richly coloured stains have spread over many of the blocks, thereby imparting to the front a tint much resembling the appearance of the terra-cotta work in England at the present day. The details of the ornament of the Certosa richly deserve the attention of the designer as, from their great variety, the lowness of their relief, and the skill with which they are adapted to and spread over the surface, they are eminently suited as examples for terra-cotta, one of the chief difficulties in preparing designs for this material being the small size of the blocks, requiring a style of ornament which may break up the flat surfaces and hide the number and unevenness of the joints.—I am, &c., GILBERT R. REDGRAVE.

UTILISATION OF WASTE HEAT.

SIR,—By Mr. Edwards's letter in your last week's impression I fear he has altogether misunderstood the remarks made by me on the utilisation of waste heat. I beg to state that I took no credit for introducing a new idea or even a new system of warming and ventilation, but simply an attempt in the simplest and cheapest form to make use of the waste heat from the rooms mostly used for increasing the temperature of bedrooms; and this not obtained only from the kitchen fire, but also from the ordinary register stoves.

Far be it from me to act in an "ungracious and unjust" manner, or to make use of others' ideas and start them as my own, but I fear that it would be uninteresting to your readers, and almost impossible without taking up much of your space, to enter into this subject; but I shall have much pleasure in taking an early opportunity of talking the matter over with Mr. Edwards. I am glad to have this means of expressing the pleasure I have had in reading Mr. Edwards's book (and which I have already twice expressed at the Association), and I beg to assure him it was simply in furtherance of his views, and not from any wish of mine to compete with him, that I bestowed a little attention on the experience of others. Trusting this letter will remove any false impression in Mr. Edwards's mind,—I am, &c.,
J. DOUGLASS MATHEWS.

Intercommunication.

QUESTIONS.

[869.]—AWARD AND AWARD MAPS.—Is there any office in London where copies of awards and award maps by the commissioners appointed to map out the different parishes in England are deposited?—M.

[870.]—DIFFERENTIALS.—Will any of your numerous correspondents oblige by informing me through Intercommunication what are the differentials of the following equations, so that the values of B and D in them may be of minimum value? And also if any of the equations can be expressed in a shorter or more concise form? W and H in the equations being constant quantities; B and D being the variable.—X + Y.

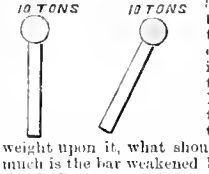
1. $W H \left(\left(D^2 + \frac{D}{2} \right) \left(\frac{D^2 + D}{3} \right) + B \left(D^2 + \binom{B + D}{2} \right) \right)$
2. $W H \left(\left(D + \frac{D^2}{2} \right) \left(\frac{D^2 + D}{3} \right) + B \left(D + \frac{B + D^2}{2} \right) \right)$
3. $W H \left(D^2 + B \binom{B + 3D}{2} \right)$
4. $\frac{W H}{2} \left(B \left(B + D \right) + \frac{D^2}{3} \right)$
5. $\frac{W H}{2} \left(\left(B + D \right)^2 - \frac{D^2}{3} \right)$

[871.]—LIMESTONE AND EARTHENWARE PIPE SEWERS.—I would thank some of your readers to answer the following:—Whether will a sewer made of limestone, 18in. square, or an earthenware pipe sewer, deliver the most sewage if both have equal fall? And how many cottages would either of them drain with a fall of 1 in 240.—A. B. C.

[872.]—TUBE WELLS.—Can you give me any information on the American tube well system, as to cost, &c., and facility, by its means, of procuring a supply of water?—W. C. (Edinburgh.)

[A short account of the system appeared in an article on "Artesian Wells" in BUILDING NEWS, No. 677.]

[873.]—INCLINED BARS.—Will any of your numerous correspondents solve the following question for me?—I have



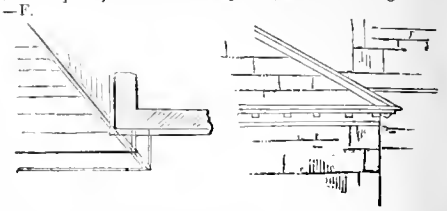
an upright bar of iron with ten tons upon it, as represented in the figure. What should be the diameter of the bar, supposing it to be round, to safely support the weight? Secondly, suppose I incline the bar, as shown in the cut, at an angle of 60 deg. to the horizon, and place the same weight upon it, what should be its diameter now? How much is the bar weakened by placing it in a sloping position?—STUDENT.

[874.]—EXPANSION OF RAILS.—How is the expansion of rails in the direction of their length provided for; and what would be the actual expansion of a rail, supposing it were 100ft. in length?—M. M.

[875.]—FORM OF GIRDERS.—What is the reason that some of the bridges carrying the various railways in and about London over the streets are of different shapes to the others? Why should some have the tops curved from the centre to the ends, and others be quite straight right through? Is it merely a fancy of the engineer, or is there any real difference in the strength of the girders by the shape being altered? Some information on this subject would be a favour to—AN OLD SUBSCRIBER.

[876.]—GEORGE FIELD ON CHROMATICS.—Will you, or any of your readers, kindly inform me, through Intercommunication, where I can get a work by George Field called "Chromatics, or the Analogy, Harmony, and Philosophy of Colours," and the price of the same?—A PAINTER.

[877.]—MANAGEMENT OF HIP.—What method can recommended for overcoming the objection of a hip cutting a main quoin, as hereunder depicted, the walls being built?—F.



[878.]—HANGING PAPER.—Can any of your correspondents inform me where I can get old bedroom or other paper matched? Perhaps there is some such house in the trade where builders and others resort to when they require anything of the sort. I have inquired everywhere, but hitherto unsuccessfully.—A SUBSCRIBER.

[879.]—GREENOCK DOCKS.—Being a competitor for Greenock Docks, a plan of which I sent on the 30th March last, and hearing nothing about it in your BUILDING NEWS, to which I am a subscriber, could you inform me, through your columns, if any decision has been come to?—W. NICHOLSON, 46, Wesley-street, Birkenhead.

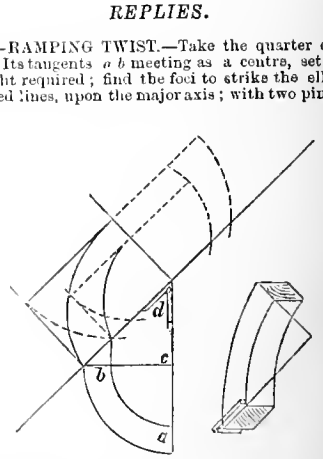
[880.]—SCARFING TIMBER.—I should like to know the best way of scarfing two half balks of timber, 12ft. by 6ft.; and also what are the advantages of the different ways of joining a rafter to a tie beam in a trussed roof. Is a bolt best, or a strap?—CARPENTER.

[881.]—FLOW OF WATER.—Could any of the contributors to "Intercommunication" inform me what is the best shape for a brick drain having about eight square feet of superficial water way; and also if it should have an invert or not, and be built in mortar or Roman cement?—C. P.

[882.]—PARALLEL RULER.—Will you allow me to ask, through the medium of your valuable "Intercommunication" columns, which is the most correct instrument to use for drawing parallel lines? I have tried the ordinary hinged ruler, but find it extremely inaccurate; and the other kind, which runs on small wheels, is not much better when worked over a large sheet of paper. I should be much obliged to anyone who would give me their own experience upon the point.—DRAUGHTSMAN.

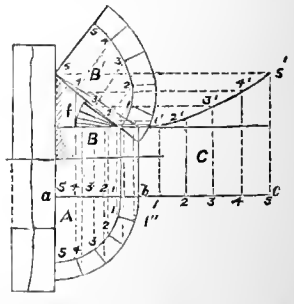
REPLIES.

[854.]—RAMPING TWIST.—Take the quarter circle as a base. Its tangents *a b* meeting as a centre, set up *c d* any height required; find the foci to strike the ellipse, as per dotted lines, upon the major axis; with two pins and a



thread complete the same. The level for its section is taken from the angle *a*, and the perspective shows its application.—M.

[854.]—In answer to "Amateur Foreman," I beg to say, taking it as a wing wall to an embankment, the top of wall would have to coincide with the slope or batter of the embankment, and which would be an oblique section of a cylinder. In the accompanying sketch, A being the plan of



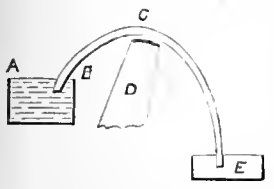
wall, B the section of embankment, divide the plan A into any convenient number of stones, and from each of the divisions draw parallel lines meeting the section line B in the points 1, 2, 3, &c., and from these points draw ordinates perpendicular to the sectional line in B', and transfer the lines 1, 1, &c., in A to 1, 1, &c., in B'; then draw the curved line through these points, which will give the curve on the top of wall. To get the development or the elevation stretched out, prolong the line *a b* in A to *c* in C, and take the distance *c* 1'' in the compass, and prick off the same number on the straight line to *c*; then from these raise perpendicular lines meeting horizontal lines drawn from the points 1, 2, 3 &c., in B and intersecting each other in the points 1', 2', 3', &c., in C, and a line drawn through these points gives your curved elevation, stretched out, and to which curve you must finish the top of your wall under the

coping. Draw the arc *f* in B, and divide it into as many parts as you have stones in the coping, and one of those divisions gives the angle or twist in the bed of each stone. —S. Lewis.

[864.]—TWISTED WALL.—If "Aspirant" will insert a plan I will endeavour to give him an easement for the same.—M.

[864.]—POLISHED GRANITE.—In reply to your correspondent "Hard Stone," I may state that the invariable method of polishing granite here is by rubbing the stone with sand and water until all tool marks have disappeared and an even surface is obtained; then rub with emery powder until quite smooth, and a dim gloss appears; lastly, with putty powder (peroxide of tin), which brings the surface to the required finish. The tools used are simply pieces of cast metal; at the last process a piece of strong felt next the stone. If he is to polish by hand labour he will require to exercise a little patience, as it is a slow process.—Aberdonian, Aberdeen.

[865.]—THEORY OF PUMPS.—Your correspondent is at fault by saying "that water cannot be raised by means of a syphon unless the level of the source of supply is higher than the top of the bend." The fact is, if the discharge end of a syphon be lower than the supply end the water will rise to a height corresponding to the amount of atmospheric pressure on the surface of supply. Thus, A B, source of supply; D, embankment; E, discharge end. I have seen water raised from a quarry bottom 30ft. right up the rock.—Aberdonian.



[865.]—The writer of the article on this subject is in error when he says that the level of the source of supply in the case of transporting water by means of a syphon, must be higher than the top of the bend of the syphon; it is only necessary that it should be above the outlet. It must be borne in mind that the short arm of a syphon must not exceed about 30ft in perpendicular height, the weight of a column of water above that being equal to the pressure of the atmosphere, which is the lifting power in a syphon.—H. Bensted, Maidstone.

[866.]—FLINT WALLS.—An authority on flint walls says that they should not, if intended for durability, be less than two feet thick. It should be built slowly and solidly, flushed up with stiff, strong mortar, compounded of quick-setting stone lime and coarse sharp sand, free from loam. As flint is a non-absorbent, brick and tiles are often worked into the middle of the walls to assist in the induration of the mortar; but for the sake of economy, lumps of hard chalk, pebbles, and flat-bedded stones are frequently used as the principal components of the core or middle of the wall. The work must be kept as dry as possible during its erection, as well as subsequently; frost is found soon to level the work while saturated with water. Flint walls are strengthend by lacing courses formed of bricks three or four courses deep, not generally showing outside. At Cambridge, Brandon, and elsewhere, they do show, and are used every two or three feet. The object is not only to get a continuous bond but to bring the work to a level bed, and again start fair. When round flints are split, and the thicker portion is kept, as usual, at the face of the wall, driving rains are easily conducted by the inclination of the upper bed of each course to the middle of the wall, and by keeping it damp conduce to its decay; but as flints are seldom split at right angles to their axis, they can be so laid in the work as to be flush on the face as well as level, and the lower bed must be firmly pinned up with fragments. It is desirable that cavities for drainage, with exit holes at the plinth level, be formed in the middle of the wall by building in rods of wood or iron vertically and drawing them up as the work progresses. The face is sometimes finished by inserting in the mortar joints gallets, or the sharp fractured bits of flint when the work is galleted or garreted.—Bookworm.

[868.]—ENTASIS OF A COLUMN.—"J. P. O." will find the best method of giving the entasis to a column by using the instrument invented by Nicomedes, and described by Blondel in his work "Resolution des quatre principaux problèms d' Architecture," and more recently by Nicholson, in his "Practical Builder," published by Kelley, Paternoster row. Vignold gives a method by lines, but "J. P. O." will find Nicholson work the best for the purpose and the quickest. As regards "J. P. O.'s" second request, there are so many works on the Five Orders of Architecture that it makes it difficult to recommend any one without knowing the purpose "J. P. O." wants it for, whether professionally or not. "Architecture Orders," by W. H. Leeds (Weale's Series), can be got for 1s.—W. R. Atkinson, Meckfield.

[868.]—"Nicholson's Five Orders of Architecture" directs:—Divide the height of column into four parts, and the difference between its diameter at base and at necking also into four parts; upon an arc describing its lower circumference square up the four latter parts to cut the former, and through the points of intersection draw a regular curve. The diminution differs with the order; and, according to some authorities, columns should commence to diminish at one-third their height, the diminution being, in some cases, one-sixth the diameter at base; in others, 8 minutes (60 minutes 1 diameter). "Leed's Five Orders," the above quoted work, Gwilt's, and "Chamber's Architecture," an anonymous work printed for J. Taylor, Architectural Library, High Holborn, and rare, seldom used, and much abused "Batty Langley," are a few of the many good works of reference upon the orders. Vitruius, Palladio, and "the Athenian Stuart," are, of course, *the* authorities.—F.

It has been decided to erect a statue to the memory of the late Mr. W. Rathbone, of Liverpool. The subscriptions to the memorial fund amount to about £3,000.

WAGES MOVEMENT.

The master masons of Crieff received an intimation last week demanding the advance of a halfpenny per hour, but they were nearly all unanimous in refusing the request. The result of the masters' refusal was that the whole of the journeymen ceased to work on Thursday week.

The Birmingham masons' labourers, taking advantage of the present masons' strike, have addressed a letter to the masters expressing their determination not to work under 4½d. per hour.

A number of the Bolton master painters have conceded the demand made some time ago by their workmen for an increase of wages, for which the men have, through the local papers, published their "hearty and sincere thanks."

BUILDING AND LAND SOCIETIES.

The directors of the Standard Investment and Building Society, Edinburgh, have issued their tenth annual report. The total receipts have reached the sum of £229,309, being an increase of £67,053 upon the previous year. The profits of the society amounted during 1867 to £9,309 17s. 5d., of which £6,447 17s. 5d. have been devoted to the payment of interest to shareholders and depositors; £764 3s. 8d. to defraying cost of management; £367 18s. 1d. for office expenses; and the balance, £1,819 18s. 11d., to the credit of the reserve fund.

LEGAL INTELLIGENCE.

Important to Contractors.—Vigers *v.* Peto.—This was an action against Sir Morton Peto by a contractor who had contracted to carry away the materials extracted in making the excavations for the Metropolitan Railway Company; and the question was as to the construction of the contract, which was that the plaintiff should be paid at the rate of 1s. 4 d. per cubic yard for the materials carted and carried away. The point was as to the meaning of the words "per cubic" yard—whether that meant the yard *in situ* (*i.e.*, as the soil lay in the earth,) or the yard, as it was measured after excavation when the materials were loose. The difference would be enormous; a matter of some thousands of pounds. At the trial, however, the plaintiff failed, the construction put upon the contract being adverse to him; evidence being adduced on the part of the defendant (which was objected to on behalf of the plaintiff, but received) to show that the phrase was understood by contractors in the sense opposite to that for which the plaintiff contended—viz., in the sense that a cubic yard means a yard of earth as it lies *in situ*. Upon this construction the plaintiff would already have been paid; on the contrary view he would be entitled to recover some thousands more. The question was whether the evidence was admissible, and whether the plaintiff's view of the contract was the right one—that the cubic yard meant the yard of earth as it lay loose after excavation. After a long argument and some deliberation, the Lord Chief Justice pronounced the judgment of the Court in favour of the defendant. Taking the words as they stood, it might be that the plaintiff's view would be right; but, taking them in the sense in which they were understood in the business, according to the finding of the jury (upon evidence the court deemed admissible), the defendant's view was the right one—that "per cubic yard" meant the earth as it stood before excavation. The other learned judges concurred. Judgment for the defendant.

The Duke of Buccleuch and the Metropolitan Board of Works.—This case was at length settled in the Court of Exchequer on Tuesday. At the late trial before the Lord Chief Baron, the jury returned a verdict for the plaintiff for the amount claimed, but the court granted a rule to enter a verdict for the defendants on a nonsuit, or for a new trial, and it was argued on Tuesday last. The Lord Chief Baron in delivering judgment said that substantially the plaintiff claimed compensation for being deprived of the causeway or jetty running down from Montagu House to low water mark in the river; and also the mansion being injuriously affected by the substitution for the river of a public roadway. The award was *prima facie* good, but if it appeared that the umpire had given compensation for anything which was not a proper matter for compensation and that he had exceeded his jurisdiction, the award would be bad, and should be set aside. He did not think it was necessary in this case to determine whether the evidence of Mr. Pollock was admissible, because it was irrelevant or immaterial, inasmuch as there was enough without it to prove that the award was good, and that the plaintiff was entitled to the full sum he had been awarded. If any person had, without the power of an act of Parliament, annihilated the causeway or jetty, and shut out the duke from immediate access to the river, his grace would have had a right of action against him, and upon the same ground he was entitled to the compensation he claimed from the defendants. He therefore thought that the plaintiff was entitled to judgment. Mr. Baron Martin, in concurring, said he was of opinion that the evidence of Mr. Pollock was admissible. With regard to the award, he added, that if the defendants had executed the works in question without an act of Parliament and the plaintiff brought an action against them, there was not a single head of damage in the present claim under which, at the trial, evidence could not have been given. Mr. Baron Bramwell, while agreeing that the plaintiff should have judgment in his favour, did not think that the umpire's evidence was inadmissible. Mr. Baron Channell also gave judgment for the plaintiff; but was of opinion that the evidence was admissible, not for the purpose of altering the terms of the award or explaining it, but with the object of destroying it, by showing that the umpire had in his calculation included something with respect to which he had no jurisdiction to award compensation. The rule was discharged accordingly.

The Prudential Insurance Company.—On Monday Mr. Coleridge applied, in the Court of Queen's Bench, for a rule on behalf of the Prudential Insurance Company, calling upon the Commissioners of Sewers to show cause why a writ of *certiorari* should not issue directing them to bring up an inquisition of the last quarter sessions of London with a view to its being quashed. The plaintiff's are the owners of freehold property to the extent of 10,884 square feet, one portion of which abutted on Ludgate-hill, and for the whole of which they had paid at different times £35,000. The Commissioners of Sewers required that part in Ludgate-hill for the improvement there going on, and having given the plaintiffs notice to treat they afterwards went before a jury at the London quarter sessions, presided over by the learned Recorder, when the jury assessed the value of the whole of the property at £34,094, being less than that actually paid for it. It was now sought to upset the verdict on three grounds, the first that the adjudication of the commissioners as provided under their private act of the premises required for the improvements was not co-extensive with the property taken. The adjudication was for the houses 57 and 59, Ludgate-hill, and the commissioners had taken in addition Nos. 2, 3, and 4, in St. Martin's court. The second point was that the act provided that the person to strike the jury to assess the damages should be specially appointed by resolution of the commissioners, but instead of so appointing, the jury had been summoned in the usual way by the clerk of the peace. The third point was the improper reception of evidence. The Court said they had no power on *certiorari* to deal with the latter point. There would be a rule on the first and second points, but not on the third point.

MEETING FOR THE ENSUING WEEK.

Fri.—Architectural Association.—A paper on "Early Brickwork," by Rev. E. L. Cutts, M.A., at 7.30.

Our Office Table.

We hear, on good authority, that Mr. Bentley is appointed, by the Archbishop of Westminster, architect to the new seminary for priests, to be erected at Hammersmith.

The council of the Society of Arts have this year awarded their Albert Gold Medal to Joseph Whitworth, "for the invention and manufacture of instruments of measurement and uniform standards, by which the production of machinery has been brought to a degree of perfection hitherto unapproached, to the advancement of arts, manufactures, and commerce." The medal was instituted to reward "distinguished merit in promoting arts, manufactures, or commerce," and among the recipients in former years have been Sir Rowland Hill, Professor Faraday, and Messrs. Cooke and Wheatstone.

At a meeting of the Metropolitan Board of Works on Friday last, the clerk read a letter from the secretary of the Metropolitan District Railway Company, stating that he was prepared to pay into the London and Westminster Bank the sum of £40,000 in the name of the Earl of Devon and Sir John Thwaites, which was one of the conditions upon which that portion of the embankment between the Temple-gardens and Blackfriars was to be proceeded with. It is intended to construct the works on a solid embankment, and advertise for fresh tenders accordingly.

The directors of the Great Britain Mutual Life Assurance Society have drawn attention to their novel system of appropriation of the profits. By their rules the bonuses may be applied, first, in extinguishing the premiums after a certain number of annual payments, and then in rendering the amount insured for payable during the assurer's lifetime. These additional advantages are offered at the usual premium. We believe this plan to be peculiar to the Great Britain Assurance Society.

On Tuesday last a public park was formally presented to the people of Paisley by Mr. Thomas Coats, of Ferguslie, who, in the formation and endowment of this place of recreation for his fellow-townsmen, has laid out no less than £20,000.

A bazaar was opened in the Leeds Townhall yesterday by the Mayor, which has for its object the liquidation of the debt—about £6,000—remaining on the new local Mechanics' Institute.

Mr. W. J. Linton, the well-known English artist, has received and accepted the appointment of general superintendent of the Cooper Institute School of Design, New York, the most important institution of the kind in the United States.

It appears that 117 drinking fountains and 99 troughs for animals have been erected, and have been kept in repair by the Metropolitan Drinking Fountain and Cattle Trough Association. But this association, like almost every good institution, is in want of funds, or it would have done a still more beneficent work. A fountain and troughs have recently been erected in Uxbridge-road. The fountain, which is made of wood, stands at one end with two large troughs attached to it, each nearly 20ft. in length, the upper one for horses and bullocks, and the lower for smaller animals, whilst a seat for weary wayfarers is placed at the back. A site for a similar erection in the Harrow road, near the cattle landing-stage of the Great Western Railway, has already been granted by the Paddington Vestry; but the society have exhausted their resources, and are obliged to wait the receipt of further contributions before they can occupy this and many other places where they are anxious to fix troughs.

Lord Cranworth's Religious Building Sites Bill, the object of which is the need of enrolling in Chancery deeds conveying the sites of chapels, mechanics' institutions, or similar institutions, has been read the second time in the House of Lords. But we fear, like the Education Bill and other bills equally useful, the Building Sites Bill will be dropped on account of the lateness of the session and the presumed pressure of work. The Lords, however, have very little to do, and that little is done somewhat lazily. The provisions and objects of this bill are so simple that they require but little discussion or consideration before they become law.

The new Streets' Act is not likely to become a dead letter. An Essex waggoner was summoned last week, before the Thames police magistrate, for obstructing the thoroughfare outside the "Plough," in Mile-end-road. Though the waggoner pleaded that he was only taking "refreshment" after working thirty hours, the magistrate fined him 2s. 6d.

The great engineering difficulty found in carrying out the work of the St. John's Wood Railway was in the stiff nature of the subsoil. Another difficulty arose in passing over the Regent's Canal, where the line has to rise at a gradient of 1 in 60. This, however, was a trifling work compared to taking all the sewage under the canal at such a level that it was always within a yard of the water over it. The work was accomplished by driving iron cylinders beneath the canal; and though sometimes within less than 3ft. of where the keels of the barges passed over them, there was no leakage or delay of any kind.

On Tuesday a deputation, composed of representatives of various local bodies of the metropolis, waited on the Duke of Marlborough, to urge their objections against the Artisans' and Labourers' Dwellings' Bill, which has been referred to a select committee of the House of Lords. The Duke of Marlborough said that the measure would probably be referred to a select committee, when he did not doubt that all that was good in it would be retained, and an opportunity would be given to the members of the deputation to show cause against those parts which, in their opinion, were useless or impracticable.

The foundation stone of Her Majesty's Theatre has been exhumed. Upon its being raised, in a cavity in the bed of the stone were found a guinea, date 1788; half-guinea, date 1789; a shilling, date 1787; a sixpence, date 1787; a fourpenny-piece, date 1786; a threepenny-piece, date 1772; a twopenny-piece, date 1786; and a silver penny-piece, date 1786. The position of the stone was in the north wall of the box corridor, on the centre line of the auditorium, under the opening leading from the hall to the pit corridor, at a depth of 2ft. 3in. below the paving of the hall. The dimensions of the stone are 2ft. 1in. long, 1ft. 1¾in. wide, and 1ft. deep. The inscriptions on the stone are as follows:—On the top, "The first stone of this new theatre was laid on the 3rd of April, 1790, in the 30th year of the reign of King George III, by the Right Hon. John Hobart, Earl of Buckingham—*Auctor pretiosa facit.*" On the front—"The King's Theatre, in the Haymarket, first built in 1703." At right end—"But unfortunately destroyed by fire on the 17th of June, 1789." On the back—"*Prevalebit justitia.*"

A bold proposal has been made to carry the Thames Embankment as far as on an even line with the southern entrance of St. Paul's Cathedral, and thence to cut a wide street from the river to St. Paul's-churchyard. We fear it is not very likely to be carried out.

The Metropolitan Board of Works have made arrangements for the paving of the portion of the Thames Embankment between Westminster Bridge and the Temple, adapted for foot passengers, and the promenade, it is thought, will be thrown open to the public in about a month from the present time.

At a recent meeting of the St. George's Committee of Works, a letter was read from Mr. Cundy, 34, Grosvenor-square, asking the vestry to widen the approach from Buckingham Palace to Victoria Station, at the expense of the parish. The clerk, Mr. Smith, said that a similar application had been made by the railway company, and an answer was returned giving consent provided it were done at the expense of the railway authorities. To this no answer had been received. The same course was adopted on the present occasion.

Mr. Francis Horner has been elected president of the Liverpool Architectural and Archæological Society, and not Mr. H. P. Horner, as stated in our last number. Mr. Francis Horner is an amateur who has been many years a member of the society, and who has taken so much interest in architectural and artistic subjects, and read so many valuable papers before the society, that they felt justified in departing in this case from their usual rule of electing a professional member to the chair.

Trade News.

TENDERS.

Lamp-posts.—The Mile-end Old Town Vestry, in answer to advertisement for the supply of 50 lamp posts, received seven tenders, ranging from £85 13s. 4d. to £144. The lowest tender, which was that of Mr. E. J. Hall, was accepted.

Brighton.—For building a Wesleyan Chapel, Brighton, for the Rev. P. Hoskins. Quantities supplied:—

		Stone spire.	Wood spire.
Regis	£5250	£ 350	—
Cheesman and Co., Brighton (inclusive)	—	4750	£4600
Holloway and Son	4447	203	170
Nightingale, London	4444	245	190
Dean and Dickenson, Brighton	4400	280	195
Saunders, London	4375	—	—
Gresswill Forest Hill	4308	263	183
Sawyer, Dulwich	4353	250	175
Anscrombe and Co., Brighton	4120	202	132
Chappell, Steyning	3944	204	156

Cambridge.—For a villa at Menea, Cambridge, for Mr. Tears. Mr. Winder, architect. Quantities supplied by Messrs Lansdowne and Co.:—

	House.	Verandah.	Total.
Gibbens, Bundingford	£1500	£65	£1565
Eaton and Co., London	1395	60	1446
Bell and Son, Cambridge	1386	60	1446
Luke Grimston, Royston	1289	50	1340
Nightingale, London	1253	60	1313

Horncastle.—For enlarging the Wesleyan Chapel:—

Thomson, Louth	£3933 7 0
Clarke, Louth	3892 10 0
Walter, Horncastle	3797 8 0
Hobson, Hogsthorpe	3587 0 0
Brown, Hatchff, and Pinchbeck	3250 11 8
Bellamy and Jay, Horncastle	3148 8 8

Kingston.—For building new house, Market-place, Kingston. Messrs. Walker and Elsam, architects. Quantities supplied:—

Goulter Kingston	£1518
Wells, Kingston	1467
Walker, Kingston	1465
Towyel, Surbiton	1394
Nightingale, London	1353
Mason, Kingston	1329

Liverpool.—For Church of St. Nathaniel, Windsor, Liverpool. David Walker, architect:—

Harrison	£4436 18 0
Westmorland	4398 0 0
Wenson	4389 10 0
Roberts and Robinson	4371 10 0
Hughes	4072 0 0
Chuck	4052 0 0
Borroughs and Son	3932 10 0
Henshaw	3929 10 0
Callie	3772 5 0
Black	3708 10 0
Murphy (accepted)	3649 10 0

London.—For the construction of sewers and temporary roadways on an estate adjoining Portobello-road, Notting Hill, belonging to the Land and House Investment Society (Limited). Mr. Josiah Houle, surveyor:—

W. Williams	£3520 0 0
Thirst	3154 0 0
Wainwright	3150 0 0
Crockett	3000 0 0
Burgess	2 90 0 0
P. Porter	2960 0 0
Harrison	2950 0 0
Lean	2850 0 0
J. and S. Williams	2800 0 0
Goodair	2778 0 0
Bloomfield	2737 0 0
Faulkner and Cowley	2710 0 0
Moxon	2478 0 0
Floyd	2450 0 0
J. Porter	2390 0 0
Tinsley	2364 1 0
Nicholson	2350 0 0

London.—For painting and carpenter's work at the Mile End Old Town Workhouse. Mr. Wm. Dobson, Mile End-road, architect. Quantities not supplied:—

	Carpenters' work.	Painting.
Kelloway, Islington	£84 12 ...	£476 12
Wallis, Gordon, and Co., London Wall	—	322 0
J. Patten, Holborn	—	250 0
King, Holloway-road	35 0 ...	241 0
J. H. Leverton, High-street, Poplar	15 7 ...	206 13
Prescott, Commercial road	—	204 0
Hemby and Mann, Hackney-road	38 0 ...	195 0
Norris, Whitechapel	25 0 ...	175 0
Derby, Whitehouse-street	21 0 ...	170 0
Britton, Trevor-square	—	140 0
Brown, Ratcliffe (accepted)	10 15 ...	134 10
Minty, Southwark	70 0 ...	97 0

N.B.—In estimating, the builders had to rely entirely on their own judgment as to what carpenter's work was necessary, and what quantity of new eaves guttering was required, which item was included in the specification of painting. Hence the difference.

London.—For erecting a Congregational Church in the Brixton road. Mr. J. Phelps, architect:—

Rider	£11,670
Little	11,599
Downes	11,560
Webb and Sons	11,466
Nicholson	11,446
Browne and Robinson	11,150
Simpson	10,990
Gammon	10,917
Jackson and Shaw	10,950
Patman and Co.	10,8 6
Adamson	10 850
Brass	10,849
Higgs	10,565
Myers	10,242

London.—For warehouse and stabling, Cross-street, Finsbury. Mr. H. J. Hammond, architect:—

Ennor	£3453
Turner and Sons	3411
Macey	3394
Bishop	3392
Eaton and Chapman	3166
Henshaw	3089

London.—For erecting three houses at Upper Clapton, for Mr. Jacomb. Mr. Cheston, architect:—

Wood	£4502
Ashby	4409
Rivett	4406
Lewis	4124
Myers	4097
Ennor	3837
Webb and Sons	3748

Longton.—For bank for Lloyd's Banking Company, Longton, Staffordshire. J. Burrell, architect:—

Inskeep, Longton	2775
Espley, Stafford	2696
Smith, Tean	2395
Barlow, Stoke (accepted)	2364

NORWOOD.—For building pair of villas for James Cann, Esq., at Norwood. Mr. J. Thomas, architect. Quantities supplied:—

Taylor	£1713
Thompson	1560
Colls and Son	1451
Nightingale	1423
Wells	1387
Bryan	1384
Ring	1358
Best	1313

RIVER (KENT).—For dwelling house, for Mr. Alfred Kingsford. Mr. Rowland Rees, jun., architect:—

Fagg	£2 83
Adcock	2150
Tunbridge	1965

PROPERTY SALES.

MAY 15.

AT THE MART.—By Mr. James Beal.—Leasehold residence, No. 838, Old Kent road, annual value £60, term 14 years unexpired, at £10 per annum—sold for £200.

Leasehold business premises, No. 8, King street, Covent-garden, let on lease at £120 per annum, term 61 years from 1831, at £28 per annum—£1,110.

By Mr. Robert Reid.—Leasehold residence, No. 8, Delahay-street, Westminster, annual value £367 10s. per annum, term 16 years unexpired, at £100 per annum—£1050.

Leasehold residence, No. 51, Tavistock-square, let on lease at £125 per annum, term 52 years unexpired, at £24 per annum—sold for £1,190.

Leasehold residence, with stabling in the rear, No. 45, Marine Parade, Brighton, let on lease at £200 per annum, term 20½ years unexpired, at £15 per annum—£1,350.

MAY 18.

By Mr. H. O. Martin.—Freehold plot of building land, situate at Upper Teddington—£30.

A freehold plot of building land situate at Upper Teddington—£33.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Newton, Albert-terrace, Notting hill, builder, June 11, at 11.—William Grey Rea, Burlington-road, Bayswater, builder, June 22, at 12—William Turner, Bromley, Middlesex, carpenter, June 12, at 12—Henry Bagge, Rose-cottages, Speldhurst road, South Hackney, builder, June 15, at 2—H. J. Barnes, Little Chester-street, Belgrave-square, builder, June 11, at 1—James Eve, Maidstone, builder, June 11, at 11—William Robertson M'Cree, late of Guildford-street-east, Clerkenwell, house decorator, June 17, at 12—C. Norwood, Twemlow terrace, London-fields, house decorator, June 8, at 1—J. Raby, late of East Ham, Essex, building contractor, June 17, at 12—G. H. Read, Victoria-place, Old Kent-road, jobbing builder, June 11, at 1.

TO SURRENDER IN THE COUNTRY.

George Gregg, Dalton-in-Furness, builder, June 2nd, Manchester—Alfred Ormerod, Heaton Norris, joiner, June 12, Stockport—Joseph Fenwick Davison, joiner, June 12, Sunderland—Thomas Thompson Laverick, joiner, June 9, at 12, Sunderland—Henry Newton, joiner, June 16, at 11, Chesterfield.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 19, T. Atkinson, Northallerton, builder—June 9, W. Burtinshaw, late of Preston, joiner—June 16, J. Gore, jun., Herne Bay, Kent, contractor—June 9, W. H. Wills, Stapehill, Hampreston, Dorset, bricklayer—June 23, H. Katcliffe, Birkenhead, painter—June 18, W. Bull and R. Jeffery, Tunbridge Wells, builders—June 24, J. Scott, Birmingham, architect—June 23, J. Cotes, Derby, painter and paper hanger—June 25, R. T. Hunter, Sunderland, builder.

PARTNERSHIPS DISSOLVED.

Ormandy and Lowther, Barrow-in-Furness, joiners and builders—F. and J. Cosser, York road, and Westminster-bridge-road, builders.

DIVIDENDS.

W. Rubardt, Duke street, Grosvenor square, painter.

DECLARATION OF DIVIDEND.

J. D. Williams, Chester, builder, div. 4s. 4½d.

SCOTCH SEQUESTRATION.

Kennedy and Russell, Edinburgh, builders, May 27, at 2.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£12	0	12	10	Archangel, yellow	..	£11	0 £12 0
Quebec, red pine	....	3	5	4	15	St. Petersburg, yel.	..	11	0 12 0
,, yellow pine	..	2	13	4	5	Finland	.....	7	0 8 0
St. John N.B. yellow		0	0	0	0	Memel	.....	0	0 0 0
Quebec Oak, white	..	5	5	5	10	Gothenburg, yellow		8	0 9 10
,, birch	.....	3	10	4	10	,, white	.....	8	0 8 0
,, elm	.....	3	10	5	0	Oeste, yellow	.....	10	0 10 10
Dantzic oak	.....	4	0	6	0	Soderham	.....	9	0 10 10
,, fir	.....	2	5	3	5	Christiania, per C.,			
Memel fir	.....	3	0	3	15	12 ft. by 3 by 9 in.			
Riga	.....	3	0	3	3	yellow	.....	11	0 13 0
Swedish	.....	1	17	2	5	Oeck Plank, Dantzic,			
Masts, Quebec red pine		5	0	6	10	per 40 ft. 3 in.	....	0	15 1 3
,, yellow pine	..	5	0	6	0	PEMICE STONE per ton		6	0 8 0
Lathwood, Dantzic, fm		6	10	7	10	Oils, &c.			
,, St. Petersburg		8	10	9	10	Seal, pale	....per tun	38	0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						sperm body	.....	100	0 0 0
						Cod	.....	38	0 0 0
						Whale, 8th. Sea, pale		34	0 0 0
Quebec, white spruce		13	0	20	0	Olive, Gallipoli	.....	72	0 73 0
St. John, white spruce		13	10	15	10	Cocoanut, Cochin, ton		53	10 55 0
Yellow pine, per reduced C.						Palm, fine	.....	40	0 40 0
Canada, 1st quality.		17	0	18	10	Linseed	.....	33	10 34 0
2nd do.	.....	11	0	12	0	Rapeseed, Eng. pale	..	38	0 0 0
						Cottonseed	.....	38	0 38 0

METALS.

IRON:—

Welsh Bars in London	.. ..per ton				0	0	8
Nail rod	..... do	7	5	0	7	12 6	2½
Hoops	..... do	8	5	0	8	0 0	
Hoops, Single	..... do	8	0	0	9	0 0	
Staffordshire Bar	..... do	7	5	0	7	15 0	
Bar in Wales	.... do	5	10	0	6	0 0	
Nailrods	.... do	7	5	0	7	12 6	2½
Foundry Pigs, at Olsag, No 1	.. do	7	12	6	2	1s 0	net.
Swedish Bars	..... do	10	0	0	10	10 0	2½

STEEL:—

Swedish Keg, hammered	.....per ton	15	0	0	15	5 0	2½
Swedish Faggot	..... do	0	0	0	0	0 0	

COPPER:—

Sheet & Sheathing, & Bol	....per ton	85	0	0	86	0 0	
Hammered bottoms	..... do	0	7	0	0	0 0	
Flat Bottoms, not Hammered	.. do	92	0	0	0	0 0	
Cake and Tough Ingot	..... do	81	0	0	83	0 0	3
Best Selected	..... do	84	0	0	85	0 0	
Australian	..... do	83	10	0	90	0 0	
Yel. Metal Sheathing & Rods	....per lb	0	0	7	0	0 7½	

LEAD:—

Pig, English	.....per ton	21	5	0	0	0 0	
,, Spanish Soft	..... do	18	12	6	0	0 0	
Shot, Patent	..... do	22	10	0	0	0 0	2½
Sheet	..... do	20	0	0	20	15 0	5
White	..... do	27	0	0	30	0 0	

RESULTS OF ANTIMONY

French	..... ton	45	0	0	0	0 0	

ZINC:—

English Sheet	.....per ton	26	0	0	26	10 0	2½
Devaux's V. M. Roofing Zinc	.... do	26	10	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	.....per ton	20	0	0	0	0 0	nett
QUICKSILVER	.....per btl	6	17	0	0	0 0	

TIN:—

English Block	.....per ton	97	0	0	98	0 0	
do Bar	..... do	98	0	0	99	0 0	2½
do Refined	..... do	100	0	0	0	0 0	
Banca	.... do	96	15	0	97	0 0	net
Straits	..... do	93	0	0	0	0 0	

THE MUSEUM OF BUILDING APPLIANCES,
(ARCHITECTURAL SOCIETIES' HOUSE, 9, CONDUIT STREET),
23, MADDOX STREET, HANOVER SQUARE, LONDON, W.,

In Connection with the ARCHITECTURAL EXHIBITION, has been established in this the central home of the various Architectural Societies of England.
OPEN DAILY THROUGHOUT THE YEAR. ADMITTANCE FREE.

The design of the Proprietor is to collect reliable information regarding all Building Appliances, and especially New Inventions and Improvements, and to communicate the same *gratuitously* to *Architects* and others interested in Building.
Prospectuses, with Terms for the Exhibition of Drawings, Address Pinnacle, Models and Specimens, may be obtained of the Curator at the Museum.

NAMES OF EXHIBITORS. (SEASON 1868.)	WORKS REPRESENTED.
Arrowsmith, A. J., and Co.	Solid Parquet Floors—Bent Wood Furniture.
Atkins, F. and Son	Moulded Carbon Filters.
Ayling, Stephen	Architectural Photography.
Baker, Rev. H. S.	Eagle Lectern in Carved Oak.
Beale, Montague, and Co.	Gas and Hydraulic Works.
Black, John	Wood Carving.
Blashfield, J. M.	Terra Cotta and Architectural Pottery.
Blundell, W.	"Bilance Cone," Air and Smoke Escape.
Borey, J.	Varieties of Devonshire Marbles.
Boyd, D. O.	Patent System of Ventilation.
Braby, F., and Co.	Zinc Roofing, Corrugated Galvanised Iron and Mouldings.
Broomhall Tile Company	"Taylor's" Patent Roofing Tiles and Damp-proof Course
BUILDING NEWS	Architectural Journal.
Bullivant, T.	Patent Airtight Noiseless Sliding Sash.
Burt and Potts	Wrought Iron Watertight Casements.
Chatwood and Co.	Patent Safes and Locks.
Coalbrookdale Company	Ridge and Roofing Tiles, Crestings.
Cooper, J. K.	Roofing Tiles, Ridge Crestings.
Copeland, W. T. and Sons	Porcelain and Stoneware Slabs and Tiles.
Cormell, J.	Art Metal Works.
Coulton, J. L.	Stained Glass Works and Decorations.
Curtiss, W.	General Building Works
Ceramic Art Union	Ceramic Statuary, Vases, &c.
Davies, C. H., and Co.	Genuine Solid Parquet Floors.
Derbyshire	Fossil and other Marbles.
Dugert and Bolfe	Asphalted Roofing Felt.
Farnworth, J. H.	Patent Self-lifting and Self-fastening Sash.
Fox, Robert	Patent Fastenings, Zinc Roofs, Sashes, &c.
Grace, C., and Co.	Green Roofing Slates, Gane's Eureka Tint.
Hobbons and White	Patent Mortise Furniture, Iron Casements.
Lever G., and Co.	Improved Dry Gas Meters.
Godwin, W.	Encaustic Tiles, Tesselated Pavements.
Hall, W.	Oxide of Iron Paint.
Hart, J., and Son	Art Metal Works and Brasses.
Haward, J.	Wall Decorations.
Hogg, W. S.	Fireproof Doors and Columns.
Johnson, C.	Patent Building Hoists.
Jones, J., and Sons	Hot Water Apparatus, Boilers, &c.
Lee, W. and J.	Patent Double action Mortise Bolts and Locks.
Letheren and Bundle	Art Metal Works.
Lizard Serpentine Company	Cornish Serpentine Marble.
Lloyd and Summerfield	Crystal Sash Bars and Aquariums.
Lowther and Co.	Patent Sun Blind, "Helio-Scene."
Macnaught, Robertson and Co.	Rolled Iron Girders and Joists.
Malkin and Co.	Encaustic Tiles and Mosaics.
Matthews, E.	Monumental Brasses.
Medwell and Son	Clipsham Down Building Stone.
Merryweather and Sons	Fire Engines, Hydrants, Fire Apparatus.
Minton and Co.	Encaustic and other Tiles and Mosaics.
Morris and Field	Sanitary Appliances, Baths, Lavatories, &c.
Moseley and Hooker	Electric Bells and other Apparatus.
Moule	The Patent Earth Closets.
Norris and Son	Moulded Bricks, Ridge Tiles, &c.
North Devon Pottery Company	Stoneware Closet and Apparatus.
Farrant Strong	Patented Cellular Construction Hexagon Hollow Tubes.
Potter and Son	General Building Works.
Ridgway and Bellenche	Encaustic and other Tiles.
Rosher, F. and G.	Bricks, Tiles, Portland Cement.
Sax, J.	Electric Bells and Indicators.
Scammell and Co.	Door Furniture, Finger Plates.
Shand and Mason	Fire Engines, Hose, Hydrants, &c.
Sidebotham, Banks, and Co.	Patent School Desks and Seats.
Smith, A. and Co.	Patent Double action Door Springs.
Smith and Turner	Patent Door Springs.
Standing and Marten	"Cracke's" Patent Capped Drain Pipes.
Tingey, W., and Son	Portland Cement.
Tuttenham and Co.	Patent Improved Twisted Iron.
Tyler, J. W., and Co.	Zinc Roofs, Dormers, Mouldings, &c.
Walford and Donkin	Fret Carved Chairs.
Warren, G.	Scagliola for Architectural Purposes.
Water Purifying Company	Patent Syphon Cistern Filters.
Watson, Charles	Double Current Syphon Ventilators.
Wheeler Brothers	Moulded and Pressed Bricks.
Whieldon, Lecky, and Lucas	Spherical Hinges, Gate and Door Fittings.

This List will be rapidly added to, and it is believed that the Museum of Building Appliances is capable of almost indefinite extension. Exhibitors will be urged to record the fullest information, and no trouble will be spared to procure for architects, *gratuitously*, any further information which may not already be recorded upon the books of the Museum. Architects and their clients are solicited to choose from the Specimen Works exhibited, and orders will be received for transmission to the exhibitors if desired. All applications to be made to the Curator.

THE MUSEUM OF BUILDING APPLIANCES,
23, MADDOX STREET, HANOVER SQUARE, LONDON, W.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 5, 1868.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

SECOND NOTICE.

EARLY ITALIAN PAINTING.

NOT many years ago such a heading as that to which we append this article would at once have condemned it. Everything previous to the age of Raffaelle was then deemed unworthy the attention of art lovers, and the general belief was that previous to the advent of this artist the "Dark Ages" literally existed. Thanks to the labours of Roscoe in translating Lanzi, and still more thanks to the Arundale Society for transmonstrating the works Lanzi wrote of, that peculiar corporate body "the British public" had learned that there were men before Agamemnon. In painting, as in all else, the world is finding out that, though one link in a chain may shine brighter than another, it is but an useless bit of metal without its fellows. Of the many links exhibited at Leeds, we propose to examine those few which lead us through the fifteenth century, for unhappily we have but little of an earlier epoch. Of the first issuing of the art of painting from the darkness into which the overthrow of the Roman empire had plunged it, we have nothing here. Such works that remain to us exist chiefly in mosaic, and must be studied *in situ*. The next links are fastened to crumbling walls in fresco, and those which emerged into the sunrise glow of the fourteenth century are scattered so wide, and are now valued so much, that it has been found impossible to reunite them here. We regret this greatly, for nothing gives so great a value to any brain labour as the evidence of that which has resulted from it. We wish that we could see how, through the labours of the Greek artists of Byzantium, the mind of Italy was tilled, and note the succeeding crops which rose, flourished, and seeded until the time of Orcagua; for the works of this great man form the initial period of the present exhibition. Of him we have but one small example, an octagonal panel, from one of his many retables representing the Coronation of the Blessed Virgin, a pure and fine piece of colour and composition, noteworthy for the clever manner in which the heavy mass of colour in our Lord's robe is balanced by its repetition in the wings of the cherubim, forming the aureole, and for the great elevation and dignity given to the principal subject by lining the background with rayonnating lines of glory emanating from a cherub's head placed low down in the picture. The accessories and details of this small panel will repay attention, the patterns embroidered on the vestments being of great beauty. Next in point of time comes a drawing purporting to be by that early master of the Venetian school, Gentile de Fabriano. Like many another unfortunate monument of early art this has suffered severely at the hands of the restorers, and though, as an useful illustration of the *technica* in painting, it is valueless from this cause, yet it still retains sufficient of its original intention to be useful as a study of the colour and composition of the fourteenth century. It is a large retable of three divisions, the central containing the figure of a saint seated, giving his benediction with his right hand, and holding a pastoral staff in his left. Very large use is made of gold in the drapery, so much, indeed, that it seems as though the gold had left the backgrounds and taken to the figure; for, contrary to the usual works of this epoch, the background is not gilt. The head is finely painted, and the broad folds of the drapery well and skilfully cast. On the right wing are figures of St. John the Baptist and St. Katharine of Alexandria, and on the left St. Paul and St. Justina of Padua. The ornament on the drapery of the principal figure is well drawn and worthy of study, though some of it is of later date than the heads and other parts of the picture.

By Fra Angelico are three pictures here, and strange to say they all appear to be genuine. The first of these is a "Death of St. Francis," a small tempera picture representing the interior of the courtyard of a monastery, where stretched on a bier lies the body of the saint, and crowding round it are the weeping brethren over whom he had so lately ruled. The sick, the halt, lame, and blind are here, all come to do honour to him they so much loved; even the doubting disciple is here too, and plunges his hand, like Thomas of old, into the wounds of the *Stigmata* to receive through his senses that evidence his reason refused. In the midst of all their grief and sorrow, the last solemn litany is chanted, and far off in the deep blue sky, which shines over the convent wall, is seen the soul of the saint borne up by angels to the home of his hope. Another specimen of Fra Angelico given here is a compounded picture, the central portion being a composition by itself of the Virgin and Child, and is below the average excellence of this great painter. To this are added the wings of what must once have been a very fine triptych of the Last Judgment, representing the rising of the blessed, and the fall of the damned. The former clad in white and crowned with flowers rise like a bird from its nest to greet the morning Sun, and marshalled and welcomed by angels of many a hue, they take their flight to heaven. On the opposite side descend the damned: down headlong they fall, yet not without that sign of "Heaven's first law" which reigns everywhere, except in Michael Angelo. Rank after rank they fall, like swathes from the mower's scythe, to where indefinite forms of demons await them. There is a world of poetry in these two small bits, but to thoroughly enter into Angelico's work we must go into the Dudley Gallery and take our stand before No. 2,910. This is a marvellous Madonna and Child. Our Lord stands on his mother's right knee, leaning against her breast, and watching her mouth with infantile instinct, and with that look of an intelligence of unseen things we often see reflected from childhood's face; whilst she, conscious of His origin and destiny, watches him with the feelings of a mother and a worshipper. The Blessed Virgin is draped in a deep blue robe, and behind her angels hold up a dossal of black and gold, a very marvel of powerful colour, and at her feet sits an angel playing upon a harp, to which a young saint sings, beating time with the palm branch of her martyrdom. All is love and purity, and in looking on it we learn how Giovanni da Fiesole became Fra Angelico, and why his name bears the prefix of "Il Beato." By Gentile Bellini there is an exceedingly interesting portrait of Mahommet the Second, who, seeing some of his paintings in the hands of Venetian merchants visiting Constantinople, and regardless alike of the law and the Prophet, sent to the senate of Venice for permission to invite Gentile to his court. Whilst there this artist painted the portraits of the Sultan and Sultana, and afterwards returned loaded with honours and this painting to Venice. How it came into Mr. Layard's hands would be a history interesting to learn, as we should naturally expect to find such a picture amongst the prized possessions of the state of Venice. To Gentile rather than his brother Giovanni (to whom both these pictures are attributed in the catalogue) should we assign a "Portrait of a Man" (71), belonging to Mr. Gladstone. It is evidently some old Venetian architect who holds in one hand a grand old pair of compasses as with the other, half raised, he expounds his views to his client. Of Giovanni there are some fine examples, and one on *canvas* signed with his name and painted in a manner which, if his, must be a very early specimen, before his touch and taste were formed. If this could be authenticated it would be a remarkably early illustration of the use of canvas for painting on, but we confess to very great suspicion as to the genuineness of the signature, despite the fact that it comes from South Kensington, and, notwithstanding the faith we feel in Cole, C.B., we should say that this is a forgery. By Andrea Mantegna are two exquisite little panels executed simply in monochrome, showing the great influence the classic predilections of his master Squarcione had upon him. One of these might be, and perhaps is, a study from a statue of the finest period of Grecian art, for Squarcione so loved ancient art that he himself made many voyages to Greece to collect for himself, and any Venetian trader who brought home such things found a ready purchaser in the Mantuan artist. By Benvennto di Senese we have a fine but somewhat damaged retable, arranged as a triptych. The centre consists of a large panel showing the Blessed Virgin seated on a throne of white marble, ornamented with inlay, having on it a crimson and gold cushion. Our Lady is arrayed in a marvellously rich crimson vestment powdered with gold embroidery, having over all a deep blue robe lined with dull olive green—a charming harmonic in colour, which, with the white coiffed headdress and dark pedecloth bearing the initials of the angelic salutation, make up a charming picture. The face of the Virgin is finely drawn, much better than that of the Divine infant, who is clad in a short purple tunic, and seated on the right knee of His mother, who presents a bunch of white roses to Him. On the back of the throne stand two angels, the one vested in white, playing a mandolin; and the other, robed in crimson, playing the viol. The valve to the triptych, on the right of the Madonna, contains a large figure of St. Peter, represented with the typical short face, bald head, and white beard, which have been traditionally handed down to us by artists from the earliest ages of Christian art. His right hand grasps the mystic keys of gold and silver, and his left is closed upon his book. His vestment is of crimson and gold, and his robe of yellow lined with green. On the opposite side is a figure of St. Nicholas, of Bari, vested as a bishop in a gold embroidered cope, having its orphreys filled with figures of saints, and bearing on his left arm the pastoral staff. This large picture is quite worthy of much professional study. The details of the ornament are charming, and the general effect is decorative in the extreme, whilst the painting of the hands and flesh generally is, for the date, very excellent; and though there is much which detracts from its merit as a fourteenth century work in the repainting it has undergone, yet as a study in the colour and composition of the time, it is very valuable.

Some very interesting cassone fronts are the only things attributed to Pinturicchio, and as works of art these are poor. In one of them, interesting from an archæological point of view as exhibiting the laying out of a table for a feast then-a-days, the napkins, manchets of bread (which served for plates), knifes, and *forks*, are all carefully represented, and an attendant brings in what appears to be a very large dish of oysters. The cassone was painted for some of Pinturicchio's great patrons, the Piccolomini family, and represents a scene from their history. Three other of these bridal chest-fronts form a series detailing the history of Patient Griselda, who by her beauty won for herself the position of a princess from that of a peasant, and from her patience and forbearance to her husband became a name in story—a very proper and pertinent moral to preach to a young bride,

and we sincerely hope it agreed with her. Sandro Botticelli is represented by a revolving panel, having on one side a portrait of a female, whose face seems to have haunted his every work, and on the reverse a typic figure of Ambition standing on a sharp and pointed mountain top, where there is no rest for the sole of her foot, and grasping the spire in her hand. From him also comes a quaint mystery, full of much poetry and feeling. It is a Nativity, or rather an Adoration of the infant Saviour. His mother and St. Joseph kneel before Him, and angels bring the Wise Men from the East and the unlettered shepherds from the hills which stand about Jerusalem to do Him homage. On the roof three angels sing of peace and good will on earth, whilst the "Gloria in Excelsis" is caught up by a heavenly choir, who in an unbroken circle hymn that strain which henceforth was without end. His pupil, Ghirlandaio, is introduced to us by a picture which has a history. It is a study for some of his frescoes in the choir of Sta. Maria Novella at Florence, where he painted a series of pictures representing the life of its patron saint, St. John Baptist. Orcagna first decorated it, but his frescoes failed, and the Ricci, who had the keeping of the chapel in their honour, like many a good old family before and since, became poor. Meanwhile the Tornabuoni became rich and solicited the honour—or perhaps we should say, the notoriety—of redecorating the chapel, stipulating, however, to retain in the post of honour the arms of the old Ricci. To the letter they kept their word, and of course in spirit they broke it, for on the pilasters were carved in profusion the arms of the new family, and the principal figures in the frescoes (as was the custom of the day) bore the likeness of its chief members, and on a little escutcheon, in the post of honour truly, for it was on the door of the tabernacle of the holy sacrament, appeared the arms of the decayed nobles. Of course the poor artist was cheated: they did him out of two hundred ducats, but, like a noble man, he preferred honour to gold, and expressed himself satisfied with a large mead of praise. Of Pietro Perugino we have several beautiful examples from Lord Dudley's collection, chiefly small pictures, but of great merit; and by Fungai is the finest specimen of him we have ever seen: it is a glorious and very unusual bit of colour. The Blessed Virgin is seated bearing our infant Lord, and is clad in a stone-coloured robe, lined with black, embroidered with gold; her vestment is of gold and crimson. The drawing is particularly good, and in the landscape behind her are seen the events of the Nativity and the coming of the Wise Men, whilst the spirit of darkness and evil hurries away at this rising of the Sun of Righteousness.

By the Crivelli are many specimens of great architectonic character. The chiefest, by Vittorio, is a large retable of six compartments, of two stages of three divisions. In the centre of the lower one is seated the Blessed Virgin and Our Lord. She is clad in a white robe, having an admirably designed blue and gold ornament upon it. The faces, like all those of this painter's work, have a painful expression. The panel to the right is occupied by the figure of an archbishop, and that to the left by St. Anthony of Padua, who is accompanied by his pig. Above them is a grand three-quarter figure of St. Peter, wearing the triple crown and bearing his symbolic keys, and a similar sized figure of St. Jerome, whilst the central compartment of the upper range is occupied by a smaller panel bearing the finest portion of the whole. It is a young figure, probably St. Lawrence, not as the others on a gold ground, but on one of a richly diapered blue, and evidently belongs to the same work as another figure here (No. 31) of a bishop, which is similarly treated. Both these are fine works of a master who was of strongly conservative tendencies, and who, whilst exhibiting the grand colouring of the Venetian school of the end of the fifteenth century, adhered to the mannerism of tempera painting when the newer mode of working in oil, which had been recently introduced by Antinello da Messina, was making head in Italy. These works which we have noticed above belong to the time and feeling when painting believed it to be her highest mission to aid architecture and to sing the refrain of that melody and rhythm she led, and when the architect, the painter, and the sculptor were, if not the same man, of the same mind, and the success of each was to the glory of all. They are therefore particularly interesting to our readers, and well worthy of their study. Next week we shall notice the easel pictures of the old masters, pictures great and glorious, but which by their very success led good men astray, and broke that triple cord which should have bound the arts in one.

MONSIEUR LAMEIRE'S DRAWINGS AT THE ARCHITECTURAL EXHIBITION.

First Notice.

We all know that the Architectural Exhibition can hardly be called a cheerful institution, if by cheerfulness is meant the companionship of our fellow mortals. Anybody who visits it during the daytime will seldom find more than two or three visitors besides himself. But yet the exhibition has generally much that is deserving inspection, if not careful study; and this year particularly so, for there are two great and additional attractions, besides the usual one of the studies of the Architectural Association. These additional attractions are the drawings of the late Sir Charles Barry and those of M. Lameire.

Of Sir C. Barry's drawings it is not my intention to make any remarks, beyond pointing out that in juxtaposition with them we have an undoubted drawing of the late Mr. Welby Pugin. We have heard so much lately of this gentleman, to whom we have all obligations, that we naturally look at the drawing with a great deal of curiosity. Strange to say, there is nothing particular about it, either in the design or in the execution. The valance is exceedingly ugly, and resembles more the work of the sixteenth or seventeenth century than that of the fifteenth, and the animals are by no means particularly well drawn. One of them, an unicorn, rivets the attention as being a most extraordinary version of that fabulous animal, and fairly divides the honour of being the most comic thing in the room with the dog in Mr. Seddon's sketch of a font at Bingen (No. 124). The designs of M. Lameire, on the contrary, are most beautifully composed and drawn. Indeed, it has hardly ever been my lot to see others which deserved more, if so much, careful consideration. It is true, as another writer has observed in the Building News, that the colour is by no means so good as it might have been. Doubtless Gabriel Rosetti would have done it better, but then men like Gabriel Rosetti are very scarce, and we must even put up with what we can get, and it is very seldom that we ever get anything one quarter as good as M. Lameire presents us with.

The history of the affair is this. Among the designs sent to the architectural section of the Great Paris Exhibition of 1867 was a series of nine drawings, representing the coloured decoration of a church. The design and the drawing were so beautiful that it is said the jury were about to give the author a grand medal. When, however, it appeared that he was no architect, but simply the chief *employé* of the great decorators, Denuelle, as it was found impossible to give him the grand medal, it was replaced by a gold one. Medals always seem a very unsatisfactory reward of merit; in our country at all events they are seldom worn as personal ornaments; they are also perfectly useless and not unfrequently utterly bad, if regarded as objects of art. Therefore, it does not particularly matter whether M. Lameire got a gold or a grand medal; all that concerns us is to know that the drawings took all his leisure time for two years, that they are in an entirely different style to that practised by M. Denuelle, that they were the most attractive designs in the architectural department of the Paris Exhibition, and that by the good offices of Mr. Spiers we have been enabled to secure them for our own Architectural Exhibition.

The design consists of the interior of a church designed in no particular style; some parts resemble Byzantine architecture, some that of the twelfth century, and others are almost Pagan. The sculptured ornament is often very bad, *e.g.*, the altar rail, which resembles what we should expect to find in the city in some of the warehouses where the "architect and surveyor" has had too much money to spend. The porch is also a very indifferent composition when we divest it of the beautiful figures on the top. The plan of the imaginary church consists of an aisled nave of five bays, a central bay, transepts of one bay each, and a choir of one bay and apse beyond. There is also a porch and aisle to choir; but this latter is blocked up by the stalls, and becomes a mere passage. No exterior elevations are given, but from the perspective drawings of the porch we learn that the exterior is ashlared, with white stone or marble, in regular courses, having sundry black bands at intervals. The aisles are lighted with bull's-eye windows filled with grisaille glass, and the interior walls are encrusted with marble. The composition of the bays is a round-headed arcade surmounted by a double triforium, or, rather, a triforium divided horizontally into two parts; the lower is pierced by a series of openings terminating in what we should call the shoulder arch, or rather, of two brackets nearly meeting. The upper part is quite solid, and affords place for a painted frieze, which forms the principal feature of the design. The building is terminated by a waggon-headed vault, divided as to the bays by means of large ribs, which are supported by pillars rising from the ground. Each bay comprises two of the arcades. The clerestory windows break through the vaulting. In the centre compartment we have a quadripartite groin at a higher level than the rest of the vaulting: underneath it is placed the altar. The apse, of course, is covered with a half dome, and the triforium becomes one composition of round-headed arches, *i.e.*, the great frieze extends only round the nave and transepts. If we look at the details we shall find that M. Lameire has carefully eschewed both mouldings and sculpture. Thus, the only sculptured caps are those of the pillars supporting the great ribs dividing the bays. The other caps are simply square masses, the circle of the column easing itself off into the square by means of a hollow moulding; but then all these masses are covered by painted ornament, and thus, probably, a better effect is produced than if the caps had been sculptured and painted, for in painting plain broad surfaces are required, as in painted furniture, where we see few or no mouldings, compared with furniture where the wood is unpainted, and where mouldings become the only decoration. The wooden stalls and entrance lobby are very poor—indeed, the worst part of the work.

So much for the building. Now let us see how the artist decorates it, and makes it tell a story. He has taken his subject from the Revelations. The centre of the apse is occupied by our Lord, not as described in the first chapter of the Revelations, but as depicted in the nineteenth, where St. John tells us that the heavens were opened, and he beheld a white horse, and he that sat thereon was clothed in a garment spotted with blood, and that he had many crowns on his head, that a sharp sword proceeded from his mouth, and that he was

followed by the armies of heaven clothed in white linen and upon white horses. M. Lameire has, therefore, placed our Lord in a circle in the middle of the vault of the apse; in a semicircle below his feet is the dragon; on either side of him, and in two lines, one above another, are the armies of heaven; below the whole, and just above the triforium, are certain circles, each containing a hand, which is pouring out the vials of wrath.

In the apse bay, which contains the altar, the waggon-headed vault is very happily treated. A great red cross divides it into four parts. Each part contains an apostle, surrounded by foliage, which springs from the cross. The cross itself is composed of a series of circles, each enclosing a lamb, while a water brook runs down between them, and flows out at the feet of the cross, whence deer come to quench their thirst. In the tympanum of an arch at the side of this bay we see an angel "treading on the lion and the dragon." This expression is generally applied to our Lord, as we see in the portals of several cathedrals. A cruciferous nimbus should, therefore, have been employed here.

The centre bay, whence diverge the nave, transepts, and choir, is much higher than the others, and has, moreover, quadripartite ribbed vaulting. In the centre or keystone is the lamb with the book with the seven seals. Each compartment has one of the evangelistic beasts in a circle (the lion is remarkably spirited), while the ribs contain angels standing upon the four winds, represented as crouching male figures; below are the four greater prophets. The easternmost arch—*i.e.*, that over the chancel arch proper, is decorated with circles, each of which contains one of the twenty-four elders. This arch encloses a lunette-shaped window. Below it is the altar of God, with an angel on either side; that on the dexter holds a censer, and kneels on the steps. This is a particularly good figure. The sinister angel is flying and holding out a book. The other figures in juxtaposition are the New Jerusalem, a female figure adorned as a bride (not very good) who looks at a tree and birds, labelled "terra renovata;"—the woman standing on the moon, who threatens with the cross the seven-headed beast;—two of the terrible horsemen—*i.e.*, the one on the pale horse, and the one who holds the scales. These are, perhaps, the weakest figures of all—the horses' backs are curved inwards in a most unnatural manner. On the great pillars are the Apostles. The nave waggon vault is painted to represent a purple velarium, with embroidered angels, two to each compartment. This velarium is supposed to be attached to an architectural composition of a very nondescript character. It should be observed that M. Lameire dresses all his angels in rich Byzantine costume, and that they consequently have covered feet, the reverse being the rule of our western iconography.

As before observed, the most prominent portion of the decoration is the great procession in the upper part of the triforium; it represents the various nations coming to be judged. This procession occupies the northern wall of the north transept, the five bays of the nave, and a small piece over, which may probably be supposed to occupy part of the west end. This leaves the eastern and western sides of the north transepts, and the whole of the southern side of nave and of the south transept unaccounted for. Probably M. Lameire has remembered that there are other nations besides the French, and has accordingly left space for them. As it is, the procession opens with Nebuchadnezzar, and ends with Napoleon I.

Transept, north face.—Nebuchadnezzar in his chariot; behind him are captives; then follows Belshazzar crouching beneath a circle containing the hand of God, and the words "Mene tekel upharsin." After him comes Cyrus on horseback, riding down a woman and child.

We now begin the compartments of the nave. The first one presents us with Cæsar Augustus in a chariot, dragging the captive nations behind him. Why not Julius Cæsar? or has the artist selected Augustus on account of the similarity of features between him and Napoleon. The rest of this compartment is occupied by Attila reclining on a litter borne by warriors: his weapons and a human head are suspended from a corner. The second bay opens with figures of Rome and Constantinople, followed by Constantine on horseback, holding the labarium; he is clad in Byzantine costume, which must surely be an anachronism. His horse tramples on the prostrate head of a colossal statue of Zeus. Behind him comes Baldwin of Flanders, the first Latin emperor of Constantinople; he holds the banner of Jerusalem, and is accompanied by the lion of Flanders. Last of all we have Constantine Dracos, the last emperor; he is preceded by a group of clerics holding the picture of the Virgin and Child, and others bearing long flabelli. The object of this group is to balance the equestrian figure of Constantine.

The third bay of the nave begins the history of France. First of all march St. Clotilde and St. Genevieve, followed by Clovis on horseback, accompanied by Gregory of Tours. Charles Martel, naked from the waist upwards [why?], leads the horse of Charlemagne, who holds a sword in one hand, and stretches out the other, which grasps the orb. This is a very excellent figure. His horse tramples on a Saxon idol. Louis, Lotharie, and Pepin, dividing their cloak, symbolical of the division of the empire, close this division.

The fourth bay is particularly good. First of all are the walls of Jerusalem, then Peter the Hermit kneeling, then Godfrey of Bouillon accompanied by his standard-bearer. The costume, if anything, is rather later than Godfrey's time, and the mail gloves are divided into fingers, an improvement which did not take place until long afterwards. Then comes St. Bernard, and then two more kneeling figures, representing a templar and a father of mercy. The latter figure is exceedingly expressive. Last of all, the good St. Louis on horseback, making a group with a blind knight, a widow, and an orphan, suggestive of his charitable foundations. The colour of this group is about the best of the lot. The blue robe of St. Louis is contrasted with the bluish green of his horse housing. The figure of Joinville is not very good.

The fifth bay continues the French nation by Joan of Arc on horseback trailing an English banner. Here, again, M. Lameire's archæology is at fault. In Joan of Arc's time the arms of England were France and England quarterly; here England alone is given.

We can easily forgive a Frenchman for putting the Imitatio Christi in the hands of Gerson, who follows Joan of Arc, although there are several other claimants for the book. Then come two groups, the first being De l'Hopital and Achille Harlay (at his feet a representation of the Bastille), and the second composed of Turenne and Bossuet. Louis XIV. on horseback follows. Like St. Louis he is accompanied by an invalid and a cadet, in allusion to his military foundations. Behind him is Vauban. The last figure is that of a member of the Assemblé National (no name given); at his feet is the Bastille in ruins.

The sixth division, which we may suppose to occupy a portion of the western wall, is devoted to Napoleon I., who is on horseback. He is preceded by two female figures, representing Milan and Paris, the former bearing the iron crown and the latter the imperial crown and the sceptre ending with an ivory hand. It is well known how Napoleon tried to surround himself with what may be called the properties of former dynasties, and for this reason made use of sundry of the sceptres, &c., kept at St. Denis. A story is told that the sceptre of Charlemagne turned out upon examination to be nothing more than a verger's staff of the fourteenth century. It is true that the inscription was filed off, but the sceptre was nevertheless used at Napoleon's coronation, and gave rise to sundry epigrams. Surely "Napoleo. magnus divini cultus restaurator," as he is called in these drawings, was great enough to have had a crown and sceptre of his own. Attached to Napoleon are two figures—viz., of a deacon and of Cardinal Gonsalvi holding up the Concordat.

Now, there is much to be learnt, both as to colour and as to composition, from these drawings. Firstly, as to colour. If we retire some distance and view them as a whole, we shall see that the colour is not quite satisfactory. It is true that there are parts of it, as in the figure of St. Louis, which are good, but the whole effect is dull and very far from the joyous colouring we see in the early Italian works. The ground is a warm white, the outlines and details are executed in black lines, and the colouring is in broad masses, partially shaded. Of course the broad masses are all right; but it becomes a question whether the shading might not have been reduced to a minimum, and the colours broken up by others worked into them.

But, after all, colour is so much a gift that it is impossible to lay down any rules upon the subject, for it is quite possible to produce a far better effect than M. Lameire has done by the very system of shading that he has adopted, while an inferior artist might use broken tints and abjure shadows without coming at all up to the mark of the present pictures.

When we consider the composition we are enabled to give M. Lameire almost unmixed praise. The system upon which these compartments have been composed is, that each should contain two figures on horseback, or, at all events, something which should go up to the top of the picture, and thus form an equivalent in height and breadth to an equestrian figure. Thus Attila in his litter balances Augustus in his chariot; the group of priests (in the second bay) holding up the holy image and the flabelli, balance Constantine; and Godfrey of Bouillon and his standard-bearer balance St. Louis.

The next thing to be observed is the way in which the void spaces occurring between the figures in the upper parts of the compartments are filled up. Thus we see the hand in the circle over the crouching Belshazzar; a shield is placed close to Joan of Arc; a cloud rising from the ground and spreading at the top, and labelled "Ira Dei," occurs several times; the walls of Jerusalem have a cross above them and rays proceeding therefrom.

Observe also the arrangement of the lower portion of the compartments, where solidity is more necessary than at top—the figures, more or less, run into one another and are made to touch. Thus the horse of Louis XIV. touches Bossuet's robe; Bossuet is grouped with Turenne (for single figures would look too thin and weak); the left leg of Turenne touches Harlay's robe; and the Bastille enclosed in a quarter of a circle connects his robe and the figure of his companion De l'Hopital with the end of Gerson's robe. Gerson, again, just touches the English banner trailed on the ground by Joan of Arc, and the space between her horse's legs contains a semi-circle enclosing the funeral pile, with the inscription "Rotomagi, MCDXXXI." Thus the whole of the figures are more or less connected with each other, and a continuous stream of colour obtained at the bottom of the picture. It will be observed that each of the equestrian figures has other figures at the side, so as to fill up the spaces between the horses' legs—sometimes a prostrate idol does the same office as in the case of Constantine.

It is rather a difficult matter to define the style of these designs. They may perhaps be described as partaking almost equally of the Nenivite, Byzantine, and twelfth century styles, all welded together with modern drawing; but whatever may be said about the evils of eclecticism, certain it is that M. Lameire has produced an excellent effect and has showed us the way for our modern monumental work. It is to be hoped that these designs will not remain upon paper, but that their author may have an opportunity of showing that his hand has lost nothing of its cunning nor his heart any of its divine gifts by producing these drawings full size upon an actual wall: and not these designs only, but others which will tell us the truths of religion and the traditions of history in a manner if anything better than we now see in Conduit-street. It now only remains to give a very short account of the nine large drawings, which I will do next week.

W. BURGES.

ROYAL BOTANIC SOCIETY'S COMPETITION.

A PRIVATE competition is going on at the Royal Botanic Gardens, Regent's Park, for the extension of the winter garden or conservatory. This, then a large work of the class before Crystal Palaces were known, was designed by Mr. Decimus Burton, architect of the society, as far back as April, 1845. A competition then took place, and the premium and execution of the work were awarded to the Messrs. Turner, of Dublin. The original design proposed a large covered garden, so that the place could be frequented by the Fellows in winter as well as in summer, the Botanic Gardens being chiefly frequented in the fine season. The cost was estimated at about £40,000, but only about two-fifths of the plan was carried out, at an expense, we believe, of about £15,000, raised by debentures. A quarter of a century has nearly elapsed, and the want of the accommodation is still as much felt by this fashionable society; but the ancient spirit no longer rules, and although the greater part of the debenture debt has been paid off, the council, instead of doubling the winter garden by such financial resources, propose to make a small enlargement by private subscription of about £2,000, which will most likely fail, even if it be not rejected by the Fellows. At present the place is no more than a large conservatory, while, had the original plan been carried out with a varied surface, suited for what are called American exhibitions or gardens of rhododendrons and kalmias, we should have had a unique winter resort in London. The same taste which has reigned in other works of the society's landscape artist, Mr. Marnock, was promised to be exerted in this instance.

The former competition for the winter garden was memorable because Mr. Turner, of Dublin, gave the first idea of a large crystal palace. This he afterwards again applied in the competition for the Exhibition building of 1851, when a scandal was created among those who knew the facts by the acceptance of Sir Joseph Paxton's famous pen and ink drawing and Mr. Turner's rejection. In those days it was quite fruitless to bandy truth with the clique which worked in the name of H.R.H. the Prince Consort, the alleged inventor of a great international exhibition, of which poor Francis Whishaw was the authentic originator.

The council, in their new scheme, it appears, have hesitated between lateral extension of the Winter Garden and a covered approach, and designs for both have been sent in, though there will only be funds for one, if for either. In fact, the idea of the covered approach is one of the lame expedients of a weak body. The site of the present winter garden is at the head of the grand walk, leading from the York Gate main entrance, and at the back there is another gate in the circular fence, about 200ft. back from the winter garden. All this space was proposed to be covered with glass, when there would have been a carriage entrance into the building, and invalids and the healthy would at once be under cover. As only a portion of Mr. Decimus Burton's design was executed, it was supposed provisionally, there is no access in winter except by a long walk not well kept.

One scheme is, therefore, to make a carriage drive within the fence, and put down a covered walk of 150ft. by 12ft., having a brick wall on one side. This is best shown in Mr. Ormson's drawings, though also exhibited in those of the two other competitors. Mr. Weeks's estimate is, we believe, £1,500. This contrivance would be ugly and lob-sided, as also inconvenient, and stand in the way of a future extension. 12ft. would not be wide enough to afford conservatory space in summer or winter and play for wide skirts or long tails, and it would be bad standing ground for visitors in summer. The scheme of the council is, we imagine, if they do not get the £2,000 for the wings, then to spend £1,500 on this passage, and, of course, no suitable gate would be erected on the north side, and no architectural effect be obtained. We have strong ground for believing that neither Mr. Burton, the architect, nor Mr. Marnock, has anything to do with the arrangements, and that it is completely under amateur auspices.

Curiously enough, after nearly a quarter of a century, Messrs. Turner, of Dublin, appear in this competition. They send in four designs. Mr. Burton's elevation is maintained by all the competitors, and they follow an alternative plan of extension originally presented by him. At present the façade terminates on each side with a small low lean-to. These Messrs. Turner propose to remove, substituting on each side a wing with a circular front, to correspond with the centre compartment, though of smaller dimensions, being only 30ft. diameter, the total extension being, therefore, 60ft. in the front. The lean-to's would be replaced outside.

Messrs. Weeks, of Chelsea, send six drawings, but, as stated, they are partly occupied with the approach. The width of their wings would be 31ft. 10in., or a total of 63ft. 8in. They make a slight alteration in the curve of the wing roofs. Mr. Henry Ormson, of Stanley-bridge, Chelsea, sends one drawing of the approach. This looks low, with a flattish roof. In the public interest it is to be hoped the council will fail in their scheme, the execution of which will not rescue the society from the danger of effete management. While the public have moved on there has been no change at the Royal Botanic for twenty years. An outlay of £20,000 to create a real winter garden will restore it to its pristine fashion and popularity, and the £20,000 can be redeemed as the £15,000 debentures have been.

SANITARY CONDITION OF CROYDON —PAST AND PRESENT.

A REPORT on the permanent sanitary works, and their cost, executed in the parish of Croydon, under the authority of the Local Board of Health, has just been published by Mr. Baldwin Latham, engineer to the board. There are few persons at present living in the parish who can form any adequate idea of the state of things that existed before the adoption of the Public Health Act. As some proof of the unhealthy state of things at that time existing in Croydon we find in 1809 an Act of Parliament passed enabling the Archbishop of Canterbury to alienate the site of his palace, the situation being described as damp and unwholesome. Dr. Westhall, speaking of the position of the town at that time, says: "In the lower parts dense fogs prevail and hang upon the surface in the vicinity of Southbridge and Bog Island, whilst at or near Waddon there are marshes with stagnant ditches from 12ft. to 15ft. wide, charged with animal and vegetable matter, from which noxious exhalations are conveyed by the prevailing winds to the town. Moreover the town itself is entirely devoid of under drainage, and therefore dependent on a surface drainage, which is a source of unhealthy exhalations giving rise to epidemics which have of late years increased." Many other authorities concur in testifying to the unhealthy and in some parts positively filthy condition of the town and neighbourhood. The returns of the Registrar General prove that the district was the "most unhealthy in the county, the proportion of annual deaths being 1 in 36, against 1 in 58 elsewhere." At length the inhabitants determined on the adoption of the Public Health Act in August, 1849. In September Mr. Donaldson and Mr. Thomas Cox, who had been appointed surveyor, were called upon to advise and report on a scheme of sewerage and water supply, and in the following year the General Board of Health sanctioned the borrowing of £32,965 for the purpose of carrying it into execution. Croydon was almost the first town that tried at that time the new system of tubular pipe sewers, and its prominence has brought upon it the attacks of all those who disagreed with the system then introduced. Other towns have profited largely by the experience of Croydon. Of the great errors committed in the early works, one was the too small size of some of the sewers, another the want of sufficient strength, as the sewers themselves, 15in. pipes, having only a thickness of $\frac{5}{8}$ths of an inch, collapsed even when laid at moderate depths. The original work, too, had been scarcely brought to a close when the town was visited by an epidemic of fever, which it can scarcely be doubted was due to the entire absence of any system of sewer ventilation. A remedial plan was at the time adopted, but a more perfect system has been substituted within the last eighteen months. The total area of the district under the jurisdiction of the Board is 9,821 acres, and as at the time of the commencement of their drainage operations the houses were scattered in groups some distance apart, and each group had its separate sewer, a number of outfall sewers at various points was the consequence, which, after frequent complaints, have to some extent been centralised. The original sewerage plan, as altered by Mr. Ranger, the then engineer of the Board, consisted in allowing a partial separation of the coarse matter by means of intercepting wells and strainers, and clarifying the finer sewage water by means of filter beds, after leaving which the water was to be allowed to flow away into the natural watercourses of the River Wandle. In his recommendation of his plan, he stated that "The works proposed would remove the sewage and allow the water it contained to flow away comparatively pure and certainly inoffensive." On the faith of Mr. Ranger's report, the Board established their works of filtration and deodorisation. They, however, very soon found that their works had but little effect in purifying the sewage, and that the most objectionable portion entered and polluted the river to a large extent. No less than nine actions and injunctions were brought against the Board in order to prevent their continuation of the works. Every known mode of dealing with sewage by deodorisation, filtration, and precipitation was tried, and large sums of money fruitlessly expended. At one time the Board actually sought to relieve the town from its difficulty by obtaining an outfall for their sewers into the metropolitan system of drainage, and went so far as to lodge a bill in Parliament that should give them the power they could not otherwise obtain. At length by the passing of the Local Government Act of 1858 powers were given to local boards to carry sewers, &c., out of their district, and to take land for the purpose of irrigation. By the adoption of this method they were at length enabled to carry out their original scheme of applying sewage by irrigation to agricultural purposes. The Board have now under their control 75 miles of sewers, of

which 23 miles have been constructed under Mr. Latham's supervision.

One of the first cares of the Board was to secure a good water supply. In this they were more fortunate, as by the construction of works, which with the extensions up to December, 1863, cost £26,553 14s. 8d., they obtained a supply of one million gallons per day. The rapid increase of the population rendering a larger supply imperative, a new well has since been sunk, which yields an additional supply of 2,000,000 gallons.

The total expenditure for the purchase of land, construction of sewers, &c., and waterworks, has amounted, since the commencement, to £196,135 6s. 5d. The result of these works is, that the death rate of the town has decreased from 28·16 per 1,000 in 1848, to 16·6 per 1,000 in 1867, and the birth rate has increased from 29·1 per 1,000 to 31·4 per 1,000. Of the results of the application of the sewage to land Mr. Latham speaks in sanguine terms. The difficulties of procuring suitable land have been great, and, in fact, appear to have been the most serious obstacles to the success of the scheme.

ART FURNITURE.

WE believe that the attempt recently made by the Art Furniture Company to encourage a taste for furniture of better design and construction than that at present in vogue has proved a failure. Either the business operations of the company have not been characterised by sufficient commercial energy, their goods were far too expensive, or love of art has made very little progress, and the common public still prefer the meretricious designs of the modern upholsterer. It is just possible that each of these causes may have contributed to failure. Of course, with a demand at first necessarily small, and good workmanship by no means to be at once easily and cheaply obtained, it was next to impossible for the company to compete in price with the ordinary upholsterers. Yet, viewing their attempt, as we did, with general approval, we cannot help thinking that they might have found a wider field, and possibly a larger amount of success, had they shaped their course a little more on ordinary commercial principles. The prices asked for some of their furniture, though not perhaps exorbitant viewed simply by themselves as works of art, were certainly very much dearer than those charged for common upholstery. Doubtless, with an increased demand a more reasonable scale of charges would have followed; but ordinary people do not see the force of furnishing at an extra cost of 50 per cent. solely for the purpose of encouraging a love of art in their neighbours. Still, if the scheme had been only burdened with this objection, it should have met with support from the wealthier section of society. It evidently did not; and we fear the reason is to be found in the absence of art feeling—in the nineteenth century love of change and fashion, that too well characterises ourselves and our surroundings. As far as we can see, the sole merit of modern furniture consists in its newness of appearance and novelty of design. No matter how fantastical and absurd as long as the design is something novel—something different from anything that appeared last season—it is almost sure to be sold and sent home in all the glory of gold leaf and French polish. In a very short time the gilding fades, the varnished surfaces are dimmed and scratched, and the article, being made on totally false principles of construction, is seized with a violent attack of the rickets, and is finally turned over to the brokers, or hidden from sight in the lumber room to tumble to pieces. Furniture now at the best is never expected to last more than one lifetime; more than this, it is never *wanted to*. Yet this was not the case two hundred years since. Articles of furniture then were heirlooms, passed down reverently from father to son—the adornment of the house and the glory of the good housewife. But we have improved on all this. Could the "wife of the period" be expected to fill her house with her parents' old rubbish—tables, sideboards, and chairs without a particle of polish on them—nothing but plain wood? What is it to her that they are solidly constructed, of good material, and have all the charm of tone and colour which age alone imparts to wood, and which now is never seen under the coating of varnish? Something new must be had, and so the upholsterer is called upon to ransack his brains for patterns—we cannot say designs—a little more absurd than the last. Of course, this is not the only phase of modern ugliness in furniture; there is another, if possible, still more absurd. Some householder, generally an illiterate *parvenu*, becomes possessed with what we will call the antique itch, and forthwith Gothic furniture of the true Wardour-street type appears throughout his house. Gothic chairs in his hall, Gothic clocks, Gothic statues defiantly bearing Gothic shields inscribed with Gothic armorial bearings, Gothic bookcases; and if his wife be a ritualist, probably a Gothic oratory in her bedroom—all this pseudo-Gothic furniture, attempting to imitate its original pure model, marred by all the hideousness of false construction.

Has it really come to this—that we are only left to choose between these two evils? Are all the existing race of architects far too gifted, far too highly engaged in designing cathedrals, courts of justice, and townhalls, to condescend to such a trivial thing as the designing of furniture? We know they are not. The work which Pugin so well begun—marred though it was by extravagant decoration—has been well carried forward by Burges, Seddon, Eastlake, Goldie, Godwin, and others, who have returned to earlier, simpler, and purer styles than those he practised. What, then, do we want? More hearty and spirited co-operation among members of the profession in some fresh effort to educate the public taste. But to meet with success it must be made to meet modern requirements, to compete with modern prices, and yet to retain all the grace and beauty of the older forms. The prospect is, after all, not quite so dark as it seems, looking at it by comparison. It is not so very long since ecclesiastical furniture was in almost as pitiable a plight as domestic furniture is now; and that a vast improvement has taken place in that it is impossible to deny. True it is that there exist for our guidance and study all the best examples of old church furniture, and but very few of the domestic variety; true, that the improvement that has taken place was aided to a great extent by the great revival of Catholic doctrine and practice in the Church; and unfortunately too true that notwithstanding that improvement the name of the number of monstrosities constantly being brought into existence is legion. Yet we take heart of grace, and patiently, but confidently, look for some new attempt in the right direction, to be, if possible, more ably conducted, more heartily supported, and to meet, we trust, with more success.

THE CHURCHES, CHURCHYARDS, AND CALVARIES OF BRITTANY.*

WHETHER ancient or modern, great or small, every Breton church has its open belfry, making it visible from a distance. These open belfries are the glory of the church, and the pride of the inhabitants. At Quimper, entirely at the cost of the faithful, thanks to a popular subscription, the two pinnacles of the cathedral have been built; Mgr. Graverau, bishop of the diocese, having opened a yearly subscription of a penny a head. At Lambour, near Pont Labbé, it was on the belfry that was wreaked the anger of Louis XIV., who wished to punish the peasants for having revolted at the stamp paper tax. It is impossible to understand this irritation, but it may be in some degree explained by the important part which the belfry fills in the imagination and in the customs of the Bretons. Like the church towers of the Flemish cities, to destroy it is to wound the inhabitants in their independence and in their dearest privileges.

The principal door of the church is not under the belfry; that is long, narrow, and massive, in order to support so great a weight. But on the right side of the edifice, a large square porch opens, which by its projection, by its artistic merit, and by its double doors, constitutes its real entrance. On the right and left are engaged columns, with spiral mouldings, above which rises a pointed arch or one with a depressed centre; in the interior, on either side, are ranged niches containing (where the Revolution has not destroyed them) statues of the twelve Apostles. In the centre, between the two doors, a group of small columns; below, the holy water stoup; above, a niche intended for some statue of our Lord, of the Blessed Virgin, of St. Peter, or of the Eternal Father. This porch is generally called "the Apostles' Porch;" there is no corresponding one on the left side of the church. That of St. Houardon, at Landerneau, was taken from the ancient church to be added to the new one built in 1860. The date of the porch is 1607. I have remarked also that of St. Goueznou, distant from Brest two kilomètres, and that of La Roche-Moriee, above Landernean. The porch of Daoulas is the most ancient of all. It is generally for this part of the exterior of the churches that the architect reserved his powers; sometimes even his freaks of imagination. Before entering the church let us walk through that which surrounds it, the cemetery. Its appearance has nothing sad about it. Four rows of elmtrees follow the line of its walls; poplars, yews, and plane trees separate and group the tombs into squares. At Plougastel, each tomb is adorned with bushes of Bengal roses, which are all the year round in flower. A little hole is piereed in the stone to receive holy water, or a little vase, a potsherd, or broken bottle, fulfils the same purpose. In front, and at the sides of the church, nearest to its walls, are the tombs of the parish priests; at St. Goueznou, the faithful have placed in memory of their rector, M. Cloarec, a statue representing him on his knees; close to this the former priest, who died at the age of forty-six, is represented with his sacerdotal vestments in a tomb, in half-relief. At the entrance, or in the corner of each cemetery, is to be seen a little low building with a pointed roof; this is the ossuary, that is to say, the place in which are collected all exhumed bones. Ossuaries are to be met with at Daoulais, at St. Goueznou, at Quimper; the most elegant one that I have seen is that at La Roche-Moriee. It dates from the seventeenth century. In ten compartments, each formed by two Corinthian columns, the artist has drawn the personages of the Danee of Death; in the centre is Death holding an arrow. Above is written, *Je vous tue tous.*

Calvaries are also ordinary accessories and ornaments of Breton cemeteries. A calvary is a huge granite cross raised upon steps; it has generally a face and a reverse. On the face, at the point of intersection, is a little figure of our Lord crucified sculptured with Byzantine stiffness and coarseness; at the extremity of one of the arms of the cross, the Blessed Virgin; at the other St. John. On the reverse, at the point of intersection, the Blessed Mother holding the body of her Divine Son on her knees (what is commonly called a *Pietà*); on the right and left, Saints and Apostles. Notwithstanding the rudeness of these sculptures, they produce a happy effect. In a calvary before a charming chapel, dedicated in honour of St. John, which stands in a grove of beech trees on the left shore of the El-Orn, opposite Poule Ar-Vilin, on either arm of the cross are angels bearing the instruments of the Passion. The calvary of Confort, near Pont Croix, is worth a visit; but the most curious, the most complete, and the most original of all those in Brittany, is that of Plougastel-Daoulais. Three crosses, those of our Lord and of the two thieves, stand over a polygonal arcade, which is supported by pillars and arches. The frieze which surrounds it is adorned with a series of bas-reliefs describing the Life and Passion of our Lord. I can only allude to them briefly, and shall therefore content myself with the single observation that all these figures, none of them lacking either character or originality, all these religious scenes of which the customs and the dresses are thoroughly Breton, in no single respect bear witness to the period at

* By M. VICTOR PIERRE. Translated from the "Revue de l'Art Chrétien," and reprinted from the "Ecclesiologist."

which they were made. The date is cut on the frieze: we read 1602. How is it that after all the great works of the fifteenth and sixteenth century, these seem to be the performance of some backward pupil of the twelfth or thirteenth? We might make this remark over and over again in Breton churches: they have an air and a style more ancient than their date; their architects and their artists have never changed their atmosphere and the breath of time has not touched them.

From the exterior let us pass to the interior of the church. There are several churches which are divided into two naves of equal width by three or four pointed or round-headed arches rising about 10ft. above the ground. This line of arches ends at the choir, which has two altars, one for each nave. This arrangement, I have been told, ought to be attributed to the Templars, who have had several important houses in Brittany, and built many churches in it. One often finds Pointed churches of the ordinary plan, that is to say, one principal nave with two low aisles on either side. But the apse, instead of being almost circular, generally ends in a straight wall, against which are placed three altars corresponding to the three naves. The vaults are in wood. Sometimes one meets with friezes in sculptured wood, such as those at St. Goueznou and at La Roche-Morice, which represent in a long series of scenes the labours of the country, its manners and customs, agriculture and fishing, burials and marriages. On the low walls, round the choir, are hollowed-out panels, empty for the most part, but which once bore either a tablet with a mortuary inscription, or a representation of the deceased. Near the church doors, wide and high granite benaturas, emblazoned and adorned on their sides with bas-reliefs, testify to some antiquity. Notwithstanding the demolitions of the end of the last century painted glass is not very rare. I saw some that was beautiful at the church of St. Nonna, in Penmarc'h, and also elsewhere.

I visited several churches, built only five or six years ago. They are worthy of their elders by the harmony and good taste of their proportions. I must mention particularly the church of St. Mark, near Brest; that of Conquet, whose belfry was brought from Lochrist; those of Landerneau and of Trégune. How little does the church of St. Clotilde, in Paris, resemble, at least externally, its sisters in Brittany! They are like wild flowers which perpetually reproduce themselves with a never-failing freshness; while it, like a hothouse plant, grows pale and fades. These village churches, whether old or young, are all interesting in some way or other; one cannot say so much for the churches of the great towns. The architecture of civilisation has passed that way, and affords to the curious every specimen of inelegance and of ugliness which they can desire. The churches of Brest, built under Louis XIV. and Louis XV, answer to this description, but are scarcely types of their kind. Vannes takes precedence of Brest in the Church of St. Patern, a building of the eighteenth century; a mass of stones and bricks without ornament, adorned with a peristyle weighed down by a tower, which in its turn carries a lantern as broad as the church; and the interior of the church is worthy of the rest. What! said I to myself, is that a work of the eighteenth century, the century of elegance, of lightness, of coquetry! What! is that the church which bears the name of the first Bishop of Vannes! But among the catalogue of monsters, the cathedral of Rennes well deserves a place. The architect, who was, I suppose, an eclectic, has conceived the thought of fastening on to a basilica, the inside of which reminds one of St. Vincent de Paul and of St. Roch, a porch adorned with two towers, each with four stages of heavy columns, which are intended to figure as Gothic towers rejuvenated and regenerated by the Greek style.

NORWEGIAN CHURCHES.

WE find, says the *Ecclesiologist*, in the last brochure of the *Norske Bygninger fra fortiden*, some interesting illustrations of two curious Norwegian churches. *Hove Kirke* is a small structure consisting of nave, so short that it is scarcely more than a square on the plan, a very small chancel with semicircular apse, and a western tower. The arch between the chancel and the nave is so small and narrow as to be scarcely more than a door. The chancel has a door (answering to our priest's door) on its south side. There is a well-moulded arch to the apsidal sanctuary, which has three deeply-recessed round-headed quasi-Romanesque windows. The altar, a solid mass of masonry, with projecting mensa (in which is sunk a reliquary on the top surface), stands isolated on the chord of the arch. The nave has two small deeply-splayed lights on each side, and a small door on the south-west. A door opens into the tower from the nave; and the tower has a small external door at the west side. The whole structure is evidently of late Romanesque date.

The other church, *Dale Kirke* (in Lyster), consists of a nave with square-ended chancel. The chancel has a single deeply-splayed lancet light in the east wall, and a similar one on the north side; one on the south side seems to have been modernised and enlarged. The chancel arch is wide and without mouldings. Here too the altar, a solid structure, stands free from the east wall. The nave has a single deeply-recessed light on its north side; two windows (one of them composed of two lights), and a small door on the south side, and an elaborately moulded west door. This church belongs to the earliest transition from the Romanesque to the Pointed style. The windows are lancet-headed. The two-light window is composed of a very slender and elegant shafted pier. The south door, which has a pointed head, has a curious mixture of earlier mouldings, among which some dog-tooth ornament is very conspicuous. The west door is a really beautiful first pointed composition; richly moulded, with several shafted orders, and an abundance of dog-tooth ornaments, and fancifully carved capitals. The labels and other details have a curious and most characteristic tendency to the lacertine patterns of Scandinavian ornamentation. The actual door is the ancient one, covered with wrought-iron floriated hinges and foliations.

THE RAILWAY BRIDGE AT RUNCORN.

THE huge railway bridge on the London and North-Western Railway, which spans the Mersey at Runcorn, was publicly tested on Thursday week. It is a trellis girder bridge, is nearly 1,000ft. long, supported on piers at an altitude of 75ft. above high water mark, thus allowing vessels of considerable tonnage to pass underneath. It is divided into three lengths of 327ft. each, the extremities of the girders resting on lofty stone piers; two of which rise from the bed of the river, and the other two being near, though not actually upon, the shore. There is a clear space of 305ft. from pier to pier. The piers are constructed of red brick, faced with Yorkshire stone, and are each crowned with a small battlemented tower, which serves to break the otherwise uninterrupted straight lines of the bridge. Three arches on the Cheshire side and five on the Lancashire side carry the bridge over the remaining parts of the river which are not spanned by the girders. These are succeeded on each side by a long viaduct, and that by an embankment with an inclination of about 1 in 120. Altogether, independent of the girder bridge, there are 97 arches, 65 being on the Lancashire side and 32 on the Cheshire side. Those which form the viaduct have a span of 40ft. The river arches are built of yellow brick, and the remainder of darker coloured materials, the contrast greatly adding to the effective appearance of the bridge, which, moreover, possesses none of the ungainly stiffness that frequently belongs to structures of this nature in consequence of the approaches necessitating the curvature of the viaducts, so that the whole structure, which is close upon a mile and a half in length from end to end, takes a serpentine form. The width of the bridge is 38ft., measured to the outside of the girders; it is 25ft. between the girders, and there is a footpath 6ft. wide on each side.

The bridge was designed by Mr. W. Baker, C.E., chief engineer of the company, and was constructed by Messrs. Cochrane, Grove, and Co., under the superintendence of Mr. J. P. Ashton, one of the most experienced of their staff, and Mr. S. B. Wells, the company's resident engineer. The cost of the bridge is a little over £250,000.

For the purpose of testing the bridge, sixteen locomotives, each loaded to a weight of 50 tons were placed on the lines. In addition to this about 90 tons of material were placed on the footpath, making a total, including the weight of the girder itself, of about 2,000 tons weight suspended between two points, 300ft. distant. The result was eminently satisfactory, the bridge stood firm as a rock, scarcely vibrating under its immense load. We may state that it is constructed to bear a weight of 5 tons to the foot, and that on Thursday week only about a ton and a third were placed on it, although that is very much in excess of any weight it is likely to have to bear in ordinary use.

BUILDERS' BENEVOLENT INSTITUTION.

A GENERAL meeting of the friends and subscribers to the above charitable institution was held at Willis's Rooms, King-street, St. James's, on Thursday, the 28th ult., for the purpose of electing two pensioners on the funds—one male and one female—from a list of nine candidates. Mr. W. R. Rogers (president) occupied the chair, and expressed his regret that they were not then able to elect a greater number, but hoped that the funds would allow another election in the present year. The amount of stock is £11,298 15s. 3d. for the Relief Fund, and £2,920 4s. 6d. for the Building Fund, making a total of £14,218 19s. 9d.

At the close of the poll the following were declared to be the successful candidates:—G. H. Mitchelmore, 74, St. Peter's-street, Islington, aged 75. He is incapacitated from following any occupation, being subject to frequent fits of epilepsy. Maria Unwin, 4, Eden-terrace, Bridge-road, Battersea, aged 67, widow of a builder, late of Peland-street, Oxford-street. She is very deaf, with declining health, and her earnings not amounting to more than 4s. a week. Her distress was caused by the failure of her husband in business. The usual complimentary votes concluded the proceedings.

INDUSTRIAL EXHIBITIONS.

EXHIBITIONS seem to be the order of the day. An industrial exhibition was opened at Abbot's Anne, near Andover, Hants, on Monday last. It consisted of useful and ornamental articles contributed by people in the neighbourhood. An industrial exhibition was promoted by Sir Antony Rothschild, at Halton, in Bucks. This exhibition consists of specimens of lace, silk, furniture, straw plait, implements of husbandry, &c., manufactured in the county; also of specimens of inventions and plans for improving the dwellings and promoting the social improvement of the labouring classes. Is this the same Sir Antony Rothschild to whom the Whitechapel vestry have unavailingly appealed about the nuisance arising from his sugar refinery in Whitechapel? If so, the same gentleman who is endeavouring to promote the physical health of the agricultural labourers of Buckinghamshire is assisting to impair the health of the citizens of London. The maritime exhibition at Rouen, which was opened on Sunday last, is reported to be a success.

THE BURLINGTON FINE ARTS CLUB.

THE Burlington Fine Arts Club, in Piccadilly, are now exhibitiog at their rooms, 177, Piccadilly, a collection of the engravings of Raimondi, more generally known as Marc Antonio, one of the earliest and one of the greatest of Italian engravers. There is a charm about these early and rare examples of ar. art that is now so familiar and so prolific which will be recognised by all those who can derive pleasure from the contemplation of grace and beauty as developed in form, though some of those specialities which give almost fabulous value to certain impressions may not be acknowledged as lending any additional attraction to the general spectator, who cannot be supposed to care whether one plate has the *chicot* or not, another is with or without the "two forks," or a third represents the Virgin with her arm bare or covered. Marc Antonio was the contemporary and companion of Raffaelle and Michael Angelo, and has translated their special characteristics into the black and white of the copper plate with more truth and force or grace than any other engraver. Working under direct communication with Raffaelle he seems to speak with the great painter's own language, and in the purity of his forms, the delicate firmness of his outline, and in his simple force of expression, we seem to come in contact more closely with the creative mind of the artist than even in finished paintings. It is remarkable by what apparently small means such perfect ideas are conveyed. As many as between five and six hundred productions from Marc Antonio's hand have been catalogued. Of course they are not nearly all here, but the collection is a very fine one, and includes many of the rarest as well as the most interesting from an æsthetic point of view of the acknowledged works. An illustrative memoir has been drawn up by Mr. Richard Fisher which will be found to render great assistance in the proper appreciation of these engravings, giving, as it does, such a well written and complete account of the artist and his productions as to render any other account unnecessary.

MR. RUSKIN ON LIFE AND ART.

MR. RUSKIN has been lecturing on "The Mystery of Life and its Arts" at Dublin. There is an element of the mysterious if not of the paradoxical or contradictory, in all that Mr Ruskin writes; and when he calls us together to lecture on something professedly mysterious, we may expect something unusually imaginative, and on this occasion we are not disappointed. From the newspaper report of the lecture which has reached us, it is difficult to ascertain the point towards which the lecturer endeavoured to steer. In the course of the lecture he said that ten years of the early period of his life were devoted to endeavouring to show the excellence of the works of a man whom he believed to be the greatest English painter since Reynolds. He had then perfect faith in the power of every great truth to prevail ultimately, and to take its right place for usefulness amongst men. Turner, during his lifetime, knew better than he did, and discouraged his views. His books, however, got talked about, and he began to hope for victory. The trustees of the National Gallery commissioned him to arrange 300 examples of the great painter's studies in the Kensington Museum. Accordingly they had been placed there; but they were not exhibited, for the room in which they were hung was always empty. That showed him that ten years of his life had been practically lost. For that he did not much care; but what he did care for was the (to him) frightful discovery that the most splendid genius in art might be permitted by Providence to labour and to perish uselessly—that in the very fineness of it there might be something rendering it as invisible to ordinary sight as an Eleusinian mystery—that the glory of it was perishable as well as invisible—that the gift of it might be as snow in summer and rain in harvest. That was the first mystery of life to him. Amongst several personal reasons which caused him to give this prosing lecture in Ireland, one of the chief was that in reading it he should be near the beautiful building, now their Engineers' School, which was the first realisation he had the joy to see of the principles he had been endeavouring to teach, but which, alas! was now no more than the richly-designed monument of one of the most earnest souls that ever gave itself to the arts—Benjamin Woodward. But it was not in Ireland only that he received the help of Irish sympathy and Irish genius, for to another friend of his—Sir Thomas Deane,—with Mr. Woodward, was entrusted the building of the museum at Oxford; and the best details of it were executed by sculptors born and trained there, and the finest window in the façade was carved from his design by an Irishman. The work they did together had, however, been vain. The architecture they sought to introduce was inconsistent alike with the reckless luxury, and the deforming mechanism, and the squalid misery of modern cities.

After a dissertation on fruitless struggles and the depressing disappointments of life, illustrated by the life and character of Pope, he said they had sent for him to talk to them about art. The one thing he had to tell them was, that art ought not to be talked about. The fact that there was a talk about it signified that it was ill done or could not be done. The highest works of art were the silent productions of instinct, which the possessor of it knew to be incommunicable, and the true critic of it knew to be inexplicable but through a long process of laborious years. They were all of them wild with enthusiasm about the work of Gustave Doré. If he were to tell them that that work was wholly bad—bad not by failure, but with a dreadful evil, with a harpy power of pollution, and that as long as they looked at such art as that they could have no perception of any pure or beautiful work, would they look at Gustave Doré's pictures the less on that account? Rather more, he fancied. On the other hand, he could talk to them about good works of art, but they would be none the wiser for that. Art could not, like science, be communicated in that way. Art was the instructive and necessary result of powers which could only be developed through successive generations, and which only burst to light under social conditions of equally slow growth. Whole eras of history and the passions of dead millions were summed up in the existence of a noble art. If such a noble art dwelt amongst them they should simply feel it and rejoice in it, and not care to hear lectures about it. Since it was not amongst them they had only to go back to the last place where the root and stock of it was yet alive. If they were to go back for germs of national art that had decayed, they should find a more signal example in Ireland than in any other European country. In the tenth century Ireland possessed a school of illumination which in all essential qualities was wholly unrivalled. He knew none that were equal to it for invention, finish, and refinement. The lecturer, in continuation, said he had seen much of the Irish character, and he thought the form of failure it was most liable to was this, that being generous, and wholly intending to do right, it did not attend to the external laws of right, but thought it must necessarily do right because it meant to do so; and then, when it did wrong without intending to do so, the consequences came upon it, and a sense of innocence and justice led it further astray than anything it would have been capable of doing with a good conscience. Mr. Ruskin concluded his lecture by exhorting his hearers to do useful work as a means of preparing society for the development of art. Let them strive to feed, to dress, and to lodge all those who required such aid. These were the three first arts. All the fine arts came after them. In respect of dress, he laid down that persons ought to dress so that their rank should be known; and the changes of fashion should be restricted within certain limits. It was not by parliamentary measures that they would reduce the amount of the distress that was multiplying daily; but everyone should ask himself this question, "How many persons can I feed, clothe, and put into wholesome rooms?" The elevation of the mind of the masses above that state into which their physical conditions had reduced them was also an essential preliminary to the future superstructure of art.

ARCHITECTURAL PUBLICATION SOCIETY.

THE annual general meeting of the subscribers of this society was held at No. 9 Conduit-street, on Wednesday, the 27th ult., Mr. Horace Jones in the chair. The minutes of the previous meeting having been read and confirmed, Mr. Arthur Cates, the honorary secretary, read the following report:—The past year has been devoted by the committee to the completion of the issue for the seventeenth year—1866, and the second part for that year is now in course of distribution to the subscribers. This part continues the text of the Dictionary as far as the article "Lead," the letter K being therein completed, and much progress made with the letter L, a further considerable portion of which letter is now in type. On examination of this part, it will be observed that many of the articles have extended to a considerable length, arising either from the importance of the subject or from the experience and knowledge of the writer having enabled him to give it fuller development than had at first been considered necessary.

As expressed in a paragraph of a former report, "it is the freshness of information which has placed the dictionary in its high position, and precludes all opportunity for anyone to assert that the text is a mere compilation from preceding works of a similar nature." In confirmation of the position which the committee again with pleasure confidently assert to have been attained by the work, they refer with satisfaction to letters lately received from M. Cesar Daly, the learned editor of the "Revue Generale de l'Architecture," and from M. Ernest Vinet, the librarian of the Ecole Imperiale des Beaux Arts at Paris, which satisfy them that, although the number of foreign subscribers is but few, those copies which have reached Paris have attracted well merited attention, and that the work has made for itself a reputation in highly informed and very critical circles. M. Daly announces his intention of noticing the Dictionary in the "Revue:"—"Avec tous les eloges que merite un ouvrage aussi interessant que bien fait." While M. Vinet says:—"Je tiens essentiellement à enrichir une collection que j'ai formée des plus beaux ouvrages qui se publient a l'etranger et le Dictionnaire des Architectes de Anglais est du nombre: acquerer ce remarquable ouvrage est difficile, il n'est pas dans le commerce et quand il se vend c'est à un prix très elèvé."

It had been the intention of the committee to have during the year issued a part of illustrations with text, but various obstacles prevented the realisation of this wish—not the least has been the difficulty which exists in procuring suitable drawings and sketches to form illustrations. This may arise from the fact of the student now relying much on the subjects produced by photography, rather than on the work of his own pencil, and that many of the best collections of sketches are now reserved for reproduction in the illustrated sketch-books of architectural societies. This difficulty, and the pressing engagements of the examiner of illustrations, have prevented the issue of the plates, but a series is now in preparation which will, it is hoped, shortly be ready for issue.

The completion of the letter L will enable the committee to issue a title-page and table of contents for the binding of volume four of the Dictionary, comprising the letters H, I, J, K, and L, and thus place that portion of the work in a more available form.

The committee much regret that the munificent offer of Mr. J. H. Wyatt, made in 1866, to contribute £100 towards the funds of the society has not led to the example being followed; but, however desirable it may be thus to obtain funds to hasten the progress of the Dictionary, the committee would prefer to rely on the individual exertions of the subscribers to extend the list of members, and thus increase the income at the disposal of the executive. The expenses of management are nearly the same for a small or a large income, and the addition of a number of subscribers would enable the committee to increase the quantity of matter issued in each part, and thus expedite the work.

The assistance received from the general body of subscribers (with some remarkable exceptions) does not encourage the committee to anticipate much aid in this direction, but they would observe that a proposal is now under consideration by which it is suggested that by an active and simultaneous exertion on the part of the present subscribers, which would result in the addition of one-half to their number, it would be possible so to arrange the funds which would thus be placed at the disposal of the committee as to secure the completion of the text without further call on the subscribers, whose payments for past years would probably cover all future expenses or nearly so.

Considering the prosperous state of the architectural profession, and the considerable increase made in its numbers during the last few years, this addition to the numbers of the subscribers ought to be readily obtained, and if encouraged to do so by the support of the general body of subscribers, the committee will endeavour to mature the scheme and submit it for consideration.

The audited balance sheets show a total receipt for the seventeenth year, 1866, of £432 0s. 10d., and a total expenditure of £308 7s. 8d., leaving a balance in hand of £33 13s. 2d. to be appropriated to meet outstanding liabilities for that year, while for the eighteenth year, 1867, £178 10s. has been received, and £52 2s. 10d. expended, the balance, £126 7s. 2d., being available towards the cost of the publications for that year now in hand.

In the discussion which followed, the accounts and balance sheets were subjected to close scrutiny, and the explanations afforded by the secretary having evidenced the satisfactory financial position of the society, the progress of the Dictionary and probability of its early completion were discussed, the chairman, Professor Donaldson, Messrs. C. C. Nelson, O. Hansard, T. M. Rickman, &c, taking part. The statement made by the secretary in reply to the inquiries addressed to him showed that the only element required to ensure the speedy completion of the Dictionary, was the immediate accession of a sufficient number of new subscribers to place an ample capital at the disposal of the committee. The individual interest of each subscriber was shown to be the introduction of new members, to meet whose demands the committee had available a stock of the publications of the past years, sufficient if all disposed of to supply nearly all the capital needed for the completion of the Dictionary of Architecture.

The report being thereon adopted, it was moved and carried that in order to economise the funds the printing and circulation of the report and accounts be discontinued.

Votes of thanks to the officers and chairman closed the proceedings.

It has been suggested that a subscription should be started to place a monument over the grave of Flora Macdonald. The loyalty of that noble-minded Highland maiden remains to this day unrecorded by stone or tablet.

RYDE CHURCH COMPETITION.

OUR illustrations this week comprise lithographic views of the selected, and two other of the meritorious designs submitted for the above church, a detailed notice of the competition for which appeared in the BUILDING NEWS at the close of last year.

We refer our readers to what we then said as to the relative merits of the designs, simply repeating here that the selected design by Mr. Peachey, of Darlington, the contract for which, we believe, has already been undertaken, and bears out our idea of the cost, while presenting some good points—as in the breaking-up of the tower and spire—was not, in our opinion, entitled to carry the palm of success either in plan or general design. The plan we deemed too long and scattered in its main adjuncts, the transepts too long and disjointed for effective hearing, and, we may add, for compact aggroupment and unity of composition. We hope the seating eastwards of the officiating desks will be confined solely to the use of the choir, and not, as we inferred at the time of our review, for a portion of the congregation. The dying-away of the nave, clerestory, and parapet against the roofs of transepts is defective, and the ridges of the latter being so much lower than the nave ridge is certainly faulty. The view we give of it will speak for itself that we did not overstate these objections of this design. Whatever merits of detail belong to this design, and the proportion of west end of nave and aisles is one, we cannot say that its author has in this case been so successful as in other of his works. There is a redundancy of pinnacles and other useless post-Gothic accessories that reminds us of that mock Gothic air so prevalent when the Gothic revival was in its infancy.

The other exterior design we give (by Messrs. Driver and Payne) shows a very dissimilar treatment, characterised by a strong continental touch and a severe verticality of outline, that contrasts rather piquantly with the effect of studied prettiness in Mr. Peachey's design—a class of effect, be it observed, infinitely more inviting and pleasing to the popular taste, and perhaps to this the accepted design owed its success. We much prefer, however, the stately simplicity of the rejected design, both in plan and general composition. The tower is nicely positioned, uniting and concentrating the masses, and serving usefully as a valuable adjunct internally. Finished with a circular apse, lighted by lofty lancets, the whole effect is pleasing; but the tower, terminated by a well-designed composition, is rather overwrought for its severely plain substructure, a fault of the school.

Our one page interior view is an accurate and faithful rendering of a design that bore unmistakable evidence of high artistic ability, though, we would say, rather misdirected for a parish church. Incomparably the most effectively tinted monochrome drawing exhibited in the competition, there are some good features in Mr. Conybeare's design that cannot be overlooked, in spite of the particular type of Romanesque he has adopted. It is a style indeed that deserves development, as suggestive of noble treatment. The nave and tower piers are simple and effective, and so are the clerestory and triforia. The proportions throughout, the management of the central lantern, with its cellular groining, the apse, with the lateral arrangement of baptistery and choir, are highly pleasing, but the design we think rather too pretentious for the purpose and outlay contemplated.

The thirty-eighth meeting of the British Association for the Advancement of Science is fixed for the week commencing Wednesday, August 19, at Norwich. Mr. Joseph Dalton Hooker, D.C.L., Curator of the Royal Gardens at Kew, will preside.

KILLED IN THE STREETS.

A CORRESPONDENT in another column calls attention to an evil which is increasing, and which, unless it is checked, is destined to increase in London and other large cities. Though London is rapidly increasing, the streets of the city do not and cannot get proportionally widened. The result is, traffic increases without enjoying a corresponding increase in elbow room. Besides, as our correspondent says, everything must be done rapidly. Almost everybody seems to have more than enough to do, and he drives on with something like railway speed. The old saying of "Everyone for himself and the devil take the hindmost," was never more applicable than now. Men not only pursue their avocations in a hurry, but they are not particular on whose corns they tread or who loses so long as *they* win. This spirit has penetrated the cabdriver as thoroughly as any other class in the community. He likes a good "fare," and for an extra sixpence or shilling he will dash his way through streets and around corners, and if by chance he should knock some luckless old fogey into the gutter, he will dash away all the more rapidly to escape if possible the consequences. The number of people who are wounded and killed in this way every year in London is almost incredible. If a man commits suicide, or if a house falls and kills a baby, an inquest is held on the dead body, and the event is chronicled in the papers. But let a man be killed in the street, so frequent is the occurrence that very frequently an inquest is held, and the outside world is none the wiser. If the ice in Regent's Park give way, and cause the drowning at one time of forty persons, there is not only a searching inquiry before a coroner, but there is a great social commotion, the newspapers, day after day, have leading articles on the matter, hundreds of thousands flock to the scene of the accident, and Government takes measures to prevent such calamities in future. But every year there are more persons killed in the streets of London than perished by the breaking of the ice the winter before last in Regent's Park; and there is but little doubt that if street traffic were subjected to police control, many of these accidents would be prevented. We believe, with Mr. Bedford, the coroner for Westminster, that some wholesome regulation ought to be made at once to prevent rapid driving through the streets, and particularly at points where streets or passages intersect each other. Cabs and carriages ought not to be allowed to drive beyond a certain pace in a given space of time, and then drivers would have more command over their horses, people would have more time to get out of the way, and fewer lives would be lost. Another way to abate the evil would be to hang a cabman.

VILLA AND COTTAGE ARCHITECTURE.*

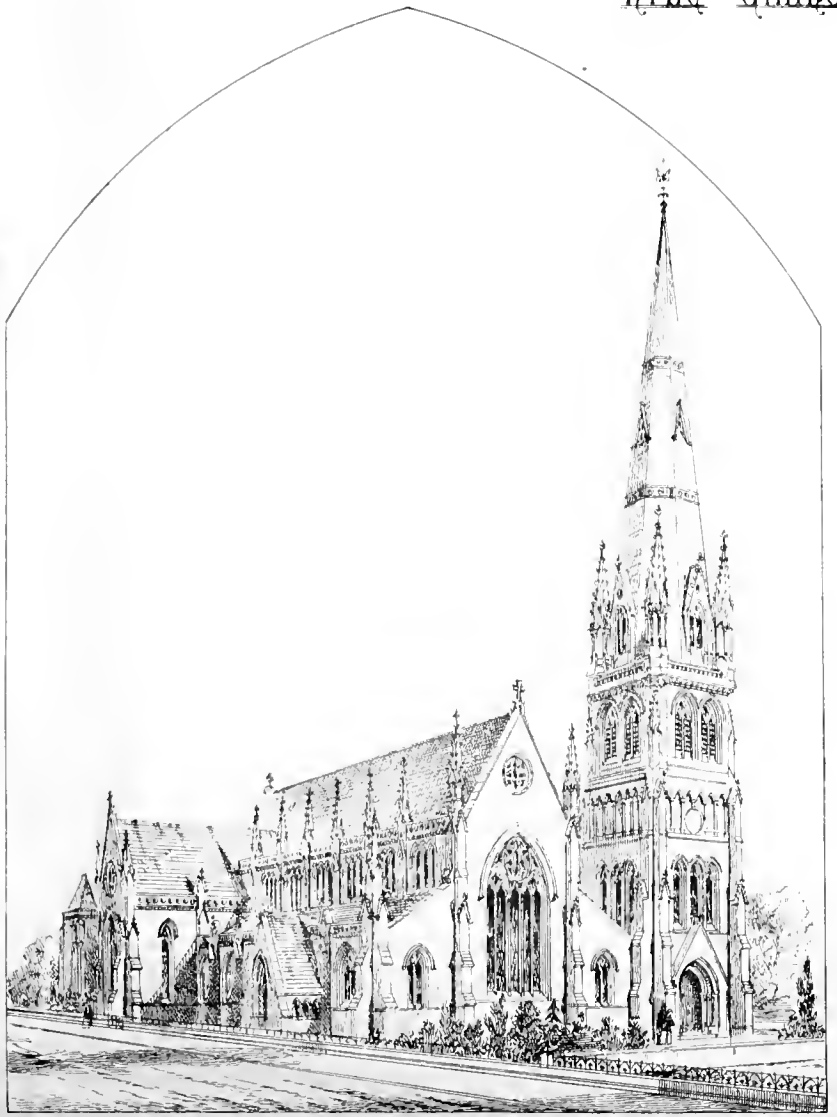
WE have received another instalment of this interesting publication, which in many respects differs from any other. Instead of being a series of fancy designs which have not stood the test of thorough examination, this work gives representations of buildings that have been erected, with the actual cost fairly set forth under headings. The architects who contribute are for the most part well known in the profession, and, although the works are by no means of equal merit, they may all be studied with advantage. Amongst the architects who have contributed will be found the names of Messrs. Ayliffe, of Manchester, Messrs. Banks and Barry, Mr. Christian, Mr. Darbishire, Mr. E. B. Lamb, Mr. Kendall, Messrs. Speakman and Charlesworth, Mr. Truefitt, Mr. Walters, and others. The introductory notice explains the object of the work, which is to give "detailed illustrations of modern buildings, serviceable as models in future architecture," and especially the work is devoted to buildings of "moderate dimensions, or erected at a cost (ascertained in nearly every one of the cases) ranging from £500 to £2,500, with more expensive exceptions." The value of the publication, therefore, lies in its positive as distinguished from a speculative character. It is true that most of the designs are capable of improvement, but it is something to know that the house we are looking at was actually erected for a certain sum. Messrs. Banks and Barry contribute drawings of a villa at Sydenham; Mr. E. B. Lamb makes public a farmhouse of most domestic character; Mr. Walters, of Manchester, shows what may be done with a double villa; and the Messrs. Thomson, of Glasgow, are not chary of pure Greek design in the latitude of Renfrewshire. Details are moreover given to a good scale, and there is nothing sketchy or indefinite to be found throughout the publication. The designs are not perfect; some are very objectionable, but they are all living representations of actual buildings. As an example of what may be done at a moderate cost, the "Sycamores," by Messrs. Paull and Ayliffe, of Manchester, may be quoted, where everything is done thoroughly for £3,600. It is always unpleasant to find fault, but we cannot refrain from remarking that a certain cottage at Govan, Renfrewshire, by Mr. Rochead, is unworthy of a place in this publication, and that an exaggerated feeling for Grecian art seems to maintain a strong hold on the architects whose lines are cast in the pleasant places north of the Tweed. It has always struck us that the ancient architecture of Scotland was most distinct and characteristic, and we cannot but look with regret on the transplanting of pure Grecian art to a soil to which it is not congenial, and to a people to whom it cannot be pleasing. The blemishes which attach themselves to this work are, however, trifling in comparison to its merits. It deals neither with palaces nor model cottages, but it gives illustrations of middle class houses, with the ascertained cost.

* "Villa and Cottage Architecture." By various authors. London: Blackie and Son.

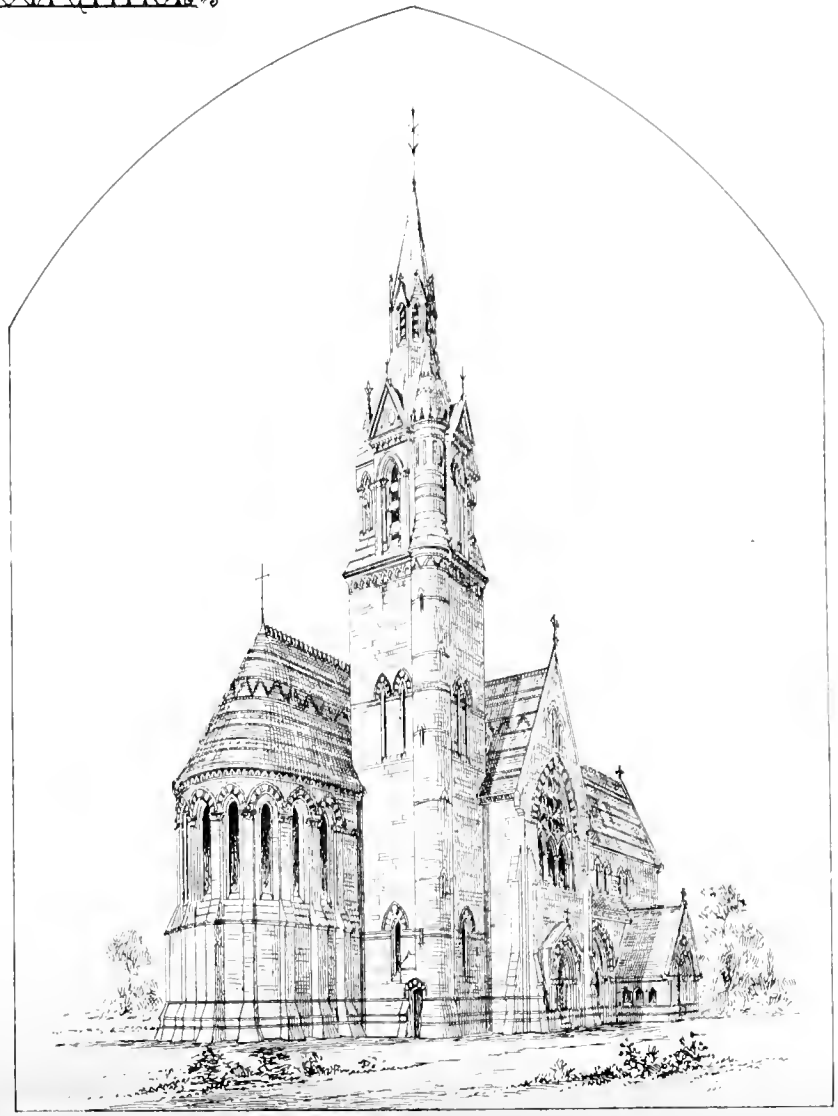
NEW ZEALAND.

IN February last a correspondent wrote asking, through "Intercommunication," for information respecting the building materials of New Zealand. He was answered by a Mr. R. H. Drew, who offered on his making an appointment to give him what information he possessed. So many of our subscribers, however, desirous of the information, wrote to him that he found it impossible to reply to their letters, and therefore determined to publish a small pamphlet on the subject, of which we have received a copy. His idea is to afford reliable information as to the colony, especially to intending colonists. Many people inseparably connect the Maori tribe with New Zealand, others look on all the islands alike as purely pastoral districts. Of the three large islands the north is the only one at all troubled by hostile Maoris; in the others they are on the most friendly terms with the colonists. Stewart's Island is especially rich in timber, admirably adapted for building purposes, and many choice kinds suitable for cabinet work. The mineral wealth in the southern island is unbounded. Coal of superior quality, serpentine, granite, marble of fine grain, and in quantity sufficient, as the author assures us, "to build twenty thousand Jernsalems," are found there. Many of these, coal especially, are being at present imported into the colony at ruinous prices, sufficient capital not being available to work the treasures it possesses. Government aid seems by no means wanting to afford investors the advantage of an indefeasible title on most advantageous terms. The author, himself a colonist of fourteen years' experience, is enthusiastic in his praise of the islands, and has, we think, done his best to invite attention to the beautiful land which he has adopted as his home.

Ryde Church Competition.

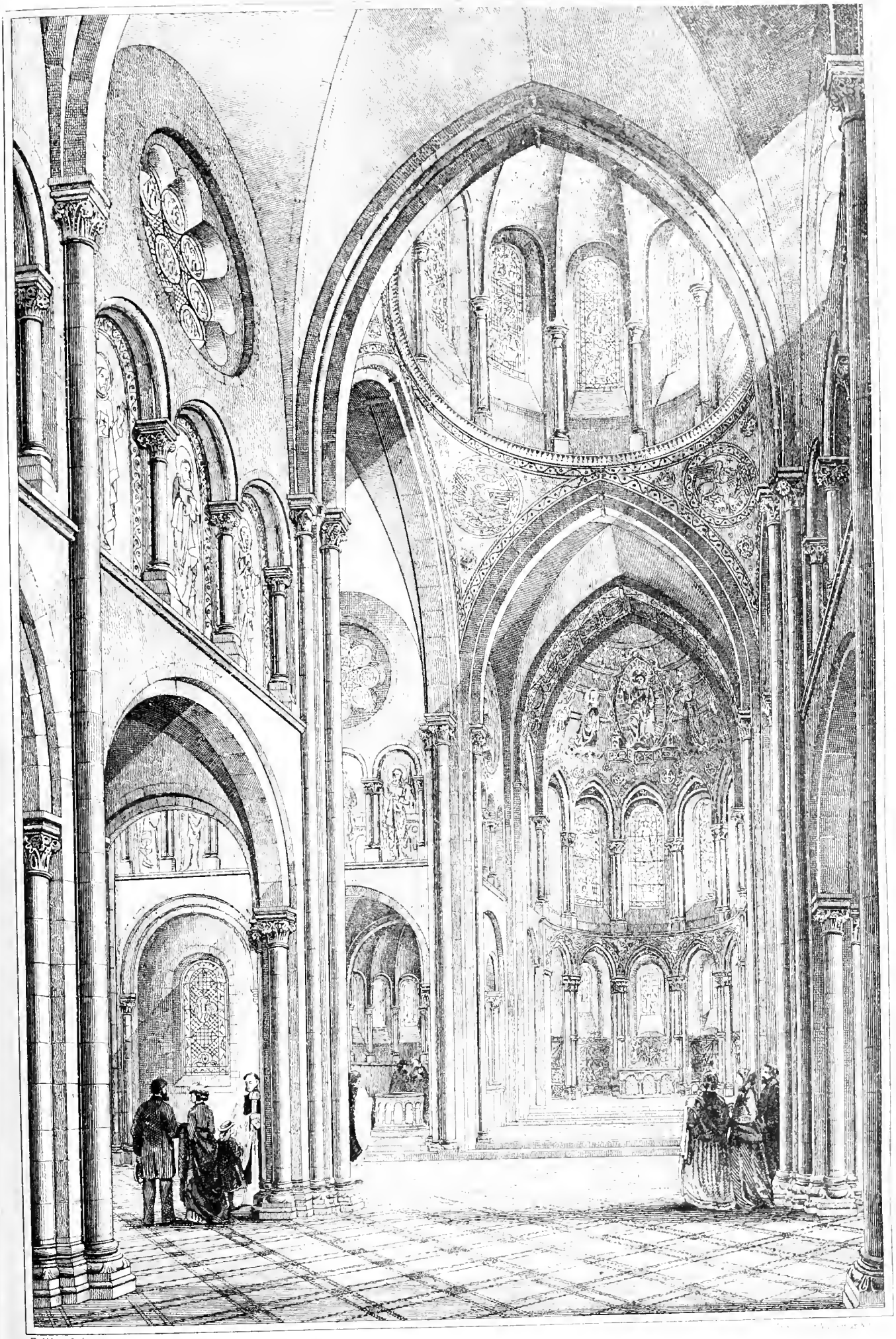


ACCEPTED DESIGN BY Wm PEACHEY ARCHT, DARLINGTON.



REJECTED DESIGN BY C.H. DRIVER & A. PAYNE, ARCHTS

Printed by Whiteman & Bass



H. Abbott Lith.

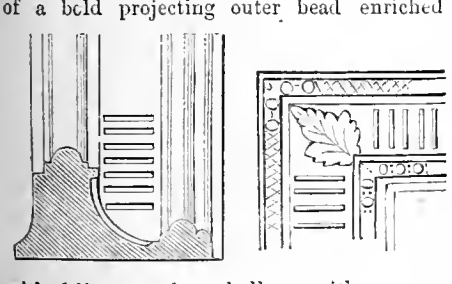
Design for Church Ryde. Interior looking East. HY CONYBEARE ARCHT

PICTURE FRAMES AT THE ROYAL ACADEMY.

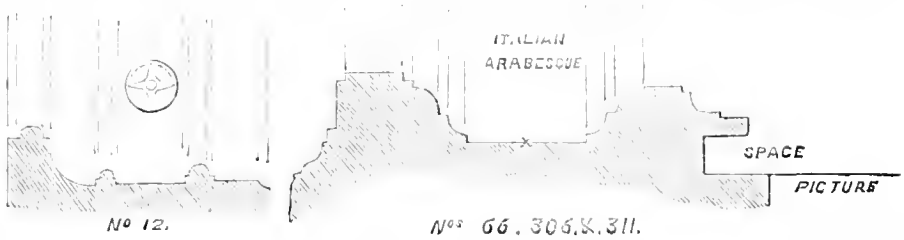
IT is certain that considerable improvement has been made of late years in the design of picture frames. The gradual diffusion of a knowledge of the principles of art among the educated classes, and the influence of teaching in our schools of design upon our designers and artisans, have tended very materially to check the redundancy of ornament and inartistic forms which twenty years ago were looked upon as triumphs of taste and ingenuity. A glance at some of the frames in the present series of the National Portrait Collection at South Kensington will be sufficient to demonstrate the sensible progress that has been attained since the commencement of the century, some of the largest and most notable of the pictures there being the most conspicuous for the utter want of taste and propriety in the frames, while one can hardly look into a third or fourth rate printseller's without seeing some evidence of design and carefulness in this particular, or at least a recognition of the necessity of some harmony between the picture and the frame enclosing it. There is no doubt room for still further improvement, the greatest desideratum being the substitution of architectural forms and definite proportions for the cabinetmakers' mouldings and the ill-regulated, purposeless divisions which disfigure the majority of modern frames, and proper subordination of treatment generally. It should be borne in mind that the frame is after all only an accessory, and if it attracts attention away from the picture which it is designed to embellish it fails in its object, no matter how good it may be in itself.

Considering the prices that are now paid to artists and the influence of a handsome, well-designed frame upon the value of a picture, we might naturally expect to find at the Royal Academy the best specimens of frames that money and taste combined could produce; but whether it be that the restrictions of the academicians discourage artists from attempting any novelty, or whether they find that a picture in a bad frame sells as well as a picture in a good one, it is certain that we must not look to the annual *salon* in Trafalgar-square for any examples of originality or taste in the arts of picture framing.

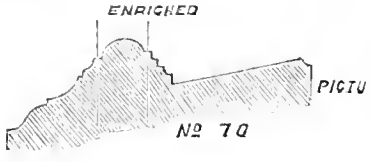
There is a painful uniformity of pattern in the frames at the present exhibition at the Royal Academy, which leads one to suppose that they all come from the same maker, or rather (which is the more probable supposition) that artists trouble themselves but little about the framing of their pictures and leave this important matter to the taste of the frame-maker, who supplies what he considers the most appropriate to the occasion, being guided in his choice by the number of that description he has sold, or its popularity among artists. The general form consists of a bold projecting outer bead enriched



with foliage, a deep hollow with narrow sinkings, then another but smaller enriched bead, and a narrow plain face with a burnished bevelled edge next the picture. Nearly three-fourths of the frames at the Royal Academy are of this type, varied occasionally in detail, but the general form remaining the same. The design is not precisely bad, although the whole of the surfaces being enriched gives the frame a heavy appearance; but its continued repetition up and down the walls is monotonous and distressing. Mr. Herbert, an artist of undoubted taste and originality, has got this popular frame, and Baron Leys has been apparently induced to go to the same establishment, his frame being almost identical with Mr. Herbert's, and is a most ludicrous contrast in its newness and conventionality to the Belgian painter's gloomy and unconventional picture. The same frame enshrines the portrait of Eneas Macdonnell (No. 51) in the east room, a piece of rampant national egotism, and these three examples fairly illustrate the absurdities of modern picture framing. Mr. Millais's frames (No. 12) are all commonplace, and it is evident he has not bestowed a thought upon them. Mr. Richmond's portraits (Nos. 66, 306, and 311



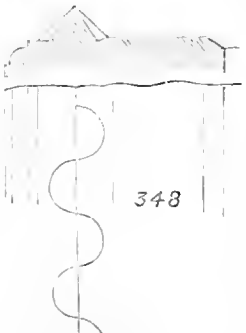
have frames of similar design, apparently from an Italian model, the mouldings being better drawn and more accentuated than in English work, but the Cinque Cento panels, although well designed, are much too overpowering. The frame to Mr. Millais's picture of Rosalind and Celia (No. 70), although commendable for



the sparing manner the enrichments are applied, is bad in form and not sufficiently important for the size of the canvas.

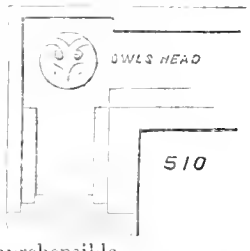
The two large paintings of Hamlet and Ophelia, by Signor Rapisardi (Nos. 93 and 151), which are most unduly prominent in the east room, serve as an example of an error in the opposite direction of most of the English frames. Here the mouldings are simple and much more architectural than the forms popular with us, but the good effect is destroyed by overlaying the angles with heavy and unmeaning foliage which extends half-way across the frame on each side.

To Mr. Ward, perhaps, belongs the bad pre-eminence of having the ugliest and most offensive frame in the Exhibition. Nothing can be in worse taste than the frame of his picture of the Royal Marriage 1477 (No. 150). The constant contemplation of Mr. Edward Barry's Gothic in the course of the painter's journeys to and from the Houses of Parliament, can alone explain the remarkable corruption of taste the selection of this frame reveals. Mrs. Ward has the same design for her picture of Lady Jane Grey, at Sion House, and it is worth remark that while one of these paintings represents an event that took place in 1477, and the other in 1553, the same frame is considered equally appropriate to the two. Mr. Cathelinaus' frame (No. 176) is in the ornate Florentine style, good in itself, but too gay for the tone of the picture, which is grey and subdued. Mr. Poole has used the same frame



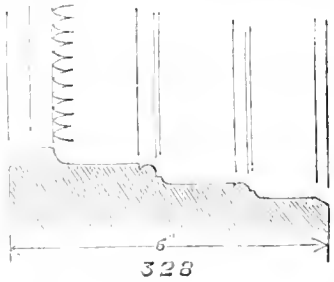
with some little variation for his two remarkable works (Nos. 188 and 382); the subject and treatment are, it is true, something alike, but it would have been well to have had a little more individuality.

The frame of Mr. Lucy's ambitious picture of the abdication of Mary Queen of Scots (No. 348) is noticeable for its novelty, but is not successful, partly on account of the unarchitectural character of its profile, and also its inadequacy to the size and importance of the painting. No. 248, a portrait of Earl Somers, by Sir Charles Lindsay, is also remarkable as a very vulgar picture in a very vulgar frame. The frame of Mr. A. Hughes's picture (No. 510) is not ungraceful, but it is as difficult to make out what relation it has to the picture as it is to perceive what connection there is between the picture and the verses in the catalogue. The incised hearts on the upper part may possibly be explained, but the owls' heads at the angles are



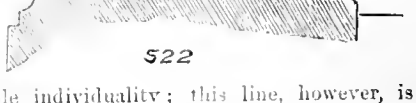
quite incomprehensible.

Mr. Leighton has a liking for a strange nondescript frame, a compound of Gothic and Greek forms. The frame of his Ariadne (No. 328) is composed of a series of slightly

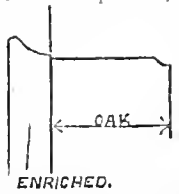


receding surfaces united by beads with a lancet-shaped ornament on the outer edge.

His Actæa (No. 522) has a nearly similar frame with a black line introduced to give a



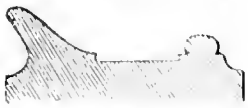
little individuality; this line, however, is much too strong, and its crudity destroys the delicate simplicity of the picture. Miss Starr has used this same frame, with some little modification, for her very clever picture of "David and Saul" (No. 509). In Mr. Leighton's other picture, "Acme and Septimius," an attempt has been made to give a rustic character to the frame by enriching one of the beads with fruits and foliage, but it is not satisfactorily carried out.



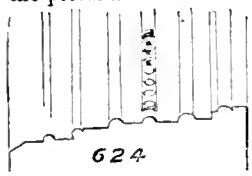
The good effect of gilding on wainscot, by which the monotonous colour of ordinary gild-

ing is relieved by the grain showing through, is now well known, but we only find a few of the younger artists employing it, Mr. Poynte being among the number. It is true that Mr. Thorburn uses wainscot to his uninteresting picture, "Forecasting" (No. 525), but it cannot be cited as a successful application, the effect being bald and commonplace to the extreme. Mr. Maclise, on the other hand, falls into the opposite mistake, the frame of his picture (No. 439) being as crowded as his canvas with useless and unmeaning accessories.

Mr. Walker's "Vagrants" has the frame,

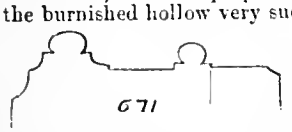


which is otherwise satisfactory, although coarse in execution, disfigured by the space between the mouldings (which ought to be left plain) being stippled over with large ill-drawn foliage of a Gothic character. Mr. H. T. Well's "Portrait of Panizzi," although very much larger in point of scale, has the same pattern of frame, omitting the foliage. Miss Sandy's small frame to her "Head of Enid" (No. 571) is nicely designed as to profile, but is spoiled by the pateras, which are too large for the picture.



Mr. Albert Moore's delicate and original "Azaleas" (No. 624) is one of the few pictures in the Academy that has a frame that fits the picture. The forms employed are simple and well known, but are so judiciously employed that they have all the charm of novelty, the ornament has a proper proportion to the plain face, and the result is a frame in perfect harmony, both in form as well as in feeling, with the painting it holds. It is purely Greek in conception, and is a most graceful and pleasant design.

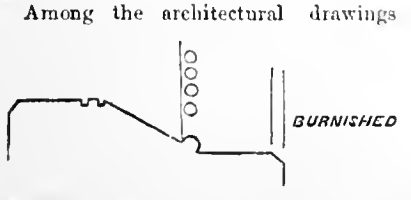
The frame of Mr. Tourrier's "Cloisters" (No. 656), although very simple in its elements, is noticeable for its good effect; the Moresque ornament is perhaps a trifle overdone, and is certainly inappropriate to the subject, which is Gothic, and very good Gothic too, but the proportion is good, and the burnished hollow very successful.



Mr. Brennan's frame (No. 671) is good in design, and is worthy of the picture, which is in every way a very remarkable one, and has not been noticed as it ought. The frame is evidently Italian, from the simplicity of the mouldings, and was not, it would seem, made for the picture, which is some inches too short for it, the space being filled with a wider margin on the left-hand side.

In the miniature, architectural, and generally incapable room, there is little to remark; the frame to the portrait No. 791 is, however, conspicuous from its resemblance to a Gothic monumental tablet, and the portrait of the Countess Dudley and Ward (No. 788) shows how it is possible to neutralise a good portrait by a well-designed but inappropriate mount.

Among the architectural drawings we



would call attention to the vulgarity of Mr. C. Barry's frame to his design for Alleyne's College, the shabbiness of Mr. M. D. Wyatt's frame for his Courtyard of the India Office, and the effective simplicity of Mr. T. H. Watson's frame for his perspective view of his design for the London Orphan Asylum.

J. M.

LEGISLATION AND PUBLIC HEALTH.

WITHIN the few years last past many Acts of Parliament have been passed with a view to the promotion of the health of the people. There is, in fact, a growing disposition on the part of many persons to look to Parliament for a solution of many of the difficulties which surround the question. Before they agitate for additional legislation it is well that they should survey what has been already done. It is quite evident that many acts are dead letters as far as many districts, not only in the metropolis, but in most of the large towns, are concerned. Perhaps there was no district in England which stood more in need of legislation on sanitary matters than that of Whitechapel. But, strange to say, the Board of Health of that district have used but very sparingly the powers which legislation has placed within their reach. We have no hesitation in saying that it would be pretty much the same with Mr. Torrens' bill, provided it became law. In his last quarterly report the medical officer of health of the Whitechapel district says that, "Within the last few years several Acts of Parliament relating to public health have been passed which, with the exception of the Sanitary Act of 1866, have not hitherto engaged much of the attention of our Board. These acts are, first, Adulteration of Food or Drink; second, the Labouring Classes Lodging Houses' Act, 1851; third, an Act to enable the Public Works' Loan Commissioners to make Advances towards the Erection of Dwellings for the Labouring Classes, 1866; fourth, an Act to amend the Labouring Classes Dwellings' Act, 1867; and fifth, the Workshops' Regulation Act, 1867. The Adulteration of Food or Drink Act gives power to the vestries and district boards to appoint analysts. The fourth section of this act empowers purchasers of articles of food or drink to have them analysed by the analyst appointed by the Board, on payment to the analyst of a sum of not less than 2s. 6d, nor more than 10s. 6d. The fifth section gives power to justices to have articles of food and drink analysed by any skilled person, as they may appoint, for that purpose. The three acts relating to the erection of dwellings for the labouring classes, 1851, 1866 and 1867, may be read as one act. The provisions of these acts enable local boards to borrow money from the Public Works' Loan Commissioners, for the purpose of assisting local boards in the purchase of land and buildings, or in the erection, alteration, and adaptation of buildings, to be used as dwellings for the labouring classes, and in providing all conveniences which may be deemed proper in connection with such dwellings. The Lands' Clauses Consolidation Act, 1845, and any act amending the same, except the clauses with respect to the purchase and taking of land, otherwise than by agreement, are incorporated with these acts." Mr. Liddle goes on to say that the Workshops' Regulation Acts will entail a considerable amount of additional labour and responsibility on the Board. The duties of the inspectors will be to inspect the means provided for ventilation in workshops not specified in the Factory Acts' Extension Act, where a less number than fifty persons are employed, and to see that the nineteenth section of the Sanitary Act of 1866 is observed, which provides for the keeping of such workshops in a cleanly state, and for their ventilation in such a manner as to render harmless as far as practicable any gases, vapours, dust, or other impurities generated in the course of the work carried on therein that are a nuisance, or injurious or dangerous to health. A perusal of this part of the report shows that it is easier to get Acts of Parliament passed than to embody their spirit in practical action.

SANITARY CONDITION OF WHITECHAPEL.

THE last quarterly report of Mr. Liddle, Medical Officer of Health for the Whitechapel district, shows that persistent efforts have been made by the inspectors, and that sanitary matters there wear an improved aspect. Though the medical officers of the union have attended 4,498 new cases of disease among the pauper population, not a single case of cholera has been returned during the last quarter. As an instance of indifference of large trade proprietors to the public health, we quote the following from Mr. Liddle's report. He says:—

It is with a feeling of much regret that I have regularly every quarter to bring under your notice the nuisance from the refinery premises of Sir Anthony Rothschild. Complaints still continue to be made of the deleterious effects of this nuisance, and I can bear personal testimony to the truth of these complaints. When the Board has interfered in the matter, assurances have been given by Sir Anthony Rothschild and his agents, to the effect that, when the several alterations in the construction of the works were completed, the nuisance would be got rid of entirely. The last promise made to the Board was to the effect that, as the premises were then being enlarged, effective measures could and would be taken to collect the heated acid vapours and condense them, whereby the neighbourhood would be entirely relieved from their noxious influence. The premises have been enlarged, but the nuisance continues to be as bad as ever.

It is too evident that Sir Anthony Rothschild will not abate the nuisance until he is compelled, and the sooner compulsion is used for the health of the district the better.

We find that during the quarter 8,820 houses have been inspected, and 667 houses have been "systematically visited to ascertain their cubic capacity," that 120 drains in houses have been improved, that 225 drains have been cleansed or repaired, that 101 water butts have been provided or repaired. We also find that 67 water waste preventors have been erected in the district.

From the last paragraph in the report, it appears that the Board contemplate reducing the number of inspectors. Mr. Liddle very properly deprecates such a step, and we sincerely hope that, for the sake of Whitechapel in particular, and London in general, such will not be done.

SCHOOL OF ART.

ON Wednesday week a large number of the supporters of the Nottingham School of Art met to hear the announcement of the result of the March examinations. Special attention was drawn by Mr. R. Birkin, who presided, to the large increase for the year 1868 of the number of students passing the examination creditably, and those obtaining prizes, and he congratulated Mr. Rawle, the able head master, on the progress made. A long list of awards of prizes and certificates was then read by the Secretary. The chairman stated that Mr. Rawle had obtained by means of voluntary contributions a fund for providing "vacation prizes," to be competed for by the students, and he trusted there would be a spirited competition. Mr. Rawle, who then addressed the meeting, pointedly referred to this new feature in the institution. He urged upon the students the necessity of thorough, honest work in their studies, and spoke at some length on the value of technical education. To the great bulk of Nottingham artisans, engaged as they were in the lace trade, a knowledge of ornamental and mechanical drawing was of the greatest service. There was now no excuse for an artisan not possessing a knowledge of drawing. By a recent minute of the Department of Science and Art artisans could obtain their education at the institution free of charge. Government also encouraged talented students, and gave them scholarships valued at £52 and £104 per annum for two years, with the privilege of working among the art treasures of South Kensington. He had hoped to have given the meeting some particulars concerning the national medal competition; but he had learned that the contest would not be decided till some time next month, when he hoped some of the golden apples would have fallen to the share of the institution. A vote of thanks to the chairman closed the proceedings.

ARCHÆOLOGY.

THE Rev. Canon Greenwell, of Durham, who has made such extensive investigations in the Yorkshire tumuli, has commenced a series of Suffolk diggings near Ingham, Bury St. Edmunds, the results of which will be made public on completion of the work. On Thursday week, the Suffolk Archæological Association met on the ground. So far, only burnt burials have been met with.

An interesting addition has lately been made to the Pompeiian Court of the Crystal Palace, consisting of specimens of the volcanic ash and scoriæ by which the city of Pompeii was overwhelmed, as well as of some of the objects discovered in the ruins. For these the company are indebted to

Signor Fiorelli, the able and indefatigable director-general of the Museo Borbonico, at Naples, who is also director-general of the excavations. A good map of the city as well as of some of the most interesting spots has also been put up in the court.

PARLIAMENTARY NOTES.

On Thursday week, in answer to a question by Lord Eustace Cecil as to what step he intended to take with respect to the memorial recently presented by the inhabitants of Barking to restrain the Board of Works from discharging the sewage of London into the Thames, Mr. Gathorne Hardy said the Act of Parliament under which the sewage was discharged into the Thames was under consideration.

The Metropolis Subway Bill passed through committee in the House of Lords on Friday last. On the same evening the following peers were named as the select committee on the Artisans' and Labourers' Dwellings' Bill:—The Earl of Malmesbury, the Duke of Somerset, the Duke of Beaufort, the Earl of Derby, the Earl of Shaftesbury, the Earl of Carnarvon, the Earl Cardigan, the Earl of Kimberley, the Bishop of London, the Duke of Argyll, Lord Foley, Lord Portman, Lord Chelmsford, Lord Westbury, Lord Athulmney, and Lord Penrhyn.

Building Intelligence.

CHURCHES AND CHAPELS.

Several new churches are now in course of completion in the metropolis. A new church, with parsonage house and schools in connection with it, is in course of erection in Somers Town, an outlying and destitute district of the parish of St. Pancras. The cost will be nearly £1,000. A new church has nearly been completed on the old City burial ground, Golden-lane, one of the most destitute districts in the metropolis. It is designed for the parish of St. Mary Charterhouse. At present the works are stopped for want of funds, only £300 being required to complete the church. A site for a new church in the Isle of Dogs has been given by Lady Mary Charteris; and the Marquis of Northampton has given a freehold site for a church in the district of St. Peter's, Clerkenwell. In the new district of St. Mark's, Bethnal Green, a new church will be commenced as soon as circumstances will admit.

The foundation stone of a new church at Newtown, dedicated to the memory of King Charles "the martyr," was laid on the 22nd ult. It is in the Early English style, and will consist of a nave 51ft. long by 24ft. 6in. wide inside, a chancel 26ft. 6in. by 17ft., a vestry, and south porch, and will afford accommodation for about 220 persons in open seats. The material used for the walls and dressings to windows, &c., is Grinshill stone. The roof will be open-timbered and covered with Staffordshire tile. The cost is estimated at £1,170. The work is being carried out from the designs of Mr. E. Haycock, junior, architect, Shrewsbury, by Messrs. Nevett Brothers, of Ironbridge.

A new convent chapel at Skibbereen has just been dedicated. The style is Early Decorated. The church is faced externally with Bath stone. The cost of the building was £1,500. Messrs. Pugin and Ashlin, of Dublin, were the architects, and Mr. W. Murphy, of Bantry, the builder.

A new R. C. Church, dedicated to the Sacred Heart, was consecrated on the 24th ult. The style is Early Decorated, and the plan comprises nave, aisles, south porch, and sacristy. The internal dimensions are 110ft. long by 44ft. wide. The walls are of local limestone, with white stone dressings. The cost of the church was £3,500. Messrs. Pugin and Ashlin were the architects, and Mr. James Scanlan the contractor.

On Friday, the foundation stone of a new Wesleyan Chapel was laid at Rugby. The style chosen is Early Pointed, and the building will seat 700. Mr. C. O. Ellison, of Liverpool, is the architect, and Messrs. Parnell and Sons, of Rugby, the builders.

The foundation stone of a new Methodist Chapel especially for the labouring classes was laid on Tuesday at Leeds. The design is Gothic, and the plan consists of nave and aisles. It will seat nearly 500 persons, at a cost of about £2,000.

The foundation stone of a new Congregational Chapel and School was laid at Ilkley, near Bradford, on Monday last. The style is Decorated. The interior dimensions are 64ft. by 42ft., and accommodation will be provided for 450 persons, at a cost, including the school, of £5,000. Mr. J. Pritchett, of Darlington, is the architect.

The memorial stone of a new Wesleyan Chapel about to be erected at Great Barr, near Wednesbury, was laid on Monday week. Its style is Early Gothic, the materials to be used in its construction being limestone, with Bath stone dressings; and its cost, including the site, is estimated at £1,500. The architects are Messrs. Loxton Brothers, Wednesbury, and the builder is Mr. Crutchley, Wolverhampton.

The restoration of Bath Abbey has been advanced another stage. We hope in the course of a few months to be able to announce the completion of the stone groining in the nave and aisles; three bays in the nave are now exposed to view. The committee have given the contractor instructions to proceed with the last bay; the men are now busily engaged upon it, and this, the most important part of the restoration, will be finished by the end of September. About £1,300, however, is still needed to make up the sum required to complete the work.

The new Tyndall Baptist Chapel, Bristol, will shortly be opened for Divine worship. The design is Decorated Gothic. The elevations are faced with Pennant stone in random range courses, tuck pointed. The roof is covered with Bangor slate, alternating in plain and ornamental courses. The contractors are Messrs. Marquiss and Munro, of Bristol. The total outlay on the chapel and its fittings will be about £6,500. The designs are by Mr. S. Hancorn, of Newport and Bristol.

At the last monthly meeting of the Society for Promoting Christian Knowledge, the chief discussion arose on the motion of the Rev. R. T. West, to grant £4,250 towards the building of churches, schools, and houses in the Natal diocese, for the use of the clergy and laity who repudiate the authority of Bishop Colenso. Mr. West's motion, after a stormy discussion, was lost by a small majority.

BUILDINGS.

A new Congregational School was opened at Leamington last week. The building is in the Gothic style, harmonising with that of the chapel. The two rooms are 45ft. by 30ft., and have separate entrances for boys and girls. The entire cost is about £900. The architect is Hy. Fuller, London; the contractor, Mr. F. A. Woolison.

The memorial stone of the school-room and dining-hall, and the first stones of the two "testimonial houses" in connection with Mr. Spurgeon's Orphanage, at Stockwell, were laid on Monday last. The foundations of four additional houses have been laid, and these, with the houses the stones of which were laid recently, will conclude all the building operations at present contemplated. Already there has been subscribed a sum of £9,000, and it is estimated that to finish and furnish the whole of the buildings a sum of £5,200 more will be required.

The rebuilding of Her Majesty's Theatre has commenced under the superintendence of Mr. Lee, architect, the contractors being Messrs. Trollope and Sons. By the terms of their contract they are to have the house ready in forty weeks from the present time, or to pay a forfeit of £1,000 a week for every week they go over that period. The old lines of the building will be preserved, as they could hardly be improved; but the *bijou* theatre will not be replaced. The seating capacity of the old house was under 1,700 seats; this will be increased in the new house.

On Wednesday the Princess Mary of Cambridge, accompanied by Prince Teck, opened the new wing of the National Orphan Home at Ham. The new wing, which is the result of an appeal made to the subscribers to the *Quiver*, will accommodate twenty-five additional girls, and also contains an infirmary ward. It is very plainly, but substantially built.

On Tuesday the foundation stone of a new wing of the Convalescent Home, Coatham, was laid. The home is in the Gothic style of architecture, and accommodates fifty patients. The new wing will make room for other fifty patients, and will be erected at a cost of about £1,700. Mr. Wm. Clephan, of Stockton, is the architect, and Mr. Kidd, of Saltburn, contractor.

On Tuesday last, the foundation stone of a new "Workmen's Hall" was laid at Monkwearmouth. The building is of plain brick, and will afford to 1,000 persons the advantages of a working man's club, library, &c.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—C. F. H.—T. G.—F. W. R.—C. B. A.—C. J. P.—C. B. A.—J. A. H.—J. W. and C.—A. M.—E. W. G.—R. G.—I. H.—I. A.

Correspondence.

MR. MOORE'S DECORATIONS.

To the Editor of the BUILDING NEWS.

SIR,—I wish to make a statement for the information of your correspondent "A. Z," and any others who may be interested in the subject on which he writes, and shall feel much obliged if you will kindly afford me a little space. The drawings for the interior decorations of the Queen's Theatre, now in the Architectural Exhibition, were originally prepared under my immediate direction, but since they left my hands last autumn they have been altered so much that they cannot now be correctly described as mine or as suggested by me. In the drawings of the ceiling, the squares and the outer belt of the fan-shaped part have been entirely changed. And in the other drawing, although no light and shade is used elsewhere, the backs of the boxes have been shaded so as quite to obliterate the colour originally placed there, and, not least, the seat covers have been changed to a colour that necessarily destroys the whole scheme. I have been so little consulted with respect to these alterations that I was not even aware of their existence till I saw the drawings the other day at the exhibition.—I am, &c., A. MOORE.

17, Fitzroy-street, Fitzroy-square, June 3.

SIR,—Your correspondent, "A. Z.," in last week's number, is evidently not aware that the scheme for decorating the Queen's Theatre, as "suggested by Mr. Albert Moore," has been subjected to a number of alterations. The "general tone of colour" upon that drawing is certainly not as it left Mr. Moore. I myself (and I have no doubt others would confirm me) can testify to the fact that the ceiling has been changed, purple shadows have been put into the box spaces, thereby obliterating the gentle tones of grey that were there. The whole of the seats of dress circle and upper boxes, that were painted a delicate flesh colour, are now an overpowering red, and on looking closely at the drawing it appears to have been rent and patched by some clumsy hand. The result of this is that the colour is more or less damaged, which being body colour, depends so much for its purity on careful preservation. It is rather unfortunate that "A. Z.," appreciating Mr. Moore's work as he professes to, should arrive at a conclusion so much against that artist, rather than believe in that impertinent treatment of artists which is unfortunately too possible.—I am, &c., A PAINTER IN WATERCOLOURS.

THE VENTILATION OF CELLARS.

SIR,—I have, in my business as a brewer, often observed that the construction of cellars is one of the greatest of our popular errors.

In cases where my customers have complained of their ale turning sour, I have invariably found a remedy by ventilating the cellar with a few inch holes perforated in the door and a brick or two withdrawn in the wall opposite, or by any other means, so that a current of air is obtained. It must follow that if the air in the cellar be impure it will enter the cask when in draught,—*i.e.*, as the cask is being gradually emptied of its con-

tents air fills up the vacant space, and if such air be impure it will have a decidedly injurious effect on the beer; of course, I premise that the ale is sound when supplied by the brewer.

Considering that the above information would be useful to the public, especially throughout the summer months, I trust you may not deem it out of place to insert it in your columns.—I am, &c.,

June 1. XXX.

STREET ACCIDENTS.

SIR,—There is an evil which has been increasing for a long time past, is increasing daily now, and ought to be diminished. The evil I allude to is furious driving in the streets. Everybody in London appears to be in a hurry. I am not about to inquire into the causes of this state of things; but it is a fact, and one of the results is that carriages, cabs and hansom cabs in particular, run through the streets like Jehu of old. Many a man when he gets into a hansom cab is not very particular who is put to inconvenience as long as he gets to his destination quickly. And hansom cab-drivers, who are not always the politest or most scrupulous of men, are too eager to get a good fare to study the safety of foot passengers. The consequence is that people are frequently knocked down and killed. I believe that not one-tithe of the accidents which happen in the streets get recorded in the newspapers. Now the question is how is this growing evil to be resisted? I believe that Mr. Bedford, when holding an inquest last week on a man who had died from the effect of being knocked down in Cranbourne-street, hit the right nail on the head when he said that the time was come when driving in London should be put under definite legislative control. As a rule, I am not favourable to governmental interference in such matters. But when men will persist in rapid and reckless driving, apparently careless of the consequences, the only thing to be done is to speak to their fears. Let them know that if they drive (say) faster than six miles an hour, they will be fined. I am sorry to say that it appears to me that the only effectual way to appeal to "cabby's" heart and judgment is through his breeches' pocket.—I am, &c.,

A MAN IN THE STREETS.

EDMONTON VESTRY HALL COMPETITION.

SIR,—I submitted a set of designs for the proposed new vestry-hall at Edmonton, and have received a communication, of which I enclose a copy, in hopes some of your readers can interpret the first paragraph thereof, as I am utterly unable even to guess the meaning of it.—I am, &c.,

A COMPETITOR.

[COPY.]

Vestry Clerk's Office, Edmonton, N.,
30th May, 1868.

Vestry Hall.

DEAR SIR,—The opponents to the object at a Vestry Meeting on Thursday last were successful in defeating it. Your design and plans were not amongst those selected, and I will forward them to you on Monday next.—I am, yours truly,

(Signed) WM. PULLEY, Vestry Clerk.

Intercommunication.

QUESTIONS.

[823.]—REYNOLDS'S "LAUGHING GIRL."—Can any of your readers inform me where the original picture of the "Laughing Girl," by Sir Joshua Reynolds, is to be found, and if it can be seen, &c.?—W. R.

[824.]—WATER WASTE PREVENTORS.—I see from the last report of the Medical Officer of Health for the Whitechapel District that there are at the present time 67 Water-waste Preventors in operation in the district. I should feel obliged if some one would give a description of the apparatus.—INVENTOR.

[825.]—LEGISLATION AND PUBLIC HEALTH.—Will you, or some one, inform me of the Acts of Parliament which have been passed during the last few years relating to public health?—INSPECTOR.

[826.]—DOLOMITE.—I lately saw that dolomite was spoken of as a superior building material, as it is capable of a beautiful polished surface. I want such a thing, and should be glad to know more of the material, and how I can get it. Some one who knows more of it will perhaps be good enough to tell me.—EXPERIMENT.

[827.]—NORWEGIAN COOKING STOVES.—I should be thankful if anyone would supply me, through Intercommunication, with information respecting these stoves. I want to know whether they can be seen in London. If not, I should like to know on what principle they are constructed.—R. GREY.

[828.]—MR. TORRENS' BILL.—The BUILDING NEWS has several times offered observations on Mr. Torrens' Bill, but I do not remember it has at any time given a *resume* or abstract of the bill itself. As I and many others, as a matter of course, are interested in the matter, I should like a little information thereon.—W. COOK, Norwich.

[The following may be taken as an abstract of the bill:—Reports are to be made from time to time by the health officer of each district, as to any dwellings in a state or situation dangerous to health. These reports are to be addressed in London to the Board of Works, in boroughs to the Common Councils, and in other places to the Improvement Commissioners or the Local Board of Health; and, on their receipt, the body or "local authority" so receiving them is to cause a specification of such alterations or rebuildings as may be required to be drawn up, and is to call upon the "owner" of the premises to carry them out. He may appeal to the local magistrates. If he does not so appeal, he has to decide, within three months, whether he will go on with the required works. If he elects to do so, the local authority may at any time alter at his expense any building which does not meet with their approval, and from their decision in such cases there is no appeal. If he elects not to do so, the local authority may buy the property at a valuation to be made by two surveyors appointed by them on the basis of its "true market value as property unfit for human habitation," and without allowance "in respect of compulsory taking." The property thus acquired may be rebuilt by the local authority, the expenses being paid out of a local rate, not exceeding twopence in the pound per year, and is then to be sold or disposed of on long lease within five years, or the site may be handed over to any company upon condition of building houses for the working classes upon it. Accounts are to be yearly rendered to the Government, but there is no provision for general superintendence or inspection of any kind. The only inspectors of the new building when erected are the health officers appointed by the local authorities themselves.]

[829.]—TELEGRAPH POSTS.—Some time ago a railway company asked my consent to erect on the top of my house a post to sustain a telegraph wire. I consented, as I was assured that I should suffer no inconvenience thereby. I see the question has now arisen about selling the property of this company to the Government. Now, I should like to know how long must my consent be given before the owner of the post can claim that it should remain where it is as a right? Can the company sell for a money value that which I granted as a favour?—R. E. P.

[830.]—PARTY WALLS.—Would some one enlighten me, through "Intercommunication," on the following particulars?—My house is placed at the end of a terrace, and is the same height, at present, as adjoining houses, and both end walls belong entirely to me, not being party walls; the other house, with chimneys, being built against mine. Can I raise on my walls another storey without being responsible by so doing for any permanent damage accruing to the other house? or am I obliged to carry up chimneys of other house with my own? I shall need to take down part of my gables to obtain a proper bed for new work; can I do this without being obliged to protect the adjoining property; or shall I be held responsible for leakage at any future time?—J. P.

REPLIES.

[734.]—BUILDING MATERIALS IN NEW ZEALAND.—In consequence of the receipt of so many letters from all parts of the country asking for the information I offered to give to one of your correspondents, I have found it impossible to answer them all, and so have determined on publishing a short pamphlet, of which I send you a copy.—R. H. D.

[A short notice of this small pamphlet will be found in another column.—ED. B. N.]

[858.]—SPECKS ON DRAWING PAPER.—The proper way to colour cold pressed or plain drawing paper is to lay the colour on with a full brush. The paper should be properly strained beforehand, so as to present a uniform surface to work upon. Blots or spots frequently appear upon drawing paper owing to the fact that the paper is not good of itself, and also owing to what is chiefly to be guarded against by the draughtsman—the pressure of a hot hand upon a part of the surface. Neither ink nor colour will run freely upon a surface upon which anything in the shape of grease or humidity has previously passed.—DRAUGHTSMAN.

[871.]—LIMESTONE AND EARTHENWARE PIPE SEWERS.—It is well known among sewage engineers that up to 18in. the earthenware pipes are to be preferred to the solidly built brick or stone drain, both from its easier and more rapid flow as well as for its economy in laying and first cost. The number of cottages that an 18in. drain would serve would depend upon the manner in which their water supply was arranged; but with a fall so great as 1 in 240 there would be nothing to fear with ordinary house drainage.—S. L.

[875.]—FORM OF GIRDERS.—Your correspondent is in error respecting the fact that the shape of the girders is a fancy of the engineers. The strains upon the upper flanges of the girders vary accordingly as they are inclined or not with reference to the section employed at the different lengths. If a girder be perfectly straight, that is, of a uniform depth, the sectional area of its flanges must vary; but if it be curved according to the laws of a parabola, the sectional area must be constant. It is, in fact, a question of uniform depth versus uniform section, and the local circumstances must decide which is the preferable to adopt.—M. E.

[882.]—PARALLEL RULER.—Will you allow me, through your valuable columns, to state that I fully understand the difficulty of your correspondent "Draughtsman." The only true way to rule parallel lines is by the tee square and the set square. This is all very well so long as the lines are horizontal and vertical, but when they are required to be parallel without the aid of these instruments, the question is not so simple. The only true way of drawing parallel lines is by the means of two set squares, sliding one upon the other in the direction of the line required. A little practice will render this method perfectly familiar.—M. P.

WAGES MOVEMENT.

THE strike amongst the flaggers and slaters of Preston has been settled.

On Tuesday week the Greenock ship-joiners on strike resolved to withdraw their demand for an increase of wages to the extent of 2s. per week, and to return to work on the old terms. The strike which has now terminated was entered upon nine weeks ago.

The labouring classes throughout America continue to make numerous "strikes" for higher wages, and generally with success. In some cases these demands are made for the restoration of wages from which a percentage was taken during the dulness of business last year. Some classes of mechanics in New York are now receiving 4dol. 50c. and 5dol. a day; and, as a general thing, their trade unions are so well organised that they can force employers to pay increased rates when demanded. The American working man shows a bitter hostility, however, to his fellow craftsman from abroad, who are now immigrating in large numbers into the United States, and who always underbid the native labourer. The trade unions seem quite as much opposed to these as to the employers.

At the Hull Police-office, on Tuesday, Donald Mitchell was sentenced to three months' hard labour for having, with other men on strike, intimidated certain of Messrs. Earle's workmen, and so prevented them going to work. The case arose out of a strike at an iron ship building yard, and will be still further investigated, owing to other trades' unionists being implicated.

A laudable attempt has been made by Mr. Sampson S. Lloyd to terminate the stonemasons' strike at Birmingham by inducing the conflicting parties to accept the mediation of Mr. A. J. Mundella, of Nottingham. The masters at once acceded to his proposal; but we regret to learn the men refused to do so, and have probably thus rendered a length ened continuance of the strike inevitable.

STATUES, MEMORIALS, ETC.

A MONUMENT from the hand of the sculptor Molin is going to be erected at Stockholm to the memory of King Charles XII. The inauguration is to take place on the 30th of November next, the 150th anniversary of the monarch's death.

The colossal statue of Luther at Worms is to be inaugurated on the 24th inst., and two following days. Besides subordinate, historical, and allegorical figures, this gigantic representation of Luther stands amid a group of four other colossal statues, above all of which it rises sixteen and a half feet. The statues represent the four precursors of the Reformation—the French Peter Waldo, the English John Wycliffe, the Bohemian John Huss, and the Italian Jerome Savonarola.

The tomb of Abelard and Heloise in Pere la Chaise is being restored. The ashes of this couple, though separated by the Church, are placed together in a leaden box which bears their names.

STAINED GLASS.

A STAINED glass window of three lights has been inserted in the north aisle of the lately restored Church of St. Helen, Bishopsgate, in memory of the late lay rector of the parish. Messrs. Gibbs and Co., of Bedford-square, were the artists.

A memorial window has just been placed in Penkridge Church. The design of the window includes the twofold subject of the Death of Lazarus and the Resurrection of our Saviour. The work is by Messrs. Ward and Hughes, of London.

The east window in the parish church St. George's, Shropshire, has been filled with stained glass as a memorial of the late Bishop Lonsdale, and was exposed to view on Whit Sunday. The subjects in the lancets are the Agony, Christ bearing His Cross, the Crucifixion, the Descent, and the Entombment; the circular lights in the upper portion being respectively Christ upon His Throne, the Good Shepherd, and the commission to St. Peter, "Feed My sheep." The work has been executed by Messrs. O'Connor.

BUILDING AND LAND SOCIETIES.

THE third annual general meeting of the members of the Star Mutual Benefit Building Society was held at Burslem, on Wednesday week. The report and statement of accounts (read by the secretary, Mr. Powell) showed that, after providing for all liabilities and carrying interest at 5 per cent. to every shareholder's account, there was a surplus profit of £885 8s. 1½d., as the result of three years' business, that the funds of the society were safely and satisfactorily invested on mortgage security, and that notwithstanding a large number of withdrawals during the year—involving the repayment of subscriptions to the amount of £1,776 10s., with interest at 5 per cent. thereon—there were now 850 shares in the society, being 31 more than at the close of the previous year.

The usual quarterly meeting of the members of the National Freehold Land Society was held last Friday evening at the Guildhall Tavern, Gresham-street, City, Mr. Ebenezer Clarke in the chair. Mr. W. E. Whittingham, the secretary, read the quarterly report, which showed that the deposits received from members had amounted to £141,000, and the advances repaid by members to £17,187 16s. 10d., while on the other hand the deposits withdrawn had been £129,426 7s. 3d., and the advances to members, £31,274 19s. 7d. A sum of £56,560 16s. 5d. was received from, and £55,340 4s. advanced to the British Land Company. The other advances repaid were £29,249 8s. 6d., and the other advances made, £28,625. The total receipts of the quarter which ended on the 30th ult., including a balance of £15 687 5s. 2d., brought forward, amounted to £259,588 3s. 11d., and the payments to £246,486 9s. 9d., leaving £13,501 14s. 2d. in hand. The members' capital stood at £1,007,748 8s. 6d. The chairman briefly moved the adoption of the report, observing that the advances to members exhibited an increase of £10,000 as compared with the corresponding quarter of last year.

The fourth annual report of the North Staffordshire Permanent Economic Benefit Building Society has been published. The committee state that the receipts (exclusive of redemptions) have amounted to £8,557 8s. 2d., being an average of £164 11s. 3d. per week, an increase of upwards of £2500 over last year. The amount received from depositors has been £1,953 5s. 5d., which is more than the amount received during the three previous years. The payments, which amount to £1,050 11s 9d., have also been proportionately greater. The stock account shows a balance in favour of the society of £290 1s. 6d, and the committee therefore recommend that a dividend of 1½ per cent. on the amount of subscriptions received be paid to those members entitled thereto until the next annual meeting.

LEGAL INTELLIGENCE.

PEW RENTS UNDER THE CHURCH BUILDING ACTS.—A case of some importance was heard at the Court of Exchequer, before Baron Pigott and a common jury, two or three days ago. It raised a question under the Church Building Acts as to the liability of churchwardens to pay a minister's stipend out of the pew rents. The plaintiff, the Rev. Henry Robert Lloyd, was perpetual curate of the district church of St. Mark's, Kennington, and he brought the action against Mr. Burrup, the elected churchwarden of that church, and Mr. Reeve, the minister's churchwarden, to recover £215, being two quarters of his annual stipend, which became due on the 24th June, 1867. It seemed that some differences had arisen between Mr. Lloyd and his parishioners, and that the pew rents had in consequence fallen off. The contention, on his part, was that his stipend was a first charge on the pew rents, and that at the time of bringing the action the defendant had money in hand from that source, ample to cover the arrears due, and which was properly applicable to payment of his claim. A portion of the pew rents had been devoted by the defendants to the repair of the church and other purposes connected with it. Under the Church Building Acts the stipend was to be paid out of pew rents received during the year, and the question whether the defendants had enough money in hand to pay it depended upon the period at which the computation of the year should commence After a long discussion, the parties came to an agreement as to the actual receipts and disbursements of the churchwardens, and there being no question of fact for the jury they were discharged from giving a verdict, and a verdict was formally entered by the learned judge for the defendants, with leave to the plaintiff to move, in order that all the questions of law involved in the case might be argued in the court above.

ALLEGED OBSTRUCTION OF LIGHT AND AIR.—POTTS *v.* SMITH.—This case was argued in the Vice Chancellor's Court, on a motion for an injunction to restrain the alleged obstruction of plaintiff's light and air. The premises are taken of the same landlord, the Earl of Harrington; the plaintiff having a contract from William Jackson, who was lessee under an ordinary lease with the usual covenants, and the defendant deriving his title under Jackson, or the Earl, to the adjoining plot of land, both plots being situate in Cornwall-road, Queen's-gate, South Kensington. The defendant's plot was west of plaintiff's, and an arrangement was come to between them as to the west wall, which was 7ft. high, by which the plaintiff alleged it was not to be raised above a certain height; but on Easter Monday a considerable number of workmen were put on, and the wall by the evening was run up 16ft., in all 23ft. This led to the filing of the bill, which alleged material interference with the light and air to the east windows of the plaintiff's house, viz.—the dining room, pantry, kitchen, and library, and the free access of light and air to his ornamental garden; and the affidavits for him stated a material interference and injury accordingly, there being chimneys in the wall. On the other hand, Mr. Jackson had made an affidavit speaking to the plaintiff's previous knowledge of what was intended, and that this was all building land, and that at his own request the house was placed further back. The plaintiff's case was rested on the material injury, the mode in which the wall was run up, the covenant for quiet enjoyment, which was said to be a contract against such interference, and that the plaintiff did not know what was contemplated. On the other hand, the defendant contended that the covenant did not constitute a contract embracing the case made; there was not such an interference as the Court would interpose to prevent, and that the plaintiff was perfectly aware of the nature of the tenure of the adjoining land. Vice-Chancellor Malins thought the plaintiff had failed to make out sufficient injury to warrant the interposition of the Court. He had, in fact, neglected to stipulate in his contract for what he now claimed, and what therefore he was not entitled to. On these grounds the bill must be dismissed, but (considering that the defendant led the plaintiff to believe that he would not raise the wall beyond a certain height, and had on an unusual day run it up suddenly, evidently to prevent the possibility of stopping it) without costs. Had the plaintiff been right his Honour would have ordered every brick to be removed.

Our Office Table.

Baron Haussmann is about to make another raid on Paris. The famous Rue de la Paix is doomed. A new street is to run diagonally from the Boulevard and to the bottom of the Rue Richelieu, and thus connect the New Opera House with the Theatre Francais. All that will be left of the Rue de la Paix is henceforth to be called the Avenue Napoleon.

At their last meeting the Clerkenwell Board of Guardians came to the determination to erect a new workhouse on the site of their freehold estate at Highgate. They appointed a committee of their number to visit the modern-built metropolitan workhouses preparatory to plans being drawn up.

Some short time since, a fatal accident took place at the corner of Baker-street, King's Cross-road, and at the inquest the jury recommended that a constant supply of gravel should be laid down at that point. The vestry, however, are of opinion that such a course would effect little or no good. They considered that a far more effective course would be to station a policeman at the point, and prevent reckless driving. The clerk was instructed to convey this suggestion to the Police Commissioners. We regard this as a step in the way of getting our street traffic brought under control, as suggested by us elsewhere.

The ancient church of Wharram Percy, on the Yorkshire Wolds, is quite apart from all human habitation. Only on Sundays is the church frequented, and the congregation have been somewhat surprised to find a breed of foxes in possession. An air-drain for ventilation from the outside has been used as an "earth," and by this means access has been gained to the pulpit, beneath which an old fox and her litter of fine cubs are—except when unearthed during divine service—comfortably domiciled. A very friendly feeling is manifested towards the little strangers, and in such a fox-hunting country they are, sure to receive fair play.

The Bath Stone Company, which raised rich hopes in the way of dividends, has just held its half-yearly meeting. Instead of a dividend, there was a deficiency of £144 8s. 2d, and in addition, £196 0s. 10d. as bad and doubtful debts.

The committee of the new Marlborough Club have bought that well-known house in Pall Mall where the British Association was for so many years, and are about to have it converted into a club, under the direction of Mr. David Brandon. Messrs. Trollope and Sons have taken the contract.

In the matter of the Park Lane Improvement Bill, the committee have agreed to a special report, published on Saturday, to the effect that, in their opinion, the inconvenience at present experienced from the over-crowded state of the traffic of Park-lane would be best obviated by opening up Hamilton-place as a thoroughfare for public traffic, with a width of not less than 60ft. roadway, to be obtained by removing the houses and other buildings on the eastern side.

The annual meeting of the Emperor Fire and Life Assurance Societies was held on Wednesday at the City Terminus Hotel, Cannon-street. The report read by the secretary, Mr. E. Clark, jun., showed that during the year 1,555 proposals had been received, amounting to £421,473, and policies issued for £335,970. The claims in the life department for the year had been only £4,784, and fire claims £1,623. All claims were payable within fourteen days after proof of death. A bonus had been given to the life-policy holders during the year of from 22 to 50 per cent. on the premiums previously paid, and new tables introduced to meet the requirements of members of building societies for redeeming mortgages, either immediately or after policies become claims. The retiring directors were re-elected, and Messrs. G. F. Larking, J. Jones, W. Middleditch, and W. E. Whittingham were elected auditors. A dividend of 5 per cent, free of income tax, and a bonus of 1 per cent., were declared.

It being deemed advisable to arrange and lessen the mass of papers which have accumulated since the foundation of the Institute of British Architects, members are informed that there are in stock several of the annual reports, and some detached copies of the papers read at the evening meetings, which can be had without charge, to complete defective sets, on prompt application to the librarian.

The council of the Society of Arts gave a brilliant *soiree* on Wednesday evening last, at South Kensington Museum. We believe it was the largest and most brilliant meeting of the kind held under the auspices of this society.

At the general monthly meeting of the Royal Institution of Great Britain, held on Monday last, Sir Henry Holland, Bart, M.D., D.C.L., F.R.S., president, in the chair, Mrs. Alfred Morrison and Rev. J. George Wrench were elected members. The special thanks of the members were returned to Sir Henry Holland, Bart., the president, for his tenth annual donation of £40 to the fund for the Promotion of Experimental Researches.

The preparations for the great Handel triennial celebration may now be said to be complete in all respects. The whole of the instrumental band has been engaged, comprising the most eminent professional and amateur instrumentalists from all quarters, both native and foreign: and when it is stated that the stringed instruments alone will number something like four hundred and twenty, a slight idea may be formed of the extent of this vast orchestra.

At the ordinary general meeting of the Institute of Architects, held on Monday evening, 18th May last, William Tite, M.P., president, in the chair, the following recommendations for membership were read:—William L. Bernard, of 3, Westminster Chambers, Victoria-street; Richard James Jones, of 8, Lind-terrace, Ryde; George Patrick, of Burnley-road, Stockwell, as associates. The following gentleman was balloted for, and declared to be duly elected:—John O. Abbott, of 6, Whitehall, as associate. The following gentlemen, having attended for the first time since their election, were duly admitted by the president, viz.:—Archibald C. Ponton, of Athenæum Chambers, Bristol; Edmund Francis Law, of Northampton, as fellows; Robert Pledge Notley, of 53, Gracechurch-street, E.C.; Percival Isaac James, of 27, King-street, E.C., as associates.

The deputation which was sent to Salford by the vestry of St. George the Martyr, to inquire into the system of tramways which has for many years been in use there, has returned, and given a report against its adoption in Southwark.

The lectures in course of delivery at the London Mechanics' Institution, under the auspices of the committee appointed by the Working Men's Club and Institute Union, are being continued. The second course will commence on Tuesday next.

On Sunday evening the pier at Rosherville was discovered to be on fire. It is believed that a lighted fusee had fallen through a crevice in the timbers, and caused the fire. A large sheet of flame was seen to issue from the pier, and for some time the timbers, which were dry, and coated with pitch and tar, blazed furiously. It was not until considerable damage had been done that the flames were subdued. This is the fourth time that the pier has been on fire, and each fire has occurred at Whitsuntide.

The Baroness de Stampe, who was the devoted friend and patroness of Thorwaldsen, the great Danish sculptor, and at whose château the artist passed the latter years of his life, surrounded by her with every mark of affection, has just died at Nysee, in Denmark, in the château of Stampeborg, in which she had a studio fitted up for him and where he executed his last works.

Mr. T. W. Rammell has addressed to Sir John Thwaites, chairman of the Metropolitan Board of Works, a letter, in which he explains a proposal to form a new means of communication across Hyde Park, in connection with a disused line of conduit belonging to the Board. The line referred to was formerly known as the Bayswater tunnel sewer, and crosses the park in a nearly direct course from Albion-street, in the Uxbridge-road, to Albert-gate, Knightsbridge. Mr. Rammell's proposal is to convert it into a pneumatic tubular way, for the conveyance of passengers across the park. The existing conduit is 6ft. 3in. in height by 5ft. 6in. in width in the clear, and in a tolerable state of preservation except at the lower part. To effect its conversion, it would be necessary to deepen and underset the side walls to the extent of about 2ft. 6in., to put in a new invert to the work, and generally to repair it, rendering the greater part of the interior in Portland cement. By these works—which would be carried to completion entirely from the inside, and without any disturbance of the surface of the park—a substantial and durable tubular way would be formed, 8ft. 9in. in height by 5ft. 5in. in width in the clear, and perfectly sweet and wholesome in itself. The increased gauge of tube thus obtained would be both high enough and wide enough for the passage of a fair-sized omnibus carriage, that is to say, a carriage 6ft. 3in. high and 5ft. across in the clear, and therefore more roomy than the ordinary street omnibus, which, as a rule, does not exceed 4ft. 6in. in width and 6ft. in height. This carriage would run upon a pair of light steel rails, of 3ft. 6in. gauge, to be laid on wooden sleepers imbedded in the invert.

WORKS OF INDIAN ART.—At the India Museum, Whitehall, may now be seen a magnificent collection of objects in jade and crystal, made during many years' residence in India by Colonel Charles Seton Guthrie, of Scotscalder. This collection is believed to be not only the most numerous, but the finest of its kind, and is of very great value. Indian jade is more valuable than that of China in the estimation of connoisseurs. The material is not common in this country or in France. The English public is familiar with that example in the British Museum which is carved into the form of a tortoise, and has long been reckoned as a trimmph of laborious art. This was found on the banks of the Jumna, near Allahabad. Jade, or nephrite—which is the scientific name of this stone,—is one of the hardest of substances, and is very tough. It is, on account of these qualities, wrought with such extraordinary difficulty that many persons believed the Chinese were in the possession of a secret process by means of which they softened it temporarily so as to render it tractable. There is little doubt, however, that in such works as Colonel Guthrie has collected we have results of that apparently indomitable patience in labour which characterises oriental lapidaries, and that they were carved by means of ordinary metal tools with corundum or diamond-dust. The principal difficulty of working jade arises from its peculiar nature, which absorbs, so to say, the corundum into its own surface, and thus grinds away the metal tools employed upon it. The cunning of oriental lapidaries has overcome this difficulty in manipulation. The articles which are now exhibited at Whitehall comprise boxes of jade, some of which are formed of the material in layers of different tints of light greyish green and darker green, one layer of which is in the fashion of fret-work, pierced in patterns, and applied so that the second layer shows through its interstices. There are also sword and dagger handles, cups of many forms, ewers, back scratchers—such as the ladies of Delhi used for the comfort of their skins, just as certain great-grandmothers of our own employed the like instruments,—spoons—many of which have beautiful forms and carvings upon their surfaces,—hookah-bottles—the surfaces of which are inlaid with gold and rubies,—arm-rests for the use of nobles when reclining, and formed like short crutches. With these are included boxes or caskets, which have been so delicately wrought that their covers adhere, under the pressure of the air, to the lower portions or bodies of the objects. This result shows, more strikingly than any other, the mathematical accuracy of the workmanship. One casket of considerable dimensions is lobated in its outline, yet the cover fits the body truly in whatever way the lobes of the one are applied to those of the other. Many of the patterns of the superficial decorations of these articles are finely designed and beautifully worked. The objects in crystal are smaller in number than those in jade, and the material is less uncommon, but they are worthy of admiration. We believe that the opportunity is now offered to the Indian authorities of obtaining this collection of art-treasures with the view of adding it to those now accumulated in the India Museum.—*Athenæum*.

MEETINGS FOR THE ENSUING WEEK.

MON.—Royal Institute of British Architects. Discussion on the paper read May 18, "On the Foreign Artists Employed in England during the Sixteenth Century, and their Influence on British Art," by Digby Wyatt, F.R.I.B.A.—A short description of the Plans of Hospitals at Paris, Munich, and St. Petersburg, by Dr. Oppert.

TUES.—London Mechanics' Institution.—Technical Education for Working Men, second course, "Iron and Wood," by F. C. Calvert, Esq., Ph. D., F.R.S.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3206 J. CARTER AND T. CHALMERS. IMPROVEMENTS IN THE DETAILS AND FITTINGS OF WINDOWS, DOORS, AND OTHER SIMILAR CONTRIVANCES APPLIED TO BUILDINGS AND OTHER STRUCTURES. Dated November 12, 1867.

This invention has reference to two former patents, dated respectively June 14, 1867 (No. 1616), and February 16, 1867 (No. 432), and consists in forming the "architraves," "facings," "plates," and other ornamental details, wholly or partly of cast iron, brass, steel, marble, slate, porcelain, glass, encaustic tile or terra cotta work. The porcelain, glass, or other materials, may be used in different colours, as in encaustic tile work. These can be fixed to the cases by screws very quickly, and, when so fixed, present a more finished external appearance (and at half the cost of masonry) than where cutting or hewing of stone is required. The invention also includes the formation of bases, stringcourses, corners, and coping, of every description of the materials mentioned to be used in combination with stone and brickwork, and will be of great value for covering, protecting and ornamenting lintels, wood, beams, and other contrivances for the outside of buildings. In brickwork where the walls are 9in. thick, or thereabouts, the wood lintel may be kept all the breadth of the wall, and the outside edge of the same may be protected from the weather by means of an ornamental metal plate and flange.—Patent completed.

3215 U. FERRENOUD-WURFLEIN. IMPROVEMENTS IN INSTRUMENTS FOR JOINING BLIND CORDS AND OTHER CORDS. Dated November 13, 1867.

Here, in order to form a union between the ends of such cords, the patentee employs two coiled springs of wire, into the end of one of which a hook is screwed or fixed, whilst the end of the other receives a corresponding eye in a similar manner. The coiled springs are respectively screwed on to the two ends of the cord to be joined until the ends have entered sufficiently far into the springs to be firmly held. The two ends of the cord thus furnished are then hooked together, and so an endless cord is obtained, which is able to pass very freely over pulleys, such as blind pulleys, and the elasticity of the spring serves to keep the cord tight upon the pulleys, and to compensate for any change in the length of the cord arising from variation in the moisture of the atmosphere.—Patent completed.

3121 W. GEEVES. IMPROVEMENTS IN THE CONSTRUCTION OF PANEL DOORS AND FRAMES. Dated November 5, 1867.

According to this invention the patentee makes the mortices with parallel ends, and between each end of a mortice and its tenon (which is parallel, as heretofore), he inserts two keys or wedges; one he places in the key way with its broader end inwards, and he then drives the other key or wedge home upon it. On the inner sides of the tenons he forms the driven wedges considerably longer than the tenons, so that they drive into holes formed for them in the substance of the rails, and serve also as dowels.—Patent completed.

3141 E. SEPHTON. IMPROVEMENTS IN THE CONSTRUCTION OR ARRANGEMENT OF BLOCKS OF SO CALLED WORKMEN'S DWELLINGS. Dated November 7, 1867.

Here the outer walls of each block of dwellings are of any desired outline in plan, and the rooms are arranged and set apart to suit the proposed class of tenants. The entrances from the street are by passages or covered ways to the back of the block, where corridors and staircases common to the tenants branch off. The staircases lead to terraces running along each floor at the back of the building, and from the terraces the doors of the respective tenements open, each tenement being preferably so arranged that one half of the apartments have light from the front of the block, and the other half from the back thereof. At certain distances, say each tenth or twelfth dwelling, a vertical shaft to receive ashes and other waste rises upwards through the terraces. Folding doors or traps are fitted to the said shaft on each terrace, and when water-closets are not provided in each dwelling, they are placed around or near the shaft.—Patent completed.

3060 A. V. NEWTON. IMPROVEMENTS IN THE VENTILATION OF BUILDINGS. (A communication.) Dated October 30, 1867.

This invention relates to a mode of supplying fresh air to apartments, and to compartments of carriages, and withdrawing and discharging the vitiated air therefrom, without producing draughts. In applying the invention to buildings, say, for example, to a hospital, which requires specially good ventilation, the internal walls are built hollow, that is, with vertical air passages in them. The portion of the wall between the air passages and the chamber or ward to be ventilated is built of bricks pierced with holes, which, as the bricks are laid, form small horizontal air channels for the air supplied to the vertical air passages. The passages are divided horizontally at a height of, say, five or six feet from the floor, and distinct air flues connect with the upper and lower divisions thus formed, the larger or upper division being used for supplying cold, and the smaller and lower division for supplying heated air to the ward or chamber. The wall is faced with porous cement, which allows the air at a pressure to percolate through, in minutely divided streams, into the chamber, after the manner of tent ventilation. The roof of the chamber is also porous, and it forms between the girders, which may be of iron, air exhaust flues. Below the floor of the chamber, or ward above, are also air flues, separated from the lower flues by substantial laths enveloped with some material that is a good non conductor of sound. These flues are connected with vertical exhaust flues built in the walls, and connected with a chimney shaft, or an exhaust fan, to quicken the withdrawal of the vitiated air.—Patent completed.

3080 S PARR AND A. STRONG. IMPROVEMENTS IN THE CONSTRUCTION OF BUILDINGS, ARCHES, BRIDGES, COFFER-DAMS, WHARF WALLS, AND SUCH LIKE STRUCTURES, AND IN THE FLOORS AND ROOFS OF BUILDINGS, AND FLOORS IN OTHER SITUATIONS. Dated November 2, 1867.

The object and intention of these improvements is to cover, enclose, or divide floor buildings and open spaces with materials of different kinds, combined together in a novel manner, for ensuring strength and economy in the construction, and for rendering them fireproof, and, further, to construct arches and bridges, and such like structures, of greater strength, with less materials, than at present used.—Patent abandoned.

Trade News.

TENDERS.

WALTHAMSTOW.—For the erection and completion of a row of four cottages at Walthamstow, Essex, for Mrs. Newmnn. Mr. G. F. Payne, architect:—

Vickers and Harding (accepted)	£990

CROYDON.—For alterations and additions to boot and shoe manufactory, for Messrs. Cooper and Son, Lower Coombe-street, exclusive of iron staircase. Mr. George Gough, architect:—

Webb	£230 0
Hill, Claxton, and Hobbs (accepted)	212 10

Messrs. Ward and Price declined tendering unless time was extended.

CHRISTCHURCH UPWELL.—For new school and residence at Christchurch Upwell. Mr. William Smith, John-street, Adelphi, architect:—

Elworthy	£671 16 8
Berry	551 0 0
Bennett	499 13 0

DALSTON.—For rebuilding workshops for Messrs. Wright and Son:—

Bracey	£477
Blackman and Morley	440
Daniels	364
Tully (accepted)	320

ESSEX.—For erecting four dwelling houses and shops in the Wanstead-road, Essex. Mr. F. G. Widdows, architect:—

Bayes	£4624
Patman	4545
Ennor	4393
Tully	4343
Munday and Hutchinson	4150
Chessum	4150
Ward	3906
Perry (accepted)	3671

FINCHLEY.—For the formation of the roads and sewers, &c. (with kerb 6in. by 12in. and circular gullies), on the Finchley estate of the St. Pancras Freehold Land Society. Mr. James W. Potter, architect:—

Frome	£2100
Kelly (accepted)	910

GREAT BARROW (ESSEX).—For the erection of a new brewery, with copper house and chimney shaft, for Messrs. Crabb, Veley, and Co. Messrs. Davidson and Scamell, architects. Quantities supplied by Messrs. R. L Curtis and Son:—

Hart	£4470
Carter	4264
Perry	3987
Roper	3870
Brown (accepted)	3600

HOMERTON.—For painters' work at the East London Union Workhouse, Homerton, Middlesex. Henry Jarvis and Son, architects:—

King and Son	£294
Mason	290
Godwin	254
Pickering and Son	240
Heeps and Son	173

LLANGWRIG (MONTGOMERY).—For erecting new farm buildings at Bailey, for Mr. C. J. Elwell. Mr. Evan Powell, architect:—

Owen	£730
Hankinson and Williams	495
Woolley	460

LONDON.—For the erection of nineteen houses, Camberwell. Mr. William Smith, architect:—

Barnes	£7865
Dover	7550
Waters	6716
Lewis	6650
Price	6587
Tully	6530
Whittaker	6380
Blackmore and Morley	6340
Saunders	6300
Parker	6188
Mundy	6145
Davis	6100
West	6030
Johnson	5955
Shurmer	5995
Harrison and Edwards	5960
Smith and Simmonds	5399
Goodman	5795
Ward	5510
Rogers and Richards	5496
Pitcher	5311
Bowler Brothers	5496
Minty	4750
Grist (accepted)	4420

LONDON.—For repairs, painting, &c., to 31, Finsbury-square, for Royal Maternity Charity. Messrs. Goulty and Gibbins, architects, London and Brighton:—

Wood	£298
Nightingale	283
Burton and Moreland	285
Geddes	285

Revised tenders from two last builders:—

Burton and Moreland	£272
Geddes (accepted)	270

MALDEN.—For four detached houses at Malden, Surrey, for Charles Blake, Esq. Mr. Henry Peak, architect, Guildford. Quantities by Messrs. Rake and Ranwell:—

	With 26oz. sheet.				With plate.		
Hill, Claxton, and Hobbs, Croydon	£9234	10	4	...	—		
Lee, Guildford	8020	0	0	...	£8210	0	0
Parker, Malden	7991	5	6	...	8137	5	6
Swayne and Sons, Guildford	7804	0	0	...	8082	0	0
Jones, Malden	—				7750	0	0
Hall, Bull, and Co., Westminster	6926	0	0	...	7211	14	0
Todd, and Saunders, Kingston	7000	0	0	...	7180	0	0
Nightingale, Lambeth	6700	0	0	...	6850	0	0
Newman and Mann, London	6950	0	0	...	7030	0	0
Weir, Hertford	6 33	9	2	...	6981	9	2
Regis, Red Hill	6614	0	0	...	6734	0	0
Collings, Kingston	6525	0	0	...	6083	12	0
Jarrett, Croydon (accepted)	6360	0	0	...	6145	0	0

LONDON.—For rebuilding foundry, No. 195 and 196, Bricklane, for Messrs. Noakes and Son:—

Peters	£900
Liddle	889
Pritchard	855
Lankhead	795
Mair	669

OKE.—For the erection of a new infirmary for the Hastings Union, at Oke. Mr. Thomas Elworthy, architect. Quantities supplied. Architect's estimate, £2592:—

D. Parkes, Hastings	£2691
G. Geary, Hastings	2632
F. W. Bourne, Hastings	2537
H. Hughes, St. Leonards	2488
G. E. Jones, Hastings	2475
W. J. Rodda, St. Leonards	2438
J. Howell, Hastings	2389
W. Wigmore, Fulham	2380
A. Vidler, jun., Hastings (accepted)	2349

STONE HALL, OXTED, SURREY.—For alterations for G. Barker, Esq.:—

Kesterton and Head	£475 0 0
J. Wright	350 0 0
Coleman	275 0 0
Galyer and Moore	260 0 0
Wallis	205 15 0

UPPER CLAPTON.—For certain additions to the residence of W. Turner, Esq., J.P.:—

	1.	2.	3
Cooper	£264 10	—	£250
Kingaby	182 0	£17 0	180
Pritchard	96 0	12 10	195

WELCOMBE.—For residence Welcombe, Devonshire, for William Walker, Esq. John Young and Son, architects:—

James Howard (accepted)	£2450

WEST HAM.—For rebuilding two houses with shops for T. Hearn, Esq.:—

Hedges	£680
Ennor	664
Rivett	623
Smith	607
Cook	503
Hunt and Elkington	499

PROPERTY SALES.

MAY 21.

AT THE MART.—By Mr. T. J. Sharp.—Leasehold two shops and premisee, Nos. 12 and 13, Rye lane, Peckham, annual value £65 each, term 95 years from 1865, at £10 per annum each—sold for £1,000.

Leasehold house, No. 13, South street, St. James's, Clerkenwell, annual value £26, term 26 years unexpired, at £4 per annum—£310.

Leasehold house, No. 14, Rodney place, Thornhill street, Islington, let at £19 4s. per annum, term 43 years unexpired, at £3 15s. per annum—£140.

MAY 22.

By Messrs. St. Quintin and Notley.—Leasehold house and shop, No. 8, Holywell lane, Shoreditch, term 14 years from 1861, at £29 per annum; also the goodwill of the business—£100.

By Messrs. Rushworth, Abbott, and Co.—Leasehold residence, No. 7, Cottage road, Paddington, let at £45 per annum, term 82 years unexpired, at £6 6s. per annum—£425.

Leasehold residence, No. 15, Cottage-road, rental and term similar to above, at £7 per annum—£505.

Leasehold two houses and shops, No. 57 and 57A, Alfred road, Westbourne green, Paddington, producing £66 per annum, term 82 years unexpired, at £5 per annum—£785.

Leasehold house and shop, No. 4, Henrietta street, Manchester square, producing £100 4s. per annum, term 35 years unexpired, at £37 per annum—£330.

Freehold residence, known as Holly Cottage, Sutton, Surrey—£660.

Absolute reversion to £1,238 0s. 2d. Three per Cent. Reduced Bank Annuities on the death of a gentleman in his seventieth year—£655.

Policy of assurance for £1,000 effected with the Protector Life Association on the life of a gentleman in the seventieth year of his age—£610.

A ditto ditto for £2,000 effected in the same office on the same life—£1,110.

Leasehold improved rent of £44 2s. 5d. per annum (for 24 years), arising from several houses and shops in Great College and King streets, Camden town—£485.

By Mr. Murrell.—Leasehold five houses, Nos. 3 to 7, Mount Pleasant, Barnsbury square, producing £224 per annum, also a large piece of building land adjoining, term 96 years from 1866, at £24 per annum—£2,400.

Freehold estate, with small part copyhold, comprising a residence, with pleasure grounds, orchard, paddock and meadow land, containing 6a. 3r.; also two cottages, sold subject to the life-interest therein of a lady aged 64 years—£2,200.

Leasehold house and premises, No. 861, Old Kent road, and premises in the rear, producing £27 10s. per annum, term 60½ years from 1821, at £2 10s. per annum—£125.

Freehold plot of land close to St. Thomas's square, Hackney, with two residences thereon known as Vine cottages, producing £43 per annum—£880.

Leasehold two cottages, Nos. 1 and 2, Walcot cottages, London lane, Hackney, producing £32 4s. per annum, term 68½ years from 1821, at £6 per annum—£260.

Freehold two residences, situate in William street, Plaistow, producing £30 18s 6d. per annum—£465.

By Messrs. Baker and Sons.—Leasehold six residences and plot of building ground, known as Canterbury terrace, Sudbury, Harrow, Middlesex, estimated to produce a profit rental of £100 per annum, term 80 years unexpired, at £27 10s. per annum—£1,050.

By Mr. Shakell.—Freehold ground rents, amounting to £22 per annum, secured on six houses, Nos. 34 to 39, Verona street, Lower Wandsworth road—£390.

Leasehold dwelling house, No 3, Arlington street, Camden Town, annual value £40, term 32 years unexpired, at £3 3s per annum—£459.

By Mr. Robert Reid.—Leasehold residence, with garden, coach house, and stabling, known as the Grammar School, Southend, Essex, let on lease at £92 10s. per annum, term 22 years unexpired, at £12 18s per annum—£1,010.

Leasehold two residences, Nos. 10 and 12, Upper Gloucester street, Dorset square, let at £60 per annum each, term 41 years unexpired, at £21 each per annum—£105.

Leasehold stabling, Nos. 43 and 44, New street mews, New street, Dorset square, let at £40 per annum, term 42 years unexpired, at £22 16s. 4d per annum—£130.

Leasehold house, No. 13, Park lane, New street, Dorset square, let at £20 per annum, term 33 years unexpired, at £4 4s. per annum—£135

Leasehold premises in the rear of Nos. 37 and 38, East street, Marylebone, let on lease at £36 per annum, term 19 years unexpired, at £6 per annum—£320.

Leasehold residence and business premises, No. 47, Mortimer street, Regent street, let on lease at £160 per annum, term 23 years unexpired, at £107 2s. 9d. per annum—£700.

Leasehold residence, No. 3, Maida Hill West, Edgware road, let at £63 per annum, term 17¾ years unexpired, at £9 9s. per annum—£100.

Leasehold two houses, Nos. 8 and 9, Hampstead street, Fitzroy square, let at £50 each per annum, term 23¾ years unexpired, at £8 each per annum—£670.

MAY 25.

By Mr. Whittingham.—Freehold building land, situate at Acton, Middlesex, in 40 lots—sold from £60 to £85 per plot.

Freehold building land, being a portion of the Collier's Wood Estate, Lower Tooting, Surrey, in 44 lots; lots to 186 comprised previous sales; lot 187, £130; lot 188, £65; lot 189, £65; lots 195 to 198, £60 each; lot 217, £70; lot 26, £60; lot 227, £60.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

WAR DEPARTMENT.—Netley, Southampton.—For external painting, colouring, &c. W. C. Hadden, Colonel-Commanding, Royal Engineer Office, Portsmouth.

SOUTH EASTERN RAILWAY COMPANY.—2,000,000 stock bricks. T. A. Chubbe, secretary, Terminus, Londonbridge.

ST. JAMES, WESTMINSTER.—June 17.—Contract for general works, repairs of sewers, &c. G. G. Buzzard, vestry clerk.

AGRICULTURAL HALL.—For erection of concert hall, &c. F. Peck, Furnival's Inn.

NEVIN, CARNARVONSHIRE.—June 8.—Trinity House.—Construction of beacon, &c. R. Allen, secretary, Tower hill.

METROPOLITAN BOARD OF WORKS.—June 9, 10 o'clock a.m.—Shoreditch and Sydenham.—Erection of fire brigade stations. T. Pollard, clerk, Spring-gardens.

METROPOLITAN BOARD OF WORKS AND THAMES EMBANKMENT.—Contract No. 3.—For the construction of embankment wall, &c. J. Pollard, clerk to the board, Spring-gardens, S.W.

TONBRIDGE WELLS, KENT.—June 9.—Erection of drill shed, &c. T. Moutier, Grove hill-road, Tonbridge Wells.

LEEDS, YORKSHIRE.—June 6.—Erection of hotel, restaurant, and shops. T. Ambler, Park place, Leeds.

LONDON AND NORTH-WESTERN RAILWAY, EARLESTOWN, LANCASHIRE.—June 17, 4 o'clock p.m.—Erection of workshops, &c. S. Reay, secretary, Euston station

LINCOLNSHIRE, LINDSEY.—Erection of gaol and house of correction. J. H Holloway, clerk of the peace, Spilsby.

NORWICH.—June 9, 12 o'clock.—Alterations, &c., of Prince's-street, chapel. E. Boardman, Queen-street, Norwich.

DARTMOUTH, DEVON.—Erection of cottage buildings. J. Birch, 16, Beaufort-buildings, Strand, W.C.

HYKEHAM, LINCOLN.—June 16.—Erection of rectory, &c. T. T. Reynolds, Heighington, Lincoln.

BOSTON (Great Northern Railway).—June 8.—For the cutting of weeds, and the roading out of the Foss and Witham navigations. Henry Oakley, secretary, secretary's office, King's Cross Station, London, May 20, 1868

BRECON.—June 12.—For takingdown the premises on top of Ship street, Brecon, and houses on the same site. Samuel Hancorn, architect.

LONGDON AND ELDERSFIELD ARTERIAL DRAINAGE.—June 17.—For widening, deepening, and straightening the Longdon Brook, &c. Frederick Moore, clerk, Tewkesbury.

EARLESTOWN.—(London and North-Western Railway.)—June 17.—For the erection of additional workshops at their Earlestown Waggon Manufactory. Stephen Reay, secretary, Euston Station.

NEW BILTON (WARWICK).—For the erection of a parsonage house. Mr Christian, 8a, Whitehall-place. London.

NEW SWINDON (WILTS).—June 13.—For the various alterations and additions to be made to the Baptist chapel, including the erection of new schools, &c. Thomas S. Lansdown, architect, Bath-road, Swindon.

NORTH WOOTTON.—June 13.—For the restoration of the parish church. Architect, Mr. Christian, 8a, Whitehall-place, London.

NORWICH.—June 9.—For the new pewing and extensive alterations and additions to Prince's-street Chapel, Norwich. Edward Boardman, architect, Queen street, Norwich.

SOUTH HYKEHAM RECTORY.—June 16.—For the erection of a Rectory house and offices at South Hykeham, near Lincoln. James Soppit, architect, Tont Hill, Shaftesbury.

SWINESHEAD.—June 8.—For making and fixing three blocks of seating for the parish church.

TAUNTON.—June 23.—For repairing and reseating the church of Lydeard St. Lawrence, near Taunton. John Shattock, James Williams, churchwardens, Lydeard St. Lawrence.

TONBRIDGE WELLS.—June 9.—For the erection of a drill shed and sergeant's house for the 17th K.R.V. Architect, Mr. John Moutior, Grove Hill road, Tonbridge Wells.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Roderick Campbell, Beaufort-buildings, Strand, civil engineer, June 22—William Lawrence, Penge, builder, June 10, at 2—William Lloyd, Symons-street, Sloane-square builder, June 22, at 11—Thomas Cross, Croydon, carpenter, June 18, at 11.

TO SURRENDER IN THE COUNTRY.

Adam Best, Bolton, Lancashire, engineer, June 17, at 11—Henry Eyers, Southsea, plumber, June 19, at 12—William Gradwell, Salford, bricklayer, June 9, at 9.30—John Plumb, Sandiacre, stonemason, June 17, at 12—George Samworth, Overton Longville, Hunts, carpenter, June 13, at 11—Luke Worrall and Thomas Hargreaves, Wath upon Dearne, masons—Charles Evans, jun., and Thomas Jacob Jones, Newport, Monmouthshire, timber merchants, June 12, at 11—George Hawley, Colsterworth, stonemason, June 11, at 11—Hugh Bennett Wildig, Pensam, near Abergele, plumber, June 12, at 3.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 25, R. Wood, Harrow road, Paddington, stonemason—June 25, G. Cox and W. Dock, Little Blenheim-street, Chelsea, builders—June 17, H. W. Smith, Plaistow, builder June 17, B. Froud, Tooting, builder—June 17, J. Davis, Aldershot, contractor—June 17, S. Dolman, Victoria grove, South Hornsey, bricklayer—June 17, J. Costin, High street, Hoxton, plumber—June 17, G. Purser, Leighton Buzzard, plumber—June 26, H. W. Hemingway, Leeds, painter—June 16, J. Haw, Maddlesborough, builder—July 2, G. R. T. Heald, Sheffield, plumber—July 2, J. Jutten, Brighton, carpenter—June 24, W. Ticklepenny, Binbrook, Lincolnshire, joiner—June 26, B. Ebbutt, Great Staughton, Hunts, plumber—June 15, E. Marpole, Llanidloes, painter.

PARTNERSHIPS DISSOLVED.

Horne and Morris, Guildford street, Russell square, architects—J. and W. Leigh, Eccles, engineers.

DIVIDENDS.

June 10 H. Hickson, Sheffield, painter—June 19, T. Barraclough, Sheffield, builder—June 11, R. Young, Lincoln, builder—June 18, A. Rose, Hollington, Sussex, builder.

BANKRUPTCIES ANNULLED.

John Pyne, Exeter, carpenter and joiner, May 14—Robert Morriss and James Meager Field, Hanover-street, Long-acre, sanitary engineers, May 21—Elizabeth Steddy, Howard-road, Stoke Newington, builder, May 28.

SCOTCH SEQUESTRATION.

David More, Partick, builder, June 9, at 12, at the Faculty Hall, Glasgow.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£12	0	12	10	Archangel, yellow	£11	0	£12
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0	12	0
,, yellow pine		2	13	4	5	Finland	7	0	8	0
St. John N.B. yellow		0	0	0	0	Memel	0	0	0	0
Quebec Oak, white		5	5	5	10	Gothenburg, yellow	8	0	9	10
,, birch		4	5	5	0	,, white	8	0	9	0
,, elm		3	15	5	15	Gefle, yellow	10	0	10	10
Dantzic oak		4	0	6	0	Soderham	9	0	10	10
,, fir		2	5	3	5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	11	0	13	0
Memel fir		3	0	4	5					
Riga		3	0	3	3					
Swedish		1	17	2	8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	3
Masts, Quebec red pine		5	0	6	10					
,, yellow pine		5	0	6	0	Pumice Stone per ton	6	0	8	0
Lath wood, Dantzic, fm		6	10	7	10	Oils, &c.				
,, St Petersburg		8	10	9	10	Seal, pale, per tun	38	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Sperm body	100	0	0	0
						Cod	39	0	0	0
Quebec, white spruce		13	0	20	0	Whale, Sth. Sea, pale	34	0	0	0
St. John, white spruce		13	10	15	10	Olive, Gallipoli	71	0	73	0
Yellow pine, per reduced C.						Cocoanut, Cochin, ton	53	10	55	0
						Palm, fine	40	0	41	0
Canada, 1st quality.		17	0	18	10	Linseed	32	15	34	0
2nd do.		11	0	12	0	Rapeseed, Eng. pale	35	0	0	0
						Cottonseed	30	0	38	0

METALS.

IRON:—

Welsh Bars in London	per ton	6	5	0	6	5	0	3
Nail Rod	do	7	5	0	7	12	6	2½
Hoops	do	8	5	0	9	0	0	
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bar, in Wales	do	5	10	0	6	0	0	3
Nailrods	do	7	5	0	7	15	0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	6	ne t.
Swedish Bars	do	10	0	0	10	10	0	2½

STEEL:—

Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	

COPPER:—

Sheet & Sheathing, & Bolts	per ton	85	0	0			0	
Hammered Bottoms	do	92	0	0	0	0	0	
Flat Bottoms, not Hammered	do	92	0	0	0	0	0	
Cake and Tough Ingot	do	76	0	0	77	0	0	3
Best Selected	do	84	0	0	85	0	0	
Australian	do	83	0	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	7	0	0	7½	

LEAD:—

Pig, English	per tot	21	5	0	0	0	0	
,, Spanish Soft	24 do	18	10	0	0	0	0	2½
Shot, Patent	do	22	10	0	23	15	0	
Sheet	do	20	0	0	20	15	0	5
White	do	27	0	0	30	0	0	

REGULUS OF ANTIMONY

French	ton	43	0	0	0	0	0	

ZINC:—

English Sheet	per ton	26	0	0	26	10	0	2½
Devaux's V. M. Roofing Zinc	do	28	10	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20	0	0	0	0	0	nett
QUICKSILVER	per bll	6	17	0	0	0	0	

TIN:—

English Block	per ton	96	0	0	0	0	0	2½
do Bar	do	97	0	0	99	0	0	
do Refined	do	100	0	0	0	0	0	
Banca	do	93	0	0	97	0	0	nett
Straits	do	91	10	0	92	0	0	

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NAMES OF EXHIBITORS.	(SEASON 1868.) WORKS REPRESENTED.
Antil, J.	Patent Cast-lead Stench Traps.
Arrowsmith, A. J., and Co.	Solid Parquet Floors—Bent Wood Furnitur .
Atkins, T. and Son	Moulded Carbon Filters.
Ayling, Stephen	Architectural Photography.
Baker, Rev. R. S.	Eagle Lectern in Carved Oak.
Barlow, Finja, and Co.	Moulded Bricks, Tiles, &c.
Bartlett G.	Cement and Plaster Ornaments.
Beale, Montague, and Co.	Gas and Hydraulic Works
Blashfield, J. M.	Terra Cotta and Architectural Pottery.
Boote, T. and R.	Encaustic and other Tiles
Bovey, J.	Varieties of Devonshire Marbles.
Boyd, D. O.	Patent System of Ventilation.
Braby, F., and Co.	Zinc Roofing, Corrugated Galvanised Iron and Mouldings.
Broomhall Tile Company	Patent Roofing Tiles, Damp-proof Course, Concrete Walls.
BUILDING NEWS	Architectural Journal.
Bullivant T.	Patent Airtight Noiseless Sliding Sash.
Burnett, Sir W. and Co.	Preserving Process for Timber, &c.
Burt and Potts	Wrought iron Watertight Casements.
Chatwood and Co.	Patent Safes and Locks.
Coalbrookdale Company	Ridge and Roofing Tiles, Crestings.
Cooper, J. K.	Roofing Tiles, Ridge Crestings.
Copeland, W. T. and Sons	Porcelain and Stoneware Slabs and Tiles.
Cornell, J.	Art Metal Works.
Coulton, J. L.	Stained Glass Works and Decorations.
Curtiss, W.	General Building Works
Ceramic Art Union	Ceramic Statuary, Vases, &c.
Davies, C. H., and Co.	Genuine Solid Parquet Floors.
Doulton and Co.	Terra Cotta Panelling.
Engert and Rolfe	Asphalted Roofing Felt.
Farnworth, J. H.	Patent Self lifting and Self fastening Sash.
Fox, Robert	Patent Fastenings, Zinc Roofs, Sashes, &c.
Gane, C., and Co.	Green Roofing Slates, Gane's Eureka Tint.
Gibbons and White	Patent Mortise Furniture, Iron Casements.
Glover G., and Co.	Improved Dry Gas Meters.
Godwin, W.	Encaustic Tiles, Tesselated Pavements.
Hall, M.	Ornamental Lead Work.
Hall, W.	Oxide of Iron Paint.
Hart, J., and Son	Art Metal Works and Brasses.
Haward, J.	Wall Decorations.
Hogg, W. S.	Fireproof Doors and Columns.

NAMES OF EXHIBITORS.	(SEASON 1868.) WORKS REPRESENTED.
Hopton Wood Stone Company	Fossil and other Marbles.
Johnson, G.	Patent Building Hoists.
Jones, J., and Sons	Hot Water Apparatus, Boilers, &c.
Lee, W. and J.	Patent Double-action Mortise Bolts and Locks.
Letheren and Randle	Art Metal Works.
Lizard Serpentine Company	Cornish Serpentine Marble.
Lloyd and Summerfield	Crystal Sash Bar, and Aquariums.
Lowther and Co.	Patent Sun Blind, "Helio-Scene."
Macnaught, Robertson and Co.	Rolled Iron Girders and Joists.
Malkin and Co.	Encaustic Tiles and Mosaics.
Matthews, E.	Monumental Brasses.
Madwell and Son	Clipsham Down Building Stone.
Merryweather and Sons	Fire Engines, Hydrants, Fire Apparatus.
Minton and Co.	Encaustic and other Tiles and Mosaics.
Morris and Field	Sanitary Appliances, Baths, Lavatories, &c.
Moseley and Hooker	Electric Bells and other Apparatus.
Moule	The Patent Earth Closets
Norris and Son	Moulded Bricks, Ridge Tiles, &c.
North Devon Pottery Company	Stoneware Closet and Apparatus.
Parnall Strong	Patented Vellular Construction Hexagon Hollow Tubes.
Potter and Son	General Building Works.
Ridgway and Bellerophe	Encaustic and other Tiles.
Rosher, F. and G.	Bricks, Tiles, Portland Cement.
Sax, J.	Electric Bells and Indicators.
Scammell and Co.	Door Furniture, Finger Plates.
Sidebotham, Banks, and Co.	Patent School Desks and Seats.
Smith, A. and Co.	Patent Double action Door Springs.
Smith and Fuener	Patent Door Springs.
Standing and Marten	"Creeke's" Patent Capped Drain Pipes.
Tingey, W., and Son	Portland Cement.
Tuddenham and Co.	Patent Improved Twisted Iron.
Tyler, J. W., and Co.	Zinc Roofs Dormers, Mouldings, &c.
Walford and Donkin	Fret Carved Chairs.
Warren, G.	Scagliola for Architectural Purposes.
Water Purifying Company	Patent Syphon Cistern Filters.
Watson, Charles	Double Current Syphon Ventilators.
Westminster Gas Meter Co.	Improved Registering Gas Meters.
Wheeler Brothers	Moulded and Pressed Bricks.
Whieldon, Lecky, and Lucas	Spherical Hinges, Gate and Door Fittings.

This List will be rapidly added to, and it is believed that the Museum of Building Appliances is capable of almost indefinite extension. Exhibitors are urged to record the fullest information, and no trouble will be spared to procure for architects, *gratuitously*, any further information which may not already be recorded upon the books of the Museum. Architects and their clients are solicited to choose from the Specimen Works exhibited, and orders will be received for transmission to the exhibitors if desired. All applications to be made to THE CURATOR.

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THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 12, 1868.

THE ARCHITECTURAL EXHIBITION, CONDUIT-STREET.

SECOND NOTICE.

IT would be neither possible nor desirable to speak in detail of every drawing exhibited on these walls, and yet the critic who undertakes the task of reviewing such a collection of drawings ought, without doubt, to give each its fair share of consideration, and silence on his part should be as eloquent as words. Indeed, we are sadly conscious that, unless words be well weighed, silence may well bear away the palm. We cannot pretend, however, to more than a desire to do justice. No. 1 (sketch of north doorway to Roslyn Chapel) W. Richardson, is a clever and effective sketch, sufficiently well seen in its elevated position, evidently from the hand of a painter who has not given much study to architectural details. Artistic and pleasant as were such drawings, the day for them has passed; photography has supplied their place, and, unless the real character and colour of the work can be given, preference may well be given to that substitute. Nos. 2 and 7 (sketches in Westminster Abbey), by John Croft, show careful work, but are weak. Nos. 3, 4, and others by Mr. I'Anson too slight for exhibition, may be accepted as giving some and sufficient notice of the curious but barbarous building, rather than architecture of Moscow. No. 34 (Townhall, Breslau) is more spirited and complete. The drawings by Mr. H. W. Brewer and Mr. E. Cole are altogether superior, and show, with the handling and eye of an artist, knowledge of architectural detail. No. 5, by the former, is masterly as a drawing, but the church and its furniture and rococo altar-piece (St. Andrew's, Ochsenfurth, Bavaria) are not worth the trouble bestowed on them; whereas the ancient synagogue at Worms (No. 10) is a good subject, well treated. No. 9, by Mr. R. J. Talbert, is a heavy and indifferent drawing. Mr. Coles's subjects are generally well selected, and delicately and ably portrayed. We have received much pleasure from his drawings of the interior of churches in Brittany, such as No. 12 in this exhibition, and another in last year's, the memory of which haunts us still. Mr. Phené Spiers is another accurate and delicate draughtsman, whose studies (Nos. 15, 24, 34, 35) neither pretend to, nor possess, similar ability to that we have described. We look for their result in the architecture of the future. The sketches by the Rev. J. L. Petit (Nos. 18, 20, 21) are altogether of another calibre. They are the work evidently of an amateur, and not of an architect nor artist. His aim has been to grasp principles of composition and colour, and his drawings have the freshness of truthful effect, of rapid sketches on the spot, unspoiled by subsequent elaboration. The above are the principal coloured architectural drawings from ancient and existing buildings, and these have been rightly congregated together by the hanging committee, as an interesting and valuable department of the exhibition. We trust, on a future occasion, to find more competitors for its honours. In another part of the exhibition is a collection of slighter and more practical sketches, among which, however, are hung two beautiful drawings, No. 135 (Hotel de Ville, Ghent), and No. 136 (Palais de Justice, Rouen), by the late J. S. Cotman. Nos. 120 and 121 are two frames full of pencil sketches, by Mr. George Patrick, hung, not unfairly, we think, too high to be examined. Below these are five powerful and truthful (but not very delicately finished) drawings by Mr. John P. Seddon, being studies in Germany. Among them may be mentioned No. 123 the noble twelfth century font of the cathedral at Limburg), No. 124 (a late Gothic font at Bingen, with some excessively comic animals at its base), No. 122 (a beautiful fountain at Sayn), No. 114 (a carefully measured plan of the chapel at St. Martin's, at Cobern, with its pavement of Mosaic). Nos. 116 and 117 are two frames containing pencil sketches, by Mr. T. H. Watson, which are pretty rather than careful—good notes for his own use rather than edifying to others. The same may be said of the sketches in frame No. 126, by Mr. R. Phené Spiers, but not of his clear and complete drawing of a Mosaic pavement in an old house at Cairo (No. 127). Next we may turn to the architectural designs, thankful to the hanging committee for their judicious grouping, by which one's labour is greatly facilitated—for we find competition drawings generally by themselves, the Mediæval works arranged together and fairly subdivided into ecclesiastical and domestic, interior and exterior views, &c., in such a manner as to invite comparisons. Thus No. 40 (the interior of St. Charles Borromeo's Church, Ogle-street, Marylebone), by Wilson and Nicholl; No. 41 (interior view of Conventual Church of Sisters of Notre Dame, Liverpool), by M. E. Hadfield and Son; and No. 46 (interior view of the Church of St. John, Torquay, Devon), by G. E. Street, hang side by side, as if to challenge each other. The first of these is a quiet and beautifully tinted drawing, with the light well concentrated upon the altar. A rood group, standing on the easternmost tiebeam of the roof, is backed by the deep and sombre blueish greys of the enriched bay over the sanctuary. The form of the undecorated part of the ceiling is plain to baldness, and its overhanging soffit at the eaves is unpleasantly rigid. The clerestory might belong to a barn, being composed of plate-traceried couplets of the meanest description; but the arcade, with its banded columns and plain archivolts of two orders, relieved by coloured voussoirs, is effective; and the east end, with its rich, delicate, and well-treated altarpiece and wall arcade of seven arches above, is exceedingly happy. There is, however, in all this so evident a sacrifice of the upper half of the interior of the building to the aggrandisement of the lower, that it would appear that its frequenters were never expected to lift up their eyes, but to take for granted all above them as veiled in a holy gloom, which they ought not to attempt to penetrate. Mr. Street's drawing is in his well-known style, which seems to have much attraction for the profession and public as well, but which is, upon examination, vexatious and disappointing, as rendering it difficult to realise the design. Here it would seem that the design needed no concealment, and that the detail deserved full elucidation. The chancel seems unusually well proportioned and rythmical. The east window is a noble one, and the carved subject of the Crucifixion, suggested above the altar, better than the ordinary composition of an ungainly cross, studded with bosses of marble, but it is injured by the decorative arrangement on either side, which are quite out of scale with the rest. We do not admire at all the triplet of openings for ventilation over the chancel arch, and the detail of this is a perfect jumble of Early English and Decorated work. Nor is the tub of a pulpit more to our mind. In fact, the clerestory window is the only redeeming feature of the nave, and that is marred by some whimsical conceits. In referring to the drawing by Messrs. Hadfield, we may group with it No. 47 (St. Hilda's Roman Catholic Church, Whitby), and No. 48 (St. Peter's Roman Catholic Church, at Doncaster), by the same firm; and would remark that they are simple and careful works, designed in a right spirit, but they do not show much power or invention. The interior views are preferable to the exterior. In the façade of the church at Whitby there is a want of unity between the five small lancets over the porch and the great sept-foiled circle in the gable, and a lankiness about the turret that not even the reticence shown in the expanse of plain space of walling below can redeem. In No. 13 we have the reredos for the church of SS. Philip and James, Merrifield, Antony-in-East, by Mr. W. White, in which we are forced to confess that the very small modicum of art proposed in the lamb seen in the centre and figure on either side is out of proportion to their canopied framework, and that the detail of the latter is crude and unpleasant. In No. 52 we have an ambitious drawing of the interior of St. Mary's Church at Kensington, by S. Goldie, architect. Both drawing and design are meritorious. The columns to the arcade, high based, banded, and with richly carved capitals, are the best portion; the arches they support are bald, while the base of the vaulting shaft unduly bears upon and spoils the capitals. The square pilasters of the clerestory are un-Gothic and unpleasant, and the trefoil-shaped ceiling of the roof more curious than satisfactory. The corbels of the chancel arch are quite out of scale with the rest, but the proportions of the apsidal choir beyond and the delicate gilded tabernacle work of the altar-piece, albeit work of a later type, are graceful and effective. No. 56 is a slighter sketch of the design of a proposed new Catholic Church at Wakefield, by the same architect, which has several good points. In No. 58 we have geometrical drawings of Christ Church, Parkgate, Yorkshire, by Mr. W. White, in which we notice, with much character and dignity, such as are always to be found in the works by this architect, a curious disregard for beauty of form. Notice the substantial, no doubt, but ugly construction of the roof. The offensive treatment of the inside arches of the aisle windows, the poverty of the east window, and meanness of the bell turret upon the angle buttress. Of designs for churches submitted in competition we have some interesting sets, viz., for Dorchester, Great Yarmouth, and Lincoln. These, however, we are obliged to defer until next week.

ROLLED IRON BEAMS AND JOISTS.*

IT is not many years since the rolled beam and joist were first introduced, the only description of solid girders in use being those of cast iron. By solid girder is to be understood a beam cast or rolled in one entire length, and so distinguished from built-up girders or those consisting of horizontal and vertical plates, united by angle irons. Cast-iron beams, except for very insignificant spans, may be regarded almost in a light similar to that of timber bridges. The well-known treacherous nature of the material, the peculiar difficulties attending the casting and foundry operation in connection with large molten masses, and, more than all, the fatal and unfortunate accidents that have ensued from the fracture of large cast-iron beams, have placed a ban upon them that will never be removed. The culminating blow that this material received was undoubtedly the breaking of the beam of the Hartley Colliery engine, and which resulted in the death of a large number of our mining population. Mr. Fairbairn, in the last series of his excellent work, alludes especially to the substitution of wrought iron for cast in this particular instance, and gives a formula for calculating the breaking weight of a similar beam constructed of wrought iron. It is not too much to assert that no engineer who was worthy of the name would ever think of countenancing the employment of cast iron upon any but a very small scale.

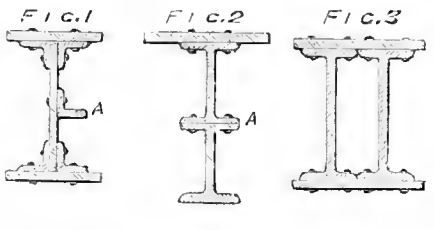
Solid cast-iron beams being therefore in-

* Third Edition. "Sections and Plans, Rolled Iron Joists, Patent Solid Flange Girders, Patent Fireproof Flooring," &c. W. and T. PHILLIPS, Engineers and Iron Contractors. London: Waterlow and Sons, Printers, Carpenter's Hall, London-wall.

adequate to meet the increasing demands of railway traffic, the exigencies of construction of iron ships, roofs of large spans, and numerous other structures, the built-up wrought-iron girder became its substitute. Although recognising the many advantages with respect to lightness and strength possessed by this new type of construction, yet engineers were not blind to the fact that it also possessed some disadvantages as well. The two principal of these are the skilled labour required in fitting together and riveting up the various component sections, and the loss of material incurred by the necessity of the connections of so many different pieces. As the strength of any bar, rod, beam, or girder is in direct proportion to its sectional area at any given point, and since its greatest strength is never more than the strength of its weakest part, it is clear that, if the area at its weakest part is less than that at any other, there is a loss in the difference. Now, as the punching out of rivet holes weakens the metal and diminishes the sectional area of metal available for calculating the strength of the girder by the area of the holes, it is manifest that the extra metal, where there are no holes, is so much dead weight, and consequently a loss. In fact, if we call A the gross area of a beam—that is, its sectional area—without making any deduction for the rivet or bolt holes, and A^1 the nett area or area available for calculating the strength of the girder after deducting all holes, then $(A - A^1)$ represents the loss of metal incurred by the built-up system, and the greater the difference between A and A^1—that is, the more holes that are necessary for riveting together the various parts of the girder—the greater will be the economical disadvantage of the principle. We have now said enough to demonstrate the superiority of a solid rolled section over a built-up one, for in a perfectly rolled beam the gross area and the nett are equal; or $A = A^1$, a condition which ensures the maximum of economy. Sometimes it is necessary to punch or drill a few bolt holes here and there, to attach other pieces of iron to the flanges of beams; but even this comparatively harmless operation may frequently be dispensed with by the employment of hook-headed or any bolts which can be made to clip over the edge of the flanges and hold everything tight. Mr. Phillips, in his estimates of the relative cost between rolled and cast-iron beams, is borne out by Mr. Fairbairn, who arrives at the same conclusion, that the wrought-iron is, all circumstances considered, more economical than its fellow. There is no question that a solid flanged girder is much stiffer, laterally, than a plate one. This is owing to the greater thickness of the web, which also has the advantage of being uniformly thick instead of being composed of alternate thin and thick sections, as is the case of a plate web, which consists of boiler plate stiffened at intervals by vertical tee or angle irons. Our statement is corroborated by an experiment which showed that a solid rolled girder, weighing 1,040lb., bore 16 tons without giving way, when a plate beam, weighing 1,380lb., yielded laterally with a weight of 14 tons. The span in both instances was the same. We are not surprised that the result of the combination of less material with less workmanship should effect a pecuniary saving of 40 per cent.

The question of the distribution of the material is one which has never been properly attended to from the earliest times down to the present. Architects, builders, engineers, and others engaged in the various branches of the constructive arts appear to have been satisfied provided the material was actually there, but cared little whether it was absolutely wanted in the position in which it was placed or whether it might not have been better situated elsewhere. We are forcibly reminded of this fact by the first examples of cast-iron beams, which were made with equal top and bottom flanges, and it was not until the laborious and accurate experiments of the late Professor Hodgkinson that the correct form was discovered, and the relative proportions of the upper and lower flanges finally determined upon. Mr. Hodgkinson commenced his experiments by taking the metal away from the upper and transferring it to the lower flange until the best form was arrived at, and the relative proportions of the two members became nearly as 6½ to 1. Much of the success achieved by Phillips's patent girders is undoubtedly due to the proper distribution of the material, adding it to those parts where it is required, and subtracting it from those where it is not wanted. Cast iron being considerably stronger in compression than in tension, more material is needed in the bottom than the top flange, and it is rather curious that, although this fact was known long before the time of Mr. Hodgkinson, yet no one ever reasoned the subject out, and applied the result to improving the form of cast-iron girders. Provided they put enough material in the beam, and that it was strong enough, it was clearly a matter of not the slightest consequence whether there was ten times the absolute necessary amount of metal or not. But with increased prices for labour and material, and, in fact, everything else, the adoption of a more scientific and economical system became imperative, and those having the control of funds intended for the execution of architectural and engineering works began to seriously examine the items of expenditure. The strength of cast iron and wrought iron being exactly opposed to each other with reference to tension and compression, wrought-iron beams have to be strengthened upon the top flange in order to equalise the resistance to the two descriptions of strains, which act, the former upon the lower and the latter upon the upper flange. By the addition of an extra plate upon the top flange, together with the other advantages possessed by the rolled section, Messrs. Phillips's patent girder affords a ratio of 45 to 33 in strength compared to a plate girder. There is one point worth remarking respecting these patent girders, which accounts for their lateral stiffness. Let fig. 1 represent the section of an ordinary plate girder built up in the usual manner. When the girder has a considerable depth it is a common practice to rivet an angle iron A along its whole length to increase the rigidity. The same arrangement is also frequently adopted in lattice girders. If we refer now to fig. 2,

FIG. 1 FIG. 2 FIG. 3



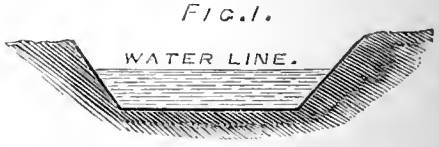
which represents a section of one of the double patent girders, it is at once perceptible that the projecting rib A, formed by the union of the bottom flange of the one girder and the top one of the other, answers the same purpose as the angle iron in fig. 1, only much more effectually, being much thicker, and extending upon both sides of the web. Fig. 3 shows a plan of manufacturing a box girder by the use of the rolled sections, and we would suggest that double the number of rivets should be put in, and not merely those shown in outline. There is no fear of diminishing the nett area, as they could be made easily to break joint, and the line of fracture across the breadth of the top or bottom flange would still remain the same. The advantages of the application of the rolled girder to fire-proof constructions are too well known to need any comment, and the public will soon have an opportunity of witnessing their adoption on a very extensive scale in Her Majesty's Theatre, now in the course of erection. It will scarcely be credited that we have known instances where built-up girders have been constructed, containing scarcely two square inches of sectional area with flanges, the workmanship being the same as would have riveted up ten times that amount of material. Rolled joists must supersede eventually all other girders, except those of a very large pattern constituting our great railway bridges, and it is perhaps only a question of time, of improvement in our iron manufacture, and of skill in combination, for us to witness them applied to even those purposes.

USE OF ASPHALTE IN CONSTRUCTION.—III.

BEFORE proceeding to the subject of asphalte roofs, it may be stated that there are several other useful applications of it, besides those we have either fully described or incidentally alluded to in our previous articles. It is, in fact, capable of rendering the various portions of any structure perfectly watertight, provided the structure combines in itself the necessary elements of strength and solidity. As a lining for reservoirs, tanks, and ponds, it not only effectually prevents all infiltration or escape of the contents, but also maintains them in a fresh and pure condition by the property it possesses of checking and arresting the growth of aquatic plants and parasitic weeds. Generally speaking, asphalte may be applied to any surface free from oily or greasy matter. The presence of ingredients of this description renders the asphalte soft, as it is more or less an absorbent of them. When treating of asphalted footpaths we drew attention to the fact of their frequently becoming plastic, and even sticky under foot, and mentioned that such a condition was due either to bad material, bad foundation, or bad workmanship. While there is no question but that an unsound and uneven foundation will spoil the best asphalted surface ever laid down, yet on the other hand no foundation however solid, and no workmanship however perfect, can compensate for the use of bad and defective materials.

Very much of the ordinary asphalte is composed of nothing more than common gas tar mixed up with small calcareous particles and fine gravel. This of course cannot be expected to afford a durable or even surface, and instances of its total failure in various situations are not wanting. As has already been described in discussing the theory of the formation of asphalte, the proper material must have a natural source, similarly to that now shipped in large quantities from the mines of Pyrimont Seyssel, in the Jura mountains, by the Seyssel Asphalte Company. One special advantage possessed by a naturally formed asphalte is that it is not liable to crack, and can consequently be laid on thinner layers or couches than other descriptions of artificially formed asphaltes and concretes. The economy both in labour and material might in some instances be very great, and worth considering in all cases. As an example let us take that represented in fig. 1, which shows a cross section of a portion of a canal constructed through a cutting in porous ground. To prevent the escape of the water into the substratum it is usual to line the bottom and slopes of the canal with puddle, a material not always readily obtainable. In the situation shown in fig. 1 the puddle

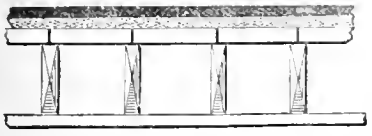
FIG. 1.



would have to be at least 1ft. or 18in. in thickness. But by the employment of the Seyssel asphalte a thickness of 1in. or 1¼in. would be sufficient, and would render the whole area watertight in a manner much superior to that obtained by ordinary puddling. Having discussed the application of asphalte to nearly every possible purpose of utility, with one exception, we now come to the subject of roofs, constituting that exception. A great difference with respect to the constructing of a

foundation or substratum upon which to lay the asphalte will be apparent here. It is no longer a case of simply forming a solid, firm, and even under surface, but of constructing an actual piece of a building. Although perhaps the best description of roof to which asphalte may be applied is a perfectly flat one, yet it can be equally well adapted to almost any pitch, and has proved perfectly successful in the case of a pitch of three to one. The construction of flat roofs is very similar to that of footpaths, which we have already described, only tiles are generally substituted for the sheeting. In fig. 2 is represented a

FIG 2



section of a flat asphalted roof. Joists of timber are laid at the ordinary distance apart, tiles placed so as to span the intermediate distance, and the covering completed in the ordinary manner. A thin layer of very fine concrete must be laid under the asphalte, as the heat suddenly applied might be injurious to the tiles. There is no absolute necessity for employing tiles, as the joists may be covered with well-seasoned sheeting laid in the same manner as for a floor, and well trussed or bridged together. At the new City Prison, Holloway, an excellent roof has been constructed by the Seyssel Asphalte Company, which we personally inspected. It is of a superior description to the construction we have mentioned, being supported by tiles resting upon the flanges of cast-iron girders, and forms a very solid piece of work. Although executed nearly twenty years ago it is as sound as when it was first put up. The greater part of the roof is in large rectangular flats, but portions are laid upon rather a sharp pitch. In the latter case arches are turned in tiles, the only difference being that a little more care is bestowed upon the laying of the asphalte owing to the tendency it has of not distributing itself so evenly as in the instance of a perfectly flat surface.

Considering that a very inflammable substance is one of the chief ingredients in Pyrimont asphalte, it might be reasonably imagined that it would be a dangerous description of roof covering to employ, with respect to its liability to take fire. Experience has not only disproved this assumption, but has demonstrated incontestably the very reverse. It has been a subject of remark that at all fires, those roofs that were constructed of Seyssel asphalte, instead of encouraging or feeding the flames as it were, actually did the very reverse and aided to extinguish them by literally smothering the rising blaze. This fact was especially noted during the great fire at Hamburg some years ago, and the authorities in charge of the British Museum took the precaution, very properly, but in this case unnecessarily, of testing whether the Pyrimont asphalte was combustible or not before they allowed it to be used in the construction of the dome of the new reading room. Similar doubts have been entertained respecting its suitability for warm climates, but the temperature to which it may be exposed is of no consequence. By slightly varying the relative proportions of the ingredients it can be adapted for work in any climate, whether the extreme temperatures are excessive or whether an average mean is the prevailing one. In our own country asphalte roofs undergo a great variation of temperature throughout the entire year, and in corroboration of this assertion, we quote rather a curious instance of the statistics of temperature. At the prison at Holloway, to which we have already alluded, a register has been kept of the daily temperature for the last fifteen or sixteen years, and it presents the following record with regard to Christmas day, 1860. At 6 a.m. the thermometer was down to 10 deg. Fah. At 8 o'clock it rose to 13 deg., at 10.30 to 17½ deg.; at noon it marked 25½ deg.; and at 2 p.m. the maximum of 30 deg. was registered. Assuming the extreme summer heat to have reached as high as 100 deg. the Holloway prison roof has consequently undergone a variation of temperature ranging through 90 deg. Fah. without evincing any sign of being affected by either of the extreme limits. Some excellent specimens of roofs executed in Pyrimont Seyssel asphalte came under our notice at the Tower, and upon one of the flats heavy guns are fired, which constitutes an ample proof of the solidity and firm support it is capable of affording. At Windsor Castle, Buckingham Palace, Guy's Hospital, Woolwich Barracks, and numerous other public and private buildings, the Seyssel asphalte has been applied with signal success. From our own observations, which have been very extensive, this material appears to be totally unaffected by alternations of temperature, and completely impervious to the ordinary attacks of the weather, and might be almost said to constitute a species of everlasting protection against heat, cold, humidity, and wear and tear.

MONSIEUR LAMEIRE'S DRAWINGS AT THE ARCHITECTURAL EXHIBITION.

SECOND NOTICE.

I WILL now give a description of M. Lameire's nine large drawings. No. 196 gives us a large drawing of the apse, showing our Lord on horseback surrounded by the armies of heaven. The crowns upon his head are very ingeniously managed as small circles attached to various parts of the hair; the face, however, gives no indication of being like a flame of fire, nor are his garments spotted with blood. 2. A plan showing the vaulting. 3. A plan showing the pavement. It should be observed that neither of these embrace the aisles.

No. 194. The reliquary of St. John—a marble chest placed on brackets evidently over an altar; on the top of the chest is a bronze eagle trailing his wings, a new idea and well carried out. Of course this reliquary could not be supposed to contain a personal relique of St. John the Divine. See the tradition of his death in the "Golden Legend." This frame also contains three sections of the porch, a perspective of ditto, and a large drawing of the figures on the top of porch. These consist of an angel in Byzantine costume on horseback, holding the labarum. At the feet of his horse are colossal heads of the four divinities that Christianity has conquered—viz., Jupiter as Europe, Buddha as Asia, Isis as Africa, and Huitzilopuchtli as America. It is much to be lamented that our artist has omitted to give us his idea of this latter divinity. In the current number of *Notes and Queries* (May 22) will be found a description of this idol, highly suggestive in an art point of view.

No. 199. A section of the building from the east end to the third bay of nave. No. 198. A perspective of upper part of one bay to a large size. We learn from these two drawings that M. Lameire proposes to confine his glass to grisaille work, as ought almost always to be the case in highly coloured buildings, otherwise the colours of the glass are apt to injure and weaken the colour of the paintings.

No. 192. Perspective of apse and vaultings of central bay. No. 193. Details of ditto. These two drawings deserve careful study, both for the iconography and for the decoration.

No. 197. Elevation of one side of ciborium. No. 200. Perspective of ditto. The ciborium is one of the most successful designs of the whole scheme. Around the altar are four pillars supporting balls of lapis lazuli; upon each of these balls stands an angel, clad in Byzantine costume, such costume as we see in the churches of St. Maria d'el Amiraglio, at Palermo and elsewhere. The heavy jewelled garment trails from behind upon the lapis lazuli ball, and with the wings, which are excellently treated, give the angels the appearance described by Dante, "Divini Uccelli." These angels support a velarium by each of the corners. In construction some other way than the rings shown on the drawing would have to be adopted or the velarium would certainly fall; but, however this may be, the design is most beautiful, and is further enhanced by the fringe of gold pendants and crystal balls. The lions at the bottoms of the pillars are by no means so successful; the backs are too much curved and suggest the idea of weakness.

No. 191 contains two bays of the frieze, extending from Clovis to St. Louis.

No. 195 ditto, beginning with Joan of Arc and ending with Napoleon.

Such are the drawings of M. Lameire, and, as such, one would naturally expect to find a crowd of English architects and amateurs round them all day; that a railing had been placed to prevent the said crowd pressing too closely; that people were waiting in Conduit-street before the doors were open; that young students were begging or borrowing money to come up from the provinces to have the benefit of their study. Alas! if anyone imagines this state of things he imagines very wrongly. During the time these notes were made, involving four separate visits at different periods of the day, there were at no time more than three or four visitors in the room—more frequently, indeed, there was only one.

Upon inquiry of the attendant it came out that on Tuesday nights, the only ones on which the exhibition is open, there is an attendance of some 18 to 20 visitors, principally, so I was informed, architects' assistants. The additional information was also volunteered that these Tuesday night visitors took a good deal more interest in the exhibition than did the day visitors, and that they both sketched and took notes of the French drawings.

Now, figure drawing and coloured decoration are the most, or two of the most, difficult parts of an architect's profession; and we all know how awkward it is for the younger members to be in advance of the elder members in any profession. Slowly, but surely, day by day, the art architect is making good his position, he is gradually being more appreciated by the public, who, on its part, is also gradually becoming more educated (thanks, above all, to South Kensington*) in matters of art. In a few years the same man will not be paid by a percentage on decoration, as he is now for a workhouse; nor will he be expected to do dilapidations and surveys at the same time that he designs sculpture for a cathedral.

When the time does come, as come it will, it is not improbable but that some of those architectural assistants who now spend their evenings in studying M. Lameire's drawings may be moved into high places, while those gentlemen who prefer the comforts of their club or suburban villa to such mental exertion may find themselves left out in the cold.

W. BURGES.

NEW BUILDINGS FOR THE PUBLIC DEPARTMENTS.

THE report of the Commission appointed by Treasury minute of November 23, 1866, to inquire into the question of accommodation of public departments was issued on Thursday last

* South Kensington Museum must be carefully distinguished from South Kensington School of Art. While the latter has been a comparative failure, the former deserves almost unmixed praise. The museum now quite equals if it does not beat, that of the Hotel de Cluny; the only thing wanting being a room where students could have the objects out of the cases. In the library, a book is produced in five minutes, to obtain which would take half an hour in the British Museum; and there is a most excellent catalogue of art books in preparation. Why should not South Kensington obtain M. Lameire's drawings; or, if he be unwilling to cede them, why not have them copied by the artist?

week. The committee state that they have thought it expedient to consider :—

"The number of storeys of which it would be convenient that public offices should consist; the space now occupied by each department, and that which when its various offices are concentrated will probably be required; the departments which require concentration in the neighbourhood of Whitehall, and those which may conveniently be housed in Somerset House or elsewhere; the most advantageous mode of grouping the departments at Whitehall; the best site in the neighbourhood of Whitehall for the concentration of these departments; the probable cost of purchasing that site, and erecting thereon suitable buildings; and the return which may be expected from the sale of existing offices and from terminating existing leases of houses used for office purposes. In prosecution of our inquiries under the above heads, we have derived great assistance from Mr. Scott and Mr. H. A. Hunt, and have taken the evidence of the heads of the great military departments' report. We likewise found it desirable to refer the question of space required for each department to a sub-committee of our body. The sub-committee recommended that the public offices should consist of four floors available for office accommodation, and we adopt their recommendation. Being of opinion that the close approximation of the military and naval departments is highly desirable, we directed our early attention to the best mode of accomplishing that object; and attaching weight to the reasons assigned by the Commander-in-Chief for retaining the Horse Guards on its present site, we recommend that the War Department should occupy the site now appropriated to Dover House, and the offices which lie between it and Downing-street. With respect to the site of the future Admiralty, we have considered the desirability of a new building providing for office accommodation and official residences being erected between Parliament-street and the River Embankment; and though of opinion that such a plan has very considerable advantages, we think, on the whole, it is better that the Admiralty should remain on its present site, augmented by the addition of the present pay office. The subjoined figures will show that the space thus proposed to be allotted to the great military and naval departments is sufficient for their estimated requirements :—

	Ft.
Building space required for Admiralty by sub committee's report	44,000
Add for three official residences	15,000
Total of	59,000
Building space required for Horse Guards	19,400
For War Department	62,000
Total of	81,400
Building space available on Admiralty site	60,000
Building space available for Horse Guards and War Department	87,000

The total requirements of these departments are thus shown to be 140,000ft., and the available space 147,000ft., leaving a surplus of 6,600ft. available for future growth.

"Should this recommendation be adopted, it would seem to follow as a most convenient if not necessary consequence, that the civil departments should be all concentrated in a line with the military and naval departments, on the area bounded by Downing-street on the north, Great George-street on the south, Parliament-street, widened by the incorporation of King-street, on the east, and St. James's Park on the west.

"The advantages attaching to such an arrangement are great, and may be summarised thus:—All the public offices would be accessible to the public from one grand thoroughfare on their eastern side, while intercommunication between them all being secured without crossing any public street, they would on the western side face the park. It would thus be actual concentration, combining accessibility with quiet. All necessity for subways would be avoided. The Horse Guards would remain untouched, and the Treasury and the offices adjacent need not be disturbed until the buildings destined for their final accommodation are ready. The question of site, and the position thereupon of the great military departments being thus disposed of, we next would direct your lordships' attention to those civil departments which we think ought to be concentrated in the neighbourhood of Whitehall, and to the most advantageous mode of so locating them. We agree with the opinion expressed by our sub-committee, that the Colonial and Home Offices, with their respective dependencies, should occupy the vacant space of the quadrangle now partially occupied by the Foreign and India Offices. Assuming the frontage of the new street to be as proposed by Mr. Scott, sufficient space can be secured for the requirements of those two secretariats, and we are of opinion that those offices should be erected without delay. The space required for these departments is 46,950ft., and the proposed site will afford a building area of 46,000ft.

"The other civil departments which it appears to us expedient to concentrate in the neighbourhood of Whitehall are—1. The Treasury, the Office of Works, the Office of Woods, the Audit Office, and the Paymaster General's office. Their requirements may be estimated at 54,000ft. 2. The Council office, the Board of Trade, and the Education Department—their requirements amount to 38,650ft. 3. The Poor Law Board, requiring about 8,000ft. 4. The Civil Service Commission, requiring 10,000ft. And 5, temporary commissions, a fluctuating but growing service, for which, looking at the general composition of such commissions and their present and probable future number, we think a certain amount of accommodation in the neighbourhood of the public offices and the Houses of Parliament ought to be found. From a paper submitted to us by the First Commissioner, and drawn up by Mr. Austin, on whom has of late years devolved the duty of providing accommodation for such commissions, it would appear that their requirements will probably amount to 28,225ft.; as, however, it is not necessary that accommodation should be found in this neighbourhood for all such commissions, and as by means of the Thames Embankment, the proposed railways, and the steamboats, easy communication will be obtained with Somerset House, where a considerable amount of space will be rendered available by the contemplated removal of various branches of the public service and of the learned societies now located there, it will probably be sufficient to allow 15,000ft. for this service, bringing up the space required for the departments proposed to be placed on this block to 126,650ft., the space available amounting to 133,000ft., thus showing a surplus of 6,350ft. It may be convenient here to call your lordships' attention to the fact that in this calculation no provision has been made for official residences for the First Lord of the Treasury and the Chancellor of the Exchequer.

"When the plans of the new Foreign Office were under discussion it was recommended by the Select Committee of the House of Commons that the Secretary of State should be provided, not with an official residence, but with a handsome suite of rooms, in which receptions could occasionally be held by every minister; this has since been done; but it appears to us that a similar arrangement might conveniently be made with respect to the First Lord and the Chancellor of the Exchequer, by which they might be provided with rooms applicable to the double purpose of official and social receptions.

"We now come to consider the probable cost of purchasing the site and erecting thereon suitable buildings. The total cost of purchasing the property before referred to, but exclusive of that already acquired, is estimated at £1,443,920. In estimating the cost of erecting the necessary buildings, we assume that none of the existing offices will be allowed to remain except the Horse Guards, and possibly that part of the Treasury buildings facing the parade. With these exceptions, we are convinced that neither real economy nor the public advantage will be consulted by retaining any of the present inconvenient and badly arranged offices. It is calculated by Mr. Scott that for buildings of this character, including their fixtures, £6 per square foot should be allowed. The total building space required being, in round numbers, 313,000 square feet, the cost of buildings and fixtures would be £1,878,000, making, together with the price of the ground, a total first cost of £3,321,920.

"We now come to consider, lastly, the probable returns from the sale of existing offices, and the termination of the system of hiring houses for public purposes. These returns will estimate as under :—1. Sale of the Board of Control, £50,000. 2. The sum represented by the capitalisation of the annual value of premises now occupied by public departments, but which would hereafter be accommodated in the proposed new buildings, cannot well be estimated at less than £175,000, making a total set-off of £525,000 to be placed against the total first cost of £3,321,920, leaving a nett cost of £2,796,920.

"Whatever may be the expense of erecting the new public offices, the work is intended for the convenience and the ornament of all future generations. Heretofore little has been done towards this object, and now it has to be done once for all. The charge ought, therefore, to be spread over a long period, like that for the new fortifications. Otherwise the present taxpayers would defray the whole expense, and a work which ought to be vigorously prosecuted at several different points, in order to avoid serious delay and inconvenience, would be subjected to the uncertain contingencies of the Chancellor of the Exchequer's annual Budget. All the circumstances of this great undertaking suggest the expediency of providing a special agency for the superintendence of the work. The sum to be expended will be necessarily large. Several years must elapse before the new public offices will all be completed. The claims of the great administrative departments will have to be adjusted and controlled in the interest both of mutual convenience and of indispensable public economy. And experience has proved that, unless certain general rules founded upon an enlarged knowledge of official requirements are observed in planning the interior of public offices, even the most liberal expenditure will not be productive of satisfactory results. We suggest that a special commission should be charged with the superintendence of the work under the directions of, and in immediate correspondence with, the Treasury, and that this commission should be appointed by Treasury, and should consist only of three persons, of whom the First Commissioner of Works for the time being should be the President. We have hitherto considered the matter referred to us simply in connection with the requirements of the public service, but we think it right, in conclusion, to draw your lordships' attention to a public improvement, long contemplated, which we think will naturally follow the adoption of the recommendations we have made. We allude to the removal of St. Margaret's Church. When a magnificent street, 150ft. wide, has been opened from Whitehall to Westminster Abbey and the New Palace, it will become more than ever necessary to remove what will then be the only obstacle to the Abbey forming the termination of a vista which will probably be unsurpassed in any European capital. A convenient site for the church, we may point out, will be found ready at hand on the ground now being acquired by the Government to the west of the Victoria Tower. The only additional expense, therefore, caused by this completion of a great public improvement would be the sum requisite to build a new church on the proposed site. For that object a sum of £26,000 would probably suffice."

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this Association was held on Friday last, when the Rev. Edward L. Cutts delivered a lecture on "Early Brickwork." Mr. Cutts said that Mr. Gladstone some years ago had stated that he looked upon the inventors of the oar, the wheel, and the plough as the three first and greatest benefactors of the human race. To this category he was certainly disposed to add the man who first invented the method of making bricks. Probably the first way in which men obtained shelter was by the use of skins stretched over branches of trees. This he might call the commencement of timber architecture. Where timber was scarce men probably dwelt in caves, and this, without doubt, suggested the use of stone as a building material. But it was to the inhabitants of districts where stone was not to be found, and where timber was scarce, that the invention of making bricks proved of the greatest use. The subject of brickwork was universal; it embraced the period since the building of the Tower of Babel to the present time, and extended all over the world. Premising that he intended to confine his remarks to early brickwork he proceeded to describe the characteristics of Roman bricks. Not many examples of Roman buildings were left. At Colchester the town wall was probably Roman and one of the old gates. When the Romans retired from Britain nearly all the towns they had built were destroyed during the anarchy of the Saxon invasion. When civilisation again appeared the Saxons, in all probability, constructed their buildings (many of which existed) of the Roman bricks of which the demolished Roman towns had been built. About this there

was a difference of opinion. Mr. Parker and others had suggested that both Saxons and Normans made their own bricks, but in his opinion it was not so. Of brick buildings of this or a little later period we had Brixworth Church and part of St. Alban's Abbey, of which it was recorded that the bricks used were obtained from the Roman town of Verulam. At Bradwell-on-Sea a church existed of which it was almost impossible to say whether the brickwork was Roman or Norman. The priory church of St Botolph, Colchester, was the earliest instance of an attempt to use brick artistically, and it had been attended with some success. The walls were of rubble stone of a dark grey colour, and the arcades of red Roman brick, producing together a very agreeable effect. Examples of artistic brickwork of this period were, however, very few. Coming down to Mediæval times we found for the first time moulded bricks. About this time Hull became the metropolis of the woollen trade, and the advent of many Flemings probably caused the introduction of brickwork there. At Trinity Church, Hull, the two chancel side walls were of bricks, and their dimensions, 10½in. by 5½in. by 2in. proved that bricks were then getting smaller than those made by the Romans. Bricks also about this time, according to Mr. Street, were used at King's Hall, Cambridge, and cost 6s. per 1,000. It was, however, in the fifteenth century that brick became really fashionable. It was then used for Hampton Court, St. James's Palace, and many provincial halls and residences. Soon after this it became used entirely, and a little later the fashion was introduced from Italy of using terra cotta instead of stone for mullions of windows, pediments of doorways, &c. One curious thing with respect to the brickwork of this period was that they covered the work with a thin coating of plaster, and then worked it into designs to imitate masonry, or even painted it to imitate flintwork. The lecturer then proceeded to consider the bearing of these early examples on modern practice. He thought that brick, though not to be used where stone could be more advantageously employed, was by no means to be despised. How was it that ancient brick buildings satisfy while modern examples altogether dissatisfy the eye? He thought the shape of modern bricks had a great deal to do with this. Roman bricks were of a much better shape; moreover they were used with no regular bond and with very thick mortar joints, and walls thus built were certainly more picturesque than those of modern times. Brick was now used in such a staring way. To obtain a better effect the mass of the building must be broken up by making some parts advance and others recede. Panels also might be introduced, the old octagonal forms might be employed to advantage, and the sky-line might be broken by pinnacles or gables. The effect of stone dressings was by no means good, the colours seldom harmonised, and an appearance of weakness of construction suggested itself. He thought the use of terra cotta a mistake, it was nearly as expensive as stone, with a very small portion of the effect produced by the latter material. Stringcourses, mouldings, and other ornaments, whether in stone or terra cotta, should be of plain and simple geometrical patterns. The use of coloured bricks, a practice lately increasing, was, in his opinion, at the best a very hazardous experiment. Of modern brick churches in London the best examples were All Saints', Margaret-street; St. James-the-Less, Westminster; St. Saviour, Hoxton; and St. Peter's, Vauxhall. Brick would, doubtless, continue to be, at least in London, the material chiefly used for houses, and he thought that a study of early English examples would afford principles by which a common house might not be quite so ugly an object as it was at present.

Mr. R. W. Edis, in proposing a vote of thanks to Mr. Cutts for his lecture, said he by no means agreed with him in his opinion that the Saxons and Normans used the old Roman bricks. He thought that, like many architects of the present day, they were simply imitators and followed the examples of their immediate predecessors. He thought if our bricks were thinner they would be greatly improved. One great objection to the use of brick in large cities like London was its liability so soon to get dirty and lose its colour. Another difficulty was the contempt brick was held in by architects' clients, in consequence of their desire for more showy materials. He feared there was very little hope of London shopkeepers becoming contented with simple, honest brickwork.

Mr. Blashill, in seconding the vote of thanks, said that in his experience brick was most generally used in the eastern parts of England. In many parts in the west the very name of bricklayer was unknown, and such a thing as a brick had yet to be introduced. This was in consequence of the abundance in those parts of stone suitable for building. He thought that the very common practice of using bricks with Bath stone dressing was by no means commendable. Red brick and dressings of red Mansfield or sandstone afforded a much better effect. He did not think it would be well to return to the earlier sizes of bricks. Bricks of the size now in vogue, though of bad material, were most advantageous and least expensive.

Mr. Redgrave said Mr. Cutts had only spoken of red bricks, and he should have liked to have heard something from him as to the existence of examples of white brickwork. He was quite of opinion that the Saxons had used old Roman bricks, for in many instances Roman names and marks had been found on bricks in Saxon buildings. He thought the use of terra cotta by no means wrong. Where it could be used for small work it was superior to stone. He would like to know whether the brick tracery in the early examples quoted was cut or moulded. He believed that the bricks in the chimneys at Hampton Court Palace were cut and not moulded.

Mr. Edis said the bricks at Hampton Court referred to by Mr. Redgrave had been re-cut within the last twenty years.

Mr. Redgrave said he had seen some of the old work, and he was quite of opinion that it had been cut and not moulded.

Mr. Lacy Ridge thought that the wide mortar joints of ancient brickwork had something to do with the better effect produced. About the time of Queen Anne they used very small bricks placed as closely as possible, with very thin joints; but unfortunately we had adopted the system of very thin joints and had only very bad bricks. He thought the abominable practice of tuck-pointing was to be condemned.

Mr. Birch said that in the brickwork of the time of Queen Anne, referred to by Mr. Ridge, it was only in pilasters and panels that the thin joints were used.

Mr. Mathews referred to a building in Cannon street, opposite the Cannon-street station, now occupied by a telegraph company, as an example of modern red brick building. It had been rubbed down to about 2½in., and had to bond as well as it could with its backing, a practice he thought very far from commendable.

The President (Mr. R. Phené Spiers) thought that bricks were not used quite so early as Mr. Cutts supposed. He thought the earliest buildings were probably of mud, and that this was in some degree proved by the raking face peculiar to all early Egyptian buildings, adopted to give strength to the structure. In his opinion it was not till comparatively late that men thought of burning the earth they had been in the habit of using into bricks. He thought that with respect to a suggestion made as to panelling by Mr. Cutts, that panelling was hardly admissible in Gothic work; it was, of course, to be used with good results in Classic architecture. He did not at all agree with what Mr. Cutts had said about terra cotta, as, in his opinion, it was for the purposes that had been mentioned infinitely preferable to stone. Although the lecturer had only dealt with English work, he would very earnestly recommend to the members the study of Flemish and North German brickwork, as affording many very instructive and interesting examples.

Mr. Cutts briefly acknowledged the vote of thanks, and the meeting terminated.

PATENT CONCRETE FIRE-PROOF SLABS FOR BUILDING PURPOSES.

THESE slabs, invented by Mr. Nichol, of Regent's-circus, are formed of a combination of iron, concrete, and fibrous materials, made fire and damp proof. The strength and durability of these slabs have been proved to be equal to 9-inch bonded brickwork; they are non-conductors of sound, heat, cold, and damp. They are washable inside and outside, and the buildings of which they are constructed may be inhabited as soon as they are erected.

The buildings are constructed by means of skeleton iron frames preserved from rust, and filled in with the slabs, secured with bolts, with prepared felt between the bolted parts. The saving in cost is said to be 25 per cent, as compared with brick, slate roofs, and ordinary floors. The weight of iron in the triple cottage at Hampton, which is built on this principle, is under 3½ tons. The saving of space in the triple cottage is 90 superficial feet in ground, and 2,250 cubic feet in span.

The ground floors are damp proof, solid, and rats cannot penetrate them. The upper floors are waterproof, which prevents the ceiling being stained and throughout the building there are no spaces where dust or vermin can accumulate. The supports of stairs and the window and door frames, &c., are composed of iron, so as to have as little wood as possible in the building, that which is used being soaked in a fire-proof mixture. The new floors of concrete, on Captain Galton's principle of ventilation.

The advantages of these slabs as compared with other methods of building now in use are said to be as follows:—The great saving in cost and space effected by them in the construction of external walls, interior partitions, ceilings, roofs, and floors. They can be fixed by ordinary carpenters or plasterers; can be made of any thickness, and when of 1in. only they will suffice to keep out sound, damp, vermin, fire, &c., and at the same time remain unaffected by hot or cold temperatures. The exterior presents a stone-like appearance, and the interior surface is prepared suitable for papering or finished with a hard polished surface tinted with colour as fresco. They have the sanitary advantages of not absorbing water or damp, of presenting the surface declared to be requisite for hospitals, &c., that of being washable, and thus saving the necessity of frequent limewashing. This surface may be washed at any time with plain water.

Thus one of the greatest uses of these slabs will be to form the partitions in houses, especially in towns, instead of quartering or 4in brickwork, as it is practically proved that a partition 4½in. thick, formed of these slabs, is as durable and will stand an amount of pressure or concussion equal to 9in. bonded brickwork.

Partitions from 1in. to 3in. thick would be as strong as would be required. These slabs will also be found to form the best kind of roof yet invented, as they are impervious to rain or snow and not affected by heat or frost; the under surface is so finished as to form the ceiling. Entire houses can be built of these slabs, including cottages, agricultural buildings, colonial huts, military buildings. Temporary camps could be erected of them, taken down and stowed away until again required; a few soldiers could erect and take down a camp in a very short time, as the slabs are simply screwed together. The advantages in point of cost, as compared with other buildings, may be thus illustrated; a cottage of two rooms, minus windows, doors, and cupboards, but otherwise ready for finishing, may be supplied for £16.

The price of the slabs is from 2½d. per foot super. Nine feet by four feet is the size expected to be in demand, but ultimately many thousands of feet of slabbing, of that and other dimensions, will be prepared and be always ready for the requirements of builders. They can be made to order of any size, shape, or curve, and when fixed will neither warp nor crack; and, being put up in a perfectly dry state, dwellings constructed of them will be ready for use as soon as erected, which is not the case with other kinds of construction.

COMPETITION.

Mr. T. Oliver, architect, of Newcastle, has had awarded to him the first premium for his design for improving the parish church of Alston, Cumberland; Mr. T. C. Evely, architect, Durham, the second premium. The drawings are to be submitted to the "Incorporated Church Building Society," for final decision.

In consequence of the scarcity of good stock bricks—which is caused by the stoppage of water conveyance by canal, the water having been drained off in some places for cleansing purposes—the works in many large contracts have been much impeded; for instance, the erection of the model dwellings at Little Chelsea, Fulham-road, and the works of the extension of the Metropolitan Railway at the same place. Smaller jobs have also been delayed, to the disadvantage of the masters.

DISINFECTANTS.

WEATHER prophets prognosticate a hot and dry summer, and it becomes us, herefore, to look carefully to the fulfilment of all sanitary precautions for the prevention of fevers and other zymotic diseases. By no means the least of our precautions should be the liberal use of disinfectants; and, fortunately, the most efficacious of these stand ready to our hand, provided by nature, while others have been furnished by science. Cold, heat, and water, are the three great natural disinfectants. The first two of these, however, are independent of our control, and are, therefore, to a great extent useless. Water, in this part of the world at least, is always with us, and is the greatest, because the most manageable, agent of cleanliness and health. There was a deep meaning in the Greek mythology, which represented Hercules as using a river to wash away the filth of the Augæan stables. We need not, however, urge upon our readers the necessity of the free use of water, but its disinfecting action, although of great value, is not perfect and needs supplementing. Artificial disinfectants which destroy noxious substances are various. Those which destroy by oxidation are perhaps the most numerous. This is effected either by rapid combustion, by the natural action of the air (in reality slow combustion) or by chemical, sometimes aided by mechanical, agencies. A putrid or decaying body when so heated as to be deprived of all its volatile particles cannot any longer decompose. Acting on this principle the ancients burned their dead, and some have recommended its adoption as suitable for modern practice; but, apart from its repugnance to our moral sense, the immense quantity of gas arising from a dead body during combustion would seriously endanger the health of the living.

Manganates, or permanganates, are the most complete disinfectants; they not only rapidly destroy the odour of putrid matter, but they oxidise sulphuretted and phosphuretted hydrogen, as well as purely organic substances. They are the mildest form of destructive disinfectants, and their application to putrid liquids of every kind will give most satisfactory results. Only small quantities should be treated at a time, and only sufficient material used to stop the smell, or at least not much more, as the manganates are acted on both by pure and impure matter, and the material may be wastefully expended on that which is not at all hurtful.

Nitric oxide, the acting principle of Dr. Carmichael Smyth's disinfectant, is a very powerful oxidiser, and most rapidly destroys organic matter; and for cases in which gaseous fumigation is applicable, nothing can be better. No person, however, must be permitted to breathe it, and exposed metallic surfaces must be protected from its action by a coating of varnish. This was used with such good effect in ships and hospitals some years ago, that Parliament awarded a pension to Dr. C. Smyth for its application. Nitrous fumes are, however, on the whole, too dangerous for general use.

Chlorine is another powerful disinfectant. It is, however, unfitted for agricultural use, or where the offensive matter is to be retained for manure, as it destroys the ammonia, the most valuable and expensive part of any fertiliser. It is also open to other objections. As a liquid it acts too rapidly, and as a solid, in the form of chloride of lime, it soon attracts moisture and loses its power. It is also said to have aggravated and even increased cases of lung disease, when employed in hospitals at Paris. Still, as a disinfectant in cases of great impurity, it is very valuable.

Acids destroy putrefaction, but they cause the evolution of noxious and unwholesome gases. Muriatic acid, in great vogue at one time, is now entirely disused, and very properly, as its action, while offensive to the breath and destructive to many substances, is only indirect as a disinfectant. Vinegar, the old remedy of the plague doctors, is the best of acid disinfectants. Wood vinegar is the best, because it unites with its acidity a little creosote. Another ancient disinfectant is sulphur, used with presumedly good effect, according to Homer, by Ulysses when he had strewn the floor of his palace with the bodies of the suitors on his return from the Trojan war. Sulphurous acid and creosote have been united with good effect in "M'Dougall's disinfecting powder." Lime is valuable for the precipitation of sewage water, and it also absorbs sulphuretted hydrogen, but allows it gradually to pass off again. Charcoal and alum have been tried, but never on any great scale. Carbolic acid, a tar product, has been used with good results both at Carlisle and in London. Sir William Burnett's chloride of zinc is also very valuable, and has the advantage of being so soluble as to take up less room than many other disinfectants.

Some of the following are at once simple and efficacious for domestic use. A tea-cupfull of chloride of lime and a tea-cupfull of vitriol placed in a basin on the floor; a chemical action at once takes place, and the chlorine flying off in vapour fumigates every corner of the house. Birds, cats, and all domestic animals must be removed from within reach of its influence. Coffee is a good deodoriser. An iron shovel should be made red-hot, and just as it begins to cool a tea-spoonful of freshly-ground coffee thrown upon it. This may be carried about anywhere, in sick rooms, water-closets, cellars, or the like. Sulphate of iron, or copperas, may be effectively used, dissolved in water, in the proportion of one pound of copperas to four gallons of water. This, sprinkled over sinks, privies, or cellars, destroys all offensive smells. A small quantity of black oxide of manganese, and an equal proportion of spirits of salts put together in a teacup, and placed on a hot brick in the centre of the room; care must be taken to stir the same occasionally.

A liberal but not lavish use of any of these means is to be counselled. A little and often, rather than much at once, should be the rule. Above all, the value of the first-named should not be forgotten. In our moist climate the insides of houses, furniture, and household utensils become covered with a thin coating, which rapidly decomposes and gives off offensive fumes. This must be removed, and by nothing but water can it be removed so often and so well.

EXPERIMENT ON THE PURIFICATION OF SEWAGE.

AN interesting experiment on the purification of sewage was made on Tuesday, at the sewage works of the Tottenham Local Board of Health. In consequence of an injunction lately granted, which restrains the board from discharging the sewage of Tottenham any longer into the River Lea, a series of experiments was commenced with a view to the early adoption of the best mode of deodorising and purifying the liquid matter. The subject of Tuesday's experiment was a peculiar preparation of alum, patented by Mr. C. G. Lenk, of Dresden. The system hitherto adopted by the Tottenham authorities consists in the discharge of the sewage into a large tank about 50ft. long by 20ft. in width. Lime is thrown in, and the stuff is gradually allowed to settle until the solid parts sink to the bottom. The surplus fluid is then discharged into the river, and the residuum is utilised as manure. This mode has proved altogether inefficient. Not only does it render the manure comparatively valueless, but it does not destroy or mitigate the poisonous properties of the water discharged into the Lea. The consequence is that the board of health is deprived of a large income which might be employed for local improvements, and that the river is polluted so as occasionally to be a nuisance and a source of danger. Mr. Lenk's "Patent Essence," as it is termed, operates, according to the *Standard*, very differently. On Tuesday 26,000 gallons of sewage were discharged into the tank, and into this were gradually poured about sixty gallons of the "Patent Essence." At first the smell was most offensive and nearly intolerable, but as the chemical preparation mixed with the liquid the odour perceptibly decreased. After some time a remarkable change was visible in the contents of the tank. The solid substances were precipitated to the bottom, the water on the surface became gradually clear, and at the end of an hour it was found to be not only transparent, but almost clear, by contrast with its condition when discharged from the sewer. It is satisfactory to find that a chemical preparation has been discovered which is capable of rendering such useful service as a sanitary and economical agent. Mr. Leunig, who holds the English patent, is so confident of the purifying power of the fluid that he is ready to enter upon experiments on a far larger scale with a view to the possible solution of a problem which has long puzzled sanitarians.

LABOURERS' DWELLINGS.

AN application was made on behalf of the Metropolitan Board of Works for the magistrate's certificate, under somewhat novel circumstances:—It appeared that in 1866 the Legislature passed an Act of Parliament for the widening and improving of the High-street of Kensington, at the cost of the metropolis, and the 42nd clause, which was inserted at the instance of Lord Shaftesbury, provided that more than 15 houses occupied by the labouring classes should not be taken down without eight weeks' notice, by means of placards affixed on or within view of the premises. The object of the present application was to obtain possession of 16 houses occupied by the labouring classes, who would be entitled to compensation.

Mr. John Giotto, the Board's bailiff, proved seeing the printed placards affixed to the walls of the houses on the 29th of February last. Mr. Dayman looked at the 42nd clause, and found that before the Board could obtain possession of the houses a magistrate must certify that the notices or placards had been posted to his satisfaction. After hearing the evidence of the bailiff, he wrote out a certificate, which was annexed to a printed copy of the placard. A fee of 1s. was charged for the certificate.

TECHNICAL EDUCATION.

THE seventeenth annual conference between the council of the society and the representatives of the Institutions in Union and Local Boards will be held on Friday, the 19th June, at twelve o'clock noon. William Hawes, Esq., F.G.S., chairman of the council, will preside.

The council will lay before the conference the secretary's report of the proceedings of the union for the past year, and the results of the examinations; and the programme of examinations for 1869 will also be considered by the conference. The following suggestions of subjects for discussion have been received from various quarters, it being understood that in putting them forward the council express no opinion whatever upon them:—

1. How can the institutions best aid in the advancement of technical education?
2. Would it be desirable for the Society of Arts to promote the issue of a series of text-books in relation to technical education, especially suitable for working men?
3. How far can the society and the institutions cooperate with the Department of Science and Art, in carrying out the objects of Mr. Whitworth's munificent endowment?
4. What further efforts can be made by the Society of Arts to obtain the co-operation of other societies, and of the great public companies, in its educational movement?
5. How far is it possible to unite in one system, or to establish any connection between the various systems of examination which are now available for the working classes in different parts of the United Kingdom?
6. How can the society aid in promoting visits of working men to various foreign centres of industry?
7. How far would it be desirable for working men to take their holidays all at once rather than piecemeal?
8. What arrangements would enable the working classes to make more extended use of the public museums and galleries which may be available for their instruction and amusement?
9. Under what arrangements could collections of useful and interesting objects of art and nature be sent to country institutions in circulation from the metropolitan national museums?

The new theatre to be built upon the site of Lyon's Inn, by Mr. Sefton Parry, will, we believe, be called the "Royal Globe Theatre," and it will open some time in October. The works were begun on Monday, and the house will be of the second or third class size, capable of seating about 1,400 people.

WHAT IS ART MANUFACTURE?

NOTHING is more surprising in an old-fashioned country than the adherence to names and forms after such names and forms have ceased to have any meaning, or, at least, have ceased to retain the meaning and significance they at first had. Words and names are not the least of the curious things that exist for a time and then for ever pass away; we are told that no language lasts for more than a thousand years, and it is quite certain that if Chaucer were alive now no one could understand his talk. But not only do words pass away altogether, but they change their meaning and sometimes contradict themselves. There are, as all know, not a few curious instances of this, as in the word "prevent," to go before—now, to stop or hinder. But one of the most curious of them all—and which I never saw anywhere noticed—is the one at the head of this paper, viz., the word "*manufacture*," including both the word itself and the thing signified by it. May we not say that what is called civilisation itself is wrapped up in it, so that it is worth a passing notice?

The word "manufacture," then, from the Latin *manus* and *facto*, *hand-made*, or to make or fashion by hand, was defined by Johnson "to make by art, to make by hand," and a manufacturer, "an artificer or workman," so that the word in his day was understood to imply that to manufacture was to form or make by hand, art, or by skilful manipulation. Thus Sir Joshua Reynolds would not have felt offence had he been told by the great dictionary maker that his last portrait was capitally "manufactured," as implying how well it was painted; but if the present president of the Royal Academy were to hear such a remark as applied to a portrait of his own, it is but too probable that he would consider it as a studied insult. It would mean that the person so making it considered the said painting to be the result, not of the hand skill of the painter, but the result of some unseen assistance, and that not one but several hands had been employed in its production. A modern painter must feel offence, and justly, at such a remark, and the reason is that the original meaning of the word is entirely changed; that it does not now mean that one pair of skilful hands have produced a fine result, but that a *number*—sometimes ten or twenty, or more—have assisted to produce it. Manufacture is not now "hand" work but "hands" work: the art element is gone, as we shall see.

If a painting, or even a note, an autograph, or a coin or medal, were in Johnson's time good instances of manufacture and examples of individual hand skilfulness we shall not be far wrong if we take an *envelope* as it was made when first brought into use as an equally good instance of "manufacture" in those days. The paper was at first cut by hand, and folded by hand, and the adhesive gum put on by hand, and the seal impression stamped by hand, so that by passing from one person to another the perfect envelope was produced. All this is now done by a machine, and an envelope is said to be manufactured, though the *hand* never touches it from first to last. But the point to be noted in all this is that the hand skill capable of being called into exercise by one person in the manufacture of an envelope is here seen to be distributed among many, so that it cannot be said that one of these useful pieces of folded paper is the work of a "manufacturer" or skilful workman. Let it here be observed that it is probably in the nature of things, and pre-ordained, that all such work as this and all else wherein a constant repetition of the same simple art as the folding sheets of paper and then stamping them, will pass in time, and as machinery improves, entirely from the hands of human and intelligent beings to that of the insensible machine. Nails, pins, beads, and a thousand other things are fast passing away from human hands, and are becoming the work of the almost living machine. Every part of an envelope is, and can be, made as well by a machine as by the most skilful hand, but one thing only in it is beyond the power of machinery and modern manufacture through a series of hands—viz., the *die* from which the seal is impressed. This is the work of the individual and the artist, and might have been "manufactured," as a work of art, in the old and forgotten sense of the word, but cannot be "manufactured" now, in the present sense of the word, as a work of art. Seal engraving is a fine art, and cannot be done by passing the die from one to another, any more than a picture can be painted by such a process. What is here said about envelopes applies equally to a far more important subject of modern manufacture—the coinage. Coins were at first manufactured entirely by hand, and the rudest Saxon one of them was a work of art, though so rude and rough. Even the "head" on it possessed character, and professed, at least, to be the *likeness* of the reigning sovereign. It is perfectly legitimate and in the course of things that our present coins in such vast numbers should be manufactured by complicated machinery by thousands at a time, instead of one by one as they were at first; but it is hardly fair that the *die* from which they are struck should go through the same process, and that the head on the penny-piece should represent nobody, and that the figure on the other side of it so badly that it would not be thought good enough for the sign of the "Britannia" public house. In the days of good Queen Bess art had not reached its present advanced state, there were no art schools, but they managed in those dark days to engrave a magnificent portrait of that vigorous queen; why, then, should we fail so utterly now-a-days? The fact is, and this is the point to note, the idea of manufacture, as it is now understood, has passed almost entirely from the envelope and the coin; the mere making of the coin, to the *art* in it, the die-cutting; and, as the envelope and the coin are cut, folded, and struck off, so is the die cut—anyhow.

But not only has the word and the subject of manufacture changed, but that change has necessitated the employment and invention of a new word to express the change that has taken place. Manufacture in its first sense has yet to come again, for it is simply art as produced by individuality of work, as in painting; but manufacture as it is now understood is fast passing from the region of workmen to the machine; the business of the workmen being merely to stand by and watch its working. A new word is wanted to express this wonderful idea, that of the almost self-conscious living power of the machine. "Machine-facture" is a long word, but it perfectly expresses the idea—that of the production of a work, as an envelope, or a coin, by the simple and sole power of machinery. It is no false exaggeration to say that a man may drop into a trough at one end of a long room a bundle of rags, and passing to the other end, may get back his bundle in the form of paper envelopes ready for use and the post office, without the human hand ever touching either rags or paper. This tremendous living power of machinery in modern days is more surprising than anything in antique Eastern fable, but it may well be doubted whether the mental if not bodily gain was not greater in those days than in ours, for the very absence of the machine compelled the use of the hand, and art was consequently the inevitable result. Manufacture and machinery, by travelling beyond their legitimate and proper place and action, have destroyed art, by taking it out of the hand of the individual artist, and have either given it to many workmen, acting successively, and so destroying each other's work and individual impression both manually and mentally; or they have put the work wholly and passively into the power of a machine. The first of these disastrous consequences may be seen in the production of a painted glass window—the work of a succession of hands; there is and cannot be any *handwriting* on such work, for one workman obliterates what his fellow workman has just done precisely in the same way as the genuineness of a letter would be destroyed by the writing over it with a fresh pen by another hand. It may be seen, too, in modern engraving, where half the work is done by a ruling machine. The only part of a modern engraving of the slightest artistic value is the preparatory *etching*; the engraving simply destroys this, and obliterates the art hand-writing as seen in it. It is a phase of modern manufacture, and a truly unfortunate one. Let it here be thoroughly understood that no objection is being made, even were it possible, to manufacture in its proper and honest sense, as a means of doing a vast quantity of necessary work in the shortest and easiest possible way. Miles of cloth and calico, and millions of nails and needles, can only be produced by machinery and manufacture. Like envelopes they are utterly beyond the power of production, one by one, nor is it necessary that they should be produced singly and by hand. Art may be multiplied by manufacture and machinery, but it cannot be created by them. The die for a coin must be cut by hands, as a picture is painted by hands, but it may and must be made to multiply the coins impressed from it through manufacture and machinery—*i.e.*, by the division of labour and the coining press.

Thus it will be seen that this vital and interesting subject of art action, and the words which express it, have changed in these modern days in a way not a little remarkable. The word "manufacture" and the thing signified by it have come to be so altered from what they at first meant, that their meaning and intention are now completely reversed. Not only is this so, but the very word "manufacture" must cease to have a meaning at all, for some other word or phrase—as the one we have ventured to suggest *machine-facture*, or some other, will doubtless come into use to express perfectly the new idea, unknown to antiquity, that of the production of an object solely by machinery. This word, then, to express the multiplication of objects or art objects by machinery, would seem to necessitate the use of another word of equally significant and accurately descriptive import to express the idea of art production by the hand of the individual artist and workman, and I can think of no better one than "art handwriting." It is thoroughly descriptive and explains itself, and means simply that, as in a common note, the artistic faculty in a man can only find expression through himself and through his own mind and hand. I hope to develope this more at length. The painter *writes* on canvas. The sculptor writes on stone. *No other hands can do these for them.* "Art handwriting" expresses both personality and individuality, the primitive and foundational ideas of art action in nature.

C. B. A.

In consequence of the death of the Rev. Pierce Butler, the arrangements for the survey of Mount Sinai, which it was proposed should be made by an officer and party of Royal Engineers from the Ordnance Survey, under the direction of Colonel Sir Henry James, R.E., were necessarily suspended. The Rev. H. G. Williams and the Rev. F. Holland have now offered to assist in the undertaking, in conjunction with Sir John Herschel, Sir Roderick Murchison, and Sir Henry James, the trustees of the fund; and if a sufficient sum is raised by subscription to defray the cost of the survey, Sir John Pakington, Secretary of State for War, has given his consent to allow the party of engineers to undertake this survey, and to go out for the purpose in October next. The estimated cost of the survey is £1,220.

BURLINGTON HOUSE COLONNADE.

ON Friday evening last, Mr. Beresford Hope called attention to the proposed demolition of the colonnade of Burlington House. It was announced in an advertisement that the "valuable materials of the colonnade, with Doric columns and frieze," were to be sold, and Mr. Hope deprecated the idea of "knocking-down to the highest bidder such an interesting specimen of architecture of the last century." As it was to be removed, he thought that the Government should re-erect the colonnade and portico in one of the public parks or gardens—at Kew, or South Kensington, or Kensington Gardens. There can be no question that the colonnade where it is possesses all the charms which Mr. Hope enumerates; but, if it were removed to either of the places mentioned by him, unless it were made the entrance to some public building, or park, or garden, it would be something like a fish out of water. One correspondent says that, with a trifling expense, the colonnade might be made "an ornament to the metropolis—in fact, a miniature piazza of St. Peter's." He does not say, however, where it shall be put up. Another correspondent is more precise. He suggests that the gateway be re-erected at one of the entrances to Kensington Gardens; and the colonnade re-adapted as a termination to one of the main walks of the same gardens," where it would form a most convenient and appropriate resting-place for the public, and a refuge from the rain." No doubt nursery-maids would be much obliged to the Government for such a privilege. As it is determined to remove the colonnade, as it is a unique specimen of architecture, well worthy of preservation, and as it may be preserved on some other site by a trifling expenditure of money, let us hope it will not be utterly destroyed. The Government, through Lord John Manners, announced, on Tuesday evening last, that it shall not be submitted to public auction.

THE APPLICATION OF TOWN SEWAGE.

MR. THOMAS CARGILL, C.E., who has paid much attention to town sewage and the best modes of applying it to general farm crops, read a paper on the question before a meeting of the Farmers' Club, at Maidstone, on the 20th ult. We have only room for the following portion of this exhaustive paper:—

Admitting the practicability of applying sewage to every possible description of soil, with nearly equally good results, it is still evident that the management must be varied to suit the particular nature of it. A much larger quantity of sewage may be applied in the case of light, porous, gravelly soils than upon stiff clays, particularly during the first year of the application. It would appear that gravelly soils require a certain time to become thoroughly saturated with the sewage, and absorb it greedily while the operation is in progress. This fact is corroborated by the experience acquired at Barking. When the sewage was first brought on to the land an enormous quantity of it went to waste in the carriers, which, being cut in the gravelly soil, absorbed it with extreme rapidity. The settling tank was, in consequence, not used for a long time, in order to allow the sewage to carry as much mud along with it as possible, and, by depositing it in the carriers, render them ultimately water-tight, which appears now to be the case. The practical lesson to be learnt from this is that if the supply of sewage was very limited, and the ground of an exceedingly porous nature, it might be worth while to make the carriers water-tight by puddling them, or by other means. During the winter time, when the crops are stationary, stiff soils probably retain the fertilising constituents of the sewage better than the lighter descriptions of land. With all crops of a rapid growth, as grass, which quickly assimilate the elements they require from the soil, the character of it is not of much consequence. Three different descriptions of soil are sewaged at Croydon with much success. One is a sandy, gravelly soil; another gravelly mixed with loam; and the other a stiff clayey one.

The question of the proportion of land to be sewaged by a given population, however interesting it may be to local boards, does not much concern the farmer, but it may be generally accepted as a good practical estimate that one acre of ground will require the sewage of one hundred persons to yield annually forty tons of grass. The application annually of 5,000 tons of sewage per acre is calculated to give a certain average return of thirty tons of grass. This quantity is sufficient to supply all the potash needed by the plant, without taking any from the soil, but if the latter be rich in potash a less amount of sewage will suffice. It is impossible to state, with respect to grass crops, the exact limit at which the application of sewage ceases to give a productive return. Between 5,000 and 6,000 tons is the most profitable quantity under all circumstances to apply annually per acre, but at Edinburgh over 8,000 tons is the usual allowance. One point is very certain, that is, that after a given quantity of sewage has been applied the application of more is not attended with a proportionate increase in the result.

There are three principal methods of actually applying the sewage to the land, known respectively as the hose and jet system, the method of sub-irrigation, and the method of surface channels. There is a fourth plan of irrigation, by total submersion, or literally laying the land for a certain time under water. This is practised in Piedmont and other continental districts, but as it is not applicable as a rule to sewage I need not discuss it. In describing these different methods the sewage is supposed to be brought upon the farm ready to be distributed. The means of conveying it, whether by pumping or by gravitation, are connected with questions of engineering works and estimates which would be out of place for me now to allude to. To commence with the hose and jet system. Small pipes are first laid down, through which the sewage must be forced. To accomplish this it is necessary to have a certain head of water, not less than about 10ft, which entails a great waste of power, consumed in not only overcoming the friction of the pipes, but also in imparting the requisite momentum to the jet. By this system the sewage must always be raised a few feet higher than the level of the land, a disadvantage not occurring in either of the other two methods. The hose and jet plan can be applied to land of any form of surface without the necessity of any especial preparation or laying out in beds. But as a balance against this advantage must be set the cost of the piping, hydrants, and other appliances, which will exceed that of the preparation of the ground for the application of the other principle. On the farms of Alderman Mechi and Mr. Neilson the hose and jet system has had a partial success, but then it must be remembered that town sewage is not used, but liquid manure, which is a much stronger and more concentrated fertiliser than the former. Moreover, at these two places ordinary farm manuring is carried on as well. The dragging of a long length of hose among crops is a troublesome and tedious operation, to call it nothing worse, and grass could not well be sewaged in this manner, except during the early stages of its growth, which would not suffice to produce the splendid annual crops which have been obtained at Edinburgh and Barking. In the best seasons at Edinburgh so much as eighty tons of meadow grass have been got off one acre, which was sold for £35. The utility of this method is very much impaired by the restrictions imposed upon it with respect to time, since one of the most important features of the application of sewage is that it should be able to be applied at any and at all times, in the day-time as well as the night-time, and at any stage of the growth of the crop. Objections have been taken to the fact that the distributing of the sewage over the crop, instead of applying it direct to the roots, is wrong in principle, and that a deposit is thereby left upon the leaves and those portions of the plant above ground, exceedingly injurious to its growth.

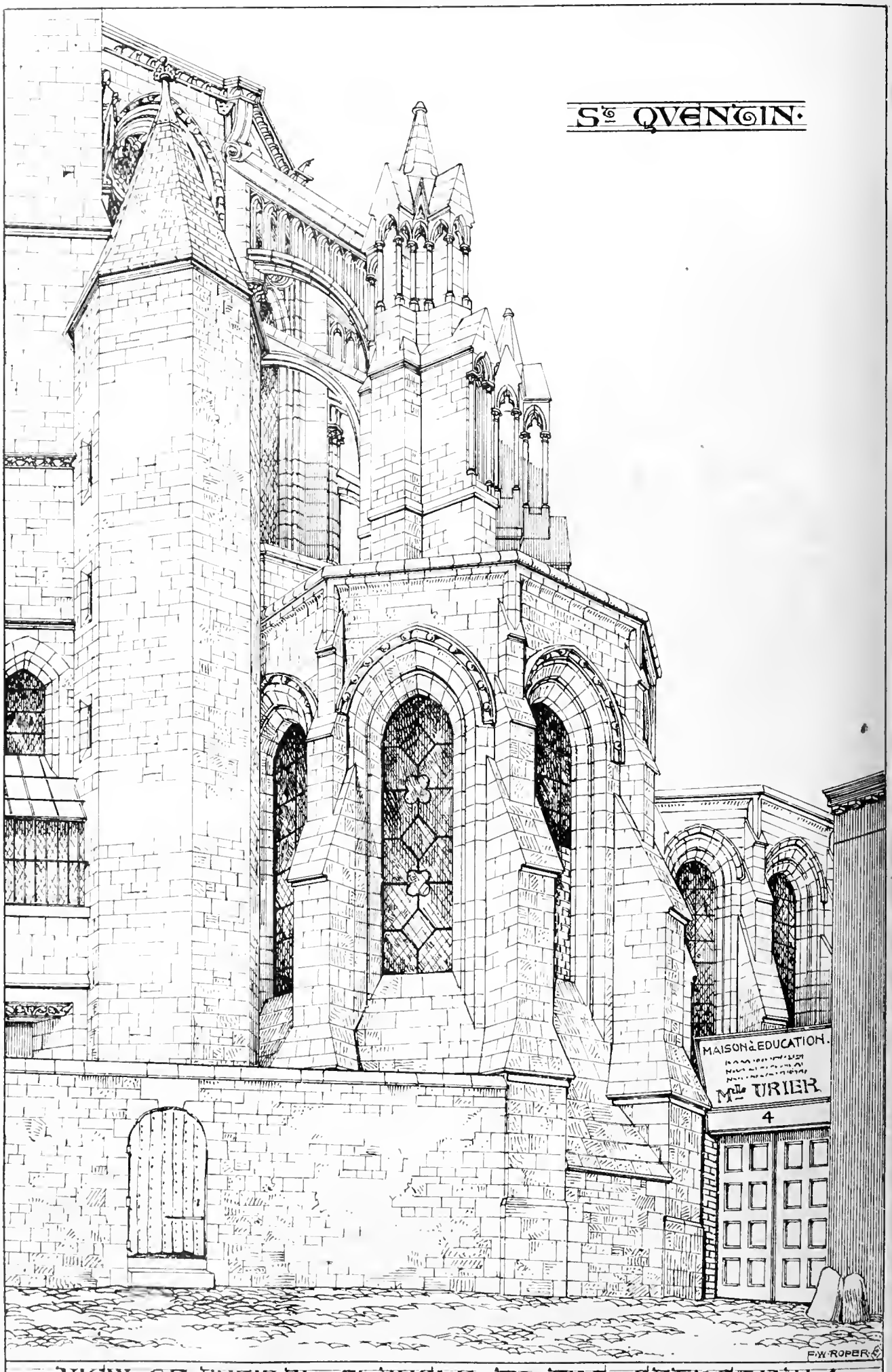
At Rugby, Alnwick, Watford, and other localities, the hose and jet method has totally failed. Mr. Rawlinson, the well-known commissioner of sewers, has stated that it would cost more to distribute 500 tons of sewage per acre by means of this method than to apply 5,000 tons by the system of surface channels.

The second method, namely, that of sub-irrigation, has not been practically tried except on a very small scale, as it is not only a very expensive plan, but also promises little hope of being successful. It consists in laying down below the top soil porous or perforated pipes, the ends of which can be closed when required, and the sewage forced through the pipes into the soil. Now it will be at once apparent that as the pipes must be laid at such a depth as to be out of the reach of the plough and other tillage implements the plants scarcely derive the full benefit that they ought to from the sewage, more particularly as it is distributed very slowly, and is in some danger of complete stagnation in the interior of the pipes, owing to the stopping up of the holes by solid deposits. It is not by any means clearly established how these underground pipes act, or whether a portion of the sewage does not drain away from them instead of rising to the level of the roots of the plant, in which case the waste might be very great. Under certain conditions the pipes used for ordinary subsoil drainage may be made to answer the purpose of this system by merely stopping up their outlets during the season of irrigation. This plan has been adopted in Switzerland and a few other places.

Of the three methods, that of surface channels is the only one which has been attended with undoubted success, and as it is the one I should recommend to be adopted I shall describe it more in detail. It is the only principle applicable upon a large scale to sewage irrigation, and fitted to contend with the difficulties that have to be encountered. It may be subdivided into three distinct kinds, namely the catch-water, or catch-work plan, the pane and gutter, and the ridge and furrow. All of these are distinguished by their simplicity and efficiency, and the adoption of one or other depends upon the physical features of the ground. The catch-work plan is best adapted in the case of steep or even hilly grounds, and is the cheapest mode of applying sewage. The ground having been first carefully levelled over, or contoured, as it is technically termed, gutters or carriers are cut along the contour lines at convenient distances from the top to the bottom of the field. These carriers are cut transversely to the slope of the ground and are perfectly level in the direction of their length. The sewage being brought into the uppermost carrier fills it, and then flows over the edges on to the land into the lower carrier, and so on until it reaches the lowest one, which conveys it away to the outlet.

A MARBLE RESTAURANT.

A NEW restaurant, of more than ordinary pretensions, to be known as the "Westbourne," has just been opened in Spring-street, Paddington, opposite the departure entrance of the Great Western Railway. The building is entirely constructed of different kinds of marble. The wall, in rear of the bar, is covered with coloured marbles of the choicest description. The pilasters, which divide this wall into panels or mirrors, are of Spanish jasper marble, with bronze bases and capitals, the whole resting upon a ground of green marble, illuminated with incised lines of gold. Supported by the capitals runs a frieze of bright jasper, with inlaid panels of Vert des Alpes marble, and above this is a bold and massive cornice, carved in figured Bardilla marble, from the centre of which rises an elegant entablature, bearing the name of the proprietor. This entablature is executed in Bardilla and jasper, with panels of Genoa green marbles. At each end of the cornice is arranged a circular pediment, the striking effect of which is heightened by some elaborately carved festoons of flowers in high relief on a rich red ground. The counter or bar is constructed entirely of marble. The plinth, standing upon a tesselated pavement, is of speckled Coquille, and the moulded base of Bardilla marble. The pilasters are of jasper, out of which in the solid block have been wrought circular niches for the reception of bronze figures supporting the cornice. The panels separating these figures are of black marble, inlaid with green and jasper marbles of alternate designs. The frieze or upper part of the panel is also of black marble, relieved by finely cut gilded lines. The cornice is of Bardilla marble, and the counter top of long slabs of the same material, with which correspond the tables and other fittings. The whole of the marble work is polished. It has been executed by Messrs. W. H. Burke and Company, of Warwick House, Regent street, under the direction of the architect, Mr. A. Evers, of Great Marlborough-street.



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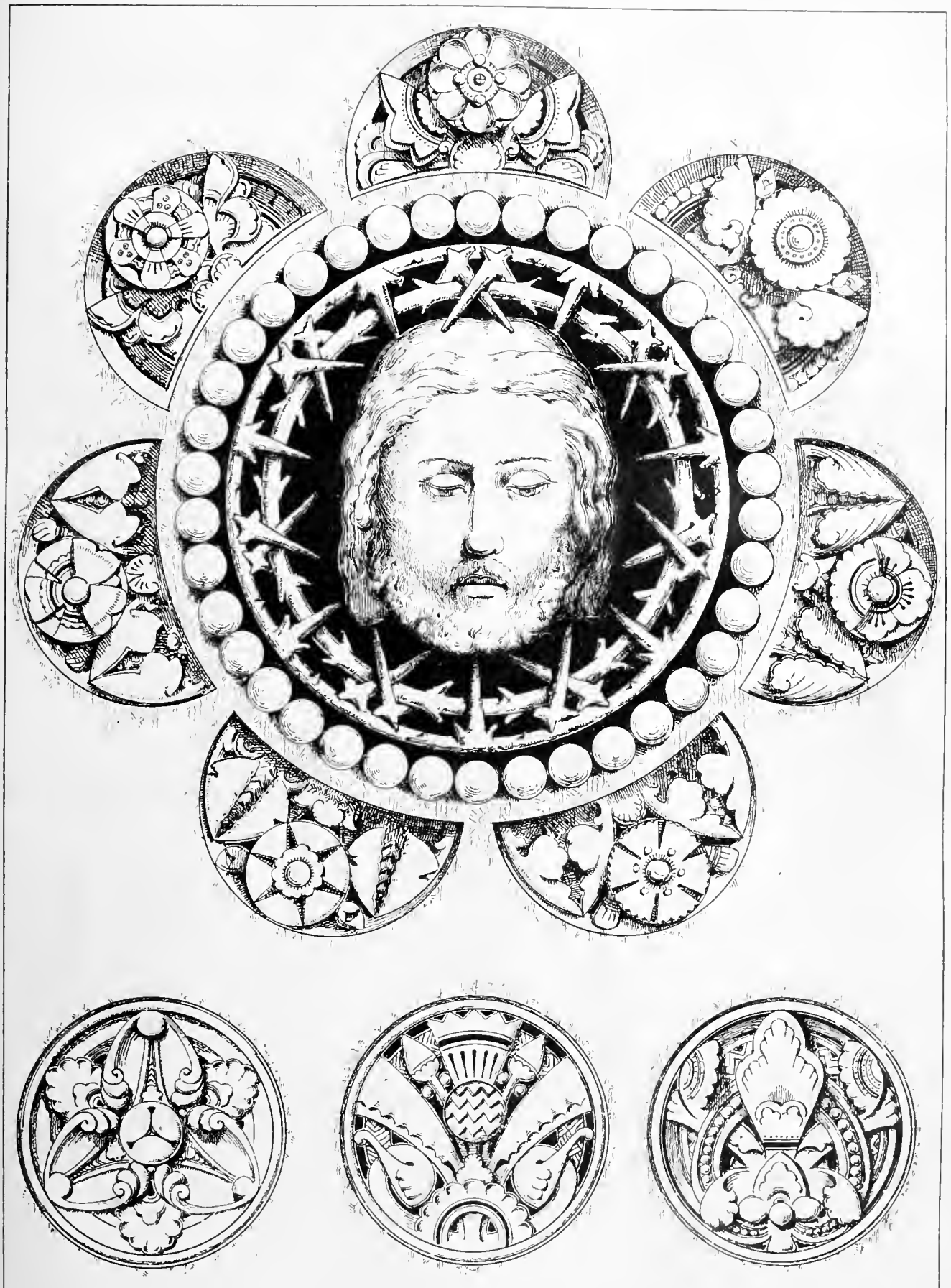

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THE NEW LAW COURTS AND THE NATIONAL GALLERY.

WE suppose the vexed question of the Law Courts is settled at last. No competition of modern times has excited half as much interest as this one. The character and dimensions of the work, the number and reputation of the architects invited to compete, invested the matter with an unusual interest. After much discussion and long delay the judges gave their award, but, instead of selecting as the best the design of one of the architects, two architects were selected—the one for his architecture, and the other for his plan. In this there was manifest unfairness; and the other competitors naturally enough demurred. It was contrary to the conditions that two architects should be jointly chosen to superintend the production of the great national work. Mr. Street and Mr. E. W. Barry were scarcely the two men to be yoked together. In fact, two men more unsuitable for joint action in such a matter could scarcely be selected. Besides, this decision was made in the face of the recommendation of the committee of barristers and solicitors. It was known from the commencement that Mr. Waterhouse had highly satisfied the judges and barristers by his Assize Courts at Manchester, and their committee almost unanimously pointed out the superiority of Mr. Waterhouse's plans. So the matter was brought to something like a dead lock, and so it remained up to the beginning of last week. A fortnight since Mr. Baillie Cochrane brought the question before the attention of the House of Commons by suggesting that the site intended for the new Courts should be abandoned, and that they should be erected on the Thames embankment. He and Mr. Montague Chambers, who followed him, gave good reasons for this change of site. It was, they said, more commanding, more level, less expensive, and more convenient. It was urged that the site was not thought of, because it did not exist at the time it was decided to erect the Law Courts in the Strand. On æsthetic grounds there is much to be said in favour of rearing a magnificent building on the banks of the Thames. But it having been decided by the Legislature, after many discussions and mature consideration, that the Strand site was the best—after the houses had been cleared away and hundreds of people had been turned adrift—after £789,000 had been paid for the site and in compensation to persons inhabiting dwellings thereon, it was not likely that a new site would be chosen. We do not, however, complain of Mr. Cochrane for introducing the question. Possibly he hastened the decision, which will no doubt be acted on.

The matter, as we said, having been brought to something like a dead lock, it was necessary that something should be done to save the credit of all parties. How, then, was the knotty point to be solved, so as to give the least disappointment? Messrs. Street and Barry could not be selected without violating the spirit and form of the original conditions. Some one therefore judiciously hit on the happy thought of giving the Law Courts to Mr. Street, and the National Gallery to Mr. Barry. It will be remembered that a limited competition for a new National Gallery was invited almost simultaneously with that of the Law Courts, and that Mr. Street and Mr. Barry were competitors in each. The National Gallery designs as a whole, though eight distinguished architects entered the field, were considered unsatisfactory, so much so, in fact, that it was supposed that neither of them would be selected. So long a time had elapsed since the designs were submitted, and nothing having been done, everyone looked on the competition as barren of results. It now turns out differently. Mr. Street is to have the Law Courts, and Mr. Barry is to have the National Gallery, and so the matter is settled by a cunning and, let us hope, a satisfactory compromise. Such an arrangement is a happy stroke of diplomacy. It is worthy of the Prime Minister himself, though he is so busily employed in mesmerising his party in the House of Commons that we can scarcely expect that he has inspired Lord John Manners.

Mr. Street and Mr. Barry having the two great national works allotted to them, a difficulty remained as to Mr. Waterhouse. There were two reasons why something should be done for that gentleman. The barristers and solicitors had pronounced in his favour, and he had considerable political influence at his back in the House of Commons. So strong, in fact, was that influence that many took it for granted from the first that Mr. Waterhouse would have been selected. He, however, was not the only one who used what legitimate influence he could to obtain the prize. Some of the friends of some of the other competitors whispered in the ears of Members of Parliament and called on newspaper editors to point out the merits of particular plans. Mr. Waterhouse, therefore, being passed over in the Law Courts, must have something; and we suppose that the same adroit genius who suggested that the Gordian knot should be cut by allotting to Mr. Street the Law Courts, and to Mr. Barry the National Gallery, added that it would be well to apportion to Mr. Waterhouse the new building at South Kensington. If Mr. Waterhouse is satisfied we will not complain. There are still two other names—those of Mr. Scott and Mr. Burges—which some months since were on almost everyone's lips in connection with the Law Courts. Mr. Scott, with his great reputation and great influence, was looked upon as most likely to be selected. In fact, for some time the pendulum, as far as the public were concerned, gravitated between Mr. Scott and Mr. Waterhouse. Neither being selected, and the latter having had tossed to him, like a tub to a whale, the South Kensington buildings, something at all events must be apportioned to Mr. Scott. In fact, we are not sure, as far as percentage goes, that Mr. Scott will not have the lion's share. He will, it appears, be the architect for the new public offices near Whitehall, which involves the expenditure of millions of public money. "In for a penny in for a pound," as the old proverb says. But what about Mr. Burges? We see no reason, though, why Mr. Scott should have this lion's share allotted to him, and if the final decision be not come to, we hope this matter will receive the reconsideration of the Treasury. Messrs. Scott, Street, Waterhouse, and Barry are no longer rival competitors, but a band of brothers in the public service. Let each one now try not only to rival, but to surpass each other, in the production of good architecture.

CARVED PANELS.

ORNAMENTAL sculpture or carving may be divided into three classes, viz., conventional, natural, and mixed conventional; and natural Egyptian, Greek, Roman, and Gothic give us examples of the first. The natural reigned supreme in the works of Grinling Gibbons and in those of his followers, while the third or mixed style is most apparent in the Renaissance and in some periods of Gothic. In the South Kensington Museum are to be found many examples of good art in all these classes—and some examples which show us more particularly what ought to be avoided. Notably in this latter class is to be mentioned the Paris cabinet of M. Fourdinois, which the "department" has seen fit to import, at some expense to the community, though for what reason the "authorities" of Olympus and South Kensington only know. In this cabinet (which is, by the way, an exceedingly clever bit of work manipulatively) nearly all the principles which guide good art are outraged; the carving, instead of being worked from the solid, is planted as a partial veneer, and, as the planted carving is frequently in a lighter coloured wood than the ground, the effect is in many instances harsh and disagreeable, and one of the great charms of low relief (the delicate softening of the raised parts into the ground) is entirely wanting. This defect is seen most strongly in the work of the lower stage, where the figures in light wood are pasted against a dark ground, giving a hard stiff look at the junction, having convexity but giving no shadow. It is not inlay, neither is it true carving, but it apes the qualities of both, and forms a hybrid which is neither fish, flesh, nor fowl, nor even good red herring. As a general rule carving should clothe the construction, but should not assume a constructive function. Even in capitals, which are usually the most weight-bearing objects for which ornament is used, this rule applies; and the best will be that which has a definite constructive bell (it may be any shape) indicated through the foliage that ornaments it. Another general rule (which, like the last, may be subject to a few exceptions) is that panel carving should be finished within the limits of the panel lines or mouldings, and should not be suffered to shoot beyond them.

J. M. S.

CHURCH OF ST. QUENTIN.

THIS noble church (erroneously called Cathedral on the plate accompanying our present number) is, comparatively to the other large churches of France, but little known to English architects; it, however, well deserves, and, in fact, amply repays a visit. The choir with its chapels dates back as far as 1257, but has been somewhat altered at a later period. The chapels, the subject of our plate, remain as nearly as possible as first built, and are a fine specimen of French Gothic. The clerestory windows of apse contain some good stained glass. St. Quentin also has a fine Hotel de Ville, of the Flemish type, built in the sixteenth century.

CABINET MAKING IN ITALY.

THE last number of the *Society of Arts Journal* contains some useful information on this question. It appears that the manufacture of furniture is one of those industries which have been carried on in Italy successfully from an early period up to the present time, without having fallen off in importance or declined in any way. During the middle ages, and especially at the Renaissance, the national as well as foreign palaces, royal dwellings, and museums, were filled with *chefs d'œuvre* due to the skill and taste of Italian artisans who were worthy of the name of artists. Although wood carving in Italy does not seem to have aspired, as in northern countries, to infinite richness—and perhaps heaviness—of the ornaments, and to crowded minuteness of detail, it has always preserved that good taste in design, purity in outline, and good proportion, which it has inherited from antiquity. Sienna may be considered as the first cradle of the art, and, up to the fourteenth century, was famous for its wood carving. During the seventeenth and eighteenth centuries this art fell somewhat into decline, but of late years has been revived by many distinguished artists. Amongst the wood carvers whose rich and varied works are an honour to Italian industry, must be mentioned MM. Barbetti, of Sienna, whose vast establishment at Florence, opened about three years ago, employs upwards of 100 workmen, and produces furniture and articles of cabinet-making to the extent of 100,000f. (£25,000) per annum. In Piedmont and the province of Genoa a good deal of turning is carried on, and for this purpose from 30,000 kilogrammes to 40,000 kilogrammes of box-wood are imported yearly. Another important branch of industry is that of chair-making, at Chiavari. These chairs are extremely light and elegant, and were formerly imported from France, under the name of Paris chairs; at the present time they are exported to France instead. The stalls of choirs, confessionals, baptisteries, lecterns, organ cases, book cases, wainscoting, &c., executed at Genoa and Turin will rival anything of their kind that has been produced in other countries. The

manufacture of common and cheap furniture is likewise carried on to a great extent, and the trade in furniture made of native wood, without veneering or gilding, has of late made great progress. At Milan, and throughout the whole of Lombardy, the manufacture of furniture has made considerable progress. At Milan alone there are thirty manufactories, in which 250 men are employed, whose earnings range from 1·76fr. to 3·52fr. per day, and more than 100 children. While conforming to the requirements of luxury and of fashion, the Milanese manufacturers make furniture of excellent design in fine woods, such as the mahogany and walnut, which are often richly carved; also in marqueterie work, inlaid with metal in rich and varied design, and others in fine woods, such as rosewood, Hungarian ash, enriched with bold ormolu ornaments, with incrustations of differently-coloured stones, or with miniatures in majolica. The articles manufactured at Milan are in no way inferior to those made in the fourteenth century, and are remarkable for the elegance of their form, beauty, and good taste of design, and solidity and good workmanship. In various parts of the province of Milan, and especially in the neighbourhood of Monza, Como, Lissone, Cesano, Boisio, Barlassina, Lazzate, Seveso, Mede, this industry gives employment to upwards of 350 families, and the number of workmen is never less than 600 in the summer, and exceeds 1,000 in the winter, with average wages of 1 76f. The furniture made in this country is chiefly of walnut, and, so far as their price is concerned, they are within reach of all classes; that of Mede is distinguished for its cheapness. In the province of Brescia there are seven manufactories of furniture, producing annually about 400,000f (£16,000). In the principal towns in the Venetian provinces the manufacture of furniture is carried on to meet the demand. There are many excellent manufacturers at Venice and Vicenza. In the provinces of Emilia, Umbra, and the Marches, a good deal of furniture of gilt wood and ordinary work is made. The manufacturers of Naples execute work of every kind suitable to the requirements of all classes. The raw materials employed in this manufacture are as follows:—Indigenous wood, such as walnut, maple, oak, cherry, jujuh tree, lime tree, elm, alder, &c.; of foreign woods—the Indian walnut, ebony, rosewood, black oak, mahogany, and sandal wood]; silk and woollen stuffs, cotton cloths, leather, and oil-cloths, from England, France, and America, as well as from national manufactories; trimmings, principally from the manufactories of Milan and other towns in Italy, and some from England, France, and Belgium; varnishes, from France, England, and Switzerland, as well as from national manufactories.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The closing meeting of the tenth session of this association was held on Wednesday week, Mr. John C. Hay, president, in the chair. The secretary read the annual report, from which it appeared that the association was in a highly flourishing condition, twenty-four new members having been added to the roll during the session; and that the business of the session had been more than usually interesting. Reference was made to a new feature—namely, popular meetings, introduced experimentally for the first time; and, from the success which had attended them, they were recommended to be continued occasionally during future sessions. From the treasurer's report, also, it was found that the funds showed a considerable balance in favour of the association. The president then delivered his valedictory address, in which, after giving a brief *resume* of the business of the session, he made a few remarks on the principal public edifices at present being erected in the city, and concluded by complimenting the members on the success of the past session, and the large increase which had taken place in the membership, and thanked them for the courtesy and good feeling which he had experienced during his tenure of office. A hearty vote of thanks was awarded to Mr. Hay for his address, and for the valuable services he had rendered the association during the time he had occupied the chair. It was arranged that the annual excursion be to Borthwick and Crighton, and that it should take place on Saturday, the 13th inst. The following gentlemen were elected office-bearers for the next session:—President, Mr. Alex. Ballantine; vice-president, Mr. John C. Hay; secretary, Mr. H. J. Blanc; treasurer, Mr. W. G. Shiells, both re-elected; librarian, Mr. Thomas Bonnar; and council, Messrs. F. C. Sumichrast-Roussy, Bryce, Dick, and Annan.

ARCHÆOLOGY.

THE monthly meeting of the Royal Archæological Institute was held on Friday, General Lefroy, R.A., in the chair. A paper was read, contributed by Mr. J. Ernest Brudenell Bruce, on recent excavations at Guisborough Priory, in Yorkshire. The very Rev. Canon Rock, in proposing a vote of thanks to Mr. Bruce, complimented that gentleman on the able paper he had communicated to the Institute. General Lefroy then read a paper on the great cannon of Mahommed II., lately received at Woolwich from the Sultan, and which was said to have been cast in 1443, the weight of which was upwards of twenty tons; and Sir T. E. Winnington, Bart., exhibited photographs of sepulchral slabs recently found in the churchyard of Droitwich.

An international congress of history and archæology will assemble at Bonn, between the 13th and 20th September. An exhibition of works of art and antiquities is to take place there at the same time.

A Masonic archæological society has been established to elucidate and popularise the antiquities and history of Freemasonry.

M. Lambert, the under librarian of the seminary at Toulouse, has just discovered at Lalande a Gallo-Roman cemetery. It is situate on the right bank of the Garonne, 150 yards from the river. Twenty tombs have been found, all formed in bricks bearing a monogram. In each was a body, which crumbled to dust on exposure. The vault is to be reopened, when a careful examination and report are to be made.

PARLIAMENTARY NOTES.

ON Friday last, in the House of Commons, Mr. B. Hope said he wished to call the attention of the House, and more particularly of the Chief Commissioner of Works, to an advertisement which had appeared, to the effect that the materials of the colonnade, with the Doric stone columns and frieze, of Burlington House, were to be sold by auction. Such a sale would, of course, bring in a few miserable pounds to some department of the Government, but it would have the effect of removing from the metropolis or of destroying altogether a work which had some historical interest and a considerable amount of architectural beauty. The Government might re-erect that colonnade in one of our public parks or gardens, or if they could not restore the whole colonnade they might at all events put up the archway. He should protest against the Vandalism which would thus destroy the monuments of the art and of the history of our country. He hoped his noble friend would give them some assurance that the building was not to be knocked down to the highest bidder, but that it would be replaced upon some suitable public site. Lord J. Manners said he should be very happy to treat in private with his hon. friend in reference to the sale of that building. He was already in communication with the member for Whitehaven (Mr. C. Bentinck) upon the subject, and if his hon. friend who had addressed to him that question would also honour him with a visit he should be glad to see him, for he could meet his views. Mr. D. Griffith said he thought the noble lord ought to have given a more serious answer to the question put to him by the hon. member for the University of Cambridge. The House had not, he believed, been informed that the colonnade was to be destroyed.

The Thames Embankment (Chelsea) Bill was read a third time and passed.

THAMES EMBANKMENT.

On Friday last the Chancellor of the Exchequer moved the second reading of a bill to enable the Metropolitan Board of Works to raise a loan under a Treasury guarantee for the completion of the Thames Embankment and Mansion-house-street. The amount of the loan he stated at £1,856,000, and he went at length into the finances of the Board to show that the Treasury had ample security for this guarantee. This security consisted in the metropolitan rates, the surplus of the coal and wine duties up to 1882, the whole of the coal and wine duties between 1882 and 1888, which, reckoned as a deferred annuity, he valued at £600,000, and the property abutting on the Mansion-house, which was worth at least £1,300,000, and these, all taken together, the Chancellor insisted, offered ample security for both capital and interest. He mentioned, too, that while the original estimates for these works were £4,935,000, and the revised estimate £5,568,000, the actual revenue applicable to them which would come into the possession of the Board amounted to £5,662,000. The bill was not opposed, but it led to some discussion, in the course of which Mr. Goschen, while approving the measure, criticised sharply the mode in which the Metropolitan Board of Works presents its accounts to Parliament, and Mr. Ayrton indulged himself in one of his usual onslaughts on the Board of Works and in a characteristic laudation of the proceedings of a Select Committee (where he had been a prominent member), which, if its recommendations had been attended to by the House, would have put the Board on a more satisfactory footing. Mr. Harvey Lewis and Mr. Tite also supported the bill, but before it could be read a second time the House was counted out at 20 minutes to 10 o'clock.

Building Intelligence.

CHURCHES AND CHAPELS.

The Dean and Chapter of York have generously offered to undertake the restoration of the church of St. Mary, Castlegate, in that city. Mr. Butterfield has been engaged in a personal investigation of the many architectural features which the edifice presents, previous to a prompt commencement of the work.

A new Congregational Chapel was opened at Tynemouth on Wednesday week. The style is florid Gothic, and the plan consists of nave, aisles, and transepts, with clerestories on either side. Mr. T. Oliver, of Newcastle, is the architect, and Mr. Robinson, of Tynemouth, the contractor.

The foundation stone of a new United Presbyterian Chapel at Hamilton, N.B., was laid on Thursday week. The style of the building is Early English, and it will seat 570 persons, at a cost of £1,250. Mr. Baldie, of Glasgow, is the architect.

The foundation stone of a new Independent Chapel was laid at Maesbury, near Oswestry, last week. The style is Gothic, and it will be built of pressed bricks, relieved with stone dressings. The design is by Mr. W. H. Spaull, of Oswestry.

St. Paul's Wesleyan Chapel, Old Swan, Liverpool, was opened for Divine service last week. The chapel is of an oblong form. It contains 460 sittings, upwards of 100 being free. The building is of red stone, in the Gothic style, the cost of the whole, including land, being about £3,000. The architects are the Messrs. Green and Parslow, of Dale-street; and the contractor, Mr. John Westmoreland, of Islington.

The church of St. Hilda, at Ampleforth, was reopened on Sunday by the Archbishop of York. The old building, a fine specimen of Norman architecture, had become so dilapidated that it was considered quite unsafe. It has been accordingly removed, and the present building erected, all of interest in the ancient church having been scrupulously cared for and preserved.

St. Andrew's Church, at Compiégne, built by the liberality of an English lady, for the use of the English residents at that town, was opened lately. The style of the building, which was designed by Mr. Thornton Shiells, of Edinburgh, is Early English, and accommodation is provided for nearly 200 persons.

The parish church of Tibberton, near Worcester, dedicated to St. Peter and Vincula, has been rebuilt, and was consecrated by the Bishop on Tuesday week. Mr. J. W. Hopkins is the architect. The cost is £1,100.

On Monday week the corner stone of a new Baptist Chapel was laid at Church, near Accrington. The chapel will be in the Italian style, and its dimensions 72ft. by 52ft. outside, height 48ft., and inside height, 36ft. The building will seat 702 persons, the estimated cost is £2,300, and it will be erected from the designs of Mr. Jonas Turner, architect.

On Tuesday week Lord Shaftesbury laid the foundation stone of a new church, at Bournemouth. The object of its erection is to counteract the effect of Catholic teaching and practice at the neighbouring church of St. Peter. There will be 1,031 sittings, only 350 of which will be free. Messrs. Cory and Ferguson are the architects. The church is to be distinguished for its "Protestant simplicity."

The foundation stone of a new Wesleyan Chapel has been laid at Clitheroe, near Preston. The style is Italian, and the estimated cost £2,400, accommodation being provided for 650 persons. The architect is Mr. J. Turner, of Accrington, and Mr. J. Parry, of Clitheroe, is the builder.

A new Roman Catholic Church in London, the Church of Nôtre Dame du France, was opened on Wednesday last. The church is situate at the north-east corner of Leicester-square, the building having been for a long series of years that in which Burford's celebrated panoramas were exhibited. There is a long passage from the end of Cranborne street, and the church itself lies behind the east side of Leicester-place. The old building has undergone many changes, and would hardly be recognised by those who in times past derived instruction and pleasure from Mr. Burford's geographical exhibitions. A splendid altar has been raised, and the other ecclesiastical arrangements have been carefully attended to by the Marist Fathers, to whom the mission has been entrusted.

All Saints' Church, Clifton, was consecrated on Monday by the Bishop of Gloucester and Bristol. A very elaborate set of plans in the Transition Gothic style were originally prepared by Mr. G. E. Street, and there is room for hope that these plans may yet be realised in their entirety. At first it was intended to complete the erection for £8,000, but already £11,000 has been expended, and it is estimated that £8,000 more is wanting. The original design provided for a nave 112ft. long and 56ft. wide; a chancel 45ft. in the clear and 24ft. between the piers. On each side of the nave were to be five arches, resting on octagonal piers with carved capitals, and over each arch a traceried three-light window. Unfortunately, much of this remains to be done. The nave piers have been carried up, but within them a temporary building has been erected, for the purpose of carrying on Divine worship without further delay. No plaster is used on the walls, the stonework and mortar being merely finished off in a smooth and presentable manner. The work, from the plinth upwards, has been executed under the contract of Messrs. J. Davis and Son; and according to the present arrangements about 500 persons can be accommodated. This is considerably less than the building will hold in its finished state, it being computed that 1,200 at least can then find sitting room.

BUILDINGS.

Last week a new range of day schools was opened at Saltaire. The style is Italian. The base of the building is in massive bosted and channelled ashlar, and the cornice and window dressings throughout in bosted ashlar, with the walls in pitch-faced work. Accommodation is provided for 750 children. The architects are Messrs. Lockwood and Mawson, of Bradford and London.

Rapid progress is now being made with the Metropolitan Meat Market. The hoarding has been removed from the southern end, and the new street from thence into St. John-street will be opened in a few days. The workmen are fast proceeding with the construction of the iron roof which will cover the main thoroughfare between the northern and southern wings. In the northern wing several blocks of shops are now nearly completed. One of the corner towers is completed, and the others are making rapid progress.

Many well-known shops, comprising a good part of St. Martin's-le-Grand, are now closed, and condemned to be pulled down to make room for the new money order office.

St. Thomas' new infant schools, Blackburn, have been recently opened. The style is Early English, built with stone dressings and pier-points, and will accommodate about 400 scholars. They have been erected from designs, and under the superintendence of Mr. James Bertwistle, architect, Blackburn.

The Victoria Hotel, Choumert-road, Peckham Rye, is being erected from the sketches of Mr. J. Arthur, a well-known draughtsman. It stands at the junction of Victoria and Choumert-roads, so as to show two sides. The first floor contains a billiard room, 30ft. by 18ft., from which there is a fine view of Dulwich and the Surrey Hills. The roof is of high pitch, which gives importance to the building. The cost will be about £3,500. The materials are white Suffolk brick, with Portland stone dressings. Mr. J. Lovejoy is the builder.

On June 3 the inauguration of the Bradford Yorkshire Institution for the Blind took place. It has been erected at the corner of North Parade and Cambridge-street, for the employment and instruction of blind workpeople. The style of architecture is plain Gothic, from the designs of Messrs. Knowles and Wilcock, architects, of Bradford. The building is four storeys in height, and has a frontage of 60ft. to North Parade, and 136ft. to Cambridge-street. The premises include a series of large workrooms for the blind of both sexes, who are employed in knitting, brush, basket and skep making, &c., &c. On the ground floor there is parlour, kitchen, and scullery, with four spacious bedrooms over, same for the accommodation of resident matron. The upper rooms are approached by open and separate staircases, which are of stone. The ground floor also contains a convenient library, with shops and offices for the sale of articles they manufacture. The following are the several contractors: J. Burnley and Son, masons' and bricklayers' work; Garforth and Walmsley, carpenters' and joiners' work; John Scholefield and Sons, plasterers' work; Michael Kelson, slaters' work; Thomas Cordingley and Sons, plasterers' work; Lishman Lupton, painters' work. Mr. Abner Rhodes was clerk of works. The total cost of the building, which has been raised by subscription, is £6,533, and at the public meeting which was held on the eve of opening in St. George's Hall, it was declared entirely free from debt.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—I. M. S.—A. P.—H. P.—C. B. A.—W. B.—E. P.—W. and D —I. M. S.—I. H. S.—B. and D.—O. W. D. —W. B.—I. R. S.—R. O. H —W. J. M.—W. G.—I. T. S. M. and Sons —J. E. G.—G. C. and Co.—W. E.—I. M. S.—W. H. R.—I. L. and Son.

CALLIPERS.—There is no such work or paper that we know of.

Correspondence.

PICTURE FRAMES.

To the Editor of the BUILDING NEWS.

SIR,—I am glad you have called attention to a subject much neglected. There is no reason for putting up with stock patterns, as all good mouldings used by frame makers are got out by hand with hollows and rounds; and I may mention that the frame you notice was made by my frame maker, Mr. Francis Draper, of Green street, Grosvenor-square, from a design I gave him, at no greater cost than a stock pattern of equal size would have been.—I am, &c.,

THOMAS HENRY WATSON.

9, Nottingham-place, W., June 8.

LOVE ME, LOVE MY DOG.

SIR,—Might I suggest to Mr. Burges that my sketch of the highly comic puppy in the Architectural Exhibition, which he classes with a unicorn by Pugin, and contrasts with the "beautifully composed and drawn" animals by M. Lameire, is no invention of my own, nor is it a drawing to set forth my ideal of the canine species. It is simply an unexaggerated representation of a caricature for which the medieval sculptor of the font at Bingen ought to be held responsible.—I am, &c., JOHN P. SEDDON.

12, Park street, Westminster, June 10.

UTILISATION OF WASTE HEAT.

SIR,—Allow me to thank Mr. Mathews for his courteous explanation, and to state that I shall be glad to co-operate with him, or with any other gentleman, who might have a suitable opportunity of thoroughly carrying out the proposed system of utilising waste heat. I have not taken out a patent, and can claim, therefore, no invidious privilege, but I am naturally anxious that when the first attempt is made every possible precaution should be taken to ensure its full success.—I am, &c.,

Great Marlborough-street. FREDK. EDWARDS, Jun.

Intercommunication.

QUESTIONS.

[831.]—WHITWORTH SCHOLARSHIPS.—Can you please inform me if there are likely to be any special conditions attached to competing for the Whitworth Scholarships; and if any preliminary examinations will have to be passed?—W. L.

[832.]—DECAY OF LEAD PIPES.—A large quantity of lead pipe connecting the cisterns and w.c.'s in a whole street, and on both sides of it, are in a chronic state of decay; and as the periodical use of new pipes necessitates a serious deduction from the rent receipts, I shall be glad to learn if it is possible to remedy the evil, and what is probably the cause of the complaint? The cisterns stand at one end of the garden, and the privies at the other, a space of 20ft. intervening. The water is supplied by the water company, and the lengths of pipe have the usual connections at their extremities; but they run about a foot under the surface of the ground for their whole length, and where embedded very soon become perfectly honeycombed and worthless. The appearance they present is very similar to some of the submarine telegraph cables after they have been attacked by the boring shell whilst *in profundis*, and found at "fault." Would lime have such an effect on lead piping? The pipes are of stout metal.—DAVEY J. BROOKS.

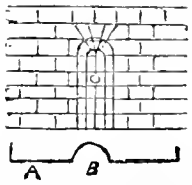
[833.]—CEMENT FOR BROKEN LEATHER MACHINE BELTS AND STRAPS.—I want some good cement for broken leather machine belts. I know of several that adhere well enough, but they do not wear well. Will somebody recommend one that satisfies both these conditions?—GENERAL JOINER.

[834.]—COTTAGE WALLS.—Will 9in. be thick enough for outside and party walls for a cottage about 39ft. long by 25ft. wide, and 15ft. high from ground to eaves, to be built in the country? Would one of your correspondents kindly answer the above?—D. R. Q.

[835.]—STEEL TOOLS.—Can anyone tell me how I can test the quality of fine steel tools?—H. H.

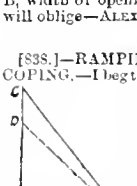
[836.]—PLASTERING WALLS.—How long a time should elapse from the time plaster is put on a wall to the time when it would be safe for interior decoration, without the probability of the decoration being injured?—CLERK OF THE WORKS.

[837.]—WORKING LINES OF A NICHE.—Would any of your readers kindly furnish me with the geometrical



working lines of a niche, as per sketch? A, ground plan: B, width of opening; and C, the height. By so doing they will oblige—ALEXANDRE.

[838.]—RAMPING TWIST AND JOINTS IN STONE COPING.—I beg to thank "S. Lewis" for answering my question (854) so fully, but would still further presume on his kindness. In attempting to work out the diagram on a larger scale, I found a difficulty in applying the rules to given heights and distances. I would, therefore, feel obliged if he would advise me how to act in this dilemma. Also how to find the joints in stone coping. The accompanying sketch will better explain my meaning. Let A B represent the distance from wall; A C, the height of one embankment; A D that of the other. An answer to the above will greatly oblige—AN AMATEUR FOREMAN.

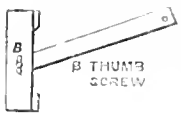


REPLIES.

[873.]—INCLINED BARS.—Allow me to inform "Student" that directly a bar is inclined it loses a great portion of its strength compared to what it possessed when it was in an upright position. The bar is weakened by being inclined in the proportion of the second of the angle of its inclination to the horizon. Taking the first case mentioned by "Student," the bar has to withstand a vertical weight of 10 tons. Wrought iron will bear safely 5 tons to the square inch, so that the area of the bar should equal 2in. to carry the whole load of 10 tons. To find the diameter, therefore, we have to put it in terms of the area. The area

of any round rod equals in terms of the diameter. Putting $\frac{\Pi d^2}{4}$ for the area, $A = \frac{\Pi}{4}$ but $\frac{\Pi}{4} = 0.7854$; therefore the area $= d^2 \times 0.7845$. But the area is equal to two square inches, consequently the diameter $d = \sqrt{\frac{2}{0.7854}}$. Having shown that the bar is weakened by being inclined in proportion to the second of the angle, it only remains, after having found that the value of $\sqrt{\frac{2}{0.7854}}$ for an upright bar is equal to a certain amount, to multiply this by the second of the angle to find the diameter of it in its inclined position.—L. P. N.

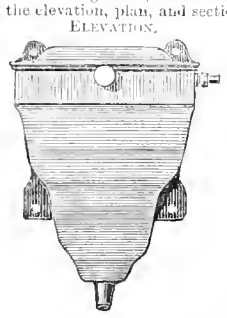
[822.]—PARALLEL RULER.—The answer given to this in my last week I do not think satisfactory. Allow me to suggest that parallel lines can be drawn easily, rapidly, and accurately with a T square, the blade of which is movable, working upon a pin to any angle, and secured by a brass thumbscrew.—W. R. ATKINSON.



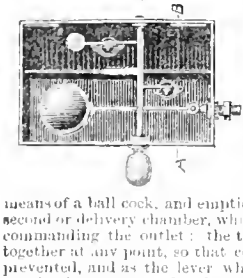
[824.]—WATER-WASTE PREVENTORS.—Every information respecting the Water-waste Preventors can be obtained from Mr. Thomas Beggs, 37, Southampton street, Strand. The price of one of these machines is about £1 10s. Since my last report two additional ones have been erected, making now 69. I believe that we have more of these machines in this district than in the whole of the metropolis combined. They are, indeed, a great boon to the poor, and the water companies now approve of them, and, I believe, are willing to promote their use. It only requires energy on the part of the medical officers of health (which energy must be supported by the local boards) to get them adopted in all the poor localities, and so do away entirely with butts and cisterns. They can be seen in operation in this district; and if any person wishes to see them one of our inspectors will accompany him, provided he call here before 11 o'clock a.m.—JOHN LIDDLE, Office of the Board of Works, Whitechapel District, 15, Great Alie-street, Whitechapel, E.

[824.] In reply to your correspondent, there have been several Water-waste Preventors introduced of late years, and some of them are still in use. One manufacturer told me that he had made some fifteen or sixteen different arrangements for the same purpose. I suggest that it would be very instructive if some of your correspondents would give us a history of all such inventions. The constant supply of water to London, as I take it, depends upon the ability to put a stop to waste. I think the Waste Preventors in the Whitechapel district are very efficient. Two kinds have been used. The first introduced had an air chamber, which filled to the extent that the compressed air would allow it, and it emptied by a cock which closed the inlet when it opened the outlet, and thus prevented a continuous flow of water. One charge could only be taken at a time. The cock was found too delicate for continuous use and hard usage, and therefore it has given place to the present arrangement, which is a service tap. The following is the elevation, plan, and section:—

ELEVATION. SECTION.



PLAN.



In the arrangement not more than a certain adjusted quantity of water can be drawn at one action, although the outlet valve may be held or fixed open; this absolutely prevents the continuous waste of water, and is secured in the following manner:—In such arrangement there are two chambers; the first or supply chamber is filled by means of a ball cock, and emptied through a valve into the second or delivery chamber, which also has a discharge valve commanding the outlet: the two valves cannot be opened together at any point, so that continuous flow or waste is prevented, and as the lever which actuates the valves is weighted so as to make the outlet valve self closing, the flow of water will cease immediately the handle is liberated. The figure, as shown in elevation and section, is intended for staircases, passages, courts, or such like positions, and can be fastened against the wall or other place by means of the brackets shown on elevation. This delivers about two and a half gallons each time. They are made in other configurations, suitable for stand-posts, and the supply of sinks, water-closets, and all purposes of domestic supply. I find they are approved by the East London Water Works and New River Company, and from either company I apprehend, particulars as to price, size, &c., may be obtained.—C.

[826.]—DOLOMITE.—Dolomite in the general sense, is the magnesian limestone. Stone is termed dolomite when composed of carbonate of lime and carbonate of magnesia in nearly equal proportions, and in a high state of crystallisation. The magnesian limestone is remarkable for its varieties throughout its range in the geological scale of this country in one district a white friable limestone, resembling the common chalk; in another district, a hard yellow crystalline stone, capable of some degree of polish. In the latter form, it can only be termed a dolomite. The Bolsover limestone is the best description of dolomite as a building stone. Its weight is 151lb. 10oz per cubic foot, and its chemical analysis is given as follows:—

Silica	3 6
Carbonate of lime	51 1
Carbonate of magnesia	40 2
Iron alumina	1 8
Water and loss	3 3
	100 0

It is a pale yellow colour, the iron occurring in dentritic spots, only visible when newly fractured. This limestone, although hard, compact, and highly crystalline, is not susceptible of the high degree of polish that marbles, porphyries, and granites will receive, and is rarely subjected to that process. Some of our common marbles are called dolomites, a term which they may justly claim, as they are largely composed of carbonate of lime and carbonate of magnesia. The term "dolomite" is rarely used in connection with building materials; it is more a scientific term applied to geology, and is derived from the French geologist Dolomieu. For all practical purposes the magnesian limestone may be considered as the dolomite, and the most important works in this material in London are the New Houses of Parliament and the Museum of Practical Geology in Jermyn street, in the former instance, the stone is rapidly perishing, and in the latter case it has withstood the destructive influences of the atmosphere in a praiseworthy manner. This is generally admitted to be owing to care in selecting the blocks of stone in the quarry; but the secret lies more in the fact that they were obtained from the lower beds in the quarry, viz., from below the level of saturation. In such positions limestones will absorb the calcareous matter removed by disintegration from the upper bed, and so become a hard compact, and highly crystalline material; one capable of receiving a polish and withstanding the influences of the atmosphere when used as a building material.—W. S. Nottingham.

[826.]—This is a name applied to magnesian limestone. In England, large deposits of this limestone occur in the upper beds of the permian system, or that group of rocks which immediately overlies the coal measures. The principal deposits occur in the north east of England, extending from the mouth of the Tyne, in a south-westerly direction through Durham and Yorkshire, into the counties of Derby and Nottingham. These dolomites are employed in the chemical works on the Tyne for the manufacture of sulphate of magnesia or Epsom salts. As a building stone, the dolomites have been highly valuable; those varieties being regarded as most durable which present a crystalline structure, and in which the carbonate of lime and magnesia exist in nearly equivalent proportions. The quarries in the neighbourhood of Bolsover Moor, in Derbyshire, supplied the magnesian limestone employed in the construction of the New Houses of Parliament.—E. E.

[827.]—NORWEGIAN COOKING STOVES.—In reply to your correspondent who inquires about the Norwegian Cooking Stoves, I beg to say there is daily an exhibition at the Polytechnic of an ingenious Norwegian cooking apparatus, which virtually cooks the food placed therein without the constant application of heat in any form. It is this probably he refers to.—SECRETARY.

[829.]—TELEGRAPH POSTS.—If "R E P." granted the use of his wall or top of his house to the telegraphic company without any written or specified conditions, he cannot well expect to get pay or rent for it, whether the company sells its interest to the government or not. I, like "R. E P.", was asked to consent to the erection of a telegraphic post on the top of my house; I did not consent, however, without stipulating for a nominal rent, so the company may be considered my tenant.—J. B.

WAGES MOVEMENT.

A deputation from the Liverpool bricklayers at present out on strike was received last week by the London Trades Council, when the following resolution was unanimously carried:—"That this council having heard the facts and circumstances of the bricklayers' strike at Liverpool stated by the deputation, are of opinion that it could be settled to the mutual advantage of both masters and men by a fair and properly constituted board of arbitration. We therefore instruct the secretary to write to the bricklayers' committee offering the services of this council to take such steps as may be deemed necessary with a view to bringing the contest to a just and satisfactory settlement."

The prevalent rates of wages for various trades in New York at present are the following: Ironmoulders, 3 dols. 50c. a day; bricklayers, 5 dols.; carpenters, 4 dols. to 4 dols. 50c; blue-stone cutters, 4 dols. 50c.; slate roofers, 4 dols. 50c.; stair builders, 3 dols. 75c.; marble workers, 4 dols. 50c.; operative masons, 5 dols.; painters, 3 dols. 50c.; plasterers, 5 dols.; labourers, 2 dols. 50c. to 2 dols. 75c. The quarrymen of West Rutland, Vt., are on strike to procure 1 dol. 75c. a day. They get 1 dol. 60c. at present.

STAINED GLASS.

A stained glass memorial window has just been erected in the south chancel aisle of St. Giles' church, Northampton. The subjects are "Jesus Raising the Widow's Son to Life," and "His command to the Young Man who Boasted he had kept all the Commandments." Messrs. Powell, of Whitefriars, were the artists.

Two stained glass windows have been inserted in the church of St. Michael, Spurriergate, York. The subjects are "The Meeting of Jesus and Martha, the sister of Lazarus" and "The Adoration of the Magi." They are both by Mr. Hodgson, of York.

A painted window (the work of Mr. Bell, of College green, the gift of an anonymous donor, has been fixed on the north side of the chancel of St. John the Evangelist Church, Redland. In one of the lower lights is a representation of our Lord as "The Good Shepherd," and in the other our Lord is represented as "The Saviour of the World."

A bust of the Right Hon. W. E. Gladstone, by Mr. Woolner, has just been placed in the gallery of the Bodleian library at Oxford.

LEGAL INTELLIGENCE.

BREACH OF BUILDING BYE-LAWS.—At Bristol, on Saturday, Mr. J. Pavey, builder, appeared before the magistrates to answer an information issued by the Board of Health, charging him with having neglected to erect certain parapet walls, thus acting contrary to the 37th section of the Improvement Act, 1847 (which provides that a parapet wall should be built two feet above the slates or roofs of the adjoining houses), thereby rendering himself liable to a penalty of £20. From the evidence of Mr. Pope, surveyor, it appeared that four houses had been built by defendant on some land near Boyce's buildings, Clifton, and the required parapet wall separating the roofs of the houses had not been built, so that, in the case of fire, there was nothing to prevent the flames from spreading from one of the houses to the others. Mr. Pope, jun., had told Pavey of the omission, but defendant referred the responsibility to Mr. Mathias, for whom he had built the houses. The magistrates considered Mr. Pavey responsible, and fined him the full penalty, £20, to be mitigated to 1s. as soon as the provisions of the Act should be complied with.

NON-FULFILMENT OF CONTRACT BY A "FREE LABOUR" MAN.—At Sheffield, on Saturday, Mr. Powell, a master builder, summoned a mason named Owen Crane for non-fulfilment of contract. The defendant was one of the men sent down to Sheffield by Colonel Maude, secretary of the Free Labour Registration Society, to take the places of the masons who had struck work. He had received from Mr. Powell the sum of 16s. as "sub money" for himself and his companions, and on the morning when the work was to have been commenced he fetched away his tools and went to Manchester. The other men took a similar course. The defendant was ordered to find sureties to carry out the contract, or in default to be imprisoned for one month. A case for the Court of Queen's Bench was granted by the bench.

THE RIGHT TO PUT FLOWERS ON A GRAVE.—ASHLY *v.* HARRIS.—This was an appeal against the decision of magistrates holding a petty session at Highgate, and the facts were these. The St. Pancras Burial Board had a cemetery at Finchley, and in 1857 Mr. Rowbottom was buried there in a grave which had been granted to his widow in perpetuity. The respondent was employed by Mrs. Rowbottom to plant flowers upon the surface of the grave; but in July, 1867, the Burial Board resolved to take such planting into their own hands exclusively, and that in future no person not authorised by them should do any planting. After this the respondent went to set some seeds upon the grave; and on that occasion the appellant, an officer of the board, prevented this being done. The consequence was that the appellant was summoned for an assault, and was convicted by the magistrates in the penalty of 1s. and costs. The question raised for the Court was whether the board had authority to make a regulation that the graves should be planted only by the persons who were appointed by them for the purpose. The Lord Chief Justice said he was of opinion that the decision of the justices was correct. By the 33d section of their act the Burial Board had authority, under such restrictions as they should think proper, to sell the exclusive right of burial in perpetuity; and in the grant to Mrs. Rowbottom they had not imposed any condition which would prevent her from planting the grave of her husband. She would, therefore, have a right to do this, and the board had no power afterwards to make regulations which would take away the right. Judgment for respondent.

THE THAMES CONSERVANCY BOARD *v.* THE VICTORIA STATION AND PIMLICO RAILWAY COMPANY.—This was an action on award made under the Land Clauses Act, and assessing the amount payable to the plaintiffs for land taken for the building of the defendants' bridge over the Thames. When the case came on in the Court of Common Pleas for trial a few days ago, a verdict was entered for the plaintiffs, subject to the opinion of the court. Mr. Serjeant Haynes now moved for a rule to enter a verdict for defendants; and stated that the bridge was built in 1858, and no claim was made by the defendants for compensation until 1867. He submitted that upon the true construction of the Conservancy Act and the defendants' private act, the conclusion was that the defendants had all their rights under their own act saved to them, and had no power to claim compensation in accordance with the form of procedure provided by the Land Clauses Act. Rule granted.

A CORPORATION'S SEWERING POWERS.—The corporation of Manchester some time ago paved and sewered a street in Ardwick, in exercise of the powers given them by the Manchester General Improvement Act, 1851, under which the cost thereof is payable by the owners of the land lying alongside or adjoining the street. A Mr. Chapman was the owner of the property forming the end of the street, and was charged with his proportion of the expenses, but resisted the claim on the ground that, as the owner of property at the end of the street, he was under no liability to contribute. The stipendiary magistrate decided in favour of the defendant, but the Court of Common Pleas, to which the case was carried, has just given judgment in favour of the corporation.

ACTION AGAINST A CORPORATION.—PAYNE *v.* THE MAYOR, ALDERMEN, AND BURGESSES OF WEYMOUTH AND MELCOMBE REGIS.—This was an action brought by the plaintiff against the defendants to recover a sum of £3,500, being the balance alleged to be due to him under a contract made with the defendants in 1858 for the construction of the pier at the entrance to the harbour of Weymouth. The defendants were authorised to erect the pier, under an Act of Parliament known as the Weymouth and Melcombe Regis Markets and Pier Act, 1859, and in pursuance of its provisions, the corporation made a contract with the plaintiff for £11,700, payable, two-thirds by bonds or mortgages on the security of the tolls and dues of the pier, and the remaining third portion was to be paid in cash on the certificate of the completion of the whole of the works to the satisfaction of the late engineer, Mr. Joseph Cubitt. The pier was accordingly finished by the year 1859, the time specified, and properly certified by the engineer. The corporation had given the contractor the bonds or mortgages as provided by the contract, but denied their liability to make the cash payments, on the grounds that the contract was *ultra vires*, and that the contractor was bound to look to the pier fund created by the special Act under which the pier was erected and the contract made for the satisfaction of his claim. The points were raised in the case by way of demurrer to the declaration setting out the particular contract, and there were also several legal and equitable pleas pleaded by both parties. The arguments commenced on Monday last, and were resumed on Wednesday. The Court took time to consider judgment.

MEETINGS FOR THE ENSUING WEEK.

TUES.—London Mechanics' Institution.—Technical Education for Working Men, second course, Professor Warington Smyth, F.R.S.

FRI.—London Mechanics' Institution.—Technical Education for Working Men, second course, Dr. E. Lancaster, F.R.S., "The Employment of Waste Material in the Arts and Manufactures."

FRI.—Architectural Association.—Election of members "The Influence of the Crusaders on Western Art," T. Wells, Esq.

Our Office Table.

The Duke of Wellington has kindly granted the use of the Waterloo Gallery at Apsley House to the Working Men's Club and Institute Union, for a reading by the Rev. J. M. Bellew, on the 18th inst. Mr. Bellew has placed his services at the disposal of the council of the union on this occasion to enable them to raise funds in aid of two of the institutions in London which it is the purpose of that society to promote.

The Northern Thames Embankment Bill now before Parliament, and which has passed the House of Commons, applying for powers to alter the streets in communication with the embankment on the north side of the Thames, has been so amended that the proposed alterations will not interfere in any way whatever with the Savoy Chapel or the burial ground attached to it, and instead of the new street terminating at the corner of Wellington street in the Strand, it will terminate at the commencement of Lancaster-place. It has also been arranged that neither Northumberland-street nor Craven-street is to be interfered with by the proposed alterations.

The workmen employed in taking down the old George Hotel, Kirkealdy, have just brought to light a curious stone, which had been placed in a recess in what was called the commercial room. It was found inside of the plaster and lath. The following scroll is near the top of the stone—"Post Nebula Phœbus," with the figures "21" on the margin. Unfortunately three or four inches are broken off at the dexter side, so that the figures there are wanting. Beneath the scroll there is a figure of the sun, and beneath the sun a bust, the face of which is somewhat disfigured. Beneath the bust are three perpendicular belts or ribbons, each having a star about the centre. There is besides a great deal of very elaborate workmanship about the figures.

The idea of a "flexible theatre" is certainly a novel one. A Paris correspondent states that he was some days since shown a plan of a theatre which is to be either small, large, or immense, as may be required, and will contain 1,000, 2,000, or 5,000 persons. By a system of movable walls—of course of wood—the theatre is to be elongated or contracted at will, just for all the world like an opera-glass.

The "Adelphi Club" is at length fairly started. The building overlooks the best part of the Thames embankment. The principal room is adorned with a small ceiling painted in oil, which is being restored by Mr. Manfred Holyoake.

Mr. Grove, as Dr. Odling recently mentioned at the Royal Institution, first showed that water may be decomposed by passing steam through a platinum tube intensely heated by the oxyhydrogen flame. M. Deville has recently shown that under such circumstances the hydrogen passes through the platinum while the oxygen is retained in the tube. M. Deville seems to have been repeating some of the experiments of Mr. Graham, with the view of supporting his own theory of dissociation.

Mr. James Nobles, an engineer, of Fitzwilliam-street, Sheffield, has greatly improved the engineers' slide rule by the introduction on it of gauge points for obtaining the weight of steel and wrought iron in square, round, octagon, and triangular bars, in inches, 8ths, 16ths; also in French lines and millimetres. On the back of the rule is a table of decimal multipliers, for obtaining the weight of steel in figures, in inches, 8ths, 16ths, 32nds, 64ths; also in French lines and millimetres in bars of the above sections. The engineer can with this rule obtain his weights without the trouble of calculating decimals. These, and other points of usefulness, render these rules a valuable acquisition to the engineer and mechanic, who owe Mr. Nobles thanks for helping to simplify the work of calculation.

The Lords of the Committee of Council on Education have awarded to Mr. W. J. Muckley, head master of the Manchester School of Art, the first prize for the best report referring to instruction in art, as suggested by the Industrial Arts Committee of the Paris Exhibition last year.

John Humphrey Spanton, to whom the gold medal was awarded by the Royal Academy in December last, has now had the honour of being elected travelling student in architecture for two years.

The members and associates of the Society of Engineers made a visit of importance to the Midland Railway Station, King's Cross, on Friday last. The works are indeed well worth seeing, in their present stage, which is sufficiently advanced to indicate the character of the design as a whole. A station 690ft. long is already spanned by 14 of the 25 main ribs which are to support its arched roof, and which, springing from side to side, cover the enormous distance of 240ft. No roof so wide has ever before been raised.

At a manufactory at Hanley, Staffordshire, about a fortnight since, it was noticed that the walls of a portion of the building called the "saggar" house were gradually falling out of the perpendicular, but several days elapsed before it was found to be due to a seam of coal, technically known as a "smut," which crops up under that part of the building, having become ignited by one of the flues of the "saggar" house, and the fire had in all probability been smouldering for a considerable time. A mining engineer was consulted, and he advised that a shaft six yards deep should be sunk near the seam, and the fire cut off by driving lateral galleries.

A correspondent of the *Scotsman* calls attention to what he calls an act of Vandalism. He says that the shaft of a cross, which for centuries marked the point whence Robert Bruce and his followers left Arran, has lately been removed, and used in the construction, in the neighbourhood, of a dry stone dyke.

The *Daily News*, one of the ablest and most consistent papers published in this or, we believe, in any other country, was reduced in price from 3d. to 1d. daily on Monday last. We regard this as a vast literary enterprise, and heartily wish it abundant success. For impartiality of judgment, breadth of purpose, and purity of principle, the *Daily News* has been unsurpassed.

A standing reproach hurled against the intelligence and prudence of the late Mr. Cobden used to be based upon his investments in the Illinois Central, which, it was supposed, had proved an utter failure. But time brings all things round. The Illinois Central shares have been steadily rallying of late, and yesterday were quoted a little above par.

Mr. Henry Weekes, R.A., has been elected Professor of Sculpture, in the place of Mr. Westmacott, at the Royal Academy.

It is reported that Mr. Holman Hunt is about to leave England for the East, on a rather lengthy period of absence.

On Tuesday last the River Wear Commissioners opened their new docks of eleven acres.

After an expenditure of upwards of £6,000, the plan of draining the town of Shrewsbury, adopted by the Town Council after a series of discussions upon the matter extending over fifteen years, has turned out to be an utter failure.

A man in Morrisania, New York, recently sued a trades' union because his son was discharged from employment on account of its members refusing to work with him, and gained his case.

The Strand Music Hall having been purchased by a gentleman of fortune, is now being pulled down to make way for a theatre of the first class, Mr. C. J. Phipps, F.S.A., being entrusted with the design for the new building.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3234 P. M. PARSONS. IMPROVEMENTS IN THE MANUFACTURE OF ARTIFICIAL GRANITE SUITABLE FOR BUILDINGS, ENGINEERING STRUCTURES, PAVEMENTS, AND OTHER SIMILAR PURPOSES. (A communication.) Dated November 15, 1867.

Here the inventor employs disintegrated natural granite mixed with clay, together with pounded glass, lava, or iron slags. The disintegrated granite he obtains by submitting fragments of natural granite to a strong heat (about 700 deg. or 800 deg. Cent.) in an oven or furnace, by which, after a sufficient time, it becomes dissolved into a granitic sand, the constituent parts of which quartz or felspar possess great powers of adhesion. One part of this granite sand is then mixed with about an equal quantity of pounded glass, or the constituents of glass, or lava, or iron slag, or a mixture of all or any of them, to which is added from twenty to thirty parts of refractory clay, or from thirty to fifty parts of ordinary clay; this mixture is thoroughly kneaded together with a sufficient quantity of water to make it of a pasty consistency; it is then moulded to any form required, and submitted to a degree of heat sufficient to vitrify the mass, for about thirty-six hours, which converts it into a hard and durable substance resembling granite.—Patent completed.

3239 R. MORSON. IMPROVEMENTS IN KEYS FOR LOCKS. Dated November 15, 1867.

Here the inventor bores the barrel of the key through from end to end, so as to obtain an opening at the rear end of the barrel within the key bow. In a key thus constructed the barrel cannot become choked, as, should any dirt enter it, it is rammed down by the pin of the lock as the key is used, until at last it passes out of the barrel at the back.—Patent abandoned.

Trade News.

TENDERS.

GRANITE.—The Poplar Guardians have accepted the tender of Mr. Ross for 1,500 tons and 500 tons of Guernsey granite spalls at 9s. 4d and 8s 8d. per ton respectively.

BIRMINGHAM.—For additions and alterations to the schools connected with the Lozells Congregational Chapel. Mr. F. D. Johnson, architect:—

Twigg and Fowke	£1445
Hurley and Bloore	1415
Corbett	1408
Bennett (accepted)	1385

BRISTOL.—For extensions, and transepts, and chancel to Emmanuel Church, Clifton, Bristol. Mr. John Norton, architect:—

Beaven	£2724
Davis and Son	2665
Thorn	2623
Jones	2550
Wilkins	2200
Diment (accepted)	1879

BRISTOL.—For the erection of a warehouse for Mr. James Habgood, in Redcliff street. Mr. S. C. Fripp, architect. Quantities supplied:—

M. Kingstone	£846
J. Harris	792
J. Crocker	776
W. Banner (accepted)	729

HOLLOWAY.—For a pair of houses in Tufnell Park, Holloway. Mr. George Truefitt, architect:—

Brass	£2597
Putman	2425
Henshaw	2394
Sharman	2380
Carter	2340
Williams	2337
Bishop	2265
Dinsdale	2260
Ennor (accepted)	2192

LEAVESDEN.—For sinking a well for the New Schools at Leavesden, Woodside, near Watford, for the St. Pancras' Guardians:—

Spiller	£936	5	0
Patten	868	15	0
Jarvine	667	0	0
Adamson	662	10	0
Tilley	485	0	0
Floyd (accepted)	453	0	0

LONDON.—For rebuilding Messrs. Farmiloe and Sons warehouses in St. John street, West Smithfield. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. Riddett:—

Sewell and Son	£14,639
Holland and Hannen	14,383
Macey	14,177
Rivett	14,103
Phillips	13,887
Perry and Co.	13,589
Patman and Fotheringham	13,290
Cooper and Cullum	13,250
Webb and Son	13,247
Browne and Robinson (accepted)	12,915

LONDON.—For the erection of Nos. 213 and 214, Upper-street, Islington:—

	Houses.		Party wall.
Grose	£1762	...	£258
Southcott	1695	...	284
Manley and Rogers	1598	...	296
Henshaw	1575	...	275
Patman and Fotheringham	1475	...	225
Williams	1448	...	239
Forrest	1365	...	224
Cowland	1360	...	209
Carter and Sons	1265	...	220

LONDON.—For a warehouse, Upper Thames-street, for Messrs. Walter Macfarlane and Co. Mr. C. H. Driver, architect. Quantities supplied by Mr. R. O. Harris:—

Piper and Wheeler	£3940
Condor	3799
Browne and Robinson	3398
Brass	3254
Gammon and Sons (accepted)	3177

OULTON.—For the erection of residence for Mr. E. C. Copeland. Mr. C. Lynam, architect, Stoke-on-Trent:—

Jeffries	£3306
Inskip (Dilhorne)	3.00
Jutton	3027
Inskip (Longton)	2900
Wool and Flight (accepted)	2750

NEWARK.—For erecting Wesleyan North-end Chapel, with school and offices, in Lover's lane, Newark. Mr. Charles Baily, architect:

	Bricklayers, Masons, Plasterers, and Slaters.	Carpenters, Joiners, Plumbers, Glaziers, Ironmongers, and Painters.	Total.
Dennett and Co.	—	—	£1332 0
Fretwell	—	—	1211 1
Lane (accepted)	£644 14	£529 4	1173 18
Henderson (accepted)	—	546 6	1060 10
Duke	—	—	
Revised tenders:			
Lane	720 14	—	1271 0
Henderson	—	550 6	

NORWICH.—For restoring and enlarging Doughty's Hospital, Norwich, for the Charity Trustees. Mr. James S. Benest, City Surveyor, architect. Quantities supplied:—

Mitchell and Walker	£1400 13 0
Wright	1310 0 0
Wiseman	1300 15 0
Downing	1599 0 0
Newham	1580 0 0
Gilbert	1570 0 0
Hood	1520 0 0
Aldous	1510 0 0
Murray	1498 18 0
Browne and Bailey	1490 0 0
Spinks	1488 0 0
Wilkin and Curtis	1476 0 0
Nelson	1467 0 0
Rice	1465 0 0
Webb	1303 12 0

PENGE.—For roads and sewers on an estate of the London and Suburban Land Company. Messrs. Hammack and Lambert, architects:

Reddin	£7540
Wainwright	7600
Benthem	7234
Ossington	7140
Crockett	7100
Nicholson	7080
Mayo	7051
Bish	7050
Pound	7032
Lawrence	6460
Pizzey	6450
Clark	6389
Bloomfield	6243
Hobbard (accepted)	5930

REIGATE.—For a mansion for Mr. Harvey, at Reigate. The quantities were taken out for Mr. Holdsworth:—

Holdsworth	£2412
Baggaley	2167
Dedman	1784

RAMSGATE.—For building a pair of villas for Mr. Morton, on Lot 14, "The Elms." Mr. John R. Collett, architect:—

Kelson (accepted)	£1434

SUSSEX.—For enclosing Hailsham cattle market, Sussex. R. K. Blesley, architect, Eastbourne:—

Crisford	£1016 6
Robson	947 4
Thompson	875 0
Stonestreet	806 5

WESTCOTT.—For houses for Mr. Thomas Paine. Mr. T. J. Dibble, architect:

Putney	£3350 0 0
Inkpen	3023 14 7
Hamblin	2827 0 0
Lynn and Dudley	2660 0 0

WINTHORPE.—For additions to house at Winthorpe, near Newark, Notts, for Miss Wadd. Mr. C. Baily, architect:—

Fretwell (accepted)	£357 16

PROPERTY SALES.

MAY 26.

AT THE MART.—By Messrs. J. J. Clemmans and Son.—Leasehold two houses, Nos. 10 and 12, Bridport place, New North road, Hoxton, let at £30 each per annum, term 60½ years unexpired, at £4 5s. each per annum—£665.

By Messrs. Hofman and Son.—Leasehold residence, No. 1, Neptune villas, Mostyn road, North Brixton, let at £28 per annum, term 95 years unexpired at £3 15s. per annum—£250.

By Mr. T. Greenwood.—Leasehold residence, No. 2, Upper Bedford place, Russell square, annual value £130, term 33½ years unexpired, at £25 per annum—£1,075.

By Messrs. Prire and Clark.—Leasehold residence, known as Warwick house, Crowhurst road, Brixton, let at £70 per annum, term 93½ years unexpired at £5 per annum—£820.

Leasehold residence, known as Stanley house, Wiltshire road, Brixton, let at £75 per annum, term 94½ years unexpired, at £11 per annum—£820.

By Mr. George Berry.—Leasehold residence, known as Rose Cottage, Rose hill, Dorking, let at £57 15s. per annum term 45 years from 1847, at £5 per annum—£1,005.

Leasehold residence, No. 128, Upper Kennington lane, let at £35 per annum, term 54 years from 1833, at a peppercorn rent—£420.

JUNE 1.

AT THE MART.—By Mr. W. Thompson.—Freehold estate, comprising Barn house Farm, Great Bridge hill, Little Bridge hill, and Farley's Farms, in the parishes of Shipley and Thakeham, Sussex, containing about 193 acres—£3,500.

Freehold and leasehold estate, known as Gratwick house and Dawke's land, Billinghurst, Sussex, containing 33a. 0r. 26p. £2,100.

JUNE 3.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold 1a. 0r. 0p. of building land, situate at Leatherhead, Surrey—£180.

Freehold 5a. 0r. 24p. of building land, situate as above—£770.

By Messrs. Edwin Fox and Bousfield.—Leasehold two residences Nos. 108 and 110, Asylum road, Peckham, producing £60 per annum, term 99 years from 1851, at £18 per annum—£410.

Leasehold residence, known as Thornbury cottage, Anerley, Surrey, let at £80 per annum, term 99 years from 1854, at £12 per annum—£750.

By Mr. Nightingale.—Freehold farm homestead, with cottage, barn, stable, buildings, and 8a 0r. 25p. of arable and meadow land, situate at Claygate, Surrey—£710.

Freehold cottage and 3a. 1r. 11p. of orchard and meadow land, situate as above—£350.

Freehold farm house and, stabling, buildings, and 10a 3r 3p. of orchard, meadow, and garden ground in the parishes of Hook and Cressingham, Surrey—£1,560.

Freehold three cottages, adjoining above, producing £26 13s. per annum—£310

Freehold 1a. 2r. 14p. of building land in the parish of Hook, Surrey—£340.

Freehold 2a. 0r. 1sp of arable land in the parish of Cressington, Surrey—£410.

Freehold residence, with stable, outbuildings, orchard, and paddocks, comprising 2a 2r. 1p. in the village of Hook, Surrey, let at £24 per annum—£470

Freehold four tenements, situate as above, producing £21 per annum—£100.

Freehold three houses, situate in the Brighton road, Surbiton, subject to a ground lease for 98 years from 1865, at £10 per annum—£104

Freehold house and shop, situate in Thames-street, Kingston, let on lease at £50 per annum—£180

By Messrs. Candy and Luckin.—Freehold house, No. 130, Barnsbury road, Islington, annual value £48—£700.

By Mr Robins. Absolute reversion to a sixth share of £56,985 15s. 6d New Three per Cent. Annuities, and expectant on the death of a Lady now in her 75th year—£5,775.

Leasehold ground rents of £17 10s per annum, secured on Nos. 16, 18, and 20, Colborne gardens, Kensal-road, term 99 years from 1865—£300.

Leasehold ground rent of £10 1s. per annum, secured on houses in Southam and Edenham-streets, Kensal-road, term 90 years from 1864—£225.

Leasehold ground-rents of £27 per annum, secured on property in Portobello road, Kensal-road—£655.

By Messrs J and A. Parish.—Leasehold shop and two cottages, situate at Northumberland-heath, Erith, Kent, let at £35 per annum, term 26 years unexpired, at £12 per annum—£110.

By Mr Searle.—Freehold five houses, Nos. 1 to 5, Great Maze court, Bermondsey, producing £65 per annum—£620.

Freehold four houses, Nos. 6 to 9, Great Maze court, producing £52 per annum—£480.

Freehold four houses, Nos. 10 to 13, Great Maze-court, producing £52 per annum—£480.

Freehold house, No. 7, Maze-pond, Bermondsey, let at £24 per annum—£350.

By Messrs. Jones and Son.—Leasehold house, No. 12, Dorset street, Commercial-road East, let at £21 9s. per annum, term 94½ years from 1850, at £7 per annum—£40.

Leasehold house, No. 37, Caroline street, Commercial-road, let at £21 per annum, term 61 years from 1822, at £4 per annum—£60.

Freehold two messuages, Nos. 26 and 28, Dorset street, Commercial road, producing £36 8s per annum—£420.

Freehold house, No. 24, Caroline street, Commercial-road, let at £21 per annum—£265.

Freehold two houses, Nos. 30 and 32, Caroline street, Commercial road, producing £33 8s. per annum—£355.

Freehold four tenements, Nos. 3 to 6, Brunswick-place, Caroline-street, producing £52 per annum—£130.

Freehold three houses, Nos. 25, 27, and 29, Dorset street, Commercial-road, producing £30 per annum—£320.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs Bennett and Cooper.—Leasehold residence, with stabling, known as Beddington Lodge, Beddington, term 99 years from 1866, at £12 per annum—£1,545.

Leasehold residence, No 5, Queen's-terrace, King's-road, Windsor, annual value £120, term 97 years from 1847, at £5 8s. 0d. per annum £1,460.

Freehold residence, with stabling, outbuildings, and grounds of about 1¼ acres, known as The Limes, Romford, Essex—£1,330.

COMPETITIONS.

ABERGAVENNY, MONMOUTHSHIRE.—July 7. Designs, plans, &c., new townhall, corn exchange offices; also for reconstruction of a general market place and erection of public slaughter houses Premiums, £30, £20, and £10. J. T. Rutherford, clerk to company.

BELGIAN ACADEMY OF ARTS AND SCIENCES.—For best Enquiry (Essay) and report on the Period at which Architecture in the Low Countries became affected by Italian influence. Premium 1,000f., about £40.

BILBOA, SPAIN.—The Municipality, &c., require designs, plans, &c., for a house of mercy For lodging the poor, &c. Premiums £200, £100, and £50 each. F. di Lizardi, 124, Cannon street, E.C.

HERTFORD COTTAGE PRIZE COMPETITION.—September 1.—Design for model cottages for agricultural labourers. Premium £30. R. Dimsdale, Esq., M.P., 9, Queen-square, Westminster.

INDIA OFFICE.—Forty appointments in Engineer establishment of India, open to competition in July next. Application to Under Secretary of State for India, India Office, S.W.

LINCOLNSHIRE, LINDSEY.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

LIVERPOOL.—July 1.—Plans for the conversion of property in Redcross-street, Strand street, &c. Griffith Davies, Esq., manager and secretary, Liverpool Financial Association (Limited), 32, Castle street.

SCARBOROUGH, YORKSHIRE.—Designs, plans, and estimates for new pier. Premiums, £50 and £30. W. E. Woodall, secretary to Commissioners, Queen street, Scarborough.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ALDERSHOT.—June 24.—For the erection of a police station. Plans of Mr T. Stopher, county surveyor, Winchester. T. H. Earle, County hall, Winchester.

ALDERSHOT.—July 11.—For painting, paper hanging, &c., at Cavalry Barracks. Royal Engineer Office, Aldershot.

ASTON UNION.—For erection of new workhouse at Erdington. Mr. G. Thomason, architect, Wellington chambers, Bennett's hill, Birmingham.

BAMPTON, OXFORD. June 27.—For restoration of transepts and lower part of the tower of the parish church. Architect, Mr. E. Christian, 8A, Whitehall-place, S. W.

BECKENHAM.—For building a villa residence, &c. T. Beesley, architect, 14, Whittington terrace, Forest hill.

BELFAST.—June 28.—For a turret clock. J. Guthrie, town clerk, Townhall.

BELFIELD.—June 17.—For the erection of a house and offices. Mr. G. Crickmay, architect, 77, St. Thomas street, Weymouth.

BROMFIELD (SHEFFIELD).—July 14.—For the erection of the new church of St. Mark. W. H. Crossland, architect, 21, Park square, Leeds.

CHERTSEY.—June 20.—For the erection of three pairs of semi detached cottages. T. Wonnacott, architect. Plans at C. Lingham's, Guildford street, Chertsey.

COMMERCIAL ROAD TRUST.—June 19.—For broken Guernsey granite, flints, &c. W. Baker, clerk, Crosby square, Bishopsgate, E.C.

CROYDON UNION.—June 16, 9 o'clock, a.m. For 1000 tons broken Guernsey granite. A. G. Blake, clerk to guardians.

DARTMOUTH, DEVON. Erection of cottage buildings. J. Birch, 16, Beaufort-buildings, Strand, W.C.

EARLESTOWN.—(London and North-Western Railway).—June 17. For the erection of additional workshops at their Earlestown Waggon Manufactory. Stephen Reay, secretary, Euston Station.

EASTBOURNE.—June 19.—For constructing a sea wall, &c. Colonel C. D Robertson, Royal Engineer office, Brighton.

EASTBOURNE UNION.—June 25.—For building new vagrant wards, &c. Mr. Rumble, Eastbourne.

FULHAM.—June 24.—Contract for broken Guernsey and Jersey granite. W. Lovely, Broadway House, Hammersmith.

GATESHEAD.—June 16.—For the whole or portion of works in the erection of Christchurch, Gateshead. Adams and Kelly, architects, 18, Park row, Leeds.

HUDDERSFIELD.—June 20.—For the erection of estate offices, warehouses, &c. W. H. Crossland, architect, 25, Park square, Leeds.

HYKEHAM, LINCOLN.—June 16.—Erection of rectory, &c. T. T. Reynolds, Heighington, Lincoln.

INDIA OFFICE.—June 15.—For supply of best British iron. G. C. Talbot, director general.

KIDDERMINSTER.—June 15.—For the erection of warehouses, dye houses, boundary walls, and other buildings, at the Waterside Mills, Kidderminster. T. D. Baker, architect, Kidderminster.

LONGDON AND ELDERSFIELD ARTERIAL DRAINAGE.—June 17.—For widening, deepening, and straightening the Longdon Brook, &c. Frederick Moore, clerk, Tewkesbury.

LYDEARD ST. LAWRENCE, NEAR TAUNTON.—June 23.—For repairing and reseating the parish church. J. Snattock and J. William, churchwardens.

MAIDSTONE.—June 24.—Alterations to rooms adjoining the Crown Court, and Second, constructing an inner gateway, &c., at the County prison. F. Russell, clerk of the peace.

METROPOLITAN BOARD OF WORKS AND THAMES EMBANKMENT.—Contract No. 3.—June 18.—For the construction of embankment wall, &c. J. Pollard, clerk to the board, Spring-gardens, S.W.

MOORBY, LINCOLN.—June 25.—For works to be done to the Parsonage house and outbuildings. C. Clitherow, architect, 17, Linnens street, Hull.

NEWPORT PAGNEL.—For works required to be done in the general restoration of Pemberton church. Mr. J. G. Bland, Unity buildings, Temple street, Birmingham.

NEW SWINDON (WILTS) June 13.—For the various alterations and additions to be made to the Baptist chapel, including the erection of new schools, &c. Thomas S. Lansdown, architect, Bath-road, Swindon.

NORTH WOOTTON.—June 13.—For the restoration of the parish church. Architect, Mr. Christian, 8a, Whitehall-place, London.

PELTER.—June 18.—For removal and rebuilding of coastguard station. Coast guard office, London.

PORTSMOUTH.—June 26.—For supplying 350 to 400 cast-iron covers for manholes, &c., for drains. Mr. J. E. Greatorex, borough engineer, Lindport hall, Arundel street.

SHERBORNE LOCAL BOARD WATERWORKS.—June 25.—1. For providing waterwheel, pumps, pipes and other works. 2. For constructing about 700 yards of brick conduit, &c. Drawings, &c., Mr. Lawson, 3, Westminster chambers, Victoria street, and Mr. Noake, surveyor, Sherborne. J. Y. Melmoth, clerk to the board, Sherborne.

SOUTH EASTERN RAILWAY COMPANY.—2,000,000 stock bricks. T. A. Clubbe, secretary, Terminus, London-bridge.

SOUTH HAYLING.—June 17.—For the erection of a small Italian villa residence. F. Whitaker, architect, 3, Westminster chambers, Victoria street, S. W.

SOUTH HYKEHAM RECTORY.—June 16.—For the erection of a Rectory house and offices at South Hykeham, near Lincoln. James Soppit, architect, Tout Hill, Shaftesbury.

SOUTH-WESTERN AND BRIGHTON RAILWAY.—June 22.—For repairs at the stations on the joint line between Portsmouth and Cosham. F. J. Macaulay, secretary, Waterloo Bridge station.

ST. JAMES, WESTMINSTER.—June 17.—Contract for general works, repairs of sewers, &c. G. G. Buzzard, vestry clerk, vestry hall, Piccadilly.

ST. MARTIN'S-IN-THE FIELDS.—June 18.—For paving and repairing the footways and carriageways, and for broken granite. J. Dangerfield, vestry clerk.

ST. MARY, ISLINGTON.—June 19.—For unbroken Guernsey granite, &c. W. Hicks, clerk, Liverpool road.

SWINESHEAD.—June 8.—For making and fixing three blocks of seating for the parish church.

TEDDINGTON.—June 16.—For finishing seven houses and premises. Mr. R. C. Fox, Clattern wharf, Kingston-on-Thames.

WAR DEPARTMENT.—Netley, Southampton.—For external painting, colouring, &c. W. C. Hadden, Colonel-Commanding, Royal Engineer Office, Portsmouth.

WEST HAM LOCAL BOARD OF HEALTH.—June 22.—For the supply of about 1,000 yards of broken granite. C. Wilson, clerk, Rokeby house, Stratford.

WOOLWICH.—June 18 and 19.—For repairing and keeping in order the waterclosets in the barracks. Lieut. Col. W. D. Gossett, Royal Engineer Office, Woolwich.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Benjamin Boots, Wadhurst, Sussex, builder, June 18, at 11—George Keeling Byford, Shepperton, brick burner, June 17, at 12—Peter Porter, Upper Clapton, road contractor, June 24 at 2—Frederick Taylor, Teddington, carpenter, June 24, at 2—William James Baker, Lissongrove and Grove mews, carpenter—John Leach Bellamy, Buckhurst hill, builder, June 23, at 2—George Large, Hemsworth-street, Canning Town, builder, June 29, at 12—Coolthurst Leigh, Isleworth, ironmonger, June 24, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Fisher, Kidderminster, builder, June 19, at 12—George Albert, Holbeck, near Leeds, engineer, June 22, at 12—Thomas Batchelor, Luton, carpenter, June 23, at 10—Henry Scarratt, Hanley, painter, July 18, at 11—Stroud Lancey Tindel, Reading, engineer, June 20, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 30, E. H. Cogswell, Hatfield Broad Oak, builder—June 30 G. W. Bodda, West Croydon, builder—June 23, C. J. Watts, Norwich, engineer—June 26, C. Fielding, Charles-street, Stepney, builder—July 3, F. Foster, Stopsley, Beds, builder—June 24, H Vere, Kensington Park-road, builder—July 14, N Olive, Truro, carpenter—July 14, W. Hellyar, Truro, painter and glazier—June 29, F. Wallis, Northfleet, builder—June 29, C. Pascall, South Norwood, engineer—July 10, W. Nunn, Hanover-street, Peckham, builder—July 7, W. Hosken, Nelson-terrace, Dalston, plumber and glazier—July 10, C. T. E. Goshawk, Stratford, builder—June 10, A. Parkhouse, Strand, house-decorator—July 10, S. Peatchcott, East Dulwich, builder—July 2, P. Coombes, Liverpool, plumber and painter—June 24, S. and R. Warich, Askham, Lancashire, joiners—July 15, T Taylor, Wootton Bassett, slater June 26, M. Mason, Cambridge, contractor June 26, C. Plumb, Cambridge, painter and glazier—July 15, J. Grace, Swanbourn, Bucks, builder.

PARTNERSHIPS DISSOLVED.

Wightman and Wightman, Three Oak lane, Southwark, engineers—T. and E Schofield, Greetland, builders—Hitch and Co., Ware, brickmakers—Kemp and Webster, Ross, timber merchants.

DIVIDENDS.

June 18, J. Morris, Oxford street and Clay-street, builder—July 1, F. Hamilton, Golden-lane and Cupid's-court, engineers.

DECLARATION OF DIVIDEND.

G. E. Mills, Cambridge, builder, div. 1s. 5½d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£12	0	12	10	Archangel, yellow ..	£11	0	£12	0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12	0
,, yellow pine..	2	13	4	5	Finland	7	0	8	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	5	10	Gothenburg, yellow	8	0	9	10
,, birch.....	4	5	5	0	,, white	8	0	9	0
,, elm	3	15	5	10	Oefle, yellow.....	10	0	10	10
Dantzic oak	4	0	6	0	Soderbam	9	0	10	10
,, fir	2	5	3	5	Christiania, per C.,				
Memel fir	3	0	4	5	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	3	yellow	11	0	13	0
Swedish	1	17	2	8	Deck Plank, Dantzic,				
Masts, Quebec red pine	5	0	6	10	per 40 ft. 3 in.	0	15	1	3
,, yellow pine..	5	0	6	0	PUMICE STONE pr ton	6	0	8	0
Lathwood, Dantzic, fm	6	10	7	10	Oils, &c.				
,, St. Petersburg	8	10	9	10	Seal, pale....per tun	36	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	98	0	0	0
					Cod	39	0	0	0
					Whale, Stb. Sea, pale	35	0	0	0
Quebec, white spruce	13	0	20	0	Olive, Gallipoli.....	71	0	73	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	53	0	55	0
Yellow pine, per reduced C.					Palm, fine	40	0	40	0
					Linseed	32	5	34	0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	34	0	0	0
2nd do.....	11	0	12	0	Cottonseed.....	32	0	38	0

METALS.

IRON :—

Welsh Bars in London ....per ton	6	5	0	6	5	0	8	
Nail Rod ..... do	7	5	0	7	12	6		
Hoops. ..... do	8	5	0	9	0	0		
Hoops, Single ..... do	8	0	0	9	0	0		2½
Staffordshire Bars... ..... do	7	5	0	7	15	0		
Bar, in Wales .... do	5	10	0	6	0	0		3
Nailrods .... do	7	5	0	7	15	0		2½
Foundry Pigs, at Glasg. No 1 .. do	2	12	3	2	17	6	net.	
Swedish Bars ..... do	10	0	0	10	10	0		2½

STEEL :—

Swedish Keg, hammered .....per ton	15	0	0	15	10	0		5½
Swedish Faggot ..... do	0	0	0	0	0	0		

COPPER :—

Sheet & Sheathing, & Bolts ....per ton	85	0	0	87	0	0		
Hammered Bottoms ..... do	92	0	0	0	0	0		
Flat Bottoms, not Hammered .... do	92	0	0	0	0	0		
Cake and Tough Ingot ..... do	81	0	0	82	0	0		3
Best Selected ..... do	84	0	0	85	0	0		
Australian ..... do	83	0	0	0	0	0		
Yel. Metal Sheathing & Bods ....per lb	0	0	7	0	0	7½		

LEAD :—

Pig, English .....per ton	21	5	0	0	0	0		
,, Spanish Soft ..... do	18	10	0	0	0	0		
Shot, Patent ..... do	22	10	0	23	15	0		2½
Sheet ..... do	20	0	0	20	15	0		5
White ..... do	27	0	0	30	0	0		

REGULUS OF ANTIMONY

French ..... ton	43	0	0	0	0	0		

ZINC :—

English Sheet .....per ton	26	0	0	26	15	0		2½
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0		

* And 5 per cent. discount if laid upon the new system

SPELTER :—

On the Spot .....per ton	20	0	0	0	0	0		nett
QUICKSILVER ..... per btl	6	17	0	0	0	0		

TIN :—

English Block .....per ton	96	0	0	0	0	0		
do Bar ..... do	97	0	0	99	0	0		2½
do Refined ..... do	97	0	0	0	0	0		
Banca ..... do	94	0	0	97	0	0		nett
Straits ..... do	91	10	0	92	0	0		

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 19, 1868.

SCULPTURE IN THE ROYAL ACADEMY.

HOWEVER opinions may differ about the merits of the paintings in the Royal Academy exhibition, there can be no question as to the humiliating character of the Sculpture Department, which, as regards both purpose and achievement, surpasses in reckless demerit that of any previous display of the kind within our memory. It requires, at the least, no slight effort of resolution to descend to the cellars to which the productions of the plastic art are consigned; and when the grim array of libellous effigies, from stolid bust to colossal memorial, with all the intermediate variety of poetic and puerile conceit, breaks upon the eye, the irresistible impulse is to beat a hasty retreat, and postpone to another day the irksome and ill-rewarded duty of critical inspection. Thus it has happened that in our own case five or six several visits have been made to the Academic dungeon before we could collect the materials and compose our thoughts for the following notice.

Making our way up the steps after our last visit—which we hope will indeed be the last to this unpleasant hole—it occurred to us to inquire how it should be that the noble art of sculpture, the highest in rank of the fine arts, should have sunk so very low as to be almost beneath notice and beyond hope, whilst her more gaudy sister still flaunted it in the eyes of the multitude, and had her indiscreet admirers by the thousand. The answer was not long in suggesting itself. The secret of the decline both of painting and sculpture in the present day is the want of poetic inspiration in both, compelling a descent to trivial and vulgar themes. In painting, this deficiency may be compensated to the ignorant observer by the attractions of colour, the trick of atmospheric effects, startling dispositions of perspective, and last, not least, the rich paraphernalia of costume and other accessories which may be made to fill up the void of an empty conception *ad libitum*. In sculpture, on the contrary, the artist has a hard, colourless, inert material to deal with, which genius alone can invest with softness, mobility, and the play of light and shade which may almost supply the place of colour—a material whiter than the pallor of death, which the inspired hand of the poetic artificer alone can fashion into the similitude of humanity, with features endowed with intellect, feeling, sentiment, all, in short, but speech and sight, yet eloquent in their blindness and their silence, and appealing as a passive but unerring medium to the sympathetic recognition of the beholder. It was by this magic power that the Greeks absolutely realised an entire mythology in marble, each personage of which had its unmistakable individuality as to proportions, build, carriage, feature, and expression, becoming, in short, a type of its kind, according to the special attributes of the ideal divinity; and it is for want of this power, and for want of worthy purpose for its use, that the degenerate moulder and carver of the present age aspires at most to the imitation of the more salient features of each vulgar patron, and, discouraged too often by the unpleasing result, seeks relaxation and occasional attraction by the introduction of animals of the lower order, still life, extravagant costumes, furniture, &c. In a word, all the offences and weaknesses of portraiture and *genre*, which pass muster with the idle multitude on canvas, are now imported into the simpler and grander province of sculpture, perverting its noble resources to the basest uses. Nor is this all. We have only spoken of the evil in principle, not the practical results. One might be inclined to fancy that sculpture, in its original great scope and purpose, being extinct amongst us—its life, in fact, being gone—the art itself might die, or pass into desuetude. But not so. It happens that the plastic art having in its mechanic application but one requirement to fulfil, that of representing form, and the modelling of form being, with a little practice, one of the easiest things possible—witness the Tussaud Gallery and the models in the hairdressers' shops—the manufacture of statuettes in every variety of extravagance and execrable taste for the adornment of cockney villas becomes a prolific source of scandal and annoyance: and hence, with the addition of the portrait bust and the portrait group business, the profitable employment of the so-called sculptor, and the degradation of his art.

But, *revenons à nos moutons*, let us go through the hundredth exhibition of sculpture at the Royal Academy, as it is provided for us. We observe, *en passant*, that two sculptor academicians, Messrs. Foley and Westmacott, are altogether unrepresented on the present occasion. Looking to the solid considerations which one, at any rate, if not both, of these gentlemen has the pleasure of enjoying, in the shape of ample testimonial and portrait commissions, their absence from the competitive display which many of their fellows aspire to may perhaps be accounted for without any disparagement of the *status* and success achieved by them in their calling.

Conspicuous in the midst of the central cell is the model of a colossal group of Her Majesty and the late Prince Consort, habited "in early Saxon costume," which has been executed in marble by Mr. Theed, and erected at Windsor Castle. We confess ourselves somewhat at a loss to understand the *rationale* of this spacious performance. The motto appended is—

Allured to brighter worlds, and led the way.

The Queen is represented resting her right hand on the shoulder of the Prince, and looking up to him with an expression of devoted love, while he grasps her left hand and points upwards, as to "another and a better world." Supposing this to be a *post mortem* "testimonial," the idea of associating the living with the dead is an incongruity too obvious to need dilating upon. There is a parallel, in poetic story, in the scene between Hamlet and his father's ghost; but Shakspeare in this case did not fall into the absurdity of bringing the figures into contact. In pictorial treatment they might be, as they have been, represented with equal substantiality; but the only way in which the difficulty might properly have been got over in the vehicle of sculpture would have been to have represented the apparition of the deceased in relief, as distinguished from that of the living, which, treated in the round, might have reverentially and lovingly followed, as it were, into the recesses of the marble. Add to this that, whilst the face of the Queen, in Mr. Theed's work, is marked with much of the womanly feeling which might befit the supposed occasion, that of the Prince is sadly deficient in the intellectuality and dignity with which such a presentment ought to have been invested.

In connection with the late Prince, we are favoured with two colossal bronze figures, intended to be placed upon "the Prince Consort National Memorial" in Hyde Park. We can only hope, in the interests of metropolitan art, that the other decorations intended for that extensive and costly mausoleum may be more successful than these. In the "Astronomy," by Mr. H. Armstead, we have a colossal, heavily draped female figure, looking down upon a globe which she holds in her hand. With the sole exception that the globe in question is, upon examination, found to be marked with the lines appropriated to the celestial sphere, there is nothing in the whole composition which might not have been more appropriate to the genius of Geography than that of Astronomy. The companion figure, by Mr. J. B. Philip, represents "Geology," who also grasps a globe, the outer crust of which is partly fractured, and who looks upward, instead of downward. Which is "Astronomy" and which "Geology" any uninitiated spectator might well inquire, and the apt reply would be that of the Waterloo showman, touching the identity of Napoleon and Wellington—"which ever you please, my little dear."

His Grace the Duke of Beaufort has favoured Mr. J. E. Boem with a sitting, on horseback, in his full equipments as "Master of Hounds," the latter of which, including riding whip, top boots, &c., are conscientiously reproduced. Opposite this interesting sporting testimonial the same artist exhibits "The Hunter of Early Days," a rough customer indeed, seated, spear in hand, upon a shaggy pony, with a rough broken ground beneath. The artist ought to have been aware that, although a well-fitting hunting coat and a pair of well-fitting boots might be successfully reproduced by a modern Phidias, the ragged surfaces which he deals with in the companion subject are utterly inappropriate to sculptural treatment. Nevertheless, reduced to the dimensions of a statuette, and brought out under the auspices of the London Art Union, as a prize for its subscribers, this is just the thing which might have a certain success.

In poetic art there are few attempts, and those serving only to exemplify how true are our preceding remarks upon the extinction of poetry amongst us. Mr. W. Calder Marshall, R.A., presents to us a semi-nude commonplace model, with an arrow in her hand, which he denominates "Psyche;" but there is none of the soul of Cupid's hapless victim in the expression, and even the conventional wings, emblematic of the soul's evanescent character, are wanting. Still more unfortunate is the same artist with "Eve's Dream"—such a starveling is the mother of nations, reclining amidst a profusion of dishevelled hair, which looks more like a torrent of water gushing from the ground upon which she rests.

"The Octoroon," by Mr. J. Bell, is a palpable imitation of Power's "Greek Slave," handcuffs, chains, and all; but it is in every respect sadly inferior to its prototype, which itself was a much over-rated production.

Mr. J. Lawlor's "Titania" goes considerably out of the ordinary run of offence in female nudities, being a seated figure, graceful in contour, and with a soft persuasive intelligence in the expression. But what is to be said of Mr. G. G. Adams's "Youth Diving," a back view of an ill-conditioned lad, heels upward, his head about to bury itself in the mud of a sedgy shore—for the water is obviously only a few inches deep. We leave the artist to settle the question with an admiring public.

Mr. J. Durham, A.R.A., treads on safer ground when he dresses his buxom village girl "At the Spring" in good substantial boddice and petticoats, and his "Paul and Virginia" in equally unexceptionable attire. But, after all, these works do not aspire higher than those tea-garden decorations which many of us recollect in our earlier days, and which were generally manufactured in the humbler materials of wood or cement.

Professor Jerichau, of the Royal Academy of Fine Arts, Copenhagen, and a pupil of Thorwaldsen, has lately, thanks to his local antecedents, obtained a considerable share of patronage in illustrious quarters, and threatens to assume a position of dangerous rivalry to our native artists. His works, whilst occasionally indulging in the sensuous or the sensational, are, as far as poetic feeling is concerned, conspicuous for its absence. His "Leopard Hunter," with a blind cub leopard tucked up under his arm, whilst with the other he wields a spear to drive off the enraged dam, is a production by which nothing

is suggested either inspiring, pleasing, or instructive; and, therefore, as far as the purposes of sculpture are concerned, is a misapplication of labour and material. In his "Amor Triumphator," he represents the mischievous little god as a very steady, stern-looking boy, as far removed from either conceiving or inspiring a tender passion as the Psyche of Mr. Marshall. It would be droll to see the two introduced to one another, and imagine their little dalliances, which should inspire an Ovid or an Apuleius. Professor Jerichau's "Cupid" makes up for his want of personal merit by a profusion of gilding upon the helmet, sword, and various etceteras which surround him—instructive suggestions of the ruling principle of the day. M. Jerichau attones for his shortcomings in his two more pretentious performances, by an extremely pretty group in relief of "Greek Girls Dancing," which hangs on the landing-place beneath the Laocoon.

Mr. G. F. Watts, R.A., who affects old Venetian colouring in his easel productions, tries his hand in sculpture also, in a marble bust of "Clytie," obviously studied in emulation of the more charged and eccentric performances of Michael Angelo. It is described as being "unfinished." May it remain so!

The portrait busts, and indeed the "Vanity Fair" department generally, present few examples to call for notice as relieving the prevailing commonplace vulgarity. Mr. Weeks's bust of the late Thos. Statham, the artist, in exaggerating the somewhat peculiar features of the original, gives none of the amiable delicacy of thought which characterised him. Mr. Theed generalises and smooths away all the expressive bluntness which presents the "Earl of Derby" to the public mind as the *beau ideal* of "the fine old English gentleman." Mr. W. Graham caricatures the eccentric features of the late Lord Brougham, with a result beyond the most unkind imaginings. Mr. P. Hollins' full-length statue of Sir Rowland Hill, standing beside a pillar letter-box, and intended to be erected in Birmingham, by public subscription, is a fine specimen of coat-and-trousers testimonial sculpture. We cannot speak so highly of Mr. T. Sharp's Lord Palmerston, executed (by subscription) for the town and corporation of Southampton. The likeness is a poor one in point of features, and the jaunty daring of the "judicious bottle-holder" is hopelessly simmered away. In child subjects, Mr. A. Munroe indulges in his favourite mode of treatment in his marble group of the "Sisters," crouching together as if growing out of a flower-bed, with the faintest possible indications of anatomy in any one of their figures. Mr. J. Durham, A.R.A., makes a fearful exhibition of the four children of parents rejoicing in the name of Smith, "Sitting for our Portraits." The same artist realises a marvellous idea in the portrait of a little gentleman, *in naturalibus*, with a big sponge in his hand, "Waiting for my Bath;" and Mr. C. E. Smith has a little lady "Retiring from the Bath," which, though a portrait subject, is not without artistic interest. Mr. J. D. Crittenden's graceless little nudity, "Resting—a little weary of her play," is in every respect an offence, and ought to be removed or covered over.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

SECOND NOTICE.

THE GREAT ITALIAN PAINTERS.

IT is singular that the brightest illustrators of any particular art should all burst forth at one and the same period. Such a constellation of poets and dramatists took place in Greece, where the space of a few years covers all the great names which have lived from that day to this. In sculpture it was the same, and in our own history the Elizabethan era held the best of our imaginative geniuses. We see the same law carried out in the history of painting in Italy, where at the commencement of the sixteenth century we find Leonardo da Vinci, Michael Angelo, Raphael, and Titian, all rivalling each other in the progress made in art. Of each of these masters and their attendant satellites—great artists, too, some of them—we have examples, or reputed examples, at Leeds. Nine pictures claim Da Vinci for their parent, but it is somewhat doubtful if more than two are descended in a direct line from him. Of these, the first which claims our notice is a lovely female face (No. 233), from the Duke of Devonshire's collection. It is in the early style of Leonardo, when he must have found such work dangerous, for even after this long lapse of years we can hardly look upon this painted semblance without a quickened pulse, so winsome is the smile with which both eyes and lips greet us. The face itself is one which evidently haunted Leonardo, for in many of his later works do we find the same pointed oval contour and the same rich rippling golden curls which we see here. That it was a labour of love with him we cannot doubt, for each minutiæ of her costume, each thread of lace, and every jewel which glistens on her bosom, are rendered with the utmost painstaking zeal, and, tied by a true-lover's knot, on her scarf are the initials "E. B." Who she was is not known, but on the back of the panel is painted a grim skull, with the inscription "Hieronymi—Casii—insigne." Beautiful as mysterious, we recommend this picture to Miss Braddon. Volumes of sensation may be obtained from it, and not even this result could make us love the face the less. Another work of his here is (No. 234) "Saint Katharine," from the Corsi Gallery, at Florence, where we see the same pointed oval outline of face, and where the virgin saint smiles so brightly as she contemplates the wheel of her torture and the palm branch of her martyrdom that the very angels who bear her company reflect it back again. None of the other works are at all entitled to the name they bear, and some are so very poor that we wonder at the hypocrisy which can be content with so very thin a mask. By Michael Angelo, that typical union of the arts, whose painting was sculpturesque, whose sculpture was picturesque, and whose architecture combined them both, we have one very interesting study. It is a small tempera sketch, the crude "blotting in" of his "Dream of Life," the dream of his "Dream," where a thousand floating ideas just leave their trace and go. The principal figure is almost the same as one of the well-known sculptured ones on the Medici tomb at Florence, and the whirl of the descending angel is magnificently managed. Of the three others attributed to Michael Angelo, only one has anything of his character about it; this is a Dantesque picture, by one of Michael Angelo's school, and represents—

> The infernal blast, increasing in its course,
> Hurrying along the miserable crowd,
> Whirling and tossing with resistless force.

Hustled and contorted in every manner, and in drawing much like Michael Angelo's. By Raphael no less than eight pictures claim to be—indeed, it is wonderful to see how many pictures by great masters there are in the world—if we take the names alone. Of these eight there is certainly not more than one which might be a Raphael, and even this is somewhat doubtful. The one we refer to is Lord Dudley's "Three Graces" (No. 218), a very much overrated work, most probably by Lo Spagna. It is very highly finished, and in very good preservation, and its *motif* is taken from the well-known sculpture in the library of Siena Cathedral; there is a little alteration, but only sufficient to translate sculpture into painting, and golden apples and coral ornaments are the only inventions of the painter, so, even supposing it to be by Raphael, we have only his hand and not his heart here. The only other picture having a fair pretext to the name of Raphael is one now pretty generally agreed to be Lo Spagna's. It is the well-known "Christ Bearing His Cross," and was exhibited in '57, at Manchester. The face is quite worthy of Raphael in its deep sorrowing look, but the head is too small for the rest of the figure, and the accessories of a pig eating thistles and the men driving an ass in the background at once would prove it not to be by one who took so much care in all his detail as did Raphael. Claim is made for *a* "Maddona del Cardellino," of Vallombrosa, as *the* original, and the one in the Uffizii, at Florence, called the copy. There is a large amount of documentary evidence to prove it so, but we fear the only truthful part about it is the present owner's name, M. Verity. As for the others they are simply impossibilities, without the slightest foundation for their fame.

To Titian are attributed no less than thirteen drawings, many of them well known to our readers as being from the Hampton Court collection. We have here his own portrait on the same canvas with Andrea Franceschini, the Chancellor of the Republic, who wears the crimson robe of the order of St. Mark, and who is in the catalogue called "Pietro Aretino," according to the rule laid down by the Executive that they will call all pictures just soever what the owners please. Strangly enough a real portrait of "The Friend of Titian and the Scourge of Princes" turns up here from Sir Stirling Maxwell's collection, where, still more strangely, it is called a "Portrait of Ariosto." The keen eyes of Mr. Redford, the assistant commissioner at Leeds, discovered the words "Petrus Aretinus" on it as soon as it arrived, and have added another to authenticated portraits by this wonderful and prolific artist. An odd misnomer of a portrait occurs in No. 237, which is now called "Allessandro de Medici," but which has once before done duty as a portrait of Boccaccio, and been engraved as such. But there is one still more curious, in No. 287. This is called a portrait of "Ignatius Loyola." It is a fine handsome youth, with face and eye radiant with poetic inspiration; his hands hold the olive crown and the palm branch, at his feet lies a quiver of arrows, and round his head a thin line nimbus. Now we know that no portrait of Loyola was known to be taken during his life, but that all that exist were taken from a wax mask prepared after death. He was not canonised till about a hundred and fifty years after Titian's death, neither did he suffer martyrdom, nor is there any resemblance to the features of Rubens' well-known portrait at Warwick Castle. Name-givers should have some ground to go upon, but the horror of the words "portrait unknown" in their catalogue seems to drive them to madness: hence this recklessness.

There is one fine head here, which, if not properly named, is happily selected. It is that of "Ginlio Clorio" (244), from Colonel Towneley's gallery, and we fancy we can trace in the keen, observant face the lineaments of the celebrated minaturist, the greatest and last of that old race of illuminators of manuscript. The printing press was gradually exterminating. The "Lucretia," from Hampton Court, and a dubious landscape are here, with some others of still more questionable reputation. Of Fra Bartolommeo there is a charming example from Lord Wenlock's gallery, representing the meeting of Saints Francis and Domenic—those simultaneous founders of the mendicant orders who divided the world between them. It is full of poetry, and none can see its quiet tone without feeling some reflex from the deep pathos it contains. Worn and weary with the work of their life, these two old men meet in its evening, but with a serenity as unsullied as the sunset sky behind them, and we feel that the "*Pax vobiscum*" each utters is but the echo of that greater peace which reigns within. Scarcely less beautiful is a "Madonna and Child" by him, from Earl Powys' collection (No. 263). We see in it much of the beauty of colouring Raphael

learned from him; indeed, the drawing is highly Raphaelesque. A very charming specimen of Andrea del Sarto is No. 258, also from Lord Wenlock's gallery, and is highly characteristic of the master. The other claimants for the honour of being his work are most of them worthless, and have not the slightest resemblance to the very marked and peculiar style of this clever but unfortunate artist. From Pamigiano we have a wonderfully decorative little picture of a round of children dancing on the deeply recessed ledge of a window. All races are here, from the dusky Ethiope to the fairer European, and as they swing round in their circular dance all varieties of position present themselves, each seeming more beautifully rendered than the other. This is one of the most graceful pictures in the exhibition, and presents many useful hints to decorative artists. Above this hangs a picture more interesting from the man who did it than what he here did. It is by old Giorgio Vasari, the gossiping chronicler of art history and scandal, from whose works all writers since have dug their precious stones, to set them as they pleased.

Paulo Veronese is represented by a caricature of his "Marriage at Cana," and a very good school drawing of his "Banquet in the house of Levi," and his grand architectural treatment is quite worthy of memorandum by our professional visitors.

The minor artists of the various Italian schools are well represented, but it would occupy too much of our space, and too much of our readers' patience, were we to comment upon them all, and next week we purpose giving a brief summary of the exhibits in the Spanish, French, and German schools.

THE ARCHITECTURAL EXHIBITION, CONDUIT-STREET.

THIRD NOTICE.

IN the designs for churches at the Architectural Exhibition reviewed in our last notice it is worthy of remark that all those intended for Roman Catholic worship, by Messrs. Willson and Nicholl, Messrs. Hadfield and Son, and Mr. Goldie, show an inspiration drawn almost exclusively from foreign models. Early French Gothic, is the type followed by these architects in the main, though Italian influence is observable in the windowless east end of the church at Marylebone (No. 40), which is treated after the manner of Mr. Butterfield's east ends of the churches of St. Albans and All Saints'. Whereas in the works by Mr. Street and Mr. White, which are intended for the use of the Established Church of England, a pure English style, that which obtained in the Early Decorated period of architecture, has been adhered to throughout. There may be a consistent reason for each of these different practices, seeing that the one church acknowledges the reigning sovereign of the land and the other a foreign potentate as their heads respectively; and it may be desirable that such a distinctive difference as that noticed should characterise the structures erected by them. With such reasons as these we have nothing to do, further than that in the former instances an excuse is afforded for a departure from the course which we would strongly urge upon English architects as a rule—we mean that they should take their beautiful national style as the groundwork upon which to form their own. We are glad to see on the part of Mr. Street, for instance, an abandonment of the bald plate-tracery and stumpy columns which injured many of his former designs, and which has proved so infectious a disease among his imitators; and we hail this change with hope for the great work upon which he is about to be engaged. And though we have felt it necessary to speak strongly with regard to some points in the designs by Mr. White, reference to the photographs of his executed works (Nos. 348 and 353) may be made as furnishing examples of the general "character and dignity" we have remarked as generally distinguishing his works. The same may be seen, accompanied with some regrettable crotchets, in his noble church of All Saints', Notting Hill, which is represented in these photographs.

During the past year several limited and unlimited competitions have occurred for churches intended to accommodate large congregations, varying from 1,000 to 1,200 persons, viz., at Ryde, Dorchester, Lincoln, Great Yarmouth, and Slough, and these have unquestionably called forth a large amount of talent, and as the problem sought to be solved in them all is one of great practical as well as artistic interest to the public, and to the profession, we intend to devote some consideration to them.

It is unfortunate that more of the successful designs are not exhibited here, so that they might be compared with the unsuccessful ones; that by Mr. Seddon for the church at Great Yarmouth is, in fact, the only "selected" design in the room. Of the Ryde Church we have the designs by Messrs. Driver and Payne (Nos. 170 and 182), the exterior of that by Mr. Conybeare (No. 189). In the BUILDING NEWS for June 5, we engraved side by side the former of these and the accepted design by Mr. Peachey, of Darlington; as also the interior view of Mr. Conybeare's. In the case of this church the choice of the committee does not appear to have fallen upon the best design; but though Messrs. Driver and Payne's design was superior to that by Mr. Peachey, which bristled with useless pinnacles, we must own it was itself far inferior to many of the designs sent for the other churches above named. The way in which the circular apse is frittered into stripes by buttress pilasters, the unpleasant tucked-in appearance that it has beneath the sills of the windows, and the too great contrast occasioned by the crowding of the pinnacles and lucernes at the base of the spire above the simple tower are great drawbacks to a design otherwise meritorious. Mr. Conybeare's design is an unpractical dream based upon the study of stately German Romanesque cathedrals and churches, the interior view of which, referred to above, was far superior to the exterior, a perspective of which is here exhibited. Mr. Conybeare also sends his design (No. 188) for the narthex or western porch for the Dorchester Church, founded upon that which exists at St. Andrew's Church at Cologne, which, though picturesque, and, antiquarianly speaking, interesting enough in the original, is not the sort of thing that would be tolerated in modern work. We may remark that the curious Saracenic cusping is in that ancient example confined to the soffits of the transverse arches, the wall ribs being judiciously left as plain roll mouldings, and the effect is infinitely better than here, where a questionable idea seems worked to death. Yet Mr. Conybeare without doubt deserves praise for his laudable effort to develope the Romanesque style for modern uses. To attain success, however, he must descend considerably more into the region of common sense and abandon this exclusively German type, in which there is far more to avoid than to copy. We have been told that the cost of the selected design for this church at Ryde having proved beyond the estimate, it and its author have been set aside, and that the work has fallen into the hands of Mr. Gilbert Scott. If this be the case, though the folly of unlimited competitions may have met with a deserved check, we are at a loss to understand how the glaring injustice done to the other competitors, who cannot all have erred alike, is to be explained, or the conduct of the architect who has lent himself to such a proceeding. For a church at Hemel Hempsted there is a simple and fair, but ordinary, competitive design by Mr. Henry Hall (No. 39); but his design submitted for the Dorchester Church is very inferior. In the competition for the church at Lincoln greater care was taken by the committee to ensure that the competitors should be architects of standing and experience, and the result, compared with that at Ryde and Dorchester, showed the wisdom of this course. Here, again, we have to regret the absence of the selected design, which was by Mr. Fowler, of Louth, and this we do the more, because we learn that it was not the one which was placed first on the list by the professional architect who acted as the adviser of the committee. We shall not attempt, therefore, to class those designs for it which are here exhibited, but simply to give our opinion upon them individually. No. 106 shows the exterior and No. 107 the interior of the design by Messrs. R. Phené Spiers and Michael Drury. These have the appearance of being careful and meritorious studies, and many parts of the design are simple and well-treated in themselves, but they are not harmoniously combined. The French-looking, dignified, and well-treated plate-traceried clerestory of the nave is out of keeping with the modestly proportioned English Gothic arcade, the treatment of the capitals of which is the only bond of union. The chancel and tower are more ambitious and less successful. The former is vaulted and square without, though treated with the effect of a polygonal apse within (a novel idea),* the effect of which is good internally but not so externally. The gables above the belfry windows of the tower piercing and rising above its cornice assist some equally ill-placed angle pinnacles in effectually spoiling an ordinary broach spire.

The plans for this church by Messrs. Giles and Robinson (Nos. 227, &c.), and Mr. Seddon (Nos. 220, &c.), are, like those for the Yarmouth Church, by the same architects, in strong contrast; the former have striven to accommodate the large number required by naves of moderate size and width, with double side aisles, while the latter makes his aisles quite subordinate to his naves, which are of no less than about 40ft. wide, but, evidently for economy, of very moderate height. Necessarily, in like contrast, is the multiplicity of parts and features in the one case, and their extreme fewness and simplicity in the latter. Thus the number of windows is at least threefold in the designs by Messrs. Giles and Robinson to those by Mr. Seddon, while the internal arches and columns would be in still more striking disproportion, and a comparison of the relative sizes of these features would be in inverse ratio. Perhaps these characteristics are severally carried to excess. Mr. Seddon seems to think nothing of arches of nearly 40ft. span, or of windows of greater width than ordinary churches, and we should certainly advise his reconsideration of the bulk of some of his piers, and his great gabled aisle windows of the Lincoln Church would need more space of masonry in the gables over them to produce a good effect. Messrs. Giles and Robinson's designs are set forth in bright and clear sepia drawings, and are full of graceful and pretty points; the north side of the Lincoln Church, which has but one aisle, is the better elevation of the two; and its continuously ranged clerestory and aisle windows, with good height of walling below them, are the best features in the design. The towers and spire in both these designs are over-laboured with no very successful result.

For the Yarmouth Church, the number of competitors of which was limited to six, we have the designs by the local architect, Mr. Bottle (Nos. 55 and 60), and those by Mr. Seddon (Nos. 226, &c.), and Messrs. Giles and Robinson (No. 382, &c.) Mr. Seddon's were evidently selected for the simplicity of his plan; and certainly he seems to have made the most of it, enclosing an awkwardly square plot of ground to its very verge, with only eight points of internal support. A nave and transept of the width of about 40ft., which he seems usually to adopt, cross each other, and divide the plan into that of a Greek cross, the re-entering angles being filled up by side aisles roofed parallel to the nave.

* An ancient example somewhat resembling this may be seen at Tour-en-Bessin, near Bayeux.

The nave and aisles, as if for economical reasons, are low (too low we think) and of nearly equal height. A simple and bold tower, with lead-covered spire, is advanced at the north-west angle, and serves to conceal the shortness of the building. Messrs. Giles and Robinson's design is so similar to the one by them which we have described as to need no further remark, with the exception of the novel and striking arrangement of its triple chancel arch, which is only carried up to the height of the wall-plate; having no wall to support, its object is purely ornamental, and we should have preferred a more obvious screen, particularly where economy was an object to be sought. This economy has been well studied in Mr. Bottle's design (No. 60), which has many fine features besides. Its general aspect is that of one of the great Belgian churches, but, from the limited nature of the site, painfully cramped in point of length. The nave is of great width and sufficient height, and has one aisle on one side and two on the other, the outer one of which is very narrow and roofed with a succession of large dormers, which give the appearance of external chapels, and which need much greater space of masonry in their gables. This aisle is divided from its neighbour by very depressed and ugly arches. The tower, also, at the north-east angle, is bold, and would pass muster among other oddities of its class in one of the cities of the Low Countries, but we fervently hope to see few such erected in our own English towns. A depressed spire rises out of a complicated belfry stage, which has angle turrets, and is placed upon a very simple tower with long shallow recessed panels, like one we remember at Bruges.

Messrs. Francis send drawings and photographs of several churches, of no very great originality or merit, but from these we may except their new parish church at Warrington, in Lancashire, just completed (No. 357), as being a fair example of a stately type of Middle Pointed, with a fine tower and spire of the class of those of Grantham and Newark. In fact, the church has in the photograph much the appearance of having grown up at various dates—depressed, heavily coped aisles by the side of an earlier and more acutely gabled nave, flanked by pinnacles which have an ominously modern-looking efflorescence of bunchy crocketing. For such a church, even if a reproduction only of a good old type, we are thankful; whereas it is with something less than complacency that we learn that No. 171 (St. Paul's Church, at Brentford) is being erected after so indifferent a design by the same architects. That that shown in the (No. 144) exterior view of St. Jude's Church, East Brixton, by Mr. E. C. Robins, or No. 186 (Christ Church, Herne Bay), by Messrs. George and Vaughan, are in actual course of perpetration can be only a cause of grief to all concerned; and No. 53 (Cemetery Chapels, Diss, Norfolk), J. W. Muskett, architect, is another lamentable addition to the number of deformities with which the "God's Acres" of our day are afflicted. Mr. Bottle, in his views of Congregational Chapel about to be erected at Great Yarmouth (No. 45), has been so far less fortunate than in his design for the church we have before referred to that it is difficult to conceive that the two designs or drawings have issued from the same source. Among the poor versions of French Gothic we are obliged to class No. 96, a design for new church at Lennoxville, Canada West, by C. Hodgson Fowler. We far prefer to it the photographs of his Church of St. Ive's, Leadgate, Durham (No. 339), which seems stern, simple, and satisfactory enough. Near it is No. 337 (photograph of Abbey Cwm Hir Church, Radnorshire), which is well studied, but of too startling an Early French type for such a locality. No. 347 (St. Saviour's Church, Croydon), by Messrs. Mullins, Lee, and Mullins, is of a "Victorian" style, of which we desire to see little. No. 355 (photograph of design for interior of chapel of Bedford Middle-class Schools), J. Usher, architect, drawn by J. Johnson, is hung too low for examination, but seems to be really good. Nos. 359 and 360 are an exterior and interior view of Church of St. John, Alloa, N.B., by R. Anderson, which is also good and unpretending, but the buttresses to the tower are carried up too high without diminution, and oppress and hide good belfry couplets. No. 190 is a quaint design for a new church now being erected at Worthing, by George Truefitt, effectively and cleverly coloured, but the style is too eccentric. Its great baseless circular apse seems to have sunk into the ground, and the simple and good tower and spire are spoiled by windows, which may be called belfry and lucernes combined, and which break most unfortunately the necessary continuity of the cornice. But such mild eccentricity pales before that which characterises the design shown in the queerly coloured drawing (No. 160) of the Church of the English Martyrs at Preston, by E. Welby Pugin. This is a pretentious building, with a lofty nave and squeezed-up aisles, and a tower which seems to have quarrelled with both and taken up a position at the side, thus leaving an ugly gap in the façade. Both tower and nave are covered with exaggerated lanky pinnacles, with an eruption of spiky little gablets. One of these pinnacles bestraddles the apex of the nave gable, by the help of a corbel of most comic description, and two or three seem to have got piled one on top of another, in order to emphasize the parapet of the tower. The tower, square and plain at base, must be at that part nearly solid, to allow the four octagonal turrets to spring out of it above, as they do, and yet to leave the wall between as thick as the deep recesses of its windows would make it appear. In fact, the whole thing is redolent of nightmare.

Several frames of photographs of executed designs are exhibited by Mr. Goldie, and show much vigour of thought and careful design, but we much desiderate in them greater temperance in the use of Early French Gothic detail and a lighter handling. The tabernacling above the altars of St. Wilfrid's, York, and St. Alphonsus' Church, Limerick (Nos. 373 and 356), are fussy and overdone. In one a range of statues under heavy canopies seems to crush the lower part of the altar, and a low altar screen has a range of stumpy columns in front, which have nothing to support, and which are quite out of scale; we also object strongly to the sort of Louis Quinze scrollwork which corrupts his Early Gothic foliage of his fine doorway at York. In No. 378 Mr. Goldie exhibits a stately new tower to a fine old church, injured, however, by gables breaking through the cornice, as noticed in other designs above. No. 390 (St. Silas's Church, Sheffield, by Blackmoor and Withers) is a very indifferent design. Having thus exhausted the designs for churches which seem to deserve notice, we must reserve the domestic examples to another opportunity.

SHAKSPEARIAN CURIOSITIES.*

It is very nearly seven years since the Shakspeare Fund was established to accomplish the following objects:—1. The purchase of the gardens of the poet at the New Place. 2. The purchase of the remainder of the birth-place estate. 3. The purchase of Anne Hathaway's cottage, with an endowment for a custodian. 4. The purchase of Getley's Copyhold, Stratford-on-Avon. 5. The purchase of any other properties at or near that town that either formerly belonged to Shakspeare or are intimately connected with the memories of his life. 6. The calendaring and preservation of those records at Stratford which illustrate his life, or the social life and history of the town in his time; and, 7, the erection and endowment of a public library and museum at Stratford. The efforts of the Fund Committee during these seven years have been so far successful that we understand three of the most important of the objects enumerated may be said to be accomplished, including the formation of the valuable collection known as the Shakspeare Library and Museum now preserved at Stratford-on-Avon. A descriptive catalogue of this unique collection has just been published in a volume of nearly 200 pages, and containing as many as 1,148 entries, more or less interesting. Indeed, considering the meagreness of our information touching the personal history of Shakspeare, we must regard this collection of books, MS., works of art, antiquities, and relics as a very remarkable one. A brief analysis of the catalogue will enable the reader to judge for himself, and to form a tolerable notion of the nature and extent of the Museum. It seems desirable, by way of introduction, that we should state a few particulars concerning Shakspeare's house itself, in which these relics are lodged. Through the selfishness of a lazy parson, one Francis Gastrell, its then unworthy possessor, the house where Shakspeare died was razed to the ground about a century or more ago "in revenge for an assessment." The said gentleman about the same time also cut down the famous mulberry tree planted by the dramatist rather than take the trouble to show it to visitors. Luckily for us this reverend vandal had nothing to do with the first home of the poet. That hallowed place is still preserved to us. The house stands at the north-west end of Henley-street, Stratford, and is a comfortable and respectable habitation of the early part of Elizabeth's reign. It consists of a framework of timber formed in squares, with the intervening compartments filled up with mud and plaster—locally termed "wattle and dab"—latticed windows, and high-pitched gable roofs. Warwickshire still contains a number of similar edifices. Shakspeare's father, in 1574, purchased this house and another for the sum of £40. At his death, in 1601, they became the property of his eldest son, William, who bequeathed them in succession to his daughters Susanna and Judith. Lady Barnard, daughter of the former, and the last surviving descendant of Shakspeare, left the tenement to Thomas Hart, the grandson of the dramatist's sister Joan, and in his family they continued until the year 1806, when they were sold to a stranger for £250. The house in which the poet was born underwent great alterations about this time. The old dormer windows and the porch were removed, and other "modern improvements" were effected on it. Originally it seems to have formed one residence, but it was now divided. The western portion, containing the birth-room, was tenanted by a butcher, the other division being the "Swan and Maidenhead" Inn. This portion was afterwards fronted with red bricks, which of course further destroyed its original character. The house was kept open as an exhibition until 1847, when it was put up for sale by the well-known George Robins, and became national property, having been purchased for the sum of £3,000, raised by public subscription. It was then carefully restored with as satisfactory a result as could be hoped for. Entering this interesting edifice from the street, the visitor passes into an apartment, long occupied as a butcher's shop, but no doubt once Shakspeare's kitchen. Behind this is the dwelling-room of the family, from which a narrow stair leads to the very room in which, there is the most probable ground for believing, the poet was born. This chamber fronts the street, being immediately over the kitchen, and is lighted by a latticed window. The ceiling is remarkably low, only a little more than 7ft. above the floor, and ceiling and walls alike are literally covered with names and inscriptions in every language. Apropos of these names, many of them the autographs

* "A Catalogue of the Shakspeare Library and Museum, Stratford-on-Avon." London: Printed for the Shakspeare Fund. 1868.

of the most celebrated characters of their time, it is recorded that a woman in former days occupied the house as tenant at the yearly rent of £10. The proprietor, finding the visitors numerous, raised the rent to £40. In consequence the woman left, and, "to wreak her spite against the owner of the house, she, previous to quitting it, whitewashed the birth-room, thus inflicting, as she imagined, an irretrievable injury on the property. The whitewash, however, proved less adhesive than was anticipated, and was, with a little trouble, successfully removed." The museum is in the eastern portion of the building, formerly the Swan Inn. For the better preservation of the Shakspeare House no fire or candle is allowed in the building, which is, however, protected from the destructive influence of damp by hot water pipes, introduced from a tenement at a little distance. To give a detailed list of all the Shakspeare relics deposited here would be impossible, but a few of the more interesting may be mentioned. The number of entries in this catalogue amount, as we have stated, to 1,148, and the collection is made up of presentations from various gentlemen, who may be said to have devoted their lives to the study of England's greatest poet, and to everything connected with his name. Mr. J. O. Halliwell, the well-known Shakspearian scholar, has given to the museum about 450 books and papers of the greatest value, many of them edited by himself. Valuable bequests have likewise been made by Mr. F. W. Fairholt, F.R.S., Mr. J. Payne Collier, Mr. Hunt, town clerk of Stratford, Mr. J. D. Denman, B.C.L., the late Captain Saunders, and the late Mr. R. B. Wheler, of Stratford. For upwards of half a century Mr. Wheler diligently occupied himself in the completion of one of the most remarkable local and antiquarian collections ever formed by a single individual. It was generously placed in the museum after his death in 1857. Mr. Wheler was the author of several works on the history and antiquities of his native place (which it was his chiefest pride to think was also Shakspeare's); and of his "Collectanea de Stratford," a MS. work, it is remarked: "This marvellous example of the results of unrivalled industry and accuracy in 536 quarto pages, is so minutely written that a transcript in ordinary caligraphy would fill half a dozen volumes of a like size." Indeed, it is chiefly to the labours of this gentleman and Mr. Halliwell that we owe this museum, as well as much of our knowledge regarding the great dramatist and his works. The first noteworthy feature of the collection is the vast amount of Shakspearian literature that has been brought together. Besides the first, second, and third folio editions, dated 1623 (a large fragment only), 1632, and 1664, there are between forty and fifty complete editions of Shakspeare's works, numbering in all nearly three hundred volumes. This does not include copies of single plays, or portions merely of the works published separately. Nor does it include "Studies from Shakspeare," "Beauties of Shakspeare," and books of that class. These are so numerous that alone they form a large and valuable library. Mr. Halliwell has written a list of one thousand volumes of Shakspeariana, which have been published. The library also contains upwards of a score of Lives of the Poet, and the originals of various legal documents relating to Shakspeare and his family, on which much of the information that we now possess regarding him is founded. Among these is a deed executed in 1596, which proves that the father of the poet resided in the house now shown as the birthplace. The discovery of this document only a few years ago cleared up what was looked upon by some as a doubtful point. The deed has the mark attached to it of John Shakspeare. It is further interesting to note that notwithstanding Shakspeare's father married a woman of gentle blood and culture, Mary Arden, the heiress of Asbies, and that he himself was a man of undoubted business capabilities who rose to be chief magistrate of Stratford, yet neither John nor Mary Shakspeare were able to write their own names. Then we have the celebrated letter of Richard Quiney, whose son afterwards married Shakspeare's daughter Judith, asking for a loan of thirty pounds. It is dated 1598, and is the only letter addressed to the dramatist known to exist. There is a deed dated 1609, with the only autograph extant of Gilbert Shakspeare, his brother, and a conveyance of premises in Sheep-street, 1599, with the autograph of Hamnet Sadler, as a witness. Sadler was a legatee and a witness to Shakspeare's will, and was godfather to the poet's son, who died in 1596, at the age of 12. The will itself is here, or rather a copy of it, the original being preserved in Doctors Commons. It was executed on March 25, 1616, not quite a month previous to his death. It is the most important document existing relative to the poet. The three signatures attached to it, with two others appended to deeds relating to property in Blackfriars, constitute the only undoubted signatures of Shakspeare that we at present possess. These deeds are in the Guildhall library. A gold signet ring which was picked up in 1810, by a workman in a field adjoining Stratford Church, is presumed to have belonged to Shakspeare. It is inscribed with the initials "W.S.," with a true-lover's knot between the letters. This relic is exhibited together with a sword and a pair of stirrups said to have been the poet's; a piece of wood taken from his pew in the parish church; an ancient desk removed from the Grammar School; and traditionally believed to have been that in which he sat, and his jug of ancient glass, from which Garrick drank wine at the jubilee in 1769. Nor should we forget to mention an old chair, known as Shakspeare's, from the Falcon Inn, at "Drunken Bidford," with the old sign of that tavern, at which, according to the well-known story, he repaired to drink not wisely but too well. There is any number of articles in the shape of caskets, snuff boxes, tobacco stoppers, and paper knives made from the celebrated mulberry and crab trees, concerning which we have heard so much, and know so little. The portraits of the poet here form an interesting collection. We note engravings of the Chandos portrait, now the property of the nation, by Howbraken and Cousins, with a copy in oil and a lithograph of the same; also a lithograph of the Felton Shakspeare, with a likeness in crayons by Mr. Fairholt, and an engraving from the Jansen portrait, Dunkarton Sculp. 1811. An oil painting, described as being a "vile daub," finds a place on the wall, because it was in the possession of the Hart family at the birth-place in the last century. Besides these we have a photograph of the *proof* impression of Droeshout's engraving of 1623, and the Ely portrait, so called from its having belonged to the late Bishop of Ely, by whom it was highly prized. Perhaps the most interesting copy of the Chandos is one in crayons by Ozias Humphrey, R.A. (1783), which was executed expressly for Malone, who on the back has written that it is a very faithful copy, and in his opinion invaluable. The poet, he thinks, was about 43 years of age when this portrait was painted. There is no likeness of Shakspeare, as has been remarked, which has enjoyed a greater celebrity, or realises to the imagination a more pleasing image of the features of the Bard of Avon than the Chandos. Dubiety, however, attaches to this famous portrait, and although the Droeshout is not so prepossessing a likeness, it is the more genuine and valuable memorial. The Stratford portrait, as it is called, having been found in an old house there about a century ago, is also doubtful, though curious in its way. It is the only painting of old date which represents the poet in the same costume in which he appears in the monumental effigy in the church. Still it is not supposed to be older than the last century. The bust over his grave in Trinity Church is, after all, the best authenticated likeness of Shakspeare that we possess. It dates from within seven years after his death, and it is believed to have been executed under the direction of Dr. Hall, his son-in-law, the sculptor being Gerard Johnson, an artist of Dutch extraction resident in London.* The Museum possesses several other works of art, including portraits in oil of Garrick and Mrs. Garrick, one or two curious old views in oil of Stratford taken about 1750, an original portrait in oil of Sir Hugh Clapton, who resided for many years at New Place, and died there in 1751. It is painted by Thomas Murray, a distinguished portrait painter in his day. Mr. Halliwell contributes a large oil painting of Windsor and the castle, of the time of William the Third, showing the street where Falstaff is said to have been carried down in the bucket-basket. This very interesting picture, and another of the same date, apparently by the same artist, in Greenwich Hospital, are believed to be the two earliest paintings in Windsor known to exist. Space forbids our pointing out many interesting articles discovered in making recent excavations at New Place, where Shakspeare resided during his latter years, as well as a variety of other objects which lend additional value to the collection. On the whole, the Stratford Museum is a cabinet of curiosities perfectly unique, and one of the most interesting not only in the kingdom, but in the world.

THE ARCHITECTURAL ALLIANCE.

THIS association, which has not hitherto been signalised by very marked success, will hold its seventh annual meeting on Thursday, July 2, at No. 8, Montague-street, Russell-square, at ten o'clock. The following delegates are appointed to attend:—

LONDON ARCHITECTURAL ASSOCIATION. — T. Roger Smith, F.I.B.A., Thomas M. Rickman, F.S.A., A.I.B.A. (secretary *pro. tem.* of the Alliance), J. Douglass Mathews, A.I.B.A., R. Phèné Spiers, A.I.B.A.

ARCHITECTURAL INSTITUTE OF SCOTLAND.—J. D. Peddie.

BIRMINGHAM ARCHITECTURAL SOCIETY.—J. H. Chamberlain, F.I.B.A. (president of the Alliance), T. Plevins, W. Harris.

GLASGOW ARCHITECTURAL SOCIETY.—Alexander Thomson, John J. Stevenson.

LIVERPOOL ARCHITECTURAL SOCIETY.—G. E. Grayson, H. H. Statham, jun.

MANCHESTER ARCHITECTURAL ASSOCIATION.—Lawrence Booth, A.I.B.A., Peter B. Alley, jun., Alfred Darbyshire, A.I.B.A.

NORTHERN ARCHITECTURAL ASSOCIATION.—R. J. Johnson, F.I.B.A., Thomas Oliver, F.I.B.A., Francis Charlton, C.E.

NOTTINGHAM ARCHITECTURAL ASSOCIATION.—T. C. Hine (treasurer of the Alliance), Frederick Jackson.

The chair to be taken by the president, J. H. Chamberlain, of Birmingham, and the following important business is to be attended to:—

1.—Read minutes of meeting, 1867.

2.—Read report for last two years.

3.—Receive resolution of the Bristol Society to retire from the Alliance.

4.—Report any resolutions of the allied societies respecting Mr. Hine's paper "On the Propriety of making the Bills of Quantities a part of the Contract."

5.—Report any further proceedings with reference to Mr. Plevins' "Form of Contract and Conditions."

6.—Receive delegates from the General Builders' Association.

7.—Election of officers.

8.—Present and discharge accounts for two years ending June 30, 1868.

We think the best friends of the Alliance will admit that the destinies of architecture are not likely to be materially affected whatever may be the fate of the above programme.

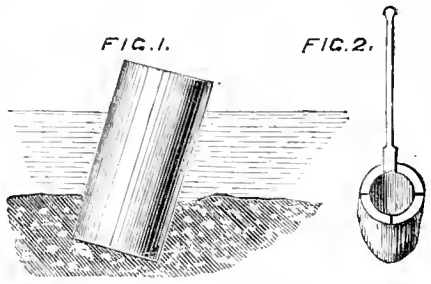
* The wretched Malone bribed the sexton of Stratford Church to let him whitewash the painted effigy of Shakspeare which stood there, in rude but lively fashion depicted, to the very colour of the cheek, the eye, the eyebrow, hair, the very dress he used to wear—the only authentic testimony we had, however imperfect, of these curious parts and parcels of him. By ——, if I had been a justice of the peace for Warwickshire, I would have capt both the commentator and sexton fast in the stocks, for a pair of meddling, sacrilegious varlets.—CHARLES LAMB.

ELEMENTS OF ENGINEERING.

Sinking Piles and Caissons.

THE different descriptions of foundations ordinarily used under water have been already treated of in our previous articles, and the various methods practised to overcome what is undoubtedly the chief difficulty attending all architectural and engineering structures fully investigated. It now remains for us to briefly describe the manner in which artificial foundations, such as piles, cylinders, and caissons, are got into position, and secured upon a firm and reliable basis. Timber piles, from their great antiquity, deserve first mention, although some of our readers might be inclined to consider them as rather obsolete. But those who have witnessed the extensive scale upon which they have been employed in the dams for the Thames embankment walls, and in numerous other large works in London, cannot fail to perceive that they will in a great measure continue to form an important part of the construction of all temporary works, even supposing that they are in future excluded from participating in permanent ones, an assumption we do not altogether concur in. The driving of ordinary timber piles, whether that operation be accomplished by the simple plan of letting a ram or monkey, as the weight is termed, of so many hundred weight fall directly upon the head of the pile, or by driving it down by steam power, is too well known to need a detailed description. Cast-iron piles may be driven in the same manner provided a block of timber is placed upon the top to deaden the force of the blow and diminish the actual impact. Otherwise, without this precaution there would be danger of the head of the pile being fractured in the driving. Cast iron piles, forming the sides of the caissons used in the foundations of Westminster Bridge, were driven in this manner with complete success. Screw piles are got in by means of a capstan and bars, which may be worked by hand or animal power. On the Bombay and Baroda Railway bullocks were used to turn the capstan that screwed home the piles into the bed of the rivers. Both piles of timber and of iron are got down with comparative facility when contrasted with cylinders and caissons. These latter enclose an area, which is of some extent in the former instance, and of very considerable amount in the latter.

There are three methods of sinking cylinders and caissons down to their proper depth. The first, which is unquestionably the simplest and the best under all circumstances, is by the method of dead weight, which consists in loading the cylinder on top with pigs of iron, castings, large masses of stone, and, in fact, any heavy material that may be at hand, until it cause it to descend to the required depth. A glance over the parapet of the temporary Blackfriars Bridge will demonstrate how the caissons employed in the construction of its successor are weighted. It will be readily understood that cylinders will not always sink uniformly. Should they happen to meet with a particularly hard bit of ground or some obstruction in the shape of a boulder upon one side, while the ground at the other is comparatively soft, they will sink more at the latter than the former side. The result of this will be that they will get out of the plumb and tilt up on one end. This is shown in fig. 1, drawn of course to an exaggerated scale, to show the thing plainly. Two courses are open to attempt to remove the obstacle. The one, and the more obvious, is to shift some of the weight from the lower side of the cylinder to the higher, and to add more, if necessary, until the high end is got down to the same level as the other, and the cylinder rights itself. In the majority of instances this plan will be found successful, but sometimes it will fail to accomplish the desired purpose. As a *dernier ressort*, divers are then sent down, who clear away the obstacle, or loosen the ground sufficiently to allow of the descent of the cylinder. The bed of the Thames presents very few impediments of this description, the cylinder and caissons, as a rule, sinking very gradually and uniformly down to their levels.



When the depth to which the cylinders have to be sunk is not considerable, the excavation of the earth inside is effected by means of scoops or spoons, similarly to that represented in fig. 2. These scoops are provided with long handles, and are furnished with a leather bag or pocket in the middle. After some time and practice the excavators are able to manage these scoops with great ease and dexterity, although upon first trial they prove very unwieldy instruments. The depth being too great for the use of these scoops after a certain portion of the sinking has been effected, the aid of divers is had recourse to. Formerly the diving bell was the usual resource in all subaqueous work, but latterly its use has been nearly altogether superseded by the employment of divers, equipped in Heinke's patent dress. The cost of men working as divers with the diving dress, and in a diving bell, is stated to be as one to three, without taking into consideration that a much greater freedom of action and liberty with respect to space and motion is afforded by the dress compared to being boxed up in a bell. Ever since the commencement of the works for the new Blackfriars Bridge, the operation of diving has been carried on almost hourly, and it has long ceased to be regarded with any greater curiosity than the rest of the working operations. The final weight with which a cylinder or caisson should be loaded depends upon two circumstances, one being the actual load it will have to carry in practice, and the other the rate at which it is sinking. Manifestly the greatest load put upon it in getting it down to its depth should not be less than the load it will have to permanently support, or there would be danger of an after settlement that might seriously jeopardise the stability of the structure. However superior the method of sinking caissons by mere dead weight may be with respect to simplicity and economy, yet there is a limit to its application, and instances continually arise where one of the other methods must be resorted to. These methods are known as the vacuum or Potts's method, and the plenum or that of Hughes's. Both are eminently useful, and we shall, therefore, briefly describe them. The principle of the vacuum method consists, as the name implies, in creating a vacuum in the interior of the cylinder, and by thus removing the pressure upon one side the cylinder descends in obedience to the atmospheric pressure it receives upon its upper surface. Any semi-fluid kind of substratum will be driven up into the cylinder by the surrounding pressure exerted by the air upon it, which is not balanced by any other inside the cylinder. When this plan was first introduced it was restricted almost to sinking hollow piles scarcely exceeding in diameter the ordinary size of timber piles, but shortly afterwards it was found that it was applicable to getting down cylinders of a large size. In fact, the larger the surface exposed to the atmospheric action the better for the practical application of the principle. There is one point to be kept in view with respect to this system which is of some importance. The greatest pressure upon the upper surface of the cylinder or caisson resulting from the exhaustion of the air does not exceed one ton per square foot, so that after it has been sunk to the proper depth, or thereabouts, it must be weighted with a load equal to the greatest it will have to sustain in practice.

This method is admirably adapted for getting caissons down through a soft stratum into one of greater consistency. The most improved plan of employing this method is to connect the cylinder at its upper end with a reservoir, and the vacuum being made by means of pumping, the sand or earth rushes up the cylinder into the reservoir. It is removed, the valve closed, and so the operation continues. Where the substratum is of a clayey character the vacuum process is sure to be successful, but it is useless for rocky bottoms, as the water would be sure to find its way in, and the vacuum could not be maintained. The occurrence of any large irregular masses, such as boulders, in the stratum to be sunk through, would also prevent the vacuum being maintained, and be fatal to the application of the principle.

Of a character the very reverse of the vacuum is the plenum method, which consists in forcing or compressing the air in the cylinder, and thus preventing the water from entering. In order not to lose a whole cylinder full of air every time any earth is removed from the inside in the process of excavation, what are termed air locks are provided, which possess the merit of being applicable to the upper part of any cylinder. This system is well suited for rocky bottoms. Forcing pumps are employed to condense the air sufficiently to drive the water out of the lower part of the cylinder, and the excavation can then be carried on without any unusual difficulty. One peculiar feature of this principle is, that the effect of the condensed air upon the workmen is to increase their energies and physical capacity for labour. At a pressure of about 2½ atmospheres, the men can do nearly twice as much work without fatigue as they could get through in the open air. Both of these atmospheric systems can be, and generally are, aided by the application of weights; as it is by loading that the real test is brought upon the cylinders sunk. We have now given ample information respecting the different principles of sinking foundations, and it will be at once seen that the nature of the locality and the character of the substratum must finally determine that particular method which should be adopted and which would be most likely to prove successful.

WOOD AND IRON.

THE first of a second course of lectures in connection with the Workmen's Technical Education Committee, illustrating the value of science to industry, was given on Tuesday evening, 9th inst., in the theatre of the London Mechanics' Institute, Southampton-buildings, Holborn, by Professor F. Crace Calvert, Ph.D., F.R.S., &c. The subject announced was "Iron and Wood," but the learned lecturer had only time to just incidentally touch upon the latter section of his subject. The attendance was very thin, and the gentleman who occupied the chair spoke with deserved severity of the change that had taken place in the management of mechanics' institutes, the educational element now being almost utterly sacrificed to the recreative one. It was not creditable to the working men that these lectures were so thinly attended. Professor Calvert had voluntarily given his services, coming from Manchester for the purpose, and bringing with him his apparatus and an assistant. Such men as the lecturer could not be expected to be at such a sacrifice of time and money when they witnessed such apathy on the part of the working men.

The lecturer, in his opening remarks, referred to his foreign accent, which was due to the fact that, when a little boy, he was sent to France to acquire the French language. While in that country he got to love science, and especially chemistry, but when he returned to this country he found that there was not a laboratory, not an

institution in the country where a knowledge of technical chemistry could be imparted. This being the case, he returned to the Continent to pursue his studies, which extended over many years, and in course of time he acquired his peculiar foreign accent. Although an Englishman, he had occupied, as a young man, some of the best assistant appointments in Paris, where every man was equal, and it was only a matter of work, talent, and perseverance to attain to the highest position. Referring to the subject of his lecture, he said that iron, owing to certain peculiar properties, was often called "cold-short" or "red-short." "Cold shortness" in iron rendered that metal incapable of being bent at natural temperature without breaking. This was due to the existence in the metal of a few thousandth parts of phosphorus. Science has not yet discovered any process by which phosphorus can be wholly removed from iron. The closest approach to it was published about three weeks since. This was the plan of a French chemist, and consisted in using a substance called fluor spar or fluoride of calcium, which dissolved the phosphates existing in iron ore. But there was a better method than this, if not to remove phosphorus from iron, at least to counteract its evil effects. This consisted in the application of manganese ores, and a notable instance of the value of this process was the improvement and consequent rise in the price of the Cleveland iron. Another substance available for overcoming the evils of phosphorus in iron was spiegeleisen, which was a cast iron very rich in manganese and carbon. Spiegeleisen had enabled Mr. Bessemer to carry on his manufacture of steel with great success. Science had not only discovered the value of spiegeleisen as an adjunct to the iron manufacture, but had produced this spiegeleisen artificially. The artificial product was produced by Messrs. Edington and Son, Phœnix Ironworks, near Glasgow. It was richer in manganese than the genuine article, but did not contain so much carbon. Turning now to "red-shortness," the lecturer said that it was due to the existence of two impurities, sulphur and silicium—the first in the proportion of a few thousandth parts, and the second in the proportion of a few hundredths. The affinity of iron for sulphur was so great that much difficulty was experienced in removing it from iron once it was combined therewith. Therefore it was necessary to remove the sulphur from the materials used in the manufacture of iron before this combination could be effected. There were two processes for removing sulphur, one of which, viz., the employment of quicklime, could be applied in the blast furnace. A second process was discovered by the lecturer some sixteen years ago, which, in its best phase, consisted in adding from 1 to 4 per cent. of common salt to coal, and converting this coal into a coke which could be used with advantage in the blast furnace. The result of melting cast iron in a cupola with such coke was that the iron was purified 20 per cent., and "honeycomb" was completely avoided. One main cause of the presence of silicium in iron was the use of cinders in the blast furnace. This was not economy, as a bad quality of iron was the result. If quicklime and not limestone were used a great portion of the silica would be removed, and the evils attending the presence of silicium in iron would be avoided. After referring to the processes of Messrs. Brown and Bessemer, of Sheffield, for producing puddled steel and improving the quality of the same, the lecturer went on to say that if great progress had not been made of late years in the manufacture of the best class of steel, we were now progressing towards improvement, and in a short period of time we should be enabled to manufacture the best class of steel with the greatest facility. Mr. Biggs and Mr. Mushet have contributed much to improvement in this branch of manufacture. With scarcely an exception, an invention was never perfected or made to pay commercially by the inventor. Successive minds must be brought to bear upon all the little points which, combined, made a complete whole. Referring to the liability of iron to oxidation, the lecturer said that the only commercially successful process for its prevention that we were yet acquainted with was "galvanising," which, however, was a wrong expression, as galvanic action had nothing to do with the process. It was carried out as follows:—The iron was first heated in a furnace until it attained a red heat, in order to remove any greasy matter which might be adhering to the surface. It was then passed into a trough of muriatic acid, which removed the oxide of iron. The iron was next passed through a bath of molten zinc, containing a certain proportion of tin, without which latter ingredient the zinc would not adhere to the iron. The iron was next passed through sand, which rubbed off any excess of zinc which might adhere, and was then left to cool. As the iron passed through the bath there was an alloy of iron and zinc formed, which fell to the bottom of the trough, and from time to time this deposit had to be removed. A few years ago this dross was deemed of little value, and was almost given away. Science has since demonstrated that this dross was of more value than zinc. By the use of this refuse alloy (instead of zinc) in combination with copper a brass could be obtained which had the tenacity of steel and the malleability of iron at a red heat. The galvanising process is a most important and valuable one, on account of the great extent to which iron is being employed in all branches of construction, especially in shipping. The galvanising process would have been of great value had it been applied to the iron used in the construction of the large number of gunboats for the Russian war, which, after being laid up for two or three years at Portsmouth, were found to be falling to decay, owing to the injurious action and reaction of the iron and the tannic and gallic acids existing in the oak upon each other. As a test of the preservative effects of the galvanising of iron, the lecturer had deposited a plate of ordinary iron and a plate of galvanised iron in the sea, allowing them to remain there many months, and weighing them from time to time, and he found that while the former lost 29 30, the latter only lost 1 f 42. Some years ago he examined the various woods employed by the Admiralty, and he had occasion to notice that both "summer-felled" and "winter-felled" oak were supplied to the authorities. If the "summer-felled" wood was used for a paling, or for any other purpose, it would go rotten in a very short time, while the "winter-felled" would last for ten, fifteen, or twenty years. To distinguish one from the other it was only necessary to put them in contact with a proto salt of iron, when the "winter felled" turned black, and the "summer-felled" became of a beautiful dark blue colour.

Iron, under certain circumstances, becomes so soft that it can be cut like plumbago with a knife. Some years since some cannon were recovered from the wreck of the "Royal George," and were found to be in this soft state. The salts in the sea water had acted upon the iron, and had left behind only a framework, principally composed of carbon. From this and similar facts described by the lecturer, he predicted that many of the handsome public piers which have been of late years erected all round the coast in cast iron would probably, in thirty or forty years' time, come tumbling down into the sea. Another curious property of iron was discovered two or three years ago by a French chemist. It is that iron at a red heat is permeable to hydrogen gas, which passes through the metal freely. Large quantities of coal gas doubtless escape in this way from the retorts in the works. Mr. Graham, the Master of the Mint, has made a most extraordinary discovery—a discovery which might lead, bye-and-bye, to some important discoveries in the manufacture of steel. This discovery is that every metal has the power of condensing within its pores an enormous quantity of gas. Platinum, which was so very dense in itself, would condense fifteen times its own bulk of hydrogen, and would retain that gas for two—or, for all we know, two thousand—years, for Mr. Graham had observed that, although a piece of metal had been exposed to every atmospheric influence for two years, still the same volume of gas was given off when the metal was re-heated as if it had not been exposed to such conditions. Palladium would condense 680 times its bulk of hydrogen, gold 40 times, and iron 46 times. If the same piece of iron was brought into contact with oxide of carbon, it would condense 415 times its bulk of hydrogen. This fact showed the peculiar affinity of iron for oxide of carbon. Silver would condense forty times its bulk of oxygen, and only twenty-one times its bulk of hydrogen. Why a metal possesses the property of condensing a larger volume of one gas than of another was not known, but it could not be a mere matter of the relative space between the pores of the metals, as these results plainly showed, for if this was the case the same volumes of different gases would be occluded. In concluding his lecture, Professor Crace Calvert expressed a hope that he had succeeded in impressing all present with the fact that scientific knowledge could be brought to bear with advantage upon all practical matters. He could continue lecturing upon many other subjects in the same way as he had then been lecturing, showing the immense progress which had been made by the union of science and practice. If scientific knowledge were acquired by the men who were constantly engaged in various manufactures and who knew the improvements that would from time to time be necessitated, we knew not what would be the result in the way of developing the resources and securing the prosperity of this country. It therefore behoved everyone engaged in manufacturing processes to acquire knowledge which would be useful to himself and his fellows and beneficial to his country.

INSTITUTION OF SURVEYORS.

THE first preliminary meeting of this institution was held on Monday last, at the Westminster Palace Hotel, Mr. John Clutton in the chair. Among the London surveyors were present, Messrs. T. Horsey, T. Chatfield Clarke, F. and R. Vigers, E. Ryde, R. A. Withall, D. Watney, F. Chinnock, H. Clutton, J. R. Bonny, J. Bailey Denton. Of the country surveyors were C. M. Bidwell, Ely; T. Huskinson, Epperstone, Notts; T. S. Woolley, Newark; T. Statter, Knowsley.

The Chairman, after recapitulating the proceedings already taken in the formation of a provisional association, shortly stated the objects of the institution, which were—1st, to secure the advancement and facilitate the acquisition of that knowledge which constitutes the profession of a surveyor; 2nd, to promote the general interests of the profession and extend its usefulness for the public advantage. He said the proposal to establish this institution had met with very considerable support, and that if all devoted their best energies to the work, they could not fail to raise the status of the profession and ensure its advance in the public estimation. It was then resolved "that the institution be forthwith organised and placed in a position to commence operations."

The following gentlemen were chosen by ballot to be members of the council for the first year:—Messrs. W. J. Beadel, F. J. Clark, E. N. Clifton, J. Clutton, H. Crawter, J. B. Denton, R. C. Driver, R. Hall, H. A. Hunt, T. Huskinson, J. Matthews, J. Oakley, E. Ryde, E. J. Smith, W. Sturge, G. Trist, F. Vigers.

The Honorary Secretary (Mr. J. W. Penfold) read the heads of the bye-laws, which provided that the institution should consist of three classes—viz., members, associates, and honorary members, with a class of students attached. Members to be more than twenty-five years of age, and in practice on their own account for more than five years, or members of a firm established upwards of ten years. Associates to be more than twenty-one years of age, not necessarily surveyors by profession, but their pursuits to be such as to qualify them to concur with surveyors in the advancement of professional knowledge. Honorary members to be persons who by reason either of their position or eminence in science and experience may be enabled to render assistance in promoting the objects of the institution. The various regulations for election of members and officers, the constitution and government of the institution, the conduct of meetings, &c., were fully set out. These bye-laws were adopted, and after a vote of thanks to the chairman and honorary secretary the meeting separated.

An act has just passed the Legislature, and will receive the Royal Assent in the course of a few days, for the purpose of enabling a company, now forming, under very favourable auspices, to erect a large retail market for South London, at Kennington, for the sale of every description of goods, as well as food, on the co-operative system. The site is at the junction of the Brixton and Clapham-roads at St. Mark's Church, Kennington, with frontage to the Brixton-road, Clapham-road, and Church-road; a very central position as regards South London, and one well supplied with omnibus accommodation. It is contemplated to erect the proposed market in the form of an arcade, and so that it shall be a new thoroughfare from the Clapham to the Brixton-road, and contain some 75 shops, to be occupied by the proper proportion of each trade.

THE INSTITUTION OF SURVEYORS.

WE beg to welcome the establishment of another institution in London. This, in fact, is an age of institutions. We have institutions for the promotion of most things, but strange, up to the present time we have not had an Institution of Surveyors. Surveyors are a numerous, and should be, and in most cases are, a respectable body of men. The new institution is founded to secure the advancement of that kind of knowledge which constitutes the profession of a surveyor, to promote its general interests, and to extend its usefulness and general advantage. The medical officers of health of the metropolis have a society which has been the means of communicating knowledge, interchanging the results of experience, and encouraging zeal amongst its members. The metropolis, in fact, is under a deep debt of gratitude to this society. No one, we think, will deny that the surveyor has duties to perform equally onerous, equally responsible, and, if wisely performed, equally beneficial to the public as the medical officer. And if the latter have experienced so much advantage from combination and mutual assistance and encouragement, we see no reason why the surveyors by similar action may not realize similar benefits. The new institution will no doubt do good by drawing a line of demarcation between those who have acquired a practical knowledge of the profession and any broken-down coal-agent or unsuccessful cow-shed keeper who puts "surveyor" on his window-board. We hope and believe that this institution has before it a useful and prosperous future.

CARVED OAK CREDENCE.

THE buffet or locker here given is of Flemish workmanship, date about 1470, and is in the furniture collection of the South Kensington Museum. It furnishes at once an example of beauty and subtle simplicity, an excellent antidote for the wayward fritterings of modern furniture confectionery. The trifling sum of £3 6s. 8d. appears to have been paid for it. The sides are plain linen pattern panels. It is 3ft. 10in. in length, 3ft. in height, and 1ft. 8in. in depth, outside measure. The design is evidently the workman's own. The plucky manner in which the whole thing is done is admirable, art concealing art most effectually, the work having the wholesome appearance of having been done right off, and it does not make any ostentatious exhibition of its constructive detail, a "conceit" those designers knowing less on the subject are fain to display. It is most suggestive in all its parts, yet here are no chamfers, notches, chops, or stops. The framing is plain and square, the scratch moulding simply butting on the rails. The carving is vigorous even to a fault, yet careful withal. Some pains have been taken to express the bone pin in the drapery of the profile head. The *motif* of the carved rail is very good—namely, a wavy, succulent foliage, meandering through a guilloche, characteristic portions of which are given on the plate. The liberty taken with the marginal line over the tree is a license which only a mind above the rule could take. The locks and hinges are little more than can be expressed by their outlines. The credence was doubtless constructed for serviceable ends, and has had a fair amount of wear and tear.

O. W. D.

ARCHITECTS' VISIT TO THE TOWER OF LONDON.

THE "Towers of Julius, London's lasting shame," were visited on Saturday last by a goodly number of the members of the Architectural Association, under the able guardianship of Mr. Thomas Blashill and Mr. Planché. We were invited to accompany them, and accordingly at three o'clock found ourselves at the old gate-house, in the midst of a number of the sturdy "beef-eaters," whose dress, while strangely contrasting with the many modern military uniforms scattered about the place, aided in no small degree to recal the memories of the days when they were the real guardians of the old fortress. We suppose the gallant deputy-lieutenant himself does not often appear to welcome ordinary visitors, or we should be inclined to request his lordship to assume for the occasion the ordinary attire of the days of Henry VIII., and so appear in harmony with his stout retainers. The acting governor of the Tower, although in days gone by a personage little less important than the Lord Mayor of London himself, fails to impress us with the proper amount of reverence when attired in modern coat and trowsers and a white hat. It is but fair to say that the association was treated with the utmost courtesy by all the officials. Lord de Ros himself offered to conduct the members over the building, and only withdrew his offer when informed by Mr Mathews, the secretary, that Mr. Planché, the able archæologist, and Mr. Blashill, a talented member of their own body, had arranged, with his lordship's permission, to show them all worth seeing. These gentlemen, with the president, Mr. R. Phené Spiers, soon arrived, and Mr. Blashill, taking his stand at the south-western angle of the building, in a few well-chosen sentences explained to the members the general plan of the Tower and its surroundings. Proceeding eastward, special attention was first directed to an old gate or postern, one of the oldest portions of the building, and then the famous "Traitors' Gate," underneath St. Thomas's Tower, was visited, and its former and present construction duly explained. The special features of the "Cradle" and Irongate towers were pointed out, and then the members, or as many of them as were able, dived into the basement of the Wakefield Tower, supposed to be of the period of Stephen, and next in age to the White Tower itself. Passing to the interior side of Traitors' Gate, the bridge connecting St. Thomas's Tower with the main building, an entirely modern work, was pointed out. This Mr. Blashill thought was modern in idea as well as construction, it being hardly probable that in early times a permanent bridge would have been built there by which invaders from the river could have so easily obtained access from the outer tower to the King's apartments. Probably all that formerly existed there was a light drawbridge, easily removed in time of danger. Waiting outside the armoury while an ordinary party of visitors, under the guidance of the warders, passed through, Mr. Blashill directed the attention of the company to the exterior features of the White Tower. The whole of this tower was cased over by Sir Christopher Wren, with the exception of the two easternmost windows, which admit light into the chapel, and which have lately been restored to their original condition. Of the four towers surmounting this tower, that at the north-east corner is circular, the other three are square. The portions of the wall in flintwork which have not been cased over are probably of the time of Henry VIII. Mr. Planché then conducted the members through the Armoury, previously addressing them generally on its history and chief points of interest. He observed that the critical knowledge of the science of armoury was in a more imperfect condition than that of any other branch of archæology. Until fifty years ago the most confused and erroneous ideas existed respecting the military habits and accoutrements of the warriors of the mediæval ages. Sir Samuel Meyrick, in his work in 1825, did a great deal to elucidate the subject, and he was employed by the Government to re-arrange what were then known as the Horse and Spanish armouries. He was, however, compelled to compromise with the existing pernicious arrangements, and was ordered to appropriate each suit of armour to some historical personage of the date of its manufacture, and this childish arrangement still exists. He was permitted to affix a star to the inscription banners above the effigies, to distinguish suits which were really known to have belonged to the persons to whom their ownership was ascribed, from the more apocryphal ones; but, of course, this slight distinction, if ever noticed, was not understood by the ordinary visitor. Not only the re-arrangement when completed, but the purchase and disposal of suits and pieces of armour, was committed to the chief storekeeper. Of course the bad results of this were soon manifest. Many worthless forgeries were purchased, pieces of armour were lost or abstracted from the Tower, and many valuable specimens that should only have found a place in the national collection were allowed to pass out of the country or into the hands of more enlightened private collectors. In 1858, he (Mr. Planché) was requested by Lord Herbert of Lea to examine into and report upon the condition of the collection. In that report he pointed out that no educated antiquarian was at the head of the armoury, and that this was the more inexcusable as the exhibition was entirely self-supporting, a revenue of some thousands of pounds being derived annually from the fees paid by visitors for admission. But for the death of that amiable and accomplished nobleman, some steps would doubtless have been taken to remedy the existing state of affairs. Lord de Ros, who had been listening to Mr. Planché with marked attention, here interposed, and said that, although the existing state of things was not one to be proud of, it was not quite so bad as Mr. Planché had inferred. The armoury had not been entirely entrusted to the chief storekeeper. The Government had derived great assistance from Mr. Hewett, and Mr. Planché himself had done a very great deal for the armoury. Mr. Planché said he did not wish to detract from the merits of Mr. Hewett, he acknowledged that he had done a great deal, but much more remained to be effected before the collection could be said to be complete. The most interesting of the specimens were pointed out in detail, and the members then proceeded to the chapel in the White Tower. Passing from thence through the banqueting room, now filled with Snider rifles, they reached the Council Chamber, in which room, as Mr. Blashill reminded the members, on the 13th of June, 1468—exactly 400 years ago—Richard III. ordered the execution of Lord Hastings. The "Little Ease" dungeon, below, having been explored, the Jewel apartments were visited, the description of the "Queen's crown, the sceptres, the orb," &c, being duly intoned by the lady in waiting. The members were then told off into small parties to visit the remaining places of interest under the guidance of the warders, and so a most pleasant afternoon's excursion was brought to a close.

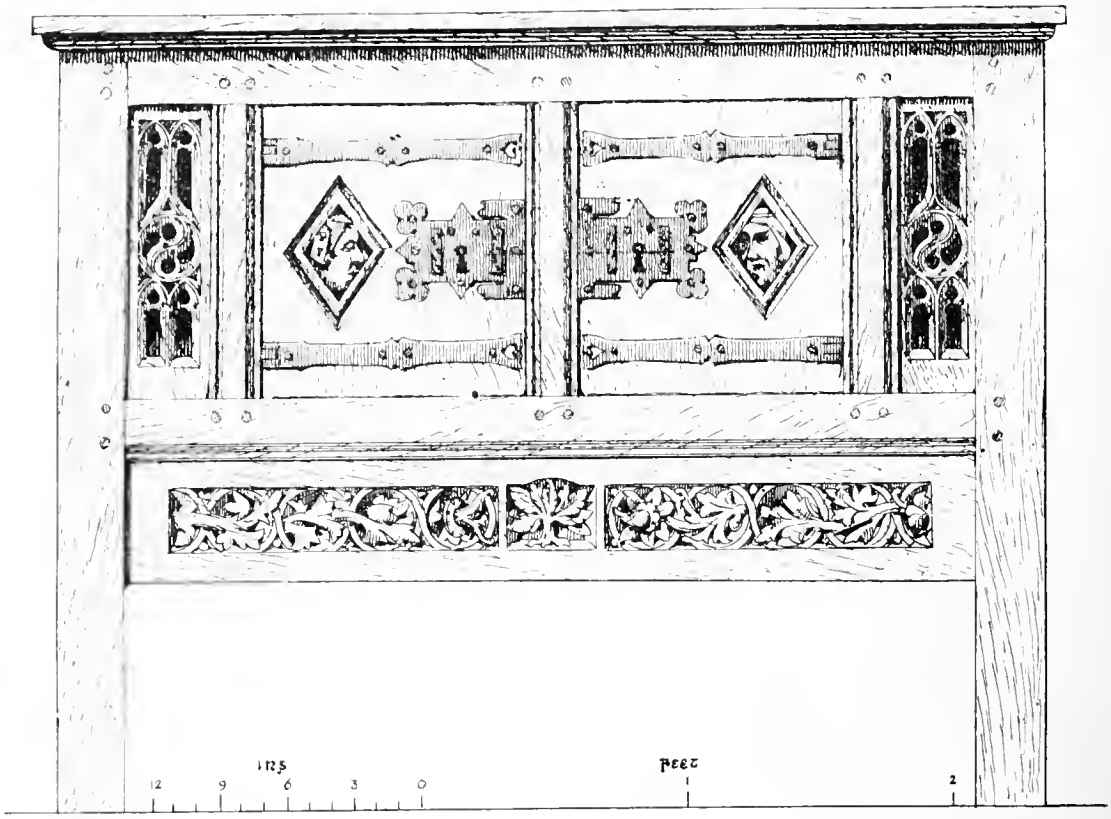
MANCHESTER NEW TOWNHALL.

WE give this week Mr. E. Salomon's design for the new Manchester Townhall. Having on a preceding occasion given our opinion on the merits of this design, it is unnecessary for us to repeat it now.

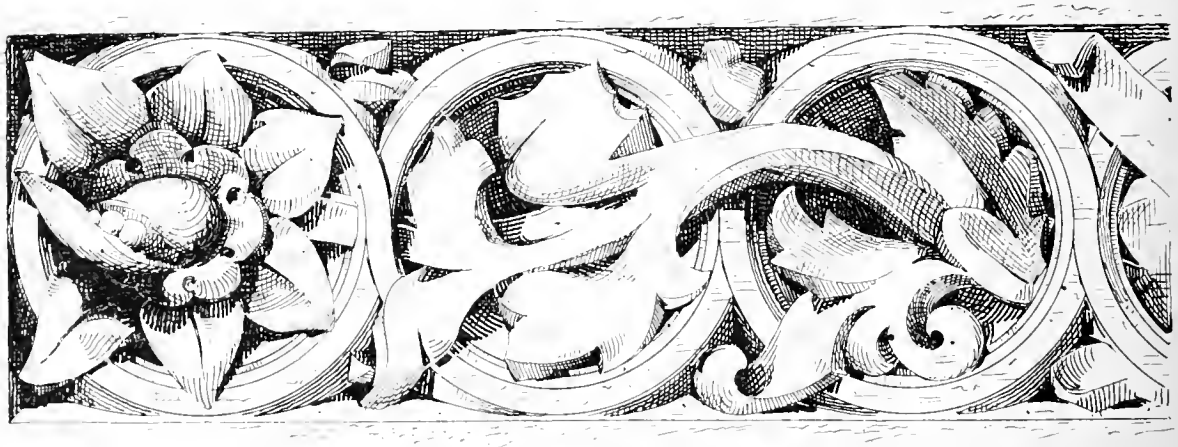
PARIS EXHIBITION, 1867.

THE Lords of the Committee of Council on Education, considering it desirable to hold out encouragement to masters and mistresses teaching in Schools of Art, to visit the International Exhibition in Paris last year, with the view of studying those objects which might be made instrumental in benefiting the instruction given in art schools, offered to every such teacher visiting the Paris Exhibition the sum of £5 in aid of his or her expenses, and an additional sum of £2 for any one report which any such teacher might make, or any useful suggestions in respect to his or her duties or teaching derived from the study of the Exhibition, such report having first been published in any journal, local or otherwise, and approved of by their lordships. For each of the three best reports the following prizes also were offered:—For the best report, £20; for the second best report, £15; and for the third best report, £10. The International Exhibition was visited by 101 art teachers, of whom 28 made reports approved by their lordships. The first prize has been awarded to Mr. W. J. Muckley, head master of the Manchester School of Art, the second to Mr. Walter Smith, head master of the Leeds School of Art, and the third to Mr. Dewar Campbell, master of the Bridport and Dorchester Schools of Art.

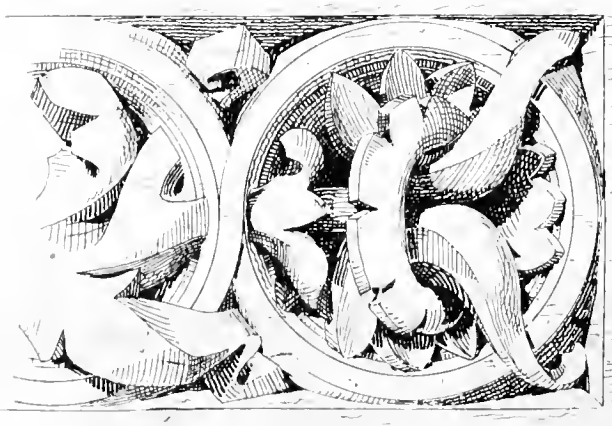
A public meeting was held at Brixton on Tuesday evening last, to protest against the erection of a smallpox hospital in that thickly populated neighbourhood. Such hospitals must be built somewhere, and the least thing the sapient speakers at the meeting could have done was to have suggested another site.



SCALE OF FEET.



MOULDING TO FRAMING



SECTION THRO' GUILLOCHE.

MOULDING TO LOZENGES.

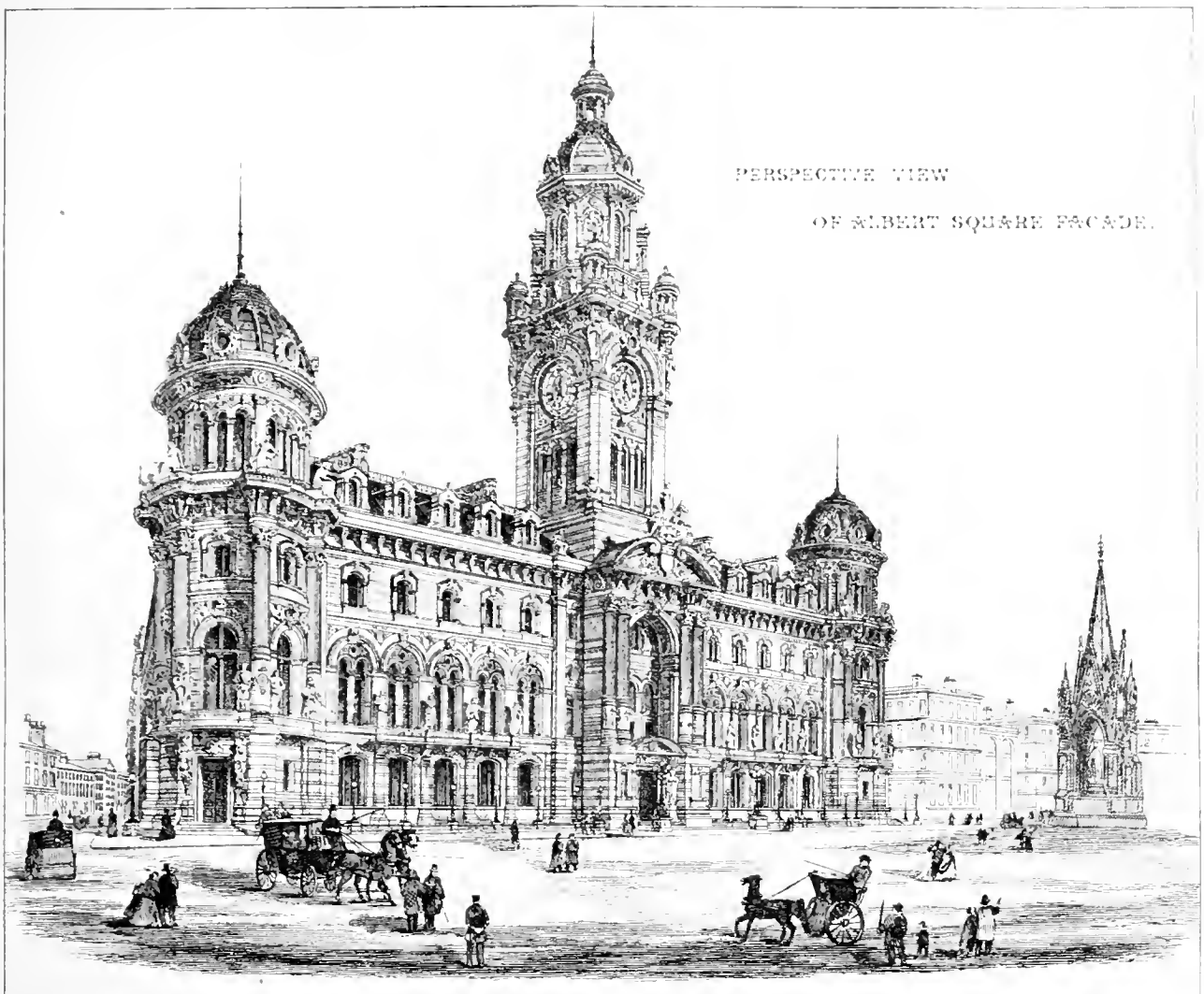
PORTIONS OF THE CARVED GUILLOCHE.

Printed by Whiteman & Bass

CARVED OAK CREDENCE, FLEMISH, 15TH CENTY WORK.

PERSPECTIVE VIEW

OF ALBERT SQUARE FAÇADE.



PERSPECTIVE VIEW

OF PRINCES STREET FAÇADE.

Abbott Lith. Printed by Whiteman & Bass

Design for Manchester New Town Hall.—E. SALOMONS, ARCHT.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—XVI.

THE details of a structure no less than the general treatment of its masses should be designed, not merely drawn. It is not too much to assert that the process is reversed in the majority of our architectural works. Drawing precedes design instead of simply becoming the means of its expression, and the expert draughtsman often finds himself, perhaps unknowingly, only embodying the idle and floating fancies of his imagination rather than thoughtfully working out the substantial realities of a building, each by itself being more or less a problem. As members of an organic whole and depending upon plan and elevation for their scope and general tenour, the fitness of every detail should be apparent instead of subserving some idle dream or whim. It is difficult, I admit, sometimes to trace any basis, principle, or type for our bit of moulding, tracery, or carving that shall become, in spite of ourselves, the foundation of it, and the architectural designer is thus drifted into a realm of imagina-

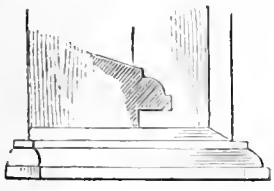
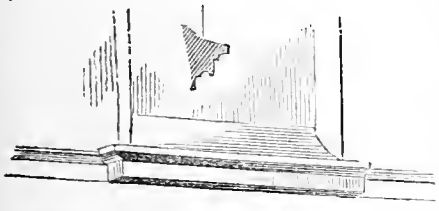


FIG. 1.



tion in which he can quickly transform a fact into a fiction, making that which should have been worked out of certain conditions a creature of fancy. In one word, the detail is drawn in, and it is only after the work is carried out that its fitness becomes evident or otherwise. Ascending from the strictly utile to the sculpturesque or æsthetic, this difficulty is increased proportionately as the connection between the useful and ornamental is lessened or becomes less apparent. In architecture alone the conflict of what it should be? and how it should appear? is carried to an excess that frequently defies the nicest discrimination. A chimneystack emerges where we least desire it, a window opening or a blank appears just in the place its opposite would have looked best, and it requires no little adjustment of *pros* and *cons* for that equitable balance of effect needed to produce harmony. But the great obstructive to progress in these matters is the copyism that prevails, the spirit that, in spite of progress, lingers behind. A precedent is all that is required, and judgment is set aside for it. No matter how devoid of common

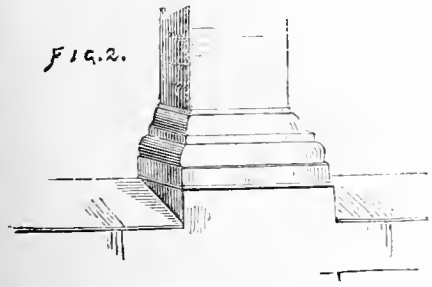
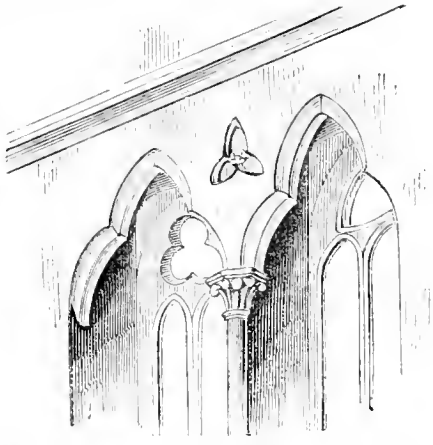


FIG. 2.

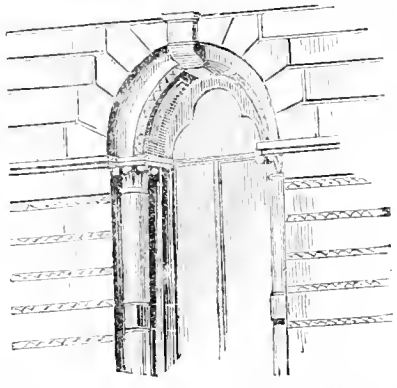
sense, useless, or extravagant, a thing is perpetrated that arose out of very different conditions, or that grew out of necessity. And the danger of this mode of study is obvious: the great principles, the very basis of our work, are forgotten or made subordinate to the decorative and minor details. Hence we see many standing high in the profession copying inferior examples for the sake of detail only; others sacrifice coherency for freshness or piquancy of effect. The first class give us modern churches with all the worn-out paraphernalia of the Mediæval cathedral, or be-

FIG. 3.

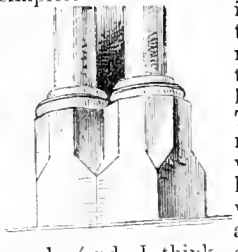
decked in all the Gothic finery of a mock Gothic era; the latter, the crude fancies of their own or the imperfect examples of an imperfect age. It is no less absurd than regretful to see the feudal fortress, with all its barbaric accessories, reproduced for national courts of justice, and the rude conceptions and chiselings of a benighted age copied in a nineteenth century church. We may conventionalise or "architecturalise" without



caricaturing, and it is nothing else but doing this when we copy contorted features and the bad drawing of Mediæval glass. Till we find architects discarding the superfluous accessories of Mediævalism and all the profuse

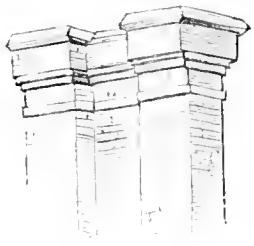


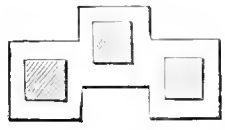
ornamentation that come parasitically of a stagnant art and thoughtless design, there remains much to be taught and done. The simplest feature or detail is often the best, as



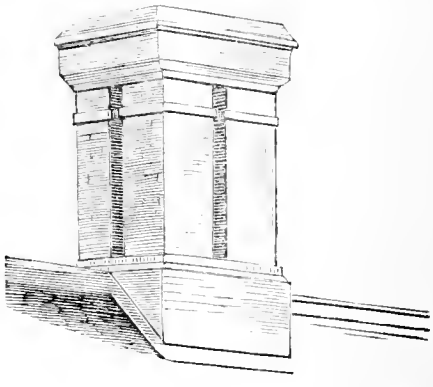
it is the cheapest—a truth our costliest and most elaborate structures have repeatedly forced upon us. The Palace of Westminster itself—about which there has been lately such a waste of words as to its art-authorship—is an example (and, I think, an unfortunate one) of a lavish display of architectural millinery—a mere network of panelled tracery, about which there can be little to take credit for, save the mechanical skill and patience that covered *ad nauseam* a well-massed exterior with it. The value of a building architecturally is in proportion to the amount of original thought and skill expended upon it, and not according to its display of surface or running ornament. Let, then, the stamp of thought or design be upon every detail, however insignificant in itself.

Our sketches show a few details taken at random. Fig. 1 shows an improvement on ordinary window sills. It is singular that the old square form should so persistently hold its place, even in good-class buildings. I think we rarely show sufficient weathering;





a good hollowed curve is a relief. Probably the idea of holding flowers has hindered improvement, but for this object why not boldly project a moulded and bracketed slab? The manner now frequently seen of finishing



pilaster projections, letting them die away flush into the plinth, is an excellent one and deserves attention (fig. 2). We often notice plinth mouldings mitred back at a doorway. I think a preferable plan is to return it downwards to the ground, as in fig. 3. The other sketches explain themselves. The chimney heads shown are suggestive of a simple and better treatment of these important appendages than generally seen, and in our next paper we will say a few words upon them.

G. H. G.

POST MORTEM HOUSES.

IN the last monthly report on the Health of the Parish of Marylebone, Doctor Whitmore, the indefatigable medical officer, says that "sanitary work during the month has progressed satisfactorily. An additional duty which I have recently imposed upon the inspectors of nuisances, and from which I am led to hope for beneficial results, is the disinfecting of houses in which sickness from smallpox, measles, fever, and scarlatina is known to exist. Hitherto the disinfecting—so called—has been done by the inmates of the house by orders from the Board, but I need hardly say that in such hands the process was utterly inoperative and useless; by appropriate chemical agents, not only are the drains, closets, dustbins, &c., disinfected, but the atmosphere of the house also, and I look forward to the time when, by the bounty of the vestry, I may be provided with the proper apparatus for thoroughly disinfecting clothes and bedding. I am also awaiting anxiously the completion of the good works which were determined upon by the vestry last year—viz., the erection of the Mortuary House and the Post Mortem House; the former is greatly needed. It is misery enough for a poor

man with a wife and five or six young children that he can only afford to rent one wretched apartment, in which all the family are compelled to live and sleep, and where the cooking, washing, and the whole daily routine of domestic duties are performed; but what must be the additional wretchedness and sorrow when one of the family dies, and when, for the period of a week at least, no other place can be found in which the lifeless and rapidly decaying body can be deposited; and yet this is a matter of daily occurrence; every feeling of humanity and reverence for the dead revolts at it, and everyone who has an interest in the health, safety, and well-being of the living will be anxious to provide a remedy."

DWELLINGS OF THE INDUSTRIOUS CLASSES.

THE directors of the Metropolitan Association for Improving the Dwellings of the Industrious Classes have issued a satisfactory report in anticipation of the annual meeting to be held on the 19th inst. It appears that since the last report ten pairs of cottages have been built at Perge, and are now occupied, and 20 more are on the point of completion. The profit during the year has been sufficient to pay a dividend of nearly 5 per cent. on the paid-up capital; but as certain contingencies have to be provided for, the directors recommend the payment of a dividend of only 4 per cent., which will leave a balance of £829 1s. 6d to be carried over to the guarantee fund. One of the most satisfactory features in the report, however, is the account given of the sanitary condition of these dwellings. The average rate of mortality in the buildings of the association has not been 14 per 1,000, while that of the metropolis generally has been 23 per 1,000. The mortality has decreased during the present year 3 per 1,000 upon the very low rate of 17, which was the average of the seven previous years.

HOFFMAN'S PATENT BRICKKILN.

A SHORT time since the local board of health of Swansea appointed Mr. R. Rawlinson, C.E., and Mr. Edward Cousins, the borough engineer, to inquire into the subject of brick smoke, which caused considerable inconvenience in the neighbourhood. The following is the substance of the report made by these gentlemen:—It refers principally to Hoffman's patent kiln, which is built in the form of a large arched passage of a circular form on plan, within which the burning of the bricks is carried on round its circumference. There are twenty-four entrance doorways, admitting of being closed with temporarily-built bricks and clay, so as to retain heat and exclude all entrance of air by the doorways so built up; the circular chamber consisting of twenty-four compartments, or spaces, with one of these doorways to each. In the centre of the ring a chimney is erected about 150ft. in height, measuring at the base about 16ft. square, and from each of the twenty-four compartments of the annular chamber an underground flue leads into the chimney; each flue has a valve by which its communication with the chimney can be cut off; arrangements are made by which a damper, or portcullis, can be inserted, so as to cut off all communication between any of the twenty-four compartments of the ring kiln and the next ones.

After the kiln has been lighted the fire is never extinguished, but the burning of new bricks and the removal of the finished produce are carried on by a continuous and regular process from day to day. Two of the compartments on each side of the kiln have their entrance-doors open, all the rest being closed. By an arrangement of valves (or dampers) in the branch flues, and the larger damper or portcullis in the main flues, air is admitted by the open doors, and has to go round the whole circuit of the kiln in order to reach the chimney. From one of the two open compartments on each side of the kiln men are taking out finished bricks, and in the other they are building unburnt bricks which are not yet quite dry.

Air entering by these compartments passes first among bricks almost cold, and then goes forward to warmer bricks, and so on to hotter and hotter, carrying the heat of the cooling bricks forward with it until it reaches half-way round one-half of the kiln, at which place there is a final accession of heat from the burning of a very small quantity of coal-dust, which is from time to time dropped in through properly-arranged flues from the top of the kiln among the bricks by numerous small openings, furnished with movable heads. The hot air, including the products of combustion, then passes forward to the bricks, which, by its continuous current, are being dried and heated, passing on among them from hot bricks to those that are less and less so, heating them as it goes on to those which are still damp, drying them, and then passing to the chimney with moisture in the form of steam or vapour taken from the damp bricks. Each day a portcullis is shifted forward one compartment, and a corresponding change is made as to the flue which is to communicate with the chimney and the air at the end of its circuit in the annular chamber. The places where coal-dust is thrown in are also advanced one compartment, and so the whole process goes on.

In the burning of this kiln there is an absence of all smoke containing sooty particles, arising from the perfect combustion of the fuel. That which is discharged from the chimney is steam or vapour from the drying bricks, mixed with gases from burning the clay. These gases are discharged into the air at about 150ft. Since the erection of these kilns no complaints have been made by the inhabitants of the neighbourhood.

Conclusions:—An examination of Messrs. Hoffman's patent brick-kilns has convinced us that bricks may be moulded, dried, and burned all the year round, and with great economy, as also without sending into the atmosphere black smoke. The patented process economises heat to a very great extent, and thereby saves fuel. The mode of feeding the kilns ensures a combustion of the carbon of the coal; and as very much less coal is required than in the rude method of open kiln firing, local nuisance is in a corresponding degree lessened, and the gases and vapours produced are delivered into the surrounding atmosphere at the elevation of any chimney provided for such purpose. At West Brompton, where Messrs. Hoffman's kilns are situated, this elevation is about 150ft.

EXPLORATIONS IN PALESTINE.

THIS is an age of restoration. Destructive as it seems to be, its purpose is to dig down to the old foundations, and discover what actually was or is beneath what seems to be. From the old Norman or Saxon churches, where the whitewash is scraped from the rudely pictured walls and the plaster is picked from the sculptured doorway, to the mounds of Babylon and Nineveh, where a heap of shapeless rubbish is made to tell us stories of forgotten history, everywhere there is an effort after better acquaintance with the past. Everywhere the ancient world lies under a heap of rubbish. Eighteenth century churchwardens whitewashed oak ceilings and plastered groined roofs, and shut up sculptured windows and doorways in the interests of economy, so that many of the ecclesiastical restorations of the age are merely the uncoverings of the past. Time has done the same with sites and places. In our towns and cities the Middle Ages are under our feet. We come on traces of old London in digging for sewers and excavating foundations. In Leicester a Roman pavement is shown in a cellar, which was once on the doorstep of the ancient house in the same old street, but the level of the street has risen above it, as all our levels seem to do. It is not the natural soil, but the rubbish of ages, on which we of the nineteenth century walk. Still worse is the rubbish of legend and story which encumbers historic sites. The ancient world lies buried under a mass of conjecture and assumption deeper than Thebes or Babylon beneath the dust of the desert. We may say, without reference to the ancient figure of speech, that historic truth lies in a well, and we must dig deep to get it. But of all ancient places to which this applies, it applies to Palestine the most. Over the sites and scenes of Sacred History so many changes have passed, so many wars have been waged, so many revolutions have swept, that they lie buried under the rubbish of ruin and legend of actual displacements and misleading guesses deeper than ordinary observation can trace them. The destructions of Pagan Rome were followed in after ages by the reconstructions of Christian Rome. Paganism obliterated the traces of Christian scenes, but Christianity sought them and found them anew. The devout feeling of earlier times sought the spots where interesting events had happened, and ready imposture or greedy faith discovered them all. Palestine is the land of falsehoods. Every scene of the Bible History has had its setting found for it, not by investigation and inquiry, but by crude guessing, by unscrupulous assertion, or by omnivorous faith. We have more to unlearn than even to learn in Palestine. Monkish lore has overlaid the land, and buried its historic sites deeper than the rubbish of its ruins. We have to cart away the one and dig through the other. We have to apply the patient habits and scientific methods of modern study and observation to the investigation of these ancient cities and landscapes and this historic soil, with the hope that some substantial addition will thereby be made to our knowledge of the past and to the literary criticism of ancient history.

This is the object of the Palestine Exploration Fund, and of the excavations which have been carried on under its direction. It was an American divine, Dr. Edward Robinson, who, in our own day, gave the first distinct impulse to Palestinian discovery. He found traces of ancient sites embedded in the speech of the common people, and was able to identify many of the scenes of Jewish history by the names by which they are still called by the Arab wanderers. In 1840, Majors Robe, Scott, and Wilbraham, with a corps of engineers, made a partial survey of the country, and Lieutenant Symonds executed a trigonometrical survey of great part of Judæa and the plain of Esdraelon, and ascertained the remarkable difference of level between the Dead Sea and the Lake of Tiberias on one hand and the Mediterranean on the other. Since then many travellers have continued their researches with various incomplete results, from the Rev. Henry Tristram's investigations into the flora and fauna of the Lebanon to M. de Saulcy's crude guesses and hasty inferences about the Dead Sea, and his more satisfactory journey during the present decade. But it is still true, as the Archbishop of York said at the meeting on Thursday, that it is a shame and a reproach to Christendom, that the land of the Bible should be so little known as to its geography, its natural history, its archæology, and all that science and literature can most desire to know as to the cradle of our civilization and our faith.

The work already done by the society is only enough to show what promise there is of rich results in the future. The actual explorations have been confined to the capital, and a few data have been procured for determining several of the sites of ancient buildings. The streets of the ancient city have been reached, drains, passages, and reservoirs laid bare, and some of the features of the original Temple-hill have been discovered. In the Valley of Kedron the well of Job was sounded to the depth of a hundred feet, and a broad causeway was found between Zion and Moriah, built arch on arch like some ancient Roman viaducts still existing in the Campagna. But the chief discovery was one single work of ancient art—the seal of "Haggai, the son of Shebaniah," supposed to be as early as the time of Ezra, and with an inscription in the ancient Samaritan character. This, with a few coins and fragments of pottery, is all that the excavations have yielded as yet. In the valleys of Kedron and the Tyropœan a succession of shafts had shown how far beneath the present surface lay the ancient level, and how the description of Josephus might have been literally true, and the view from the battlements of the ancient city before its ruins had choked the valley may have been the giddy height the historian so proudly tells of. But the little which has been done is only the promise of more, and if the excavations proceed it may come to be with Jerusalem as with Rome and Pompeii, that travellers will go, as Dr. Stanley says they are already beginning to do, to vivify their interest in history, and increase their intelligent understanding of it by looking at the scenes amid which it was enacted, and tracing out the spots which great events have rendered memorable. This is the practical use of such explorations. To vivify an ancient narrative, to light it up with something of the brilliancy of contemporary chronicles, we must reconstruct the scenes amid which it lies. It is this which gives such sharp reality to some events of our own remoter history, and helps us to feel as we do the continuity of our national life. It is this, too, which in addition to a clear and brilliant style is the charm of Renan's Life of Jesus. Written among the scenes in which the life was lived, there is something in it of the natural setting in which it was placed, something of the background before which its august subject moved, however unnatural and monstrous may be the figure Renan has put in His place. The popular interest in

Palestine arises from the fact that pictorial teaching is more vivid and lifelike than any description can be. The critical interest in it arises from the better understanding of any narrative which is given us by knowing something of the scenes among which the persons it speaks of moved, and the events it tells of happened. Some disappointment will therefore be felt at the small results which Palestinian exploration has as yet produced. But those results are at least the promises of greater. They have laid the foundations for the archæology of Jerusalem, and they already promise to correct the false impressions of tradition, and to restore the true position of places which association has consecrated. Already monkish geography, which is nearly all we still have of Palestine, has got additional discredit thrown upon it, and, as Dean Stanley said on Thursday, "the reputation of our old friend Josephus has been considerably rehabilitated." Perhaps the completion of the survey may completely vindicate the old historian's credit and restore his fame.

The interest which has been already awakened in these explorations ought to guarantee their continuance. This is a work which peculiarly needs time and patience. In such investigations success is often the sudden reward of long continued labour. In Lieutenant Warren the society has an able and enthusiastic agent, emulous of the fame of earlier explorers, and entirely equal to his task. We are glad to hear that he starts for Palestine to-day to continue his researches. There can be but little doubt that the £300 a month needful to carry on the work will be supplied by English liberality. Literature and science are both interested in Lieutenant Warren's proceedings, and even religion may be benefited in the more vivid interest which greater knowledge of its historic scenes may throw over its narratives, and the more life-like reality which may be given to poem, and prophecy, and parable. To give a local habitation and a name to places known to all our children from the Bible narrative, is, as Sir Henry Rawlinson said, one of the purposes of Palestinian Exploration, in which it comes, most closely home to the interest of every English man, woman, and child. —*Daily News*.

MR. LAYARD AND ASSYRIAN DISCOVERIES.

AS we before announced Mr. Layard was presented with the gold medal of the Institute of British Architects for the present year. Mr. Tite, the president, was in the chair, and concluded a complimentary speech in these words: "I have, sir, the greatest possible pleasure, by the gracious permission and command of Her Majesty, in presenting to you the highest distinction we can possibly confer—the gold medal of the Royal Institute of British Architects."

After some introductory remarks Mr. Layard said: The only claim I could have to this honour —and that claim is indeed but a small one—is that I have succeeded in the partial recovery of an ancient and important branch of architecture, from which many of our most beautiful forms have been derived, and to which some of the noblest conceptions of classic, mediæval, and modern times may trace their origin. I did my best conscientiously as an amateur without professional training (I may almost say without that elementary knowledge which was absolutely necessary to such an undertaking), in describing and illustrating, to the utmost of my ability, the discoveries which I had been fortunate enough to make. If I may venture to trace the considerations which have induced the Institute of British Architects to confer this honour upon me, I might attribute them to a certain extent to that desire, which is especially characteristic of our age, to go to the origin of things, and to submit every branch of art, as well as of science, to the minutest analytical investigation. If I be correct in this view, the discoveries during the excavations at Nineveh of the remains of Assyrian architecture, may be of some importance in affording data for such investigations, because in them we find the original types—or, if not the original, the most ancient types with which we are acquainted—of some of the most beautiful details and ornaments of the most elegant and refined order produced by the Greeks, namely, the Ionic. It is highly interesting to trace this human progress. Every day's experience and all modern discoveries tend to show that no art nor science came to man at once as a new creation or revelation, but that all things have been brought to the state of perfection which they may have attained by a gradual process of development and by patient and intelligent labour. These discoveries probably owe their interest chiefly to the fact that they show us one of the phases of this process of the human mind, and afford us valuable and instructive insight into the history of man, of his civilization, and of the development of his intellectual faculties. But, sir, in considering the nature of these discoveries, I would not wish to attribute to them too much importance. I am afraid that you may have done so, but this I may venture to say (and I do say it with an earnest belief that it is true), that whatever may be the result of my labours I devoted myself to them conscientiously and assiduously. From my earliest youth I felt a deep interest in and a love for art, and it was my wish to be as useful as possible in promoting its knowledge and influence. As regards my connection with the profession (of which I may consider myself almost a member, as I have long been an honorary member of the Institute, and am now one of your medallists), I look upon that connection with very great pride, for I believe that in no other part of the world does that profession contain a larger number of highly-educated, able, conscientious, and honourable men than in this country. I do not think that architecture is sufficiently appreciated or understood in England; I do not think that the English public have yet realised the fact that it is the noblest of the arts, and bears upon it most vividly and eminently the impress of the civilisation, greatness, and culture of a country. In the very best times of the ancient world (and, indeed, of the modern world) in ancient Greece and Rome and in Italy, architecture did hold its proper position. It was then recognised that all the other arts were subordinate to it, and that it was in completing and perfecting the work of the architect that the genius of the sculptor and painter was brought into play, and received its greatest impulse. I believe that until that fundamental principle is recognised in this country, architecture will not assume its proper position. If I can do anything in the direction of endeavouring, to the best of my humble ability, to inculcate this truth, and in making these principles better known, I shall feel that I may have some more valid claim than I now have to the high honour you have conferred upon me. Allow me, sir, to thank you personally for the kind and flattering manner in which you have alluded to me, and have expressed the feelings of the Institute with regard to my services to art. I may perhaps venture to correct one statement which you have made, not, I hope, from any feeling of vanity on my part, but for the sake of truth. You let fall an expression which is not strictly accurate: you said that I was aided and assisted in my labours by a distinguished Frenchman. That was not the case. I received no assistance or aid from M. Botta, the gentleman to whom you no doubt allude. So far from such being the case he and I were not at Nineveh together engaged in excavations. I preceded him in visiting the ruins, and his discoveries were independent of my own. In 1842 I was for the second time at Mosul, when M. Botta was sent there as French consul, and it was partly owing to the information and encouragement which he received from me that he was induced to open the mound of Kouyunjik, and afterwards that of Khorsabad, which led to those important discoveries which he has so well described and illustrated in his magnificent work. I do not say this to detract from the merits of M. Botta; on the contrary, I have always said that to him is to be attributed the merit of the first Assyrian discovery; and no man is more worthy of the distinction and of the honour which he may derive from it, both on account of the readiness which he showed in giving every information to me, his fellow labourer, and the modesty with which he described his own discoveries. I have been accused of Philo-Turkish proclivities, but you will perhaps not think the worse of me if I venture to bear my testimony, on an occasion like this, to the kindness and generosity displayed by the late Sultan, the Turkish Government, and the natives, with regard to my researches in Assyria. Considering the anti-Turkish feelings which prevail among a large number of persons in this country, and which are sometimes carried, I fear, to a great length, it is right that this tribute to a much abused people should be borne by me. In no other part of the world could I have received such disinterested assistance, and have been allowed to pursue such labours and researches without interruption or molestation.

ARCHÆOLOGY.

FRIDAY last there was discovered on the farm of Arniebog, in the parish of Cumbernauld, on the line of the old Roman Wall of Antoninus, which runs across that farm, a large stone, on which was sculptured in *alto relievo*, within a square moulding, a naked figure bending on one knee in a suppliant attitude, with the hands tied behind the back. The figure is about 10in. in height from the lower moulding, upon which the knee rests, and from the foot to the other knee of the figure about 3½in. The stone is a hard, coarse-grained freestone, and is evidently a portion of an altar erected to commemorate some conflict or skirmish between the Roman soldiers employed on the wall and some of the Caledonian tribes.

During some recent excavations on the sites of Heliopolis and Memphis, a curious pavement was discovered at the depth of 7ft. But on digging 7½ft. lower still a much more ancient piece of paving was discovered, composed of the fragments of some old building, inscribed with the names and honorific titles of the Disc-worshippers. The features of the Disc-worshippers are characteristic, but very little seems to be known about them. It was apparently the policy of a later dynasty to destroy all traces of them.

An interesting archæological discovery has been made in a railway cutting at Pont de Pierre, not far from Châlons sur-Saône. At 3ft. below the surface of the ground a group of thirteen skeletons was found in a narrow space, and wonderfully preserved. They seem to be the bones of full-grown men who had died in battle. The skeleton of a woman has been discovered among the others. Between the jaws of one of the dead was found an obolus, which the friend of the defunct had no doubt slipped in to enable the departed to pay his fare to Charon. A coin, very much defaced, but still seen to bear the effigy of the Emperor Gordian, was also picked up among these remains, which leads to the conclusion that 1,700 years have elapsed since they were there interred.

PARLIAMENTARY NOTES.

ON Monday night Mr. Waldegrave-Leslie asked the First Commissioner of the Board of Works whether the statement that Mr. E. M. Barry, A.R.A., had protested against the appointment of Mr. Street, as architect of the new Law Courts, on the ground that such appointment was at variance with the letter and spirit of the conditions of the competition entered into by the architects, was correct. Mr. Sclater-Booth (in the absence of Lord J. Manners) said that such a protest was received from Mr. Barry after the appointment of Mr. Street. The designs having already been exhibited during six months in Lincoln's Inn, and it not being probable that any one of them would be carried out, he did not see what advantage could arise from compliance with the suggestion that they should be again exhibited in the library of the House.

On Thursday week Mr. Goldsmid asked the First Commissioner of Works whether it was true that Mr. Street had been appointed architect of the Law Courts, and Mr. Edward Barry of the National Gallery; and if so, whether those gentlemen had been informed of their appointment; and whether it was proposed by her Majesty's Government to ask the House for votes on account towards the erection of those buildings. Mr. Sclater-Booth (answering for Lord J. Manners) said it was true that Mr. Street had been appointed, and had received official notice of his appointment. Mr. Barry had received a printed notice of his appointment, but the official notification had not yet reached him. A vote had been taken this session to acquire the site of the National Gallery, and no further vote would be taken this year. A vote had also been taken on account of the site of the Courts of Justice, but it was possible that a further small sum might be required to clear the latter site. The correspondence moved for by the hon. member for Whitehaven would be laid upon the table of the House when ready.

WATER SUPPLY AND SANITARY MATTERS.

DR. ROBINSON, the medical officer of Leeds, has just issued a report on the sanitary condition of that town. The death rate last year in Leeds

was 26·9 per 1,000, compared with 30·9 during 1865, and 32·3 during 1866. In Leeds, as in Liverpool, the health committee have taken the scavenging work into their own hands, and from April 13, 1867, to the end of last year 14,991 ashpits were emptied, containing 45,307 tons of manure and rubbish, at a cost of £7485. The sales of manure, however, amounted to £4,183. Dr. Robinson is in favour of the water-closet principle. He says—"With water as a carrier, and sewers as a *via*, available means for cleanly and expeditious removal are always at hand, **and, therefore,** with such palpable advantages to be derived by selecting water carriage as a conveying medium, it is worthy of consideration whether the chief objection to its use in a sanitary point of view—viz, increased pollution of sewers, and consequent generation of deleterious gases in large quantities—cannot be obviated by proper gradients, efficient trapping, flushing, and ventilation, supplemented by the copious use of deodorisers and antiseptics. It is impossible to form rightly an opinion on the merits of the water carriage system apart from such considerations, for the efficient working of any method materially depends for its success on the completion of the mechanism employed, which has not only to be so contrived as to fulfil the original design, but also so arranged as to meet the varied conditions and difficulties which bad habits and ignorance create."

The Pollution of Rivers Commission paid their first visit to Manchester yesterday, and proceeded to the townhall, where they were introduced to the corporate authorities, and the newly appointed officer of health. The present object of the commission is a preliminary inspection of the basins of the Mersey and the Ribble. All the rivers in this neighbourhood, including the Irk, Irwell, Medlock, Etherow, and others, are tributaries of the Mersey, and carrying an immense amount of filth into that river will furnish ample material for inquiry.

Mr. Orton, the medical officer for Limehouse, in his last report, said he had received several complaints of the state of the River Lea, which he attributed to the condition of the weather, as no real improvement could be looked for while the river received the sewage of Westham.

Building Intelligence.

CHURCHES AND CHAPELS.

Bampton Church, Oxfordshire, is in course of restoration under the direction of Mr. E. Christian, of Whitehall. The chancel is nearly finished, and the transepts are now in the hands of the builders.

A new Wesleyan Chapel is about to be erected at Fenton, in the Pottery district. It will be built of red bricks, with blue bands and plinth. Sittings will be provided for 450 persons. Mr. E. Penn, of Stoke-on-Trent, is the architect, and Mr. A. Barlow, of the same place, the contractor.

The foundation stone of a new Congregational Chapel was laid on Wednesday week at Hexham. The style is Early English, and the building will seat 375 persons, at a cost, including the site, of £3,500. Mr. Johnstone, of Newcastle, is the architect.

The Ridgway Memorial Chapel was opened at Hanley last week. Messrs. Scrivener and Son, of Hanley, are the architects, and Mr. C. Woveridge the contractor.

The foundation stone of a new Wesleyan Chapel was laid at Alsager, Staffordshire, on Tuesday week. The style is Gothic. The materials to be used are red pressed bricks, relieved by bands and voussoirs of black and white bricks and stone dressings. The contract for the erection of the buildings has been taken by Mr. John Stringer, of Sandbach, and the entire cost, including land and all other charges, is expected to amount to upwards of £2,200. Mr. G. B. Ford, of Burslem, is the architect.

On Whitsun-Tuesday the rite of consecrating the new chancel recently added to the parish church of Herne Bay, was performed by the Bishop of Gloucester and Bristol. The style of the new east end added is the Gothic of Northern Italy. Messrs. George and Vaughan were the architects.

The foundation stone of a new church for the Capuchin Friars was laid at Dublin on Friday last by Cardinal Cullen. The style is fourteenth century Gothic, and the plan comprises a nave 130ft. long by 45ft. wide. Mr. J. J. M'Carthy is the architect.

On the 2nd inst. the new district church of Limbury-cum-Biscot, near Luton, Beds, was consecrated by the Lord Bishop of Ely. The church, which has been built at the sole cost of John S. Crawley, Esq., consists of a nave 58ft. by 26ft., a chancel, 35ft. by 20ft., a north chancel aisle, 16ft. by 10ft., divided from the chancel by a double arch, supported on a polished marble pillar, an organ chamber, a sacristy, a north porch, a double bellcote, and a warming crypt. The style is Decorated. The walls, which are 3ft. and 4ft. thick, are faced inside and out with light coloured bricks, relieved with others of a deeper tone, and cored with chalk. All the dressed work is out of freestone. The roofs are open framed, of pitch pine, covered with heavy green slates, and are felted and boarded. The benches are also of pitch pine. The aisles are laid with encaustic tiles, and the chancel wall below the window is faced with similar tiles, supplied by Mr. Godwin, of Hereford. The pulpit and font are carved, the former diapered. An oak screen separates the chancel from the nave, and the chancel is fitted with stone sedilia, piscina, and credence. The church was built by Mr. Gough, builder, of Bishop's Castle, from the designs and under the superintendence of T. Nicholson, F.I.B.A., of Hereford, the diocesan architect.

On Saturday last the foundation stone of a new Presbyterian Chapel was laid at Rochdale. The style is Early Decorated, and the building will seat over 800 persons, at a cost of about £6,000.

On Friday last St. Mary's Church, Notts, was reopened after restoration. The whole of the stonework and tracery of the exterior of the building has been repaired; the gallery at the west end has been cleared away. New benches have been placed in the nave and aisles, new floors laid, the windows glazed, new roofs constructed, &c. The work has been carried out under the joint direction of Mr. H. Currey, of London, and Mr. S. D. Walker, of Nottingham.

A wealthy Jew is about to build a new synagogue at Chatham, as a memorial to his late son. The building, the contract for which has been taken by Mr. J. G. Naylor, of Chatham, is to cost nearly £5,000, and will, it is said, be a very imposing structure.

On Thursday week the foundation stone of a new Wesleyan Chapel was laid at Whitstable. The building, which is of a very plain description, will accommodate 800 persons, at a cost of about £1,600. Mr. Foad, of Whitstable, is the contractor.

St. Andrew's Church, Stockwell-green, was consecrated on Thursday morning, with the usual ceremonies, followed by a sermon, a collection, and a dejeuner.

On Wednesday week the church of the Holy Trinity at Hawley, Hants, was reconsecrated, a new chancel having been added in place of the former small apse. The cost of the works was £2,500. Mr. C. Buckeridge, of Oxford, was the architect.

Middleton parish church is at present undergoing restoration. The removal of the organ and the western gallery has laid open the tower arch, which has been blocked up some three-quarters of a century. It now exhibits many points of interest, showing that the present church, probably erected not long before the Reformation, replaced one built within a hundred years of the Norman Conquest. The materials of this earlier church had been used in building the new one, and of this circumstance the tower arch affords a remarkable example. The jambs probably remain as they were originally, but the semicircular arch has been taken down and rebuilt as a pointed arch, with the stones as wrought for its predecessor. The principal feature of the decorations is a very bold zig-zag, not carried all round, but interspersed with other plainer moulds from the same or some other arch. The caps and abaci are enriched with ornaments such as are usually found in the finest and most elaborate examples of Norman work.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its last meeting but one for the present session this week at the society's house, 7, Whitehall, S.W., His Grace the Archbishop of Canterbury (President) in the chair. Grants of money amounting to £1,090 were made in aid of the following objects:—Building new churches at Bethnal-green, St. Mark, London; two churches in the extensive parish of Holbeach, Lincolnshire, Jarrow (Christ Church), Durham; Millwall (St. Luke), parish of Poplar, London; and North Ormesby, near Middlesborough; rebuilding the churches of Kenarth, near Carmarthen; Taf Vechan, near Talybont, Brecon, and West Lulworth, near Wareham, Dorset. Enlarging or otherwise increasing the accommodation in the churches at Bampton, near Farringdon; Beaconsfield, Bucks; Hannington, near Northampton; Linsdale, near Leighton Buzzard; Maidstone, St. Philip; Middleton Stoney, near Bicester, Oxon; Minster, near Boscastle, Cornwall; Munslow, near Church Stretton, Salop; and Wimbledon, Holy Trinity. The grants formerly made towards building the church of St. Columba, Haggerstone, and restoring the church at Broadwood Kelly, North Devon, were each increased. The society likewise accepted the trust of sums of money as repair funds for the new churches at Southsea, St. Simon, Hants, and Chapmanslade, SS. Philip and James, near Westbury-on-Trym, Wilts.

BUILDINGS.

On Thursday week the foundation stone of a new Townhall was laid at Gateshead. The style of architecture will be Italian, treated with some freedom in the details. The design is not elaborate, but the massive and substantial character of the structure, combined with its good proportions, and the studied boldness of its main features, are likely to render it a striking object, expressive of the purpose for which it is being erected. The architect is Mr. John Johnstone, of Newcastle; the contractor, Mr. Bulman, of Exeter; and the clerk of the works, Mr. William Burnip, of Gateshead. A very distressing accident took place during the ceremony. One of the platforms gave way, and about 400 persons were precipitated to the ground. Over fifty were seriously injured, but fortunately no lives were lost.

On Tuesday the new building of the Leeds Church Institute was opened with due ceremony. The style is English Gothic of the fourteenth century, and the building is constructed of brick, with stone dressings and coloured bands. The entire cost of the building was about £4,000. Messrs. Adams and Kelby, of Leeds, were the architects.

A new wholesale and retail market will be opened in a few weeks at King's Cross, immediately adjoining the Great Northern Railway terminus. The market covers an area of more than an acre, and contains separate and ample accommodation for the wholesale fish, meat, poultry, provision, and fruit and vegetable trades. In addition there is a spacious covered retail market containing about ninety stalls.

The foundation stone of the Royal Albert Asylum was laid at Lancaster, with full Masonic ceremony, on Wednesday. The design is Gothic, adapted to modern requirements. The whole of the exterior is built of durable light-coloured freestone, and the walls are lined with brickwork. The plan of the building is something in the form of the capital letter E. The building will accommodate 500 inmates, at a cost of £60,000. Mr. E. G. Paley, of Lancaster, is the architect, and Mr. Baynes and Mr. Blades, both of Lancaster, the contractors respectively for the masonry and woodwork.

The seventeenth exhibition of fine arts at Bordeaux, now open, is said to be superior to any that have preceded it. The number of works exhibited is 635, and they include specimens of some of the best living French painters, and of some lately deceased artists; amongst the latter is the "Source," by Ingres, the property of the Countess Duchâtel. The purchases amount to £3,200, besides two works bought for the museum of Bordeaux, of which the price is not given. The works which have found purchasers are of all classes—paintings by Duverger, Landelle, Ribot, Antigna, Bonheur, Bourgeois, Chaplin, Paul Flandrin, Phileppoteaux, and many other well-known artists, and sculpture and bronzes by such artists as Carpeaux, Carrier Bellouse, and Paul Dubois.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—G. T. R.—L. J. D.—T. G.—G. H.—M. G.—I. F.—R. T.—I. W. F.—I. D. W.—I. P. S.—W. R. D.—I. H. C.—T. N.—W. H. R.—I. R.—I. F.—T. and A.—E. P., Stoke, with photo's.—R. L. B.—G. and C.—I. H.—E. F.—I. W. P.—H. B.—W. Y.

W. C. F. HARBORNE.—We should like to know more of the *modus operandi*.

CARPENTER.—We cannot understand how it is you have not received any reply or notice from so respectable a firm, Messrs. Virtue, of Ivy-lane, now publish most, if not all the treatises of the "Weales Series," and it might be as well for you to address them on the subject.

Correspondence.

MR. MOORE'S DECORATIONS.

To the Editor of the BUILDING NEWS.

SIR,—The letter which I addressed you last week upon this subject arrived, it seems, too late for publication. In it I gave my unequivocal denial to the assertions of Mr. Moore and your other correspondents, which I again repeat, that the drawings had been altered since they came into my possession, excepting only the colour of the seating of the three tiers of galleries, which has been darkened. But it is the veriest nonsense to speak of this, as it forms no portion of the decorations at all. On Saturday last, however, I received a letter from the young man, *a friend of Mr. Moore's, and a painter in water colours*, who prepared the drawings for me partly at mine and partly at Mr. Moore's chambers, under his direction, saying that in the sketch of the ceiling I made certain suggestions while the drawing was in progress, which he carried out, as he now asserts, without Mr. Moore's knowledge. I confess this is the first time I have heard of this, which appears to me the weakest of special pleading, the sketches forming the subject of almost daily discussion during their preparation, and I should never have dreamed of appropriating a single line of that sketch to myself; nor can I, after a careful examination of the drawing, detect the alterations Mr. Moore complains of. However, it is a very simple matter, if Mr. Moore wishes it, to erase his name from the drawing altogether, a course which I doubt not the committee of the exhibition will permit. When your anonymous correspondents speak of "that impertinent interference with artists which is too possible," they, perhaps, do not consider that if artists wish to be engaged on more lasting and higher work than simply easel pictures, they must, in a measure, work *with* the architect who employs them, who, it must be presumed, has as much interest in any scheme *as a whole* being successful as the artist who aids is anxious for his own particular portion, be it a figure subject, or otherwise. Had more of this spirit been shown at the Queen's Theatre, I should not now have to deplore the utter want of harmony between the general decoration and the frieze which Mr. Moore painted.—I am, &c.,

CHARLES J. PHIPPS, F.S.A.

26, Mecklenburgh-square, June 15.

THE LATE NATIONAL COMPETITIONS.

SIR,—Your readers are aware that, after very much discussion and delay, it has been determined that Mr. Edward M. Barry shall be the architect of the new National Gallery, Mr. George Edmund Street the architect of the new Law Courts, and that the completion of the new Government Offices shall be confided to Professor Scott. You have ventured to assent to this decision, and to express a hope that these gentlemen will now hestir themselves to give the nation grand works deserving of the high patronage it has accorded to them. But, in saying this, I suppose you do no more than express what you perhaps hold in common with all Englishmen conversant with the subject, a tacit acquiescence in an award to which we have become resigned as the best under all the circumstances that have arisen and all the false steps that have been irretrievably taken in connection with these three famous but very unsatisfactory competitions. In the case of the National Gallery, we have had a limited competition, resulting, as everyone says, in the production of a group of most unsatisfactory designs, useful only as a means of showing Mr. John Bull "how not to do it." As an architectural work, Wilkins's edifice in Trafalgar-square has been severely condemned, but whether well or ill, no one can surely say that Mr. Edward Barry's design is an improvement upon it. His was one of the best, perhaps *the* best, of the commonplace designs exhibited at Westminster, but in architectonic power and invention we hold it to be immeasurably inferior to the present building, with its bald podium and pediment, "pepper boxes," and all. Mr. Barry has produced an excellent plan, but an exterior design, or, to use his own term, "elevation," altogether unworthy of his, or at least of his father's reputation. Now the National Gallery is just that very building for whose successful construction a good plan is not the "be-all and end-all." Looking at such smaller works as the Royal Institution at Manchester, or even at the old townhall in that city, or, again, at the Fitzwilliam Museum at Cambridge, one cannot but hope that the architect of the new National Gallery, if he be not overburthened with other professional work, will give the nation an edifice of more pretension to grandeur, and, above all, of individuality, than is offered in his beautifully executed competition drawings: and I express the hope (not the mere wish) sincerely, remembering, as we all should do, that Mr. Edward Barry, while competing for the National Gallery, was also engaged on another elaborate design for the new Law Courts. I trust he has been "selected," as he tells us in the morning papers Mr. Street has been in the case of the Law Courts, "not for what he has done, but for what he may yet do," and, so saying, bow to the decision of the authorities, desiderating in all future cases of the kind a national—nay, a cosmopolitan—competition in place of these abortive "limited" competitions, of which I devoutly trust the competition for the Law Courts will be the last.

Let anyone ask himself whether on the whole the open competition for the new Townhall at Manchester has not been a great success, and the two recent limited competitions been on the whole a failure. Who knows now what unheard-of talent, possessed by some tyro, hereafter destined to employ it in assessing dilapidations and altering old tenements, might not have been elicited by an open instead of a limited competition for the National Gallery and for the Law Courts? Of one thing I feel certain—the country may well feel proud of such architects as the authors of the three designs for the Manchester Townhall, which will be found engraved in your journal. We owe our knowledge of them to the principle of open competition. Next to the evil of no competition at all is a limited competition, in which all the competitors, good, bad, and indifferent, are to get a fixed sum for their drawings. We see the wretched result in these two great national competitions now decided. It merely intensifies one of the worst abuses of the unreformed open system, warrants Mr. Digby Wyatt in getting up a big view of his design for the National Gallery, and Mr. Seddon in producing a bigger one—perhaps *the biggest* ever made—for the Law Courts, and leaves the gaping public to wonder whether the two were tinted from a ladder, or from a movable scaffold. Competitors should certainly be placed on a fairer equality with respect to the sizes and the number of their pictorial drawings, as anyone might see at Lincoln's Inn, where the contrast between Mr. Burges's one little view and Mr. Scott's several big ones was a manifest hindrance to fair discrimination between the two designs, as such. It is an old, old tale; as none knows better than the talented proprietor of the biggest of these *magnum bonums*.

It will be seen from these remarks that I do not take part in "the solicitude of some friends to the right management of competitions," who, with the *Builder*, wish to deprive Mr. Street of his commission to build the new Law Courts. There are very few architects who did not entertain a preference for the design of Mr. Burges; but fewer still who did not appreciate the high merit of Mr. Street's design. I am sorry to see your contemporary is one of these very few, and that his advocacy of Mr. Edward Barry's claims has led him quite away from his usual delicacy and reticence where criticism of any sort is looked for. Will it not be best to let well alone? We have, it seems, got out of these two precious competitions a National Gallery *plan* whose "elevation" will not do at all, and a Law Courts *design*, whose plan (so says the *Builder*) "is out of the question." It is a very unpleasant reality, and to deal with it we would suggest that the two architects had best make ends meet as well as they respectively can, the one by cobbling up his plan, the other his elevation.

SOLOMON SET-SQUARE.

ART UNION OF LONDON.

SIR,—I think it is high time to call attention to the behaviour of the committee of this society. They advertised some time ago for a series of designs, which were sent in on March 2 (three months and a half ago), and from that time they have not, so far as I am able to learn, moved in the matter. Competitions are at all times ticklish things, and the more open and aboveboard the proceedings are, the more satisfactory it is for all concerned, and, were it not for the honourable names on the committee, all sorts of suspicions might be current relative to the motives which have brought about this most unreasonable waste of time. It is, I think, due by the committee not only to proceed to the conclusion of this matter at once, but also to give the competitors some account of the reason of this unseemly delay.—I am, &c.,

W. B.

Intercommunication.

QUESTIONS.

[883.]—A GOOD AND SUFFICIENT FENCE.—In the deed of a plot of ground a clause stands thus: "To erect and for ever maintain a good and sufficient fence." Could you, or any of your readers, give me the legal definition of the same; in fact, what I can be compelled to put up?—S. T. R.

[884.]—ARCHITECTS' BENEVOLENT SOCIETY.—If anyone would supply me with a word or two of information on the constitution of this society, and what means should be adopted in order to obtain relief from its funds, he would confer a favour on—AN OLD PROVINCIAL ARCHITECT.

[The object of this society is limited strictly to benefit those engaged professionally in all branches connected with architecture, their widows and children, excluding only such as have in any way been engaged in, or are deriving emolument from, the executive department. Annual subscribers of one guinea, or donors of ten guineas in one donation, are members, whether professional or otherwise, and will be entitled to vote and take part in the proceedings at all general meetings, and in the election of officers and council. Applicants for relief must strictly conform to the following rules:—1. The candidate for relief must be of good moral character, and known to be honourable in his practice; he must have been duly educated in an architect's or surveyor's office, or he must give such evidence as may be satisfactory to the council of his having produced a valuable invention or work of art useful to the profession, or must be the widow or orphan child of a person so qualified. 2. No one who has embarked in speculations in trade or bills of exchange, or transactions inconsistent with his profession, can be admitted as an applicant. 3. Applications for relief must be transmitted to the secretary or his assistant on or before June 1 or December 1, certified by two subscribers, one of whom shall state his knowledge of the truth of the statement made. The distribution of the funds takes place in the months of January and July. 4. Relief can be afforded only once within twelve months to the same applicant, unless in an urgent case of sudden distress occurring after relief has been granted. 5. Urgent cases, entitled to immediate assistance, are limited to such as arise from the death of a near relative, sudden illness, distraint of household goods, imprisonment, fire, or other unavoidable calamities. 6. Applications for relief or urgent cases may be made at any time, but they must be certified by four subscribers, one of them testifying, by letter, his knowledge of the truth and merits of the case. 7. Every widow must transmit the certificate of her marriage and of the burial of her husband. 8. Orphans must produce certificates of the marriage of their parents, and of their own baptisms, or other satisfactory evidence of their identity. 9. The names of persons relieved by this society are not made public.]

[885.]—CONSTRUCTION OF FLUES.—Will you, or some of your correspondents, inform me the method of constructing flues from the boiler of a manufactory so as to consume its own smoke?—MASON.

[886.]—MAKING A POND.—Can one of your correspondents kindly inform me the best method of making a pond? Will bricks or tiles laid in cement stand all weathers in an exposed situation?—J. W.

[887.]—INSTITUTION OF SURVEYORS.—I see that an institution of surveyors has been established in London. Will you please inform me what are the qualifications of membership, the fees to be paid, and whether any country surveyor may become a member?—COUNTRY SURVEYOR.

[888.]—RESISTANCE OF STONE TO FROST.—Is there any reliable means of testing the tendency of different kinds of building stones to exfoliate by the action of frost? If so, will some of your correspondents kindly point them out?—J. T., Keynsham.

[889.]—KAUREE PINE.—Can any of your readers give us the benefit of their experience in the behaviour of this wood, apparently so desirable for joinery? It is proposed to us for use in dowelled flooring.—WILLSON AND NICHOLL, 126, Marylebone-road, N.W.

REPLIES.

[830.]—PARTY WALLS.—Your correspondent "J. P." in his future operations with respect to his houses, will do wisely to bear in mind the legal maxim "*sic utere tuo, ut alienum non ladas*." While there is no question that he may build another storey, as he wishes, yet if he occasions any pecuniary damage to his neighbour he is sure to suffer for it, even if in nothing else than legal costs. SOLICITOR.

[833.]—CEMENT FOR BROKEN LEATHER MACHINE BELTS AND STRAPS.—Gutta percha dissolved to the consistency of treacle in bisulphide of carbon is an excellent cement for leather belts and straps. The parts to be joined must be well thinned down, and a small quantity of the cement spread on each end; then warm the parts over a fire for half a minute, apply them quickly, and hammer well on a level surface. This cement will wear for two years or more.—BONA FIDE.

[833.]—Allow me to inform "General Joiner" the plan I adopt when a belt or strap breaks. I get a good piece of leather and make a graft, fixing it firmly with copper rivets. This plan I always find answer well. I do not think cement of any kind will stand the strain required.—ONE OF THE SAME TRADE.

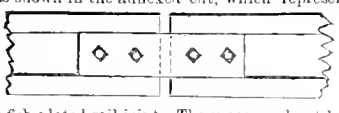
[834.]—COTTAGE WALLS.—Build your foundations 18in. wide of rubble work, 12in. above ground line; insert a damp course, and the superstructure of brickwork 14in. thick.—F. H. L.

[835.]—STEEL TOOLS.—There is a great deal of useful information on steel in the "Management of Steel," by George Ede. Use is the only way whereby to test the quality of fine steel tools. If aqua fortis be applied to the surface of steel previously brightened, it immediately produces a bright spot; but if applied to iron the metal remains clean.—W. W.

[836.]—PLASTERING WALLS.—If the walls are built hollow of brickwork in cement, on a strong and well laid damp course, and if they have not been exposed to rain and other moisture, I should say that they would be fit for painting at the end of two years, and sooner if dried by artificial means. It is considered that bricks absorb one-fifteenth of their weight in water: lime, or Portland cement and sand, required to mix into mortar, one third of their bulk of water. It is on this that I base my calculations that all moisture, by the time above stated, should be evaporated, and the walls perfectly dry for the painter.—C. W.

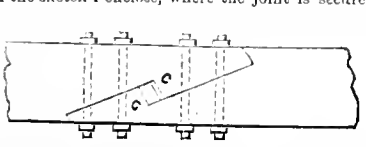
[837.]—WORKING LINES OF A NICHE.—Purchase "Nicholson's Work on Masonry."—F. H. L.

[874.]—EXPANSION OF RAILS.—The expansion of rails is provided for by leaving a small space between each length, as shown in the annexed cut, which represents an



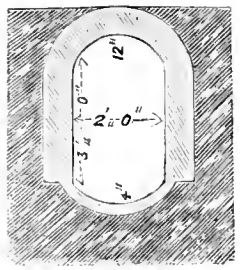
ordinary fish-plated rail joint. The space need not be more than about the eighth part of an inch. The amount that a rail or any other bar of rolled iron would expand between certain temperatures may be easily calculated. Let L equal the length of the rail at a temperature t, and L^1 the length required at a higher temperature t^1. Putting C for the coefficient of the expansion of wrought iron, we have $L^1 = L(1 + C t^1)$. Substituting for C its value 0.000035, $\frac{}{1 + C t}$ and for t and t^1 the least and greatest temperatures to which the rail is exposed, its expansion can easily be determined. At the same time, the average length of rails does not exceed 21ft. About 15ft. was the limit, but they are now rolled up to 27ft., and even longer.—A. E.

[880.]—SCARFING TIMBER.—"Carpenter" will find that timber may be scarfed in a sound, workmanlike manner, in the sketch I enclose, where the joint is secured by



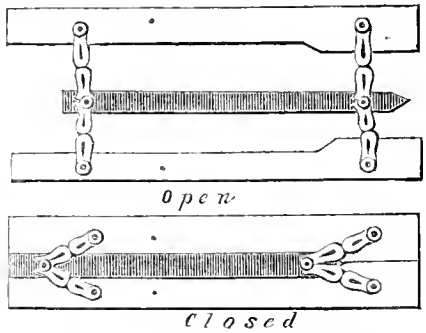
driving the small wedges c c well home. With respect to his second question, a strap is preferable to a bolt, as it avoids making a hole in the balk, and thus diminishing its strength. Straps may be used in the scarfing joint I have given, and will make a better though rather more expensive job than bolts. In all the details of carpentry work, the rule to bear in mind is to make as few holes and cuts as possible in the timber.—APPRENTICE.

[881.]—FLOW OF WATER.—Allow me to inform "C. P." that, theoretically speaking, the egg shaped sewer is the best, but it is rather a troublesome one to construct. For the case he alludes to, a plain culvert would answer perfectly well, having the following dimensions shown. The invert should certainly be turned in Portland, not



Roman cement: and it is sometimes necessary to build the whole sewer in cement also.—BUILDER'S CLERK.

[882.]—PARALLEL RULER.—This description of parallel ruler is obviously preferable to the common one, and is



respectfully recommended to the gentleman who discovered a difficulty in drawing parallel lines.—F.

[882.]—Parallel lines can be drawn easily and rapidly by a T-square. It should be made like an ordinary T-square, the crosspiece of square to be made in two pieces, the blade fixed in one of the pieces, the other piece to move on a thumb-screw connecting the two together. I think "Parallel Ruler" will find this answer his purpose, being both a square and a level.—J. B.

WAGES MOVEMENT.

THE workmen of at least two of the principal master masons in St. Andrew's, N.B., went out on strike on Monday, in consequence of the masters having signified their intention to reduce the wages ½d. per hour.

The wages of operative joiners in Crieff have for some time past been 20s. a week of fifty-seven hours, but the men, considering that they were working at lower rates than those paid at other places, applied for a rise of 2s. 6d. per week. This the employers refused to give, and the result was that none of the journeymen returned to work on Monday.

The bricklayers of Taunton, county town of Somerset, have struck for an advance in their wages. Their demand is an addition of eightpence per day upon the present rate.

STATUES, MEMORIALS, ETC.

THE House of Commons has received a promise on behalf of Mr. A. Stevens, that the Wellington monument for St. Paul's, which has been so many years in the hands of the sculptor, should be "approaching completion in the course of the year 1869."

On Friday last the statue to the memory of the late Mr. Cobden was lifted to its pedestal on the site granted by the vestry of St. Pancras, at the entrance to Camden Town. It stands nearly 9ft. in height, upon a pedestal of some 15ft. or 16ft., and has been cut out of a solid block of fine Sicilian marble of 7 tons. The figure itself weighs nearly 3 tons. Messrs. Wills, of the Euston-road, are the sculptors.

The monument to Richard Oastler, the "Factory King," is to be placed in front of the Midland station, at Bradford, during the ensuing autumn. About £300 is required by the committee to cover all expenses.

A marble bust of the late Prince Consort has just been placed in the plant house of the Royal Botanic Gardens, Regent's Park. It is the gift of Sir Walter Stirling, Bart., and was executed by W. Theed, Esq., under the immediate superintendence of her Majesty.

STAINED GLASS.

THE chancel window of St. Michael's Church, Worcester, has been filled with stained glass by Messrs. Done and Davies, of Shrewsbury. The window is of three lights, the subject being the Crucifixion. The same artists have also just finished another window for the parish church of Bishop's Castle. It consists of two openings, with tracery. The subjects are the four Evangelists, with their emblems.

BUILDING AND LAND SOCIETIES.

THE annual meeting of the Earl Shilton Building Society was held at Earl Shilton, last week. The report which was adopted, was very satisfactory. The society have had out of borrowers to the extent of £5,150 only two or three defaulters and their debts are amply covered by the value of the property mortgaged the society has now existed eleven years, and it was suggested that as the fourth and last will be declared next year to depositors who commenced with the society, and that as they will receive their shares, which may be worth £60, when only £10 12s. 6d. shall have been paid, the event should be celebrated by some public festivity.]

LEGAL INTELLIGENCE.

THE ATLAS BRICKWORKS.—STEVENS *v.* PAINE.—Mr. W. M. James, Q.C., and Mr. C. Hall moved before the Vice-Chancellor to continue an interim injunction restraining the defendants from issuing circulars calculated to mislead the public and induce the belief that the business carried on by the plaintiff's testator at the Atlas Works, Woodfield-road, Harrow-road, under the firm of Henry Clayton and Co., is no longer carried on, and also restraining the use of any patterns, or castings of patterns, of the firm of Henry Clayton and Co., obtained by the defendants while in the employ of that firm. It appeared that previously to December, 1865, the late T. B. Dixcee had for some years been engaged in the business of consulting engineer and machinist at the Atlas Works, in partnership with Mr. H. Clayton, under the style or firm of Henry Clayton and Co. In December, 1865, the partnership was dissolved, and the goodwill of the business and the patent rights and patterns were appropriated to Dixcee, and by subsequent arrangements a lease of the Atlas Works was granted to him, where he continued to carry on business as "Henry Clayton and Co." until his death in April, 1867. The plaintiff Stevens was acting executor of Dixcee, and in accordance with the directions of his will had carried on business at the Atlas Works as "Henry Clayton and Co.," since Dixcee's death, until the 1st of April last, since when the business had, in accordance with a decree in a suit for the administration of Dixcee's estate, been carried on by H. F. Ransford, the receiver in the cause. The defendants, Paine, Slaughter, and Amor, had been employed at the Atlas Works as foremen and clerk until recently, and were now carrying on business in partnership as constructive engineers and machinists at the Globe Works, also in the Woodfield road. They had recently issued the following circular:—"We beg most respectfully to inform you that we have opened the above works for the manufacture and sale of precisely the same class of brick, tile, and pipe-making and pressing machinery (as lately made by the firm of Henry Clayton and Co., of the Atlas Works, Harrow-road, where we have been employed for a number of years, and, in consequence of the decease of the late principal, have commenced business on our own account), and having made vast improvements in the same, beg to say that we can supply any machinery at a much reduced price, consequent upon the patents on them being out, and ourselves being satisfied with smaller profits. Any repairs or new portions of Clayton's or any other machines you may require we can supply you with on the the shortest possible notice. We are compiling a catalogue, and as soon as same is ready we shall have the pleasure of forwarding you a copy, but meanwhile beg to call your polite attention to the prices on the other side of a few of the machines which we manufacture, and which will bear comparing with H. Clayton and Co.'s published prices." The case made by the bill and affidavits in support of the motion was that the effect of this circular was to induce customers of Henry Clayton and Co. to believe that the business had ceased to be carried on, and thereby the goodwill would be very much lessened in value. The Vice-Chancellor after hearing counsel decided that the only inference that could be drawn from the circular was that the machines were no looger made by Clayton and Co., and that therefore the injunction must be continued.

ACTION FOR TRESPASS.—TULK *v.* THE METROPOLITAN BOARD OF WORKS.—This was an action of trespass, and the great question was whether Leicester-square was within the jurisdiction of the Metropolitan Board of Works. It appeared that formerly the land of which Leicester square formed a part belonged to the Earl of Leicester, and by different conveyances the part called the square became the property of Tulk, and there was always a condition that the square should be kept open, and in a proper state for the use and enjoyment of the inhabitants, who, if they chose to use it as a promenade, should pay a rental for the same. It was submitted that the square surrounded by iron railings had been set apart for the use and enjoyment of the inhabitants, and it was so set apart otherwise than by the revocable permission of the owner. At one time the houses and shops surrounding the square had been held under leases, but the last of those expired in 1847. Mr. Tulk had covenanted to keep the square without any building upon it, but in an ornamental state, and not to suffer the statue to be taken down or defaced. The Board had entered upon the square, on the ground that the square was in a neglected state, and they acted under the statute. There was an action of trespass. The Court below decided for Tulk. After hearing counsel on both sides the Lord Chief Baron delivered judgment. The Court were of opinion that the judgment of the Queen's Bench must be affirmed. The question was whether, under the Act, the Metropolitan Board was entitled to enter upon this garden and commit the act they had proceeded to do. The words of the first section raised the question. It was said to be for the protection of the garden or ornamental ground set apart for the public or the inhabitants; and it then enacted that when any enclosed garden or ornamental ground had been set apart for the public or the inhabitants, and the owners neglected to keep it up in a proper state, then power was conferred upon the Board to enter, &c.; and the question and the sole question was whether this square, called Leicester-square, had been set apart for the use or enjoyment of the inhabitants thereof. He was of opinion that in order to comply with these words some right, some legal right must by some means have been conferred upon the inhabitants of the place in question; and the question was whether that had been done. He was of opinion that no such right had been conferred, and that no inhabitant had a right to enter upon the square without the express permission of the owner. Mr. Baron Bramwell would add one word,—that he did not think it was open to the owners to build upon it.—Judgment affirmed.

THE WORKSHOPS' REGULATION ACT.—12 HOURS OR 13½?—At the St. James's Vestry, Mr. Buzzard, the vestry clerk, stated that, in accordance with instructions given him by the vestry, he had taken counsel's opinion as to whether the 12 hours mentioned in the Act did or did not include the 1½ hour required for refreshment and rest. At first, Mr. Keane, the counsel applied to, was inclined to think with him that the 12 hours included the 1½ hour, but, on further consideration, he came to the conclusion that it did not do so; consequently, a person might be employed 13½ hours, including the 1½ hour for rest and refreshment.

DEATH THROUGH NEGLIGENCE.—MOORE *v.* DENTON AND ANOTHER.—This was an action brought by the widow of a bricklayer against the two defendants to recover damages

for the death of her husband, which was caused by their alleged negligence. The defendants pleaded "not guilty." It appeared that in February last the defendant Shipney, a publican at Finchley, employed a carpenter to design a building, and employed the defendant Denton, a builder, to carry out the design. In the course of the execution of the work a wall fell and killed the deceased, a working bricklayer. The defence was that neither of the defendants was liable, inasmuch as Shipney had only employed Denton, who had employed the deceased, and Denton was merely engaged in carrying out the design of an architect. The jury, after having retired, found a verdict against both defendants, on the ground that Shipney had employed an unskilful person to design the building, and that Denton was guilty of negligence in endeavouring to carry out a design which he must have known to be faulty. They assessed the damages at £650, to be apportioned thus:—£200 to the widow, and £450 to be divided among her six children.

MEETINGS FOR THE ENSUING WEEK.

MON.—Royal Institute of British Architects.—To proceed to ballot for members. The following papers will be read:—"On the Terra-cotta Work adopted in the New Alleyne College, Dulwich," by C. Barry, and "A Short Description of the Plans of Hospitals at Paris, Munich, and St. Petersburg," by Dr. Oppert.

TUES.—London Mechanics' Institution.—Lectures to working men on science and industry. "On Mechanical Drawing," illustrated, by E. A. Davidson, Esq., S.

WED.—Society of Arts.—The one hundred and fourteenth annual general meeting, for receiving the councils report and treasurer's statement.

Our Office Table.

There is some talk of repairing the Eagle Tower of Carnarvon Castle, so as to make it available as a museum for the counties of Carnarvon, Anglesey, and Merioneth.

The directors of the Manchester Royal Exchange, at their meeting last week, received eight tenders, from as many eminent building firms, for the erection of the new Royal Exchange. The tender accepted was that of Messrs. Parker and Son, of Liverpool, who are at present engaged in the erection of the Liverpool Exchange, and who have just completed the new Corporation Buildings in Dale-street.

The Leeds Property Owners' Protection Society have been in communication, through Mr. Baines, with Earl de Grey, asking for an amendment of the Artisans' and Labourers' Dwellings Bill, in respect of adequate compensation to owners of property, when such is closed, demolished, or destroyed by the authorities. Earl de Grey replies "that the point raised will be fully considered by the select committee; and if the just claims of the owners of property are not met by compensation, some means will be taken for that purpose."

The St. Luke's guardians have appointed Mr. Hill as surveyor to the gift estates of the parish, *vice* Mr. Christie resigned. The remuneration is derived from fees only.

The Hon. Society of Gray's Inn have appointed Mr. Isaacs as their surveyor, who is also surveyor to the Holborn Board of Works.

The Bethnal-green Guardians have sealed the contract for the alterations at Leytonstone House, and Mr. Munday, the surveyor, has submitted plans for a lodge and receiving ward at the same establishment, which have been accepted.

The plans of the new infirmary, about to be erected by the Paddington Board of Guardians, at an outlay of £11,300, have been approved of by the local board.

Members and others having occasion to refer to the Institution of Civil Engineers during the next few months will find that the offices have been temporarily moved to No. 1, Great George-street, as the alterations now in progress in the old building are so extensive that it was impossible to continue in occupation there.

A picture, by an old Dutch artist, representing the exhumation of the body of St. Hubert, has just been added to the National Gallery.

A correspondent in the Birmingham district, writing on the state of the hardware trade, remarks that the damaging effect of foreign competition is likely to give a great impetus to the educational movement in that town and district. It is getting to be known, he says, that in some branches, machines, invented and made in England, produce better goods in the hands of educated workmen on the continent than can be obtained in workshops in this country.

The crown and state dress of King Theodore have been temporarily deposited in the India Museum.

The gold medal attached to section I of the Halton Industrial Exhibition, under which competition was invited, for the best block of model cottages, was awarded to Mr. A Mayne, of Aylesbury, who exhibited models of cottages, which he proposed to erect at £225 a pair. By the terms of the competition, the successful competitor has to erect one pair of cottages at the price named.

The annual conversazione of the Royal Institute of British Architects will be held on July 19 next. Members who have any works of art which they may be willing to lend for exhibition on the occasion are requested to communicate with the assistant secretary, stating the size and nature of the objects to be lent, and the hours between which they may be fetched. They should be ready for delivery at least two clear days before the date of the conversazione. It being deemed advisable to arrange and lessen the mass of papers, which have accumulated since the foundation of the Institute of Architects, members are informed that there are in stock several of the annual reports, and some detached copies of the papers read in former years at the evening meetings, which can be had, without charge, to complete defective sets, on prompt application to the librarian.

The works of the important improvement in Whitechapel, by extending the Commercial-road in a direct line to the corner of Leman-street (Red Lion-street), High-street, Whitechapel, are in a very forward state of progress. The demolition of houses and other buildings has been very extensive, and is still continued. A very great clearance has been effected in High-street, Plough-court, Leman-street, Colchester street, Back Church-lane, Church-street, and the west end of the Commercial-road. The remaining houses required for the formation of the new street by the Metropolitan Board of Works have been vacated by the occupiers, and preparations are being made to raze them to the ground.

The subject of the "Stanhope" essay, read by Mr. T. R. Buchanan at the Commemoration Festival, on Wednesday, at Oxford, was "The Effects of the Renaissance on England."

We mentioned last week that the shaft of the "King's Cross" at Arran had been carried away and used in the construction of a dyke. Somebody has moved in the matter, and the stone being fortunately uninjured, it is to be restored to its original position. The explanation given by the person who removed it is that he did not think any especial value was attached to the stone.

The Corporation of London have paid for rent of Southwark Bridge, during three and a half years, £18,868; and now pay for purchase of the bridge £200,000, making a total of £218,868. The Chamberlain has handed cheques to the Comptroller for the completion of this purchase, and the legal documents being completed, the bridge is now handed over to the Corporation, and becomes free for ever for the public use.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3294 G. F. REDFERN. IMPROVEMENTS IN PAVING (A communication.) Dated November 21, 1867.

According to this invention the patentee makes blocks or slabs of small stones, bound or cemented together in moulds of the required sizes, with asphalte or other bituminous cement. These blocks or slabs are laid on a concrete foundation, and can be laid down and taken up from the streets and roads as easily as the flagstones of foot pavements.—Patent abandoned.

3364 W. R. LAKE. AN IMPROVED SPRING HINGE. (A communication.) Dated November 27, 1867.

This invention relates to a simple device which is well adapted to take the place of ordinary door and other hinges, or may be used in connection with the same simply as a spring. The invention consists, chiefly, in constructing and arranging the two parts or leaves of the hinge in such a manner that one part, or a portion of the same, forms the spring to act upon the other part.—Patent completed.

Trade News.

TENDERS.

TO THE EDITOR OF THE "BUILDING NEWS."

SIR,—I beg to hand you for insertion in your next issue a list of tenders I received on the 6th inst., and I do so because they were unfairly stated by some one in last week's *Builder*.—I have no doubt by one of the three firms whose tenders I was bound in honour to reject. I annex them as quoted in the number of the *Builder* to which I refer, and also as they should be inserted.—I am, &c.,

14, St. Helen's place, E.C., EBENEZER GREGG.
London, June 16.

(Copy) From *Builder*, June 13, 1868.

For building No. 50, Old Broad-street:—

*Holland and Harmer	£10,327
Trollope	9860
*Mansfield	9860
Cubitt	9850
Jackson and Shaw	9743
Ashby and Horner	9700
Ashby and Sons	9647
*Lawrence and Sons	9430

* The tenders of Messrs. Holland and Harmer, Messrs. Mansfield, Price, and Co., and Messrs. Lawrence and Son were not received, because they would not deliver them on the required form.

LONDON.—For additions to No. 50, Old Broad-street, for Mr. Sands. Mr. E. Gregg, architect. Quantities by Mr. R. Roberts:—

G. Trollope and Sons	£9860
W. Cubitt and Co.	9850
Jackson and Shaw	9743
Ashby and Horner	9700
Ashby and Sons (accepted)	9647

ASHTON-UNDER-LYNE.—For erecting St. Peter's parsonage, Ashton under Lyne. Medland and Henry Taylor architects:—

John Thompson	£1868
W. Storrs	1860
J. and G. Longson	1790
Joseph Thompson	1787
Thomas Clay	1695
James Grundy	1635

BOLTON-LE-MOORS.—For reseating nave and forming "chorus cantorum," &c., for Holy Trinity church, Bolton-le-Moors. Medland and Henry Taylor, architects:—

James Grundy	£978
John Thompson	819
W. Clark	750

BURTON-ON-TRENT.—For the new Infirmary and Dispensary. Mr. Edward Holmes, architect:—

Jefferey and Pritchard	£3250 0 0
Webb	3211 0 0
Horsley Brothers	3044 0 0
Lovatt	2990 0 0
Matthews	2891 0 0
Gregory	2884 15 0
Maddocks	2860 0 0
Trow and Sons	2829 0 0
Wielman and Wigley	2813 0 0
Hadfield	2797 0 0
Smith and Chamberlain	2774 0 0
Bowler and Beck	2740 0 0
Clarke	2621 19 0
Mason	2620 0 0
Lilly and Son	2616 1 0
Nelson	2613 0 0
Neale and Sons	2592 0 0
Hardwick and Son	2591 0 0
Lowe and Sons	2488 0 0
Lilly	2360 0 0
Hunter and Bennett (accepted)	2312 16 10

CHESHIRE.—For erecting Wltinstow parish schools. Medland and Henry Taylor, architects. Quantities by Mr. H. Breary:—

John Thompson	£2146
J. Robinson and Son	2000
Thomas Hawe	1995
Arthur Warham	1968
John Lane	1960

EASTBOURNE.—For the construction of brick and pipe sewers, and other works for the Local Board:—

	Contract 1.	Contract 2.	Contract 3.
Rodger	£1235 11 3	£1582 17 0	£580 9 0
Williams	1005 6 0	1654 13 6	611 7 8
Bloomfield	1068 0 0	1433 0 0	643 0 0
Coker	1038 0 0	1394 15 0	614 0 0
Robson	916 18 0	1442 8 8	631 9 8
Reard	837 11 0	1389 2 2	606 16 0
Gooch	936 4 6	1297 4 9	566 15 4
Porter	749 11 1	1444 14 3	546 17 11
Hayward*	724 3 8	1348 15 3	514 11 3
Hounsom	—	1348 18 3	551 15 0

* Accepted.

ESSEX.—For cottage residence, Romford, Essex. Mr Charles Pertwee, architect:—

A. Davey	£509 0
W. Roper	507 0
J. Hammond	498 10
G. W. Death	490 0
A. Bacon	405 0

ESSEX.—For reseating and improving Bocking Chapel, Essex:—

Mr. James Browne (Braintree)	£1068

FINSBURY.—For rebuilding the Whitfield Tabernacle, Moorfields. Charles G. Searle and Son, architects. Quantities supplied:—

Browne and Robinson	£4804
Patman and Fotheringham	4613
Hedges	4395
Ashby and Horner	4353
Perry and Co	4350
Colls and Son	4305
Brass	4255
Piper and Wheeler	4212
Higgs	4211
Newman and Mann	4154
Dove Brothers	4049

GUILDFORD.—For two small cottages, for Mr. John Smith. Mr. Henry Peak, architect, Guildford:—

Pollard and Son	£301 10 0
Mason	267 0 0
Garnett	250 0 0
Dives	245 0 0
Swayne and Sons	197 10 0

GUILDFORD.—For additions to Blackwell Farmhouse near Guildford. Mr. Henry Peak, architect:—

Loa (accepted)	£549

GUILDFORD.—For additions to the male and female Infirmaries at the Guildford Union. Mr. Henry Peak, architect:—

Strudwick	£260 15 0
Mason	258 5 0
Dives	233 17 0
Garnett	230 7 0
Loe	192 0 0
Foster	163 0 0

HAILSHAM (SUSSEX).—For enclosing cattle market. R. K. Blessley, architect:—

Crisford	£1016
Robson	917
Thompson	875
Stonestreet	806

KENT.—For building a wheel-tireing furnace, fixing two new shop fronts, and sundry repairs to house, at Hamshaw, Kent. Mr. Henry M'Calla, architect:—

Seager	£583
Foord	416

LANCASHIRE.—For fittings, glazings, &c, St. Matthews' Church, Ardwick. Medland and Henry Taylor, architects:—

Davies and Mawdsley	£1022
W. Clarke	994
M. Toggett	988
M. J. Connor	915

LANCASHIRE — For enlargement of Withington parish schools, Lancashire. Medland and Henry Taylor, architects:—

William Clark	£785 0
Benjamin Hoyland	812 10
T. Darnbrough	738 0
J. Dawes	778 0

LONDON.—For paving Latimer-street, Stepney Green:—

W. Lansbury	£181 0
Jabez Druitt	180 0
James Rollinson (accepted)	175 10

MANCHESTER.—For erecting Union Chapel, Oxford-road, Manchester. Medland and Henry Taylor, architects. Quantities by Mr. H. Pinchbeck:—

Thomas Clay	£9850
R. Neill and Sons	9600
M. Toggett	9568
Ellis and Hinchliffe	9550

RAYLEIGH.—For reseating and improving Baptist chapel, Rayleigh:—

H. Gozzett	£570
T. Thorn	555

ROCHDALE.—For rebuilding Deeplish cottage, Rochdale, for Owen March, Esq. Medland and Henry Taylor, architects:—

James Grundy	£1165
James Lord	1124

SOUTHWARK.—For the erection of five houses in King-street, Southwark, for the trustees of the Borough Market. Henry Jarvis and Son, architects:—

	Sum allowed for old materials.	
Carter and Son	£2095	£2095
Hart	2040 £30	2060
Tarrant	2046 50	1996
Rider and Son	2034 20	2014
Henshaw	1990 90	1900
Marsland and Son	1980 30	1950
Castle, jun.	1974 30	1944
Baguley (accepted)	1960 115	1845

STOCKPORT.—For erecting St. Paul's schools, Portwood, Stockport. Medland and Henry Taylor, architects:—

Gothard	£2600
T. L. Garbutt	2591
W. Forrester	2400
L. Walford	2240
W. H. Brown	2195

TORQUAY.—For villa to be erected on Vane-hill, Torquay for A. C. Stark, Esq. Mr. R. S. Wilkinson, architect. Quantities by Mr. F. S. Smith:—

R. Shinner	£1030 18 5
G. Drake	870 0 0
W. A. Goss	858 0 0
T. Gibson	850 0 0
Call and Pethick	839 0 0
J. Harvey	809 16 0
J. P. Mountstephen	797 12 0
E. P. Bovey	740 0 0

COMPETITIONS.

ABERGAVENNY, MONMOUTHSHIRE.—July 7. Designs, plans, &c., new townhall, corn exchange offices; also for reconstruction of a general market place and erection of public slaughter houses. Premiums, £50, £20, and £10. J. T. Rutherford, clerk to company.

HERTFORD COTTAGE PRIZE COMPETITION.—September 1.—Design for model cottages for agricultural labourers. Premium £10. R. Dimsdale, Esq., M.P., 9, Queen-square, Westminster.

INDIA OFFICE.—Forty appointments in Engineer establishment of India, open to competition in July next. Application to Under Secretary of State for India, India Office, S W.

LIVERPOOL.—July 1.—Plans for the conversion of property in Redcross street, Strand-street, &c. Griffith Davies, Esq, manager and secretary, Liverpool Financial Association (Limited), 32, Castle street.

LIVERPOOL.—July 21.—For plans and specifications for erection of new hospital on the site of present Everton Hospitel for Infectious Diseases. Mr. J. J. Still, 17, Water-street.

SCARBOROUGH, YORKSHIRE.—Designs, plans, and estimates for new pier. Premiums, £50 and £30 W. E. Woodall, secretary to Commissioners, Queen street, Scarborough.

ST. MARYLEBONE.—July 7.—For particulars or information of any site suitable for public baths and washhouses. Mr. Foot, clerk to the commissioners

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ALDERSHOT.—June 24.—For the erection of a police station. Plans of Mr. T. Stopher, county surveyor, Winchester. T. H. Earle, County hall, Winchester.

ALDERSHOT.—July 11.—For painting, paper hanging, &c., at Cavalry Barracks. Royal Engineer Office, Aldershot.

BAMPTON, OXFORD.—June 27.—For restoration of transepts and lower part of the tower of the parish church. Architect, Mr E. Christian, 8A, Whitehall-place, S. W.

BELFAST.—June 23.—For a turret clock. J. Guthrie, town clerk, Townhall.

BROMFIELD (SHEFFIELD).—July 14.—For the erection of the new church of St. Mark. W. H. Crossland, architect, 21, Park square, Leeds.

CHERTSEY.—June 20.—For the erection of three pairs of semi detached cottages. T. Wonnacott, architect. Plans at C. Lingham's, Guildford street, Chertsey.

EASTBOURNE UNION.—June 25.—For building new vagrant wards, &c. Mr. Rumble, Eastbourne.

FULHAM.—June 24.—Contract for broken Guernsey and Jersey granite. W. Lovely, Broadway House, Hammersmith.

GATESHEAD.—June 26.—For the whole or portion of works in the erection of Christchurch, Gateshead. Adams and Kelly, architects, 18, Park row, Leeds.

HUDDERSFIELD.—June 20.—For the erection of estate offices, warehouses, &c. W. H. Crossland, architect, 25, Park square, Leeds.

LYDEARD ST. LAWRENCE, NEAR TAUNTON.—June 23.—For repairing and reseating the parish church. J. Shattock and J. William, churchwardens.

MAIDSTONE.—June 24.—Alterations to rooms adjoining the Crown Court, and Second, constructing an inner gateway, &c., at the County prison. F. Russell, clerk of the peace.

MOORBY, LINCOLN.—June 25.—For works to be done to the Parsonage house and outbuildings. C. Clitherow, architect, 17, Limneus street, Hull.

PORTSMOUTH.—June 26.—For supplying 350 to 400 cast-iron covers for manholes, &c, for drains. Mr. J. E. Greaterex, borough engineer, Landport hall, Arundel street.

SHERBORNE LOCAL BOARD WATERWORKS.—June 25.—1. For providing waterwheel, pumps, pipes, and other works. 2. For constructing about 700 yards of brick conduit, &c. Drawings, &c., Mr. Lawson, 3, Westminster chambers, Victoria street, and Mr. Noake, surveyor, Sherborne. J. Y. Melmoth, clerk to the board, Sherborne.

SOUTH-WESTERN AND BRIGHTON RAILWAY.—June 22.—For repairs at the stations on the joint line between Portsmouth and Cosham. F J. Macaulay, secretary, Waterloo Bridge station.

WAR DEPARTMENT.—Netley, Southampton.—For external painting, colouring, &c. W. C. Hadden, Colonel-Commanding, Royal Engineer Office, Portsmouth.

WEST HAM LOCAL BOARD OF HEALTH.—June 22.—For the supply of about 1,000 yards of broken granite C. Wilson, clerk, Rokeby house, Stratford.

STRATFORD-PLACE, OXFORD-STREET.—For alterations to No. 17. Mr. T. A. Klein, architect, 110, Cannon street, E.C.

CARMARTHEN.—June 30.—For building St. Peter's School Church. Rev. Latimer Jones, Vicarage.

For completing a gap in a wall about 10,000 yards. Johnson and Raper, solicitors, Chichester.

ANGLESEY UNION.—July 6.—For the erection of new workhouse, infirmaries, &c. Plans, &c., Mr. R. G. Thomas Menai Bridge.

BLACKHEATH.—For the erection of two semi-detached villas at the Manorway. Mr. Moreing, 11, Carlton street, Waterloo place.

STOGURSEY, NEAR BRIDGEWATER.—June 29.—For the erection of a vicarage house. Mr. J. Norton, architect, 24, Old Bond-street, W.

GRAVESEND.—June 25.—For certain alterations and additions to Christchurch schools. Messrs. Parr and Strong, architects, 25, College hill, E.C.

BROMLEY-BY-BOW.—July 10.—For the erection of a chapel in Devon's-road. Messrs. Hovenden and Heath, 181, Bishopsgate street Without.

June 30.—For the erection of a country residence. J. P. Spencer, architect, Wantage.

HURSTPIERPOINT, SUSSEX.—July 7.—For the erection of national schools. Messrs. Goulty and Gibbins, architects, 12, Union-street, Ship-street, Brighton, and 40, Torrington square, London.

HERBERT HOSPITAL, WOOLWICH.—June 26.—For repairing and keeping in order the waterclosets, &c. J. W. Sherman, Purveyor's office.

METROPOLITAN BOARD OF WORKS.—July 4.—For draining, forming paths, mounds, &c., in Finsbury Park. J. Pollard, clerk to the Board of Works, Spring Gardens.

BROOMFIELD.—July 14.—For the erection of the new church of St. Mark, Broomfield, Sheffield. W. H. Crossley, architect, 21, Park-square, Leeds.

ASTON UNION.—For erection of new workhouse at Erdington. Mr. G. Thomason, architect, Wellington chambers, Bennett's hill, Birmingham.

HEREFORD.—July 11.—For taking down and rebuilding St. Andrew's Church. Architect, Mr. J. Johnson, 35, Moorgate street, E.C.

DARLINGTON.—June 22.—For various works in the construction of new roads, drains, &c., for his grace the Duke of Cleveland. J. Ross, architect, Darlington.

NEWCASTLE-ON-TYNE.—June 22.—For the several branches of the works required in the erection of a wool warehouse, hide mart, &c. John Wardle, architect, 7, Higham-place, Newcastle-on Tyne.

MORPETH.—June 24.—For the whole or any part of the works required in taking down and rebuilding the Townhall. Messrs. Austin and Johnson's offices, New Bridge-street, Newcastle upon-Tyne.

NEWCASTLE-ON-TYNE.—June 29.—For erection of a new drill shed. Thomas Oliver, F R I.B.A., architect.

LICHFIELD.—June 23.—For the enlarging and altering Christ Church Parsonage. Mr. T. H. Rushworth, Carlton Chambers, Regent street, London.

LAMBETH.—June 26.—For supplying and laying dressed kerb and rubbed York paving. T. Roffey, vestry clerk, vestry hall, Kennington-green.

PROPERTY SALES.

JUNE 8.

AT THE MART.—By Mr. Gausden.—Leasehold 12 houses, Nos. 8 to 13, York buildings, and Nos. 13 to 15, Churchway, St. Pancras, term 41 years from 1841, at £4 17s. per annum, and underleased for the whole term at £78 12s. per annum—sold for £380.

By Messrs. Bromley, Son, and Kelday.—Freehold residence, known as Elm Cottage, Kirkdale road, Leytonstone—£200.

By Messrs. Beningfield and Chetwood.—Freehold 11a. 3r. 27p. of arable and pasture land, forming part of Mackhouse Farm, in the parish of Ware, Herts—£930.

Freehold the remaining portion of Mackhouse Farm, comprising the homestead, three cottages, buddings, and 4a. 1r. 15p. of meadow land, situate as above—£2,000.

Freehold pleasure farm, known as Millett's, situate 1¼ mile from Ware, Herts, comprising homestead, two cottages, buildings, and 22a 0r. 15p. of arable and pasture land—£470.

Freehold brickfield, known as Harris Field, Ware, Herts, containing 11a. 0r. 1p.—£160.

JUNE 9.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Freehold residence, No. 22, Fairlawn villas, Merton road, annual value £50—£750.

Freehold two houses, Nos. 4 and 5, Star and Garter yard, St. George street, E., producing £14 6s. per annum—£105.

By Messrs. Scobell and Jenkinson.—Leasehold two houses, Nos. 1 and 2, York villas, Wingmore road, Loughborough Park, producing £66 per annum, term 99 years, from 1866, at £9 per annum—£550.

Leasehold two residences, Nos. 63 and 65, Cornwall road, Westbourne Park, producing £135 per annum, term 91 years unexpired, at £26 per annum—£1,490.

By Messrs. St. Quintin and Notley.—Leasehold house and shop, No. 72, Baker street, Portman square, let on lease at £105 per annum, term 4 years unexpired, at £6 per annum—£290.

Leasehold house, stabling, and premises, No. 50, George street, Portman square, let on lease at £128 per annum, term 4 years unexpired, at £8 8s. per annum—£400.

Leasehold house and shop, with stabling and premises in the rear, No. 51, George street, producing £120 per annum, term 4 years unexpired, at £7 7s. per annum—£470.

Leasehold house, No. 16, Manchester street, Manchester square, let on lease at £96 16s. per annum, term 20 years unexpired, at £11 per annum—£1,050.

By Mr. T. R. Meakin.—Leasehold residence, No. 8, Edith villas, North end, Fulham, annual value £65, term 72¾ years from 1850, at £4 17s. per annum—£505.

By Mr. Joseph Salter.—Leasehold house, No. 119, Leighton road, Kentish Town, let at £33 per annum, term 89 years from 1851, at £5 5s. per annum—£310.

Leasehold residence, No. 121, Leighton road, let at £32 per annum, term same as above, at £5 per annum—£310.

Leasehold residence, No. 1.3, Leighton road, let at £86 per annum, term same as above, at £5 5s. per annum—£120.

Leasehold house, No. 11, Hammond street, Islip street, Kentish Town, annual value £28, term 90 years from 1859, at £5 per annum—£875.

Leasehold two residences, Nos. 27 and 29, Prince of Wales road, annual value £46 each, term 80 years unexpired at £7 7s. each per annum—£8.5.

JUNE 10.

AT THE MART.—By Messrs. D. Smith, Son, and Oakley.—Leasehold five residences, Nos. 1 to 5, Kidbrooke Park road, Kent, term 97 years unexpired, at £13 each per annum—£4,900.

By Messrs. Edwin Fox and Bousfield.—Freehold residence No. 7, Blenheim villas, Abbey road, St. John's wood, let at £50 per annum—£810.

Freehold residence with stabling, known as Guildford Lodge, Lower Grosvenor place, Margate, Kent—£1,065.

Leasehold residence, known as Bruce House, No. 37, Highbury New Park, annual value £120, term 82 years unexpired, at £15 per annum—£1,350.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. Furber and Price.—Freehold house, No. 5, Boyle street, Saville row, Westminster—£1,050.

The chattel interest in the leasehold stabling and premises known as Umcorn yard, Ossulston street, Somers Town, annual value £200, term 29¾ years unexpired, at £27 per annum—£420.

The chattel interest in the premises behind Nos. 34 and 35, Ossulston street, Somers Town, annual value £90, term 12 years unexpired, at £24 per annum—£100.

Leasehold house, No. 9, Raddington road, Westbourne Park, let at £36 per annum, term 95 years unexpired, at £7 per annum—£320.

Leasehold two houses, Nos. 3 and 4, Raddington road, let at £36 per annum each, term 95 years unexpired, at £14 per annum, subject to a mortgage of £320—£130.

Leasehold three houses, Nos. 5, 7, and 9, Raddington road, producing £38 each per annum, term similar to above, at £7 each per annum—£1,020.

Leasehold two houses, Nos. 1 and 2, Blagrove road, Raddington road, let at £36 each per annum, term similar to above, at £7 each per annum—£640.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

David Dunham, Toddington, near Dunstable, builder, July 1, at 2.—Edward Etheridge, Horsham, builder, June 24, at 1.—William Fenn, Woolwich, carpenter, June 29, at 12.—Simeon Jones, St. James's-street, house-decorator, June 27, at 11.—Robert Marrable, Forest-hill, builder, June 25, at 12.—William Price, Clarence road, Bow, timber merchant, June 24, at 2.

TO SURRENDER IN THE COUNTRY.

John Henry Docton, Padstow, builder, June 9, at 10.—Edward Evans, Geascoed, timber carrier, June 80, at 11.—William Richard Simpson, Chester, plumber, June 80, at 12.—William Booth, Hartlepool, builder, June 29, at 11.—Henry Hickman, Sedgley, Staffordshire, timber dealer, June 18, at 12.—James Lee, Balsall Heath, builder, July 3, at 10.—Sophus Frederick Mathias Lindhard, Hartlepool, timber merchant.—John Fulshaw Lupton, Leeds, painter, June 22, at 12.—George Patrick Rooney, Birkenhead, builder, June 25, at 11.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 26, 1868.

THE ARCHITECTURAL EXHIBITION, CONDUIT-STREET.

FOURTH AND CONCLUDING NOTICE.

THE domestic buildings, for which designs are here exhibited, are not exclusively confined to the Gothic style, like those for ecclesiastical purposes which we have already reviewed. The hanging committee have, however, so judiciously grouped those of the same classes together that we cannot do better than take the subjects much as arranged by them. In design for coachman's cottage (Nos. 62 and 70), recently erected for J. J. Tufnell, Esq., at Langleys, Great Waltham, Essex, Frederic Chancellor, architect, we have a really well-studied brick building, with upper part of timber construction, and tiled roofs. Such a work is quite refreshing. No. 71 is a perspective view of a proposed country house, by Thomas Harris, architect, which is such a jumble of queer detail, and so badly composed, that we trust it may proceed no further than a proposition. No. 65 (Eldon Lodge, Victoria-road, Kensington, with studio and recent additions made, for Edward Henry Corbould, Esq.), by Thomas Henry Watson, architect. Doubtless the designer was much cramped by the original building, and is not altogether answerable for the very modern Gothic style of the building, with its ugly, though ordinary, drop-handle labels to the windows; but why he should have taken the trouble to make a drawing of it, or, having done so, should have exhibited it, we are at a loss to conceive. No. 61 (house erecting at Ashford-Carbonnel, Shropshire, Henry Curzon, architect) is a plain Elizabethan building, the only special feature in which is a circular bay window, which would have been preferable had it stopped below the roof; the manner in which it is carried up as a dormer being objectionable in our opinion. No. 69 ("Design for baths and washhouses, which obtained Sir Francis Scott's prize, Royal Institute of Architects' Competition"), by Ernest C. Lee, is clever, and has many points of merit, but is of too exaggerated an Early French type, and has too great an abundance of great round holes and stumpy features, such as couplet windows of the prevalent all-head and no body style No 64 (design submitted in competition for proposed new club at York, by Goldie and Child, is altogether unworthy of its authors, and too much in harmony with the pseudo-Gothic bridge in the foreground. No. 72 is a drawing of the banking house for the General Credit and Discount Company, Lothbury, City, by G. Somers Clarke. It does not do justice to the building, which is one of mark, and for which we are thankful, as a relief from the usual vulgarity of the City buildings. As may be better seen by the photographs 391, 393, and 394 than by the drawing, it is a delicate—almost too delicate—version of Venetian Gothic. We like particularly its bold chimneys, but deplore the manner in which the upper square-headed windows run up into the cornice, and protest against the elongated granite bosses with which it is freely studded as carrying to excess a style of ornament with which we were already satiated in its milder forms. No 73 is a very simple block of model dwellings in course of erection at Fulham for the Bishop of London, with a single entrance in front leading to balconies in the rear; and No. 68 is designs for cottages, &c., in Oxfordshire, for Lord Dillon, of the same class, by John P. Seddon, architect. Mr. Murray also exhibits "improved industrial dwellings" at the Mall, Kensington (No. 86), the interior arrangements of which afford a greater boon to the class intended for its occupants than the exterior does to the gaze of the public, the building having rather the look of a warehouse, which is due mainly, we think, to the treatment of the open staircases. No. 77 (Humewood, County Wicklow, in the course of being rebuilt for W. W. Fitzwilliam Dick, Esq., M.P.), by William White, architect, is an important work which deserves attention. Study enough of a sort has been given to it, and the arrangements are sufficiently convenient. It is a "gentleman's house" contrived on true mediæval principles, in which every room seems to have been placed just as and where it was wanted, without consideration for the rest, or, at any rate, without proper fusion of the whole, and in defiance of symmetry and even composition and grouping. The external result is a thorough jumble, rendered worse by a redundance and affectation of Irish features, such as stepped gables and battlements, which are quaint enough when capping massive abbey towers, but are out of place when running up and down at their own sweet will alike over gables and dormers, bay-windows and porches, leaving no rest anywhere. There are many features, also, to which we are obliged to object, such as a heavy angular turret springing with too sudden corbelling out of an insignificant dwarf-pier, and light wooden oriel windows growing out of heavy stone corbelled tablings, capable of supporting ten times such trifling weights. No. 78 (North-west view of Dromore Castle, Co. Limerick, now being built for the Earl of Limerick), Messrs. Godwin and Crisp, architects, is more picturesque and far quieter than the last mentioned. It exhibits many of the same national features, but more temperately and on a grander scale, and it is more in keeping throughout in the general character and scale of its windows and other openings. It is, however, so mediæval that, when the Fenian frenzy has passed away, it will, we fear, be found rather unsuitable to modern requirements, and become looked upon as quite as great a curiosity as the more venerable castles of the county. Four other drawings are exhibited by the same firm, and, like all that emanates from the able pencil of Mr. Godwin, are worthy of note, but they leave us in curious uncertainty as to what architectural flag he intends to serve under. They are rather clever antiquarian studies than designs such as we should look for from one of the leading architects of the nineteenth century. No. 78* is a gateway about to be erected for the Marquis of Northampton, at Castle Ashby, and is a delicately treated and refined specimen of the "pestilent" Renaissance style, and we rubbed our eyes and looked again before we could believe its authorship, particularly as it presents some of the least excusable features of the style in its flanking scroll brackets. Then Nos. 80, 81, and 82 show us the three premiated designs by this firm for the first competition for the Bristol Assize Courts. While we heartily regret the untoward result by which the Town Council threw away the opportunity of having municipal buildings of which it might be proud at their hands, we can hardly wonder at their declining to erect such a stern-looking fortress as the first of these, which looks as if it had stepped out of Lombardy, and for which "Ten hundred and sixty-six" was a motto suitable enough; and, tempered by the colouring and associations of the intervening autumns, we should have hailed it with glee had we met it when on a sketching tour; but, as the worthy burghers are not anticipating a raid from the citizens of Gloucester, and have quite lost the costume and mincing gait of the figures that M. Viollet le Duc delights to draw, we incline rather to the second design, which savours more of a peaceful age, the outline of which is better, and the ornamental detail well concentrated. We should ourselves perhaps quarrel a little with it as being of too late a type of work, and too much after the character of the Rouen townhall, for Bristol.

Happy, however, we could ourselves have rested with either, had not we been further distracted by the *embarras des richesses* before us, for design No. 3 carries us back to the primæval days of Gothic architecture, and gives us three grand couplet windows finely grouped, but nothing else, if we except just enough of a sculptured frieze to whet one's appetite for art, and put us in a rage that it has been broken up into bits because some ancient precedents exist for such a practice in either some clumsily designed old buildings or others that have been tampered with. We had thought that the miserable result of the similarly treated paintings in the Union at Oxford would have been the first and the last realisation of such patchwork, since Mr. Woodward, fortunately for himself, was not allowed to perpetrate his intention of so decorating the Foreign Office. Then why, with relieving arches over these couplets fit to bear tons of masonry, have they no load at all? The whole design is weakened by the range of trivial little openings above them. Then why is this central feature recessed, while the comparatively uninteresting and irregular flanking masses are pushed forward to its detriment? and what is the use of the complicated group of shafts dividing the simple two-light openings of these wings, while lintels and jambs are perfectly unmoulded? And, as we are in a questioning mood, let us ask, lastly, why, with such a bill of fare before us to choose from, are the dishes all French, a fashion which we think would be more honoured in the breach than the observance in such a case?

Mr. Robert W. Edis exhibits No. 83, a new warehouse in Addle-street, City, the windows of the ground and second floors of which are semicircular headed, while those of the first and second floors have lintels, an arrangement for which we see no reason but caprice. Still the design shows an effort to treat architecturally an ordinary class of buildings, which we do not recognise in his new houses, Queensborough-terrace, Bayswater (No. 90), which we should not have suspected to have emanated from the office of an architect at all.

No. 84 (the Oriental Hotel, Cairo), by C. G. Wray, is a tolerably simple and successful work, with plenty of shadow. The treatment of the pediment and cornice, in the centre broken into as that last described, is open to the same objection. A fairly commendable work, by an English architect abroad, is No. 88 (design for quadrangle, Nice), by T. T. Smith, with some delicate external polychromy. So, also, on the whole, is No. 392 (Government House, near Poona), by Messrs. Trubshawe and T. R. Smith. No. 158 (the City Offices Company in Lombard-street), F. and H. Francis, architects, is one of those overdone buildings in which the main object seems to have been to spend as much money as possible. We really cannot find one word to say in its favour; usually one row of garnishing pots is considered sufficient, but here, besides that which mars the skyline, another surmounts the order to the first floor. Bad details are applied in profusion, like butter upon bacon, in the vain hope of producing a startling effect.

No. 210 (terrace, with proposed hotel at Saltburn), by George and Vaughan, architects, is a work of much originality, simplicity, and merit. We wish we could say as much for the pretentious design for Proprietary College, Birkenhead, David Walker, architect; or for the proposed Cheshunt College, Messrs. Landers and Bedells, architects, both of which are indifferent buildings. In No. 50 (Sanatorium, Harrow) we have passed over a picturesque and satisfactory building by Mr. C. F. Hayward. Drawing No. 400 shows the first design for the decoration of the Queen's Theatre, suggested by Mr. Albert Moore (Charles Phipps, architect), and has certainly the merit of being subsidiary to the beautiful

painting by that artist on the proscenium, much as that tattooed on the limbs of a red Indian would be to the natural expression of his countenance; but we cannot really wonder at or lay great blame on the manager who declined a style of decoration so very remote from the predilections of his probable audiences. We admit that architects and artists alike have to teach the public rather than try to please them, but they will teach better if they can contrive to please somewhat as well. We have carefully examined this drawing, and do not see that the scheme of colouring can have been materially altered, and it is delicate and refined enough, in pleasant contrast to the mustardy yellows and raw reds and blues of Prince Napoleon's glaring mansion, and for the purpose to the more sombre tones of Monsieur Lameire's church decorations. Painters and architects need greater experience in working together than they have had, and the sad result of their failure in this case to hit the right and acceptable thing is unfortunate, as the picture in the theatre is utterly ruined by its surroundings, and a great opportunity has been lost. It is not for us to lay the blame on anyone. We only point out as a principle that to ensure success they must work in harmony, as it does not quite do to be told, as we have been ourselves by an artist, that to bring out his picture a whole interior should be painted black.

WALWORTH COMMON ESTATE.

A FEW months ago the Guardians of St. Mary, Newington, Surrey, advertised for plans for laying out Walworth Common Estate. They have received in answer about twenty-three designs, which were privately exhibited last week in the Walworth Vestry Hall. It is seldom that a more important problem is presented to architects than the laying out of a large district in the neighbourhood of the metropolis; and we propose to offer a few remarks upon the way in which it is grappled with in this instance by the competitors. The estate in question is bounded on the west side by Walworth-road; on the north by Walworth Common, John-street, and Prince's-lane; and on the south and east it extends nearly to Albany-road and the Old Kent-road. It is at present occupied by the most wretched class of houses; in fact, there scarcely seems one on the whole estate worthy of preservation. In their instructions, the Guardians require two good roads to run through the estate, east and west, and most of the houses to range from £28 to £45 annual rental.

In laying out such an estate as this, the chief points seem to be—first, to provide good and convenient access between the main thoroughfares from each side, which would be furnished by the two roads demanded by the instructions; and secondly, to lay it out in the most suitable manner for the class of people who will probably tenant it. The numerous railroads round the metropolis are rapidly tending to divide the town into separate districts. The central parts become the great shop and office of the community—the great heart which receives and gives out its flow of population every morning and evening. The great majority of those who can afford it live in the suburbs. The districts between the more central parts and the suburbs proper appear most suitable for the lower ranks of the middle classes and for the poor, and those whose places of work being sometimes in one neighbourhood and sometimes in another are obliged to occupy as central a position as possible. Now this estate is just one of these districts. It is not likely to be tenanted by those who can afford to give £50 or £60 a year and upwards in annual rental, except in the case of shops along the main roads. The estate is close by the Metropolitan Extension Railway, which runs through the beautiful suburbs of Clapham and Brixton; and those whose circumstances will permit them will most certainly choose these places in preference to Walworth, especially as the season tickets to Victoria and Ludgate Hill stations are the same from each place. We may consider it pretty certain that the estate will be occupied by shopkeepers, the lower ranks of the middle class, and the poor. If houses at a rental of from £50 to £100 a year are built, they will, as in other parts of London, be taken by speculative lodging-house keepers, who will perhaps let them out to some nine or ten families in each house. Now it should be the duty of the competitors to consider these circumstances beforehand, and arrange for houses which are designed to be let in flats, so that each flat could have the conveniences of a small house. The estate should be separated into districts; the main roads should have shops (which would let at a good rental), houses designed to be let in flats for the middle classes, and small houses for clerks, &c., and the back streets should be appropriated to the poor; model lodging-houses should be provided; and the houses in these streets should be so designed that a poor man could obtain one or two or three rooms with conveniences specially designed for an occupant of his means, and not be stuffed with his family into a parlour or drawing-room, where all the cooking and so forth must be done in rooms designed for a totally different purpose. Another important point to be studied in a case like this is the greatest possible economy of space consistent with light, air, and sanitary arrangements; houses of the same class should have the same amount of air space around them.

Now let us turn to the plans. What do we see? With very few exceptions almost every point mentioned above is neglected. The estate is shown laid out in a manner suitable to the Isle of Wight or Brighton. Long rows of villas are provided, such as would be taken by those whose incomes vary from £500 to £1,000 a year. In almost all the plans there is very little difference shown in the sizes and character of the houses all over the estate. There is a prodigal waste of space; roads are turned and twisted about as if land in London was worth nothing; some houses are provided with plots of ground 150ft. long; others of the same size must be content with about 50ft.; while the style and size of the houses generally shown on the elevations are much too pretentious for such an estate.

The plans are so much alike in most of these particulars that we do not intend to make any lengthy remarks upon each. There seems to have been some misunderstanding about the amount of ground belonging to the workhouse. Some of the competitors have found room for forty or fifty houses where others have shown only workhouse property; one or two of them have entirely ignored the Guardians' instructions by carrying a road completely through the workhouse buildings; others do not preserve the right of way now enjoyed by the houses on the south side of Boundary-lane. One of the competitors has shown remarkable ingenuity in the "get-up" of his plans; his large plan folds up with hinges like a folding shutter, and he evidently has an idea that a remembrance of Abyssinia will take, as we have on his plans "Robert Napier-road," "Senafe-road," "Magdala-road," &c. There are not so many bird's-eye views as we should have expected to see in days when pretty pictures are the most likely things to win in architectural competitions; there are, however, two or three. One is particularly clever, as an artistic view, from the shadow which separates Walworth Common Estate from the surrounding property. We shall be rather curious to hear the decision in this competition. Will the bird's-eye perspectives or the coloured views of mimic Regent-streets win the day? Very few of the plans seem to be a really satisfactory solution of how to lay out to the best practical advantage such a valuable piece of ground as Walworth Common Estate.

THE SCULPTURAL ORNAMENTATION OF THE THAMES EMBANKMENT.

OUR attention has been drawn to this subject by a departure from all State precedent so remarkable as really to promise a success in that apparently to us most difficult of all arts—ornamental sculpture. It is not probable that the Thames Embankment will become the site of the new Law Courts; still it cannot be supposed that such a river frontage will be left in association with the mean intervals of dusky brick and mortar that occur between Waterloo and Blackfriars bridges; and hence the necessity of such a finish of the quay as shall not be put to shame by any buildings that may hereafter be erected in the course of the old water line. The public feeling with regard to what is called improvement is represented by the remarks of certain members of both Houses of Parliament, when they express a desire for utility and convenience rather than beauty in public buildings. In the expenditure of the seventy-six millions sterling which the reconstruction of Paris thus far has cost, embellishment alone has been contemplated; whereas in our own case utility has been the predominant consideration in all matters of Government enterprise. Exterior effect has been too lightly considered, although symmetrical and graceful ornament is not more costly than commonplace and inharmonious decoration. The Thames Embankment has been pronounced a signal opportunity for the display of a redeeming taste in open air embellishment, but our antecedents in this direction have so far schooled us in resignation as to leave little hope of amendment without an entire change of system. Perhaps in this the initiative will be taken on the Thames Embankment, where a short time since there appeared on one of the pedestals an erection intended to represent a lamp pillar. The sketch, for such it was, showed a central shaft, round which were clinging two boys, the higher of whom holds a torch, with which he is about to light the lamp above, while the lower of the two supports and lifts him on his shoulders. A model of the subject, worked out in the round, half, or one-third the size of the intended pillar, was submitted with others to the Board of Works, and was selected from those by which it was accompanied. The exertion and energy of the figures are admirably described, and they compose with the shaft in a manner so successful as to present in every view an effective system of lines and quantities. The projectors of such a study require the figures to be lighter than the fleshy cherubs of Rubens and Murillo, and to move with a grace superior to those of Correggio, because in their movement there is an immediate purpose, of the accomplishment of which we should despair if the boys were less agile. The modelling is accurate, so that the play of muscle corresponds with the action. The figures are not merely supplementary—the idea is extremely happy as applied to a pillar for supporting a light. Wherever the shaft is seen it shows a course of spirals so arranged as to assist the idea of ascent. Whatever interpretation the artist himself may give to his design, he furnishes, on a small panel below the figures, a key to his intention in a neat configuration of the caduceus and the trident. These may be received as merely complementary, and the upward striving of the boys may be read literally, as their intention is sufficiently obvious. Or, accepting the trident and the caduceus as symbolical of power and commerce, the energy and determination of the figures may typify those national attributes, to which our country is indebted for its eminence among the nations. As the composition has been maturely studied all round, we may suppose that the shafts will alternately show different fronts. The lion's head on the pedestal is, when closely examined, admirably designed, but there has been some mistake in its original adaptation

to the pedestal. The ring in the mouth suggests its having been placed there as a means of mooring barges and boats; but a crowd of carrying craft would be a most unseemly garniture to such a river terrace as we hope to see there. Thus, in order to prevent the rings being so employed, a circular groove has been cut, and they have been sunk and fixed in the granite. For the vacant pedestals nothing has as yet been determined. The large one is, of course, prepared to support a colossal aggroupment, and we scarcely know how the artist, whoever he may be, will escape allegory—that very trying class of subject which always leaves the sculptor in uncertainty as to whether his conceptions have in them more of the sublime or the ridiculous. Those grave and mystical personages that represent the cities of France in the space once known as the Place Louis XV. cost the French committee of taste some trouble, and the impersonations do not now all respond gratefully to the pains that have been taken with them. If, however, in the selection of our own public monuments the French system were adopted, we should have less reason to be ashamed of those that we should erect according to such rules than of those which we have already set up, it may be said, without any rule of judgment. In questions of public sculpture in Paris, the commissions for models are given directly to those sculptors who may have distinguished themselves in the particular line of which it is desired to have an example. If the design or model be not satisfactory to the judges it is paid for and destroyed, and another sculptor is applied to; and this method is followed until a work of the required standard be produced. It may be said that there is ample room for improvement in lamp-posts, but it would have been difficult to meet with anything more beautifully appropriate than the conception described and the manner in which it is carried out—the idea is worthy of Gean Bologna.

ZINC AS A CONSTRUCTIVE MATERIAL.—I.

MOST of our readers are probably familiar with zinc as a material for the covering of roofs, for cisterns, gutters, pipes, and a variety of other useful purposes which we shall briefly direct their attention to in this and the following articles. But many of our readers may not be aware that zinc has been used to replace its sister metal in the sheathing of ships, and, were certain difficulties once thoroughly surmounted, that which has hitherto been an expensive operation, would become, comparatively speaking, a cheap and economical one. To properly fulfil certain conditions, and to be adapted to particular types of construction, a material must be endowed with peculiar properties. It may not possess them to a maximum; it may demand the skill of the engineer and the architect, and the care and ability of the manufacturer and contractor, to improve and develope them, and from the raw material to finally turn out a useful and valuable article. But the greatest skill and the most unremitting perseverance will fail to render a substance suitable for certain duties if it does not possess *per se* some inherent qualities congenial to the task that will be imposed upon it. The natural characteristics of zinc as a metal are well known, and we shall therefore dismiss this portion of our subject by remarking that it is found associated with lead ores in the state of a sulphuret and a carbonate, the latter being the most productive ore, usually termed calamine. Pure zinc tarnishes in the air very slowly; its specific gravity is about 7.00, and under ordinary circumstances it is of a brittle consistency. With a rise of temperature it becomes malleable, and at a heat of 260 deg. Fah., it may be hammered or rolled with facility and safety. A peculiar property it possesses, and which renders it well adapted for the purposes under consideration, is that after once being subjected to the process of rolling or hammering, it retains its malleability ever afterwards.

Reversing the ordinary method of algebraical and mathematical reasoning, which proceeds from the known to the unknown, we shall commence with the application of zinc to the sheathing of ships, as that subject is less trite than the others we have alluded to. Previously to the employment of copper, wooden vessels were bottomed or sheathed with sawn planks steeped in pitch, and frequently covered with large-headed nails or spikes. This primitive description of sheathing was intended to preserve the keel and hull against the attack of worms, but, however well it might have answered this purpose, it altogether failed to prevent the adherence of barnacles and rapid growth of marine vegetation, which in a few weeks seriously impeded the speed of the ship. Copper sheathing was first introduced about the year 1760, and was applied to an English frigate "The Alarm." Since that period its use has been general with all wooden ships. From twenty-six to twenty-nine shillings per ton may be taken as a fair average sum that the coppering of a vessel will come to. The duration of copper sheathing is very limited. In the French navy the men-of-war only last about five years, and they are sheathed with what is known as red copper, while the bottoms of the ships in the mercantile fleets, which are of yellow copper and thinner than those of their warlike neighbours, scarcely last beyond three years. The temperature of the waters in which they generally sail has a marked effect upon their powers of endurance. Vessels despatched to the China Station, the coast of Africa, or for a lengthened cruise in the warm Indian seas, require to be fresh coppered after a stay there of a couple of years. Sea water is a solvent of copper, and it is by reason of the solubility of the material that it is not covered with vegetation. The whole process is both curious and instructive. Directly a morsel of a marine plant, or of any shell or mollusc, is deposited upon the sheathing, the pellicle to which it is attached becomes separated by the act of solution and is carried away by the current. The truth of this is fully corroborated by the fact that a copper bottom is rapidly covered by enormous incrustations, equally quickly as one of iron or wood, if its dissolution be prevented, as was the case when a trial was made of "Davy's preservers." That distinguished chemist had remarked that when two metals in contact with one another were plunged into salt water an electrical current was at once set up, and that the electro-negative metal was rapidly oxidised, while the electro-positive was preserved intact. He, therefore, justly argued that to prevent the dissolution of the copper sheathing all that was required was to attach to the keel of the ship pieces of any metal electro-negative with respect to copper. This was accordingly done, and cast-iron pigs, denominated "preservers," were attached to the keel. These were soon oxidised, while the copper remained sound and undissolved, and so far the success of the "preservers" was undoubted. But, unfortunately, although the copper had ceased to dissolve, it continued to foul, and in a short time became covered with barnacles and the products of marine vegetation to so serious an extent as to lead to the abandonment of the "preservers." Of two evils one is bound to choose the least, and the gradual dissolution of the sheathing was accepted in the English navy as an inevitable necessity and of less moment than the growth of incrustations, which seriously interfered with the actual progress of the vessel at sea, besides being attended with numerous other grave disadvantages. The armour-plated ships of war of the French navy present a remarkable proof of the electrical action noticed above. With very few exceptions these vessels are constructed of wood and are copper bottomed, but their armour plates descend about seven feet below water line, are in contact with the copper, and act precisely as one of "Davy's preservers." Consequently, although the sheathing is not dissolved, the bottom becomes covered with confervæ and molluscs with incredible rapidity, and the iron plates are corroded and placed *hors de service* in a space of time equally short. It is easy to perceive in this case that the iron is the electro-negative and the copper the electro-positive agent.

Both the commercial and inventive spirit of individuals were concerned in the important question relating to the great expense incurred in copper bottoming timber ships, and from time to time attempts have been made to substitute another and a cheaper metal for the purpose. Zinc was accordingly tried, but when this metal, attached to a timber keel, is exposed to the action of salt water, it forms insoluble compounds, which adhere to the surface and manifestly form a nucleus for future incrustations and the growth of plants, which quickly develope themselves. For this reason zinc applied to timber ships has proved a failure and been practically abandoned, and we have now to consider its application to the last triumph of naval architecture—in the case of iron vessels. So long as iron, whether dull or polished, is permanently immersed in pure salt water it undergoes no change, but if it be exposed to the action of a damp atmosphere it rusts or oxidises rapidly. The hulls of iron vessels, which undergo alternate submersion and emersion, accordingly as the ship is loading or unloading, and which, moreover, remain frequently for a considerable length of time in harbours and roadsteads, the waters of which are abundantly charged with organic matters, are subjected to a quick oxidisation. As a result, an insoluble compound is formed which adheres to the iron plates, and is highly conducive to the old evil, the growth of plants and incrustations. All the methods hitherto tried to prevent the formation of these impedimenta upon iron vessels have failed either partially or altogether. Many descriptions of paint, mineral coatings, and thin layers of various substances have been employed, and have been so far successful as in some instances to prevent the iron rusting, but they have all the disadvantage of giving rise to the production of insoluble deposits, which, in spite of their poisonous qualities, have no terrors for confervæ, barnacles, and molluscs. In our next we shall describe the method proposed for the application of zinc to the sheathing of ships, and then pass on to the consideration of the other uses that may be made of this valuable and economical material.

A NEW PROFESSIONAL DIRECTORY.*

WE have here the first classified list of the members of those professions and trades which are connected with the arts of construction, together with their institutions and charities, and the various public bodies and official personages with which they are brought into contact. It is true that it cannot possess the authority of the lists and directories of those professions which are under strict legal regulations, so that a reference to them will show the professional status of a particular member; but for most of the purposes for which a trade directory is required in daily business, this work does for Great Britain what each ordinary directory does for its own locality. Turning over the leaves of the handsome-looking volume, and noting the great variety of interests grouped round the two leading professions, it seems surprising that, as a mere matter of convenience, this task has not been undertaken before, and, in view of the difficulties which

* "The Architects', Engineers', and Building Trades' Directory." A business book of reference for the various industries connected with the arts of construction throughout England, Scotland, and Wales. London: Wyman and Sons. 1868.

must have attended it, the projectors may fairly claim the consideration which they ask for their experimental volume.

In the six divisions of the work we find, first, a list of the societies, institutions, and charities connected with art, archæology, and construction, with details of their constitution and objects. Then follow separate directories of architects, engineers, surveyors, sculptors, &c., with "a concise record of the salient facts" in the professional career of each individual. The third division contains a classified directory of the trades connected with building; the fourth consists of separate trades' directories for each town in England, Scotland, and Wales; the fifth furnishes particulars of the patents relating to construction granted during 1867. Of the sixth division, which is composed of the ordinary trades' advertisements, we would only remark that several which are absent from it are a great deal too conspicuous by their presence in those quiet spots which ought to exist between the other divisions of the work, which they not only disfigure but confuse. Some additional heads of information might with advantage have been added, such as lists of the county surveyors, the diocesan architects, and the members of the local architectural societies. There is besides a large section of the architectural profession to whom a few special particulars of the Diocesan Church Building Societies would have been welcome. Amongst errors in arrangement we note that the bye-laws of the Metropolitan Board of Works are given as if in force in the City of London only, while the standing orders of the City Sewers Commission are made to apply to the whole metropolis. The frequent repetition of names and addresses is a hindrance to the usefulness of the book, and adds very considerably to its bulk. For instance, in the London trades, the name and address of one firm are repeated some thirty times. It appears successively under boilermakers, bolt and rivet makers, brasslounders, brick and tile machine makers, brickmakers, and so on to the end of the list, the said firm being all the while, as far as we know, simply an agency for all of these various trades. The same evil is equally apparent in the general list of towns. Taking quite at random one of the first, Berkhampstead, we find that out of the seventeen addresses classified under eight trades, one man's name and address are repeated five times and another's twice. Surely some distinguishing mark might have been affixed to these names where they first occur, denoting that they also belonged to other trades. A large amount of space might thus have been saved. Very misleading, too, is the plan, or rather want of plan, adopted in the list of towns. Some large suburban districts, such as Limehouse, Millwall, &c., are incorporated with the London list, while others, such as Hackney, Tottenham, and Barking, are given separately. We find it, too, seriously stated that Hackney, with a given population of 76,687, possesses only two builders and *one* carpenter, this one carpenter being also one of the two builders. We know some of the streets of Hackney, and we can hardly trust this statement as correct. Woolwich is equally unfortunate with Hackney, only one carpenter residing there.

With regard to one feature of this arrangement, to which the projectors attach considerable importance, they hardly do themselves full justice. In undertaking to furnish a list of the professional achievements of living architects and engineers, they are surely not following any precedent to be found in other class directories, but rather striking out a new line of their own, and they might on that account have claimed credit for any advantages which the plan may possess. At any rate, so far as these professions are concerned, the scheme has sufficient novelty to justify a particular examination of it. A complete list of the work of each individual would have considerable value for purposes of reference, though most persons would find it rather tiresome reading. A careful selection of the principal or typical works of each would also have its uses, for it would give some idea of the kind of experience which each might possess. To make it perfect, however, it would need to be firmly and impartially written, for unless cognisance were taken of those achievements which are on the wrong side of mediocrity, the comparison would be rather in favour of those who are least deserving. As it could not reasonably be expected that either of these schemes would be carried into practice, it was proposed to let each person tell his own story in his own way, and a series of such accounts would undeniably be the most lively reading of all, but the necessity which existed for conciseness has evidently interfered with the simplicity of the scheme. A set phraseology has been applied to the whole of the accounts, which, however necessary in many cases, frequently conveys impressions that could not have been intended by the autobiographers. Thus, in numerous instances, where a list of works is appended to a name, it will include not only those which he designed and superintended, but such as may have fallen into his hands to complete or alter, or perhaps to carry out. Scarisbrick Hall, which was recently illustrated in this journal as a work of the late Mr. Pugin, is here said to be comprised in the works of his son. In like manner the engineer to the Metropolitan Board of Works is said to have *planned* the main drainage of London, *introduced* subways for carrying gas, water, and other pipes, and *designed* the new street from Blackfriars Bridge to the Mansion House; the first of these works having really been planned by his predecessor, the late Mr. Frank Foster, who afterwards reported upon it in conjunction with the engineer to the City Sewers commission. The competition for designs for subways, and the share of Mr. Marrable in the design of that executed in the new street to Covent Garden, should not have been quite overlooked; and, inasmuch as the late Mr. Bunning not only designed but commenced the construction of the new street through the city, the fact of the completion of the scheme having been transferred from the Corporation to the Metropolitan Board does not transfer the design likewise. Mr. Butterfield is said to have introduced the use of coloured stone and marble into the Gothic style, as if such use had not previously been heard of. In all these cases a few words would have sufficed to express the true relation of the artist to the work; and the needful explanation should have been given at whatever cost of space, for inaccurate information is worse than useless—it misleads.

We appear to be at the beginning of what may grow into a new system, for there is a magical charm in *couleur de rose*; and when such an opportunity of taking an annual portrait of themselves is offered to some minds, the temptation to dip too deeply in that tint will be irresistible. Even now, in early days, it blushes into view in a hundred quiet spots. A manages to insinuate that the works named in his account are a mere trifle to the numerous other important ones which have fallen to him; B "has had large experience" in churches, schools, or villas; C is frequently consulted, or is appointed umpire, by this or that important public department; D, whom blind fate had destined for a builder, slipped past her, "competed with four architects and was successful" (David, the keeper of sheep, only slew *one* Philistine); E, who appears to be chiefly a builder, candidly places his works done in that capacity in the architectural division of the work. There is a good deal of this kind of thing, which would have been more in place in the sixth division, which has for its motto "Advertising is to business what steam power is to commerce."

So far as this feature of the work affords to professional men means of knowing more of each other, it is of small utility; and so far as it might be used by clients with the view of forming a judgment of the professional status of a particular man, it is a false guide. Small men of pushing tendencies obtain lengthy notices, while the leading names in several departments of practice are dismissed in a single line. The professed object of this feature in the work, which is to raise the status of the profession, can hardly be obtained, but the status of individuals may be affected, and it will open a fine field for the practice of an art which has been somewhat neglected by professional men. The proprietors will do well to consider whether all desirable objects will not be fulfilled by giving only the name and address of architects and engineers, the degrees, honours, and appointments of a public nature which confer responsibility, or are of use as matters of information, together with the titles of any literary work by which they may have endeavoured to render their experience useful to their fellows. The space so gained may well be filled with useful facts, and continued care in the collection of information of this kind will no doubt ensure the success of their undertaking.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE closing meeting of the session of this Institute took place on Monday evening last, Mr. James Clarke, vice-president, in the chair, at which a paper on "The Terra-cotta Work adopted in the New Alleyne College, Dulwich," by Mr. Charles Barry, was read.

The author of the paper commenced by remarking that he need make no apology for introducing the use of terra cotta for strictly architectural purposes to the consideration of the meeting. Interest has been taken in its revival and use in many directions of late years, and the fact that in this practically imperishable material we have preserved to us more completely than in any other the thoughts and works of artists from almost fabulous antiquity, through each successive age of the world and in every country at any time civilised, down to our present time, serves to show the immense field there is for intelligent inquiries into the use and advantages of the artistic employment of such a historic material. All nations whose early history is known, Egyptians, Greeks, Romans, Gauls, have left us records of their thoughts in terra cotta, as well as in other materials which are usually deemed of a more noble character, thus showing that its importance has never been entirely lost sight of; and coming down to more recent times we have its use and facility of application exemplified in the numerous buildings of Italy, particularly North Italy, with a beauty and artistic fancy which must, he thought, satisfy the most fastidious artistic taste.

Having traced the history of the employment of burnt clay for articles of domestic use from the most remote ages of the world down to its adoption for architectural work in Italy in the twelfth century, Mr. Barry went on to speak of the development of this material under various manufacturers in this and other countries, and then proceeded to treat the subject in a practical form under the following heads:—

1. The materials used and the mode of manufacture.
2. The advantages attendant on its use in lieu of stone.
3. The difficulties which attend its use in an ordinary architectural work.
4. Its cost compared with stones in ordinary use.
5. Its resistance to transverse and crushing strains.
6. Its durability and miscellaneous special qualities.

The materials used are the clays of Cornwall, Dorset, and Northamptonshire, Lynne sand, ground glass, China stone, felspar, and flint; also broken terra cotta, or burnt ware pulverised. For very light porous articles fossil bone is used with terra cotta. The variation of colour in white, buff, and red terra cottas is due to the clays. Other colours, such as black, grey, green, blue, &c, are obtained by the admixture of mineral colours with clays and other substances forming the body of the ware. Having described the manipulations of the ingredients, the author re-

marked that clay thus prepared can be used by a sculptor for modelling a statue, or by a mason for running a moulding with a template. When the same form of design has to be repeated more than once or twice, it is desirable, for economy, to make a model, and from that a plaster mould, and impress the clay into the mould, the size of the object determining the thickness of the clay. For architectural works, the smaller the pieces, or the nearer they approach to the size of a large brick, the more economical will be the work. At the same time, there is no practical objection to using terra cotta in large pieces. These are then made hollow, for the purpose of ensuring equal hardness and contraction throughout, and it used, as at Dulwich, bonded into the walls as stone would be, they are filled at the work with fragments of terra cotta in Roman cement, although he was not at all sure it was essential, as the transverse strength, even of the hollow blocks forming projections of cornices, strings, and the like, is very great, and he believed sufficient.

On the advantages of terra cotta to architects Mr. Barry remarked that foremost among these is the facility it affords to architects to see, actually full size, any of the more ornamental portions of their designs, inasmuch as the material actually built in is the same as that modelled, and he submitted that a far better reflex of the personality of the architect will thus be found in a building than can ordinarily be the case. Again, except where there is much repetition, no moulds are used, so that bassi-relievi, enriched panels, friezes, sculpture of animals, foliage, or figures, made in terra cotta, and used in a building, cannot be copied. They are and must remain the sole originals, and thus have a greater value to the artist or architectural student than when it is possible to find the same composition in different buildings, in perhaps totally different positions and circumstances from those in respect to which it was originally designed. The other points of advantage claimed for this treatment were the opportunity it gives for brilliant effects of light and shade by the facility of what in masonry would be undercutting, but in terra cotta is the appearance of separately modelled pieces of the material superimposed over the recessed parts while all are in a plastic state. Then there is the opportunity of heightening the effect of a design by the use of terra cotta blocks of delicately varied harmonious tints. The next point is its indestructibility and freedom from decay by the action of weather and the acid gases contained in the atmosphere of the metropolis and other large towns. Next there is the practical question of weight, and consequently of cost of transport. In the case of stone brought in masses to the building and then worked up, the necessary quantity of waste makes up an alarming amount of useless weight, which has to be transported in order to produce a given result. With terra cotta, on the contrary, where the work is necessarily modelled in the workshop and studio of the manufacturer, and moreover is for thoroughness of burning made of moderate thickness and hollow, the weight to be conveyed is reduced to a minimum. The weight of terra cotta, as compared with some building stones, was given as follows :—

Portland...	158lb.	per ft. cubic
Hapton Wood	158lb.	,,
Bolsover...	140lb.	,,
Kelton	128lb.	,,
Terra cotta (solid)...	122 b.	,,
Terra cotta (hollow 2in. thick	68lb.	,,

Of the difficulties in the use of terra cotta one of the most embarrassing is the arrangement necessary to have the blocks made and ready on the ground almost before the rest of the work is begun, in order to work in when wanted as the bricklayers progress. There is also some considerable extra labour in the office put on the architect by the use of terra cotta, arising from the necessity of making all full-size detail drawings one-twelfth larger than the wall is to finish, in order to allow for its contraction, which is in that proportion. Another disadvantage is the risk in making and burning, the annoying result being sometimes that all the pieces of a large window or door are perfect except a few, when the work must stop till new blocks in lieu of the defective ones are made, or a temporary block must be put in and replaced with the proper one when ready. Next there is the maker's difficulty of burning blocks which are to constitute jambs, strings, and continuous features so as to be perfectly true and correct in the mouldings, but a marked improvement has taken place in this respect in the work sent up by Mr. Blashfield to Dulwich now as compared with that at first sent. In the rubbing down of surfaces with sharp sand and water there is no risk with properly manufactured terra cotta of getting a less lasting weather surface. The risks referred to are much reduced if the size of the blocks is not too great.

On the subject of the cost of terra-cotta work the author observed that he would mention some actual facts by way of examples, which as far as they went were highly satisfactory, yet in his opinion the cost of terra cotta would be largely reduced if it became a material more extensively employed in this country than it hitherto has been. In that case no doubt in all the items of manufacture more economical arrangements might be made than those now found in terra cotta manufactories. At the same time, with all the existing drawbacks, the economy of terra cotta as compared with stone is great. Speaking in general terms it may be said that, taking cube for cube as fixed in a building, terra cotta costs a little less than the soft stones, as Bath, Caen, &c., while as regards Portland the average differences would be about 35 to 40 per cent. The greatest economy is to be found when there is much work either in under cutting of mouldings, which costs nothing extra in terra cotta over ordinary mouldings, and in artistic modelled work. To give the meeting some useful facts he would mention that the ground floor windows at Dulwich (as shown in a drawing exhibited) have been made and fixed complete for £19 each ; their cost in Bath stone would have been £20, and in Portland £28. The principal floor windows, which are of rather elaborate design, have been fixed complete for £41 each ; they would cost in Bath stone £57 ; and in Portland £86. This cost includes the modelling the busts in high relief. These windows do not come with all their work to more than 5s. 6d. per cube foot. The second floor windows have been fixed complete for £10 each ; they would have cost in Bath stone £19 ; and in Portland, £28 10s. each. The cost per foot run of the cornice, which is 15in. projection and 4ft. high exclusive of the stone corona, fixed complete, is £1 13s. a foot run ; in Bath stone it could not be done for less than £4; and in Portland, £6 per foot run.

Attention having been directed to the specimens of terra cotta exhibited in the room, consisting of hollow blocks, &c., of an average thickness of 2in. of material, the author went on to state that if the blocks are made hollow and filled in with broken terra cotta or brick in Roman cement, the cost may be stated as 3s. 1d. a cube foot. The relative cost taken in the same way would be about 5s. 6d. for Bath stone, and 9s. for Portland.

The next point treated of was the strength of good terra cotta as compared with that of the stones in ordinary use. A table of experiments upon terra cotta manufactured by Mr. Blashfield, of Stamford, and carried out at the testing works of Mr. Kirkaldy, at Southwark, was exhibited, which showed the results of 46 experiments made with different shaped pieces of terra cotta, some of them solid, some hollow, but left empty, and some with the hollow blocks filled in, as was done at Dulwich, with brick and Roman cement. The result of these experiments showed that the filling in doubles the strength of the hollow blocks, as the one showed signs of cracking with a strain of 42 tons to the square foot, and the other required 86 tons to produce the effect. In these experiments the ware was only 1¼in. thick, while the thickness of that used at Dulwich was always 2in. A solid 12in. cube of terra cotta did not show a crack till a strain of 442 tons was put upon it, and to crush a hexagon stable floor brick 4in. diameter and 2¼in. thick, required no less than 855 tons. The red terra cotta he had used for the shafts to jambs and mullions of the principal floor windows were proved to be capable of bearing a pressure of 246 tons on the square foot. It was remarked that the clays which are technically termed "fire clays," and resist the largest amount of heat, are the weakest against a crushing or transverse strain, and those which flux or run at a less heat are the strongest.

In his general remarks on other qualities of terra cotta the author remarked that the absorption of terra cotta, as compared with Bath stone, is considerably less. In experiments to test the wearing capabilities of terra cotta tiles for foot traffic on Westminster Bridge, the friction of sharp sand and water was applied to a terra cotta tile 12in. square, and a similar piece of York stone, for five hours, at the end of which it was found that the terra cotta tile had lost 1-16in. in thickness, while the York stone had lost ⅛in. It was, the author remarked, necessary to caution his hearers that all that had been said was, of course, only applicable to terra cotta, in the proper sense of the word, composed of such materials as he had enumerated, very carefully mixed and blended and carefully burnt. Some materials were offered in the market as terra cotta, which are nothing but clay and common sand. Such compositions will not bear, without great distortion, the necessary firing heat, and are consequently soft on the surface, with little transverse strength, and not durable. He mentioned that there had been recently discovered at Watcombe, in Devonshire, some very excellent terra cotta clay nearly pure from all foreign matter. The ware made from this, without any mixture of other substances, is said more nearly to resemble the best Italian terra cotta than any other. This clay existed in an enormous mass not far from the surface. Mr. Barry proceeded to enumerate the more recent instances of the use of terra cotta in buildings in the metropolis, &c., as also a list of the best moulded brick remains in England dating from 1260 to 1507.

In conclusion, he remarked that there need be no jealousy or fear on the part of masons that if terra cotta be largely substituted for stone, their trade will be injured. It is but a new material for them, with the peculiarity that their work with it lies in the manufactory when the clay is in a rather hard dry state. Then they can work mouldings, mitres, &c., in it with ease and perfect truth. Then stone carvers may add their works of taste and fancy in a material soft and plastic enough to give them free scope, but to become as their hands leave it, by being then burnt, an imperishable work. In the building also terra cotta should always be fixed by a mason, and not an ordinary bricklayer.

At the conclusion of the paper a vote of thanks was passed to Mr. Barry, and the discussion upon it was postponed till the next session.

A short paper, descriptive of the plans of hospitals at Paris, Munich, and St. Petersburg, was read by Doctor Oppert, which brought the proceedings of the session to a close.

PARLIAMENTARY NOTES.

On Friday night in the House of Lords the Marquis of Salisbury asked if it were true that the Government had rejected the design which was recommended by the professional judges, and the judges of design, as the best for place and internal arrangement, and had adopted the design which was recommended by elevation only ; and further, if the competitors were instructed that utility and convenient arrangement were to be preferred to architectural effect. He had understood that the Government had instructed the competitors that convenience for the transaction of public business would have the preference, and when Mr. Barry's plan was selected by the judges for its utility the Government had set it aside, and adopted Mr. Street's plan, which was recommended only for its elevation? He strongly deprecated such a practice on the part of the Government. The Lord Chancellor said the Government had neither selected nor rejected any design. The matter was left in the hands of the five judges of design, and they said that all the designs were so good that they were unable to say which was the best, but they considered Mr. Barry's the best for internal arrangement and Mr. Street's for elevation. The award was sent back to them for reconsideration, but they returned it, saying they could make no other. By the terms of the competition any dispute that arose was to be referred to the Attorney-General, and that was accordingly done. He decided that the award was invalid, and there was an end of the competition. It happened that about that time there was a competition for the National Gallery, and the same thing occurred there—the judges could not say which was the best, but they did say that Mr. Barry's plan had the greatest architectural merit. Upon that the Government gave Mr. Barry the superintendence of the National Gallery, and Mr. Street that of the Law Courts. After a short discussion the subject dropped.

On Friday last the Towns' Drainage and Sewage Utilisation Bill was read a second time in the House of Lords.

About fifteen varieties of marble are quarried in Italy ; the annual value of that exported from Carrara amounts to upwards of a million francs.

THE NEW LAW COURTS.

MR. E. M. BARRY is not satisfied with the decision of the judges in this matter. He accordingly writes to the public newspapers, inserts large advertisements, and petitions the House of Commons. In this petition he states that the contract between the Government and the competitors prescribed that utility and convenient internal arrangement were to be the chief points to be considered, and were to be treated as superseding all considerations of architectural effect, so that the winner in the competition should be the architect who had produced the best plan; that the judges, whose award was to be final, had declared that his plan was the best, and that two of them—Messrs. Shaw and Pownall—had recorded their opinion in a detailed report, awarding forty-one points of excellence to Mr. Barry and only three to Mr. Street. Mr. Barry concludes his petition by a prayer asking for a select committee to inquire into the case, so as to ensure a decision consistent with "the interests of the public service." Mr. Lowe, who presented the petition, gave notice of his intention to move for a select committee on the subject of the petition of Mr. Barry. If this committee be appointed we hope that its duties will not merely be confined to an inquiry into the relative merits of the respective plans of Messrs. Street and Barry, or the relative merits of those gentlemen as architects, but that "the interests of the public service," as Mr. Barry puts it in his petition, will receive due consideration. A survey of the history of this competition will show that many and manifest mistakes have been committed. In fact, it would be next to impossible for ordinary mortals to conduct so important an undertaking without making mistakes. Mr. Barry, whether he is aware of it or not, is going the right way not only to disturb the decision of the Treasury, but to overturn the whole platform which has been erected, and there are many who wish him to succeed, not that he may become the architect of the new Law Courts, but that a clean sweep should be made of the whole matter preparatory to proceedings being commenced anew. Mr. Barry's policy leads to this point or nothing. He must see that he cannot successfully oppose the decision of the Government without giving the Government an opportunity for saying that the whole matter must be reconsidered. And if it is to be reconsidered in the case of the Law Courts, the decision on the new National Gallery will meet with a similar fate. What will Mr. Barry have got by his petition then?

HOUSE AT SEVENOAKS, KENT.

THIS house, of which we give perspective and plans, has been erected, under the superintendence of Mr. John Johnson, architect, Moorgate-street, City, by Mr. D. Grover, builder, on a plot of ground belonging to him in St. John's-road, near Sevenoaks. It is built to suit the requirements of a gentleman who receives a limited number of pupils to prepare for college. The plan was originally arranged to form two houses, but as the cost was considered too great, the staircase, &c. was omitted and the pupils' rooms placed close to party wall. It was also required that the pupils' portion of the house should be separated, yet conveniently accessible without interfering in any way with the private portion Everything has been considered in making the left hand side of the party wall thoroughly complete as to domestic arrangements, so that by adding staircase, &c. at any future period on the left hand side another house could be formed. These considerations have been kept in view in case at the expiration of the present lease there would be a difficulty in letting so large a residence.

The materials used in the exterior are light yellow bricks, with Bath stone dressings, and red bricks in bands and arches; as the builder had a quantity of rag stone on hand the basement walls were built of that material, with quoins of Bath stone. Between the plinth and ground-floor window sills a broad band of red bricks was inserted to relieve the cold effect of the rag walling. All the external walls are built hollow to prevent dampness. The roof of tower is covered with lead. Balconies are provided at the upper part of tower, as some little escape in case of fire, provision being made for fixing ropes, &c., &c. The bay windows and conservatory are of wood painted a dark brown. The bay and several other wiudows have balconies to receive flowers. The entrance hall and staircase ceilings are of boarding, fixed diagonally, and divided into bays with moulded ribs with turned and carved pendants. The soffit of stairs is of V-jointed boarding, the joists of galleries show, and are moulded and chamfered, stained and varnished. The floor of staircase, also the stairs, are stained and varnished. The entrance hall and conservatory are paved with red and buff tiles, with red and black borders The walls of entrance hall and staircase are distempered, with the exception of about 4ft. from the floor, which is painted a maroon colour, a small amount of decoration being placed at the junction with the distempering. The soffit enrichments to the coruices of principal rooms were designed and modelled by the architect, so that they should be in character with the rest of the work. The supply and service pipes pass through the waterclosets to the main cistern, and adjoin the hot-water pipes from kitchen boiler to bath, so as to avoid the possibility of freezing in winter. The accommodation in the basement consists of kitchen, scullery, servants' sitting-room, large cook-house and store closets, larder, pantry, wine, beer, coal, and wood cellars, boot cleaning room, box-room, boys' play-room, with water-closets, &c., adjoining.

REFERENCES TO PLANS.

GROUND FLOOR.

A. Drawing Room. ..... 25ft. by 16ft.
B. Conservatory. ..... 21ft. by 8ft.
C. Dining Room. ..... 19ft. by 16ft.
D. Entrance Hall. ..... 16ft. by 6ft.
E. Principal Staircase. ..... 17ft by 13ft.
F. Study. ..... 14ft. by 13ft.
G. Pupils' School Room. ..... 19ft. by 16ft.
H. Pupils' Dining Room. ..... 19ft. by 16ft.
I. Pupils' Garden Entrance.....
J. Lavatory. .....
K. Back Stairs .....
L. Tradesmen's Entrance.....

FIRST FLOOR.

A. Best Bed Room. ..... 18ft. by 16ft.
B. Dressing Room. ..... 12ft. by 7ft.
C. Bed Room. ..... 19ft. by 16ft.
D. Linen Closet.
E. Principal Staircase.
F. Spare Bed Room.
G. H. and I. Pupils' Bed Rooms.
J. Bath Room.
K. Back Stairs.

DETAILS.

1. Corbel to Balcony, first floor windows.
2. do. do ground floor do.
3. Mullion, Window Head and Cornice, first floor.
4. Window Head and Cornice, second floor
5. Door and Architraves, and Decoration to Walls of Staircase.
6. Newel Posts and Balusters to Principal Stairs

TENDERS FOR THE WHITEFRIARS THAMES EMBANKMENT.

OUR readers are aware that tenders have been invited for this work on three separate occasions. The highest of the tenders is £314,700, the lowest £126,500—a difference of £218,200.

TENDERS FOR No. 3 CONTRACT OF NORTHERN THAMES EMBANKMENT.

	ARCHED. Original specification. Tenders opened on Oct. 5, 1866	ARCHED. Modified specification. Tenders opened on April 17, 1868.	SOLID. Tenders opened June 19, 1868.
Hiscock & Williams	£344,700	—	—
Joseph Thackery	320,000	—	—
Brassey & Co.	305,000	£193,000	£137,900
Hill & Keddell	302,000	232,000	179,000
William Webster	268,000	195,000	126,500
T. Pearson	265,000	225,000	144,000
A W. Ritson	239,000	224,450	—
Jennings	—	225,000	146,649
George Furness	—	236,000	—
Thomas Docwra & Son	—	217,000	142,000
Kelk, Waring Bros., & Lucas	—	187,183	127,000
Eckersley & Bayliss	—	169,800	159,000
Thomas E. Ridley	—	—	173 500

At the meeting of the Metropolitan Board, on Friday, June 19, the tender of Mr. William Webster, £126,500, was accepted.

The Archæological Institute will hold its annual meeting at Lancaster on July 28 next. There will be excursions to Furness, Cartnell, Levens Hall, Sisergh Hall, Skipton Castle, and Bolton Abbey. A temporary museum will be formed in the Mechanics' Institute.

PROPOSED COURTS OF JUSTICE—TEMPLE BAR.

MR. STREET having been selected as architect for the new Courts of Justice, our readers will not object to see an illustration of his design for Temple Bar, as submitted in the competition last year, and which evoked a considerable amount of criticism at the time. No doubt the propriety of re-erecting Temple Bar in any form will, like many other matters in connection with the said Courts, undergo reconsideration before the time for its erection; and, though it forms a portion of Mr. Street's design on paper, we doubt whether it will form a portion of the completed edifice.

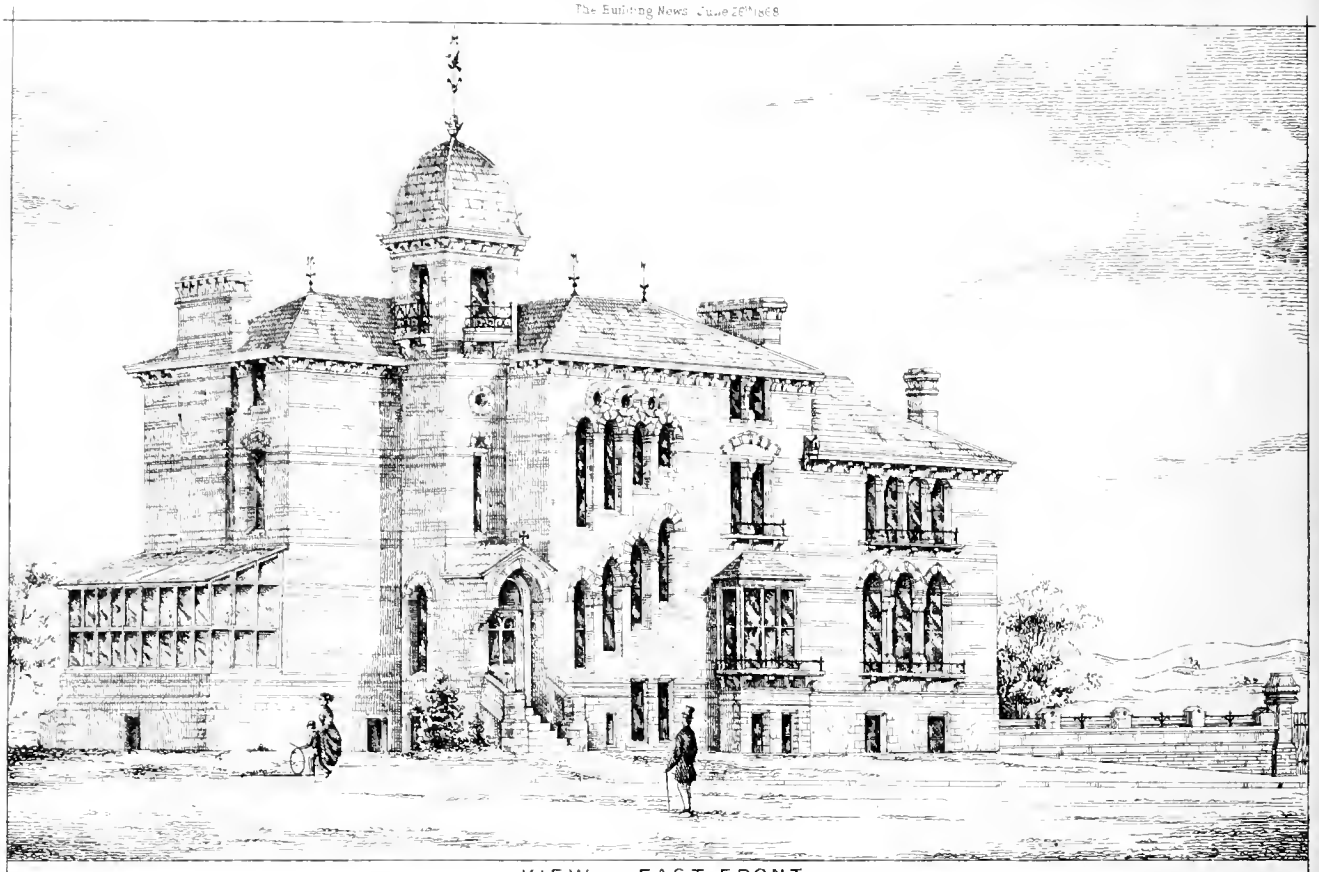
SCHOOL OF ART.

THE seventh annual report of the Boston Are School has just been published, from which it appears that the number of pupils who attended the different classes during the past year was 86, 68 in the first session, and 63 in the second. The amount of fees paid by them was £101 4s. The total income from all sources for the year was £166 15s. 10d., and the expenditure was £162 1s. 3d., leaving a balance in hand of £4 14s. 7d. The committee "have again to express their regret that the advantages of such an institution as a school of art have not been as yet appreciated by the working men and artisans of this town to any satisfactory extent. At a time when so much is being said and written on the subject of 'Technical Education' for artisans, and the acknowledged deficiency of our country in this respect, when compared with the continent, the reluctance on the part of the working men to embrace all available opportunities of supplying the want is the more to be regretted. On the other hand it is a great satisfaction to the committee to know that, independently of the school, but under the direction of the art master, a large portion of the boys of the town in the various schools are receiving the groundwork of a most valuable technical education in art, and with no small success; and they hope, when the required subjects have been passed by them in the parochial schools, that the more promising of the pupils will be drafted into the art school in order to complete their education." During the past year a night class has been opened at Louth by the art master (Mr. V. Howard), and has been recognized by the Science and Art Department as a branch of the Boston school.

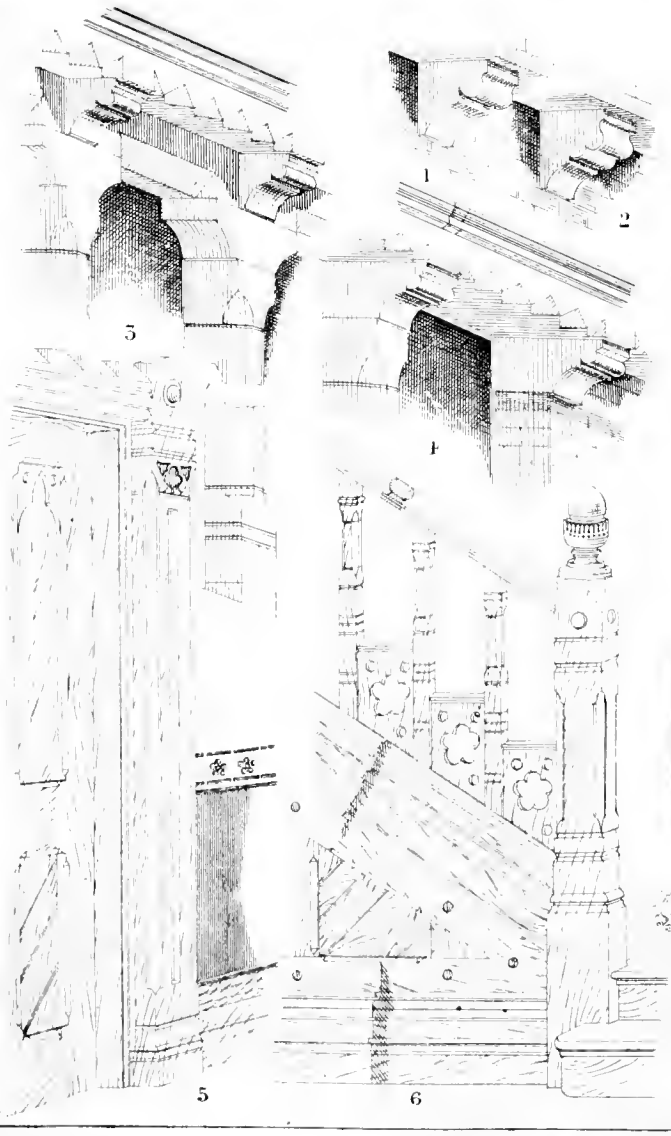
COMPETITIONS.

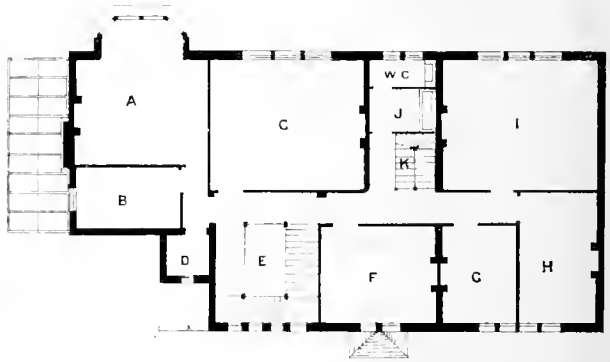
THE plans of Mr. Edward Holmes, of Birmingham, for the erection of cow lairs, pig dormitories, and other improvements to Smithfield Market, Birmingham, which were submitted in limited competition, having been selected by the Markets and Fairs Committee of the corporation of that borough, were approved by the Town Council at their last meeting. The same committee have also selected a design by the same architect for a new fish market, to be erected on a site opposite to the market hall in Bell-street; the report on those plans has been referred back to the committee with a view to consider and report upon the adaptability of a site which is considered more suitable on account of its approximity to the Central Railway station.

The plans submitted by Messrs. Francis under the motto of "In Domino Confido" in the late competition for a new church at Slough, have been selected by the committee, subject to the architects being able to satisfy them that it can be executed for the stipulated sum of £10,000. We understand that the funds at present in hand do not warrant the immediate commencement of the church, so that ample time will be afforded during which the required test may be applied to Messrs. Francis' design. It will be remembered that in our notice of this competition we placed the design with the motto "Triangles intersecting" first. One of the conditions of the competition was that "the committee purpose calling in a professional man to aid them in coming to a just decision." Mr. Christian, of London, was accordingly called in for the purpose, and we are informed on good authority that he selected the same design as we did for the first premium. The committee, however, disregarded the advice of their own referee, and selected the design submitted by Messrs. Francis.

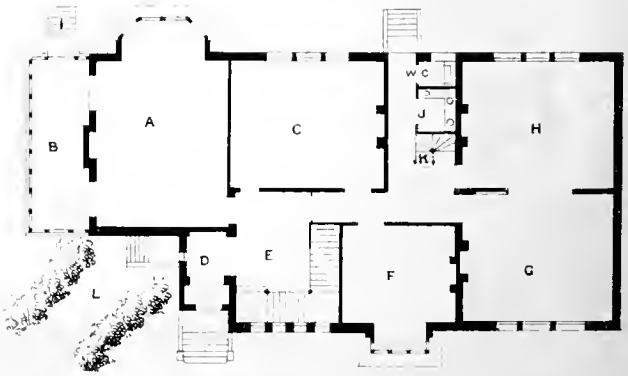


VIEW OF EAST FRONT





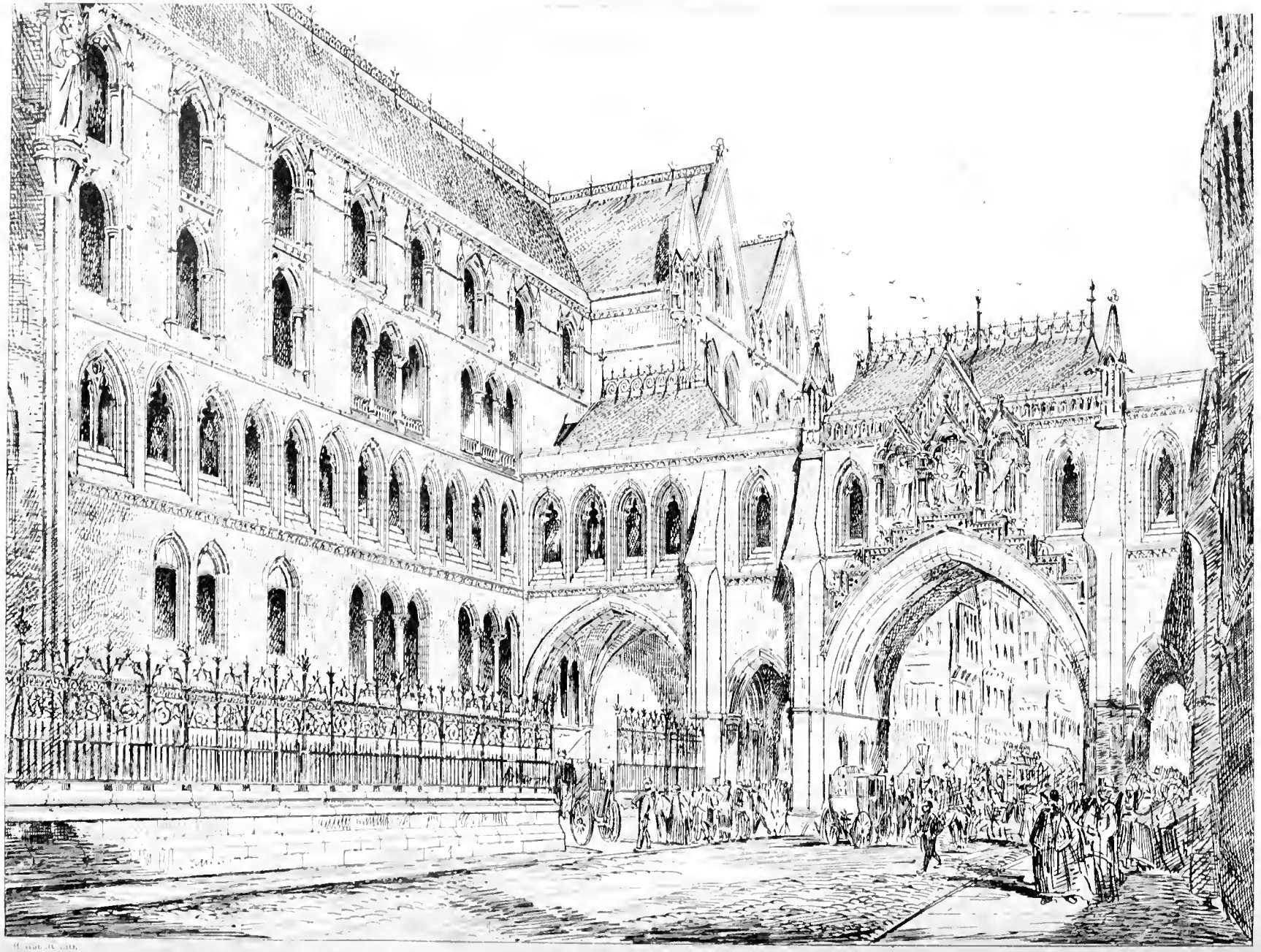
1ST FLOOR PLAN



GROUND FLOOR PLAN

HOUSE AT SEVENOAKS KENT. J. JOHNSON ARCHT.

Printed by Whiteman & Bass



Proposed Courts of Justice, Temple Bar: West Side. G.E.STREET. ARCHT.

LINCOLN DIOCESAN ARCHITECTURAL SOCIETY.

THIS society, which has now existed a quarter of a century, held its annual gathering at Lincoln last week. On Wednesday morning, immediately after Divine service, the Rev. Precentor Venables, accompanied by the members and friends, gave a lecture on some of the more interesting monuments in the cathedral, including those of Remegius, first Bishop of Lincoln, Katherine Swinford, Sir Robert Burghersh, Sir Nicholas de Cantilupe, Prior Wymtysshe of Noeton, Bishop Fleming, Bishop Russell, Bishop Longland, Little St. Hugh, &c.

The company then adjourned to the County Assembly Rooms, where E Sharpe, Esq., delivered a preliminary lecture on the "Architectural Features of the Cathedral."

At the evening meeting held in the County Assembly Rooms (the Bishop of Lincoln in the chair), a paper was read by Mr. Gambier Parry on "The Polychromy of Lincoln Cathedral," and another by the Ven. Archdeacon Trollope, F.S.A., on "The Ermine-street, or Great Roman Road of Lincolnshire." We are prevented from want of space from giving the last-named paper in its entirety, and can only show the value of it by a few extracts:—

"This great work, constituting one of the four principal Roman roads of Britain, may fairly vie with any of the other three, both as to length and grandeur of design. Its Roman name is lost, but by the Saxons it was termed Earminga-street, or Eormen-street, the terminal of which, derived from the Roman stratum, is still represented by the modern word street, or road. Perhaps the term Earminga or Eormen was derived from the name of some British tribe, as Wætlinga-street was from Wætla, or from Eormen, a Saxon deity, or the same word applied to anything vast or noble. That portion of it running from Castor near Peterborough, to the Humber, which I can now alone describe, is called by various names in, certain localities, such as the Forty-foot or Norman-gate, the High-dyke, the Old-street, and the Ramper, but the whole constituted one continuous road, still usually designated the Ermine-street. The Romans were certainly not the first road makers in Britain, whence it is quite possible that part of the great military roads they constructed followed the lines of more ancient ones; but these Roman works so far surpassed all that had before existed as to constitute a new era in British road making, which must have been regarded with wonder by the natives of this island, although they perhaps looked angrily upon them as serving to confirm their subjugation.

"The structure of the Ermine-street was not so elaborate as that enjoined by Roman authorities on this art, for from a section of it discovered in the parish of Winterton, as carefully recorded by Mr. Padley, to whom I am indebted for the information, the earth has been excavated to a depth of 17 inches, and then two layers of rough stones on edge slanting in an opposite direction were laid to constitute the foundation of the road, which had no central rise, nor was there any trace found of the summum dorsum, or surface paving. The width of this paved portion of the road was between 12ft. and 13ft., and the ordinary height of its embankment 3ft.; but some portions of it are considerably higher. Of the date of this ancient work we have no record.

"The Ermine-street, in its entirety, may be reckoned to commence at Pevensey 'Auderida,' whence it ran to Chichester 'Regnum,' and London; passing along Bishopsgate-street, it proceeded by Enfield, Cheshunt, Ware, Broughing—'Ad Fines,' Royston, where the Ikenild-street crosses it—Caxton, Godmanchester 'Durolipons,' Huntingdon, Stukely, Sawtry, Stilton, to a point between Chesterton and Atwalton, or the site of the great station of Durobrivæ, close to the village of Castor, in the county of Northampton. This at least in part existed before the Ermine-street was constructed, as demonstrated by the remains of a Roman potter's kiln found by Artis beneath the bank. When made, the road was carried through the centre of an entrenched camp of an irregular oblong form, now called 'the Castles,' or else the camp was subsequently formed to take advantage of the road.

"The road, after leaving the above-named camp, and crossing the River Nene, divides that which may be termed an eastern branch of it, coming nearly due north to West Deeping, Bourn, Sleaford, and Lincoln, which I cannot now advert to; while the main road continued to run for some way in a north-westerly direction, to which I must confine my description. Passing Sutton Wood on the east, this road bisects the hamlet of Southoree, where coins of Antoninus Pius, Marcus Aurelius, Claudius Gothicus, Magnetius, and Constantine the Great have been found, together with Roman pottery, &c., chiefly in the pits on the eastern side of the road. Next it may be traced in the parish of Barnack as a wide tank, thus described in 'Gough's edition of Camden, v. 2, p. 270.' Here it rears a high hedge, particularly in the little wood of Barnack, where it has a watch tower upon it. This so-called watch tower, however, no longer exists, but a Roman fibula and some urns were found close to the Ermine-street, at Barnack, in 1731; since which many Roman coins have also been picked up here, and more recently the torso of a small male figure cut in Bernick stone was dug up, now in the possession of the incumbent, the Rev. Canon Argles. Hence the Ermine-street runs by Walcot Hall and through Burghley Park, since its enlargement by John, Earl of Exeter, in 1665, but before that time it formed part of the public road between Stamford and Peterborough. Here it is now not traceable, because its bank having been formed of gravelly materials, was carted away to make walks about Burghley House; 'Bridge's Northamptonshire, vol. 2, p. 501.' Next it may be detected crossing a branch of the Welland, near Wothorpe Park wall, where its bank is 3ft. high and 20ft. wide, whence it descends the valley of the Welland, and crossing that river at a spot on which Bedcroft Hall formerly stood, enters Lincolnshire, according to Stukeley's words, 'with broad elated crest.' Passing by the sites of the Benedictine Nunnery of St. Michael's and the Augustine Priory, it leaves the town of Stamford on the east, in the form of a broad raised bank, called Greenbank, and then, as a turnpike road, reaches Casterton. None of the Roman Itineraries mention the existence of any town or station between Durobrivæ and Causennæ, yet there certainly was a large camp at Casterton, ten miles north of Durobrivæ, or Castor, a considerable portion of which still remains, close to the Ermine-street. Probably this camp, like the one below Castor, was made before the road that subsequently passed by it. It is situated in the bend of the River Gwash, which thus defended nearly two-thirds of its circumference. Its area was about 27 acres in extent, and it was probably wholly surrounded by a fosse and vallum. [The via is then traced throughout its course to the Humber; and the Archdeacon points out as he proceeds all the sites where Roman camps and stations are known to have been fixed during the Roman occupation of this part of England.] Between Ancaster and a spot called Bayard's Leap, where it is intercepted by the Sleaford and Newark road, the Ermine-street presents a grand appearance, its well developed bank from 3ft. to 6ft. high, and wide in proportion, remaining in nearly as perfect a condition as when it was first made by the Romans."

WATER SUPPLY AND SANITARY MATTERS.

THE first instalment of the drainage works which have for the last eighteen months been in progress at Douglas, Isle of Man, for the improvement of the sanitary condition of the town, has been completed. The portion finished consists of a main intercepting sewer running along the shore, and of an outfall sewer, which empties all the sewage into the bay. The cost of the work has been about £4,000; but in addition to this a large number of district and subsidiary sewers have been formed. The engineer of the works is Mr. G. W. Stevenson, C.E., borough engineer of Halifax, and the contractors Messrs. Quine and Kewley, of Douglas.

On Monday Colonel Sir Wm. Denison, K.C.B., Royal Engineers; Dr. Ed. Frankland, F.R.S.; and Mr. John Chalmers Morton, with their secretary, Mr. S. J. Smith, visited Bolton. The commissioners were met by the Mayor (Mr. Jas. Barlow) and the Sanitary Committee, and after explaining the object of their visit, proceeded to inspect the River Croal and the arrangements for the sewerage of the town, as also the present and prospective water supply.

The town of Harrogate is to have a combined system of sewerage and irrigation at a cost of £7,000. The plans and specifications were passed by the Improvement Commissioners on Monday, and the works ordered to be advertised.

The Sanitary Commissioners have very properly recommended the removal of the Regent's Park barracks to a more appropriate site.

Building Intelligence.

CHURCHES AND CHAPELS.

Hawley Church, Hants, has been opened after enlargement. A new chancel has been added also a south aisle and north and south transept. A handsome reredos of Caen stone inlaid with coloured cements, with shafts of green Connemara marble, has been erected by Bell, Redfern, and Allen. The style is thirteenth century Gothic. The designs are by Mr. C. Buckeridge, of Oxford, and the works have been carried out by Messrs. Goddard and Son, builders, Mr. John Pickering being the clerk of the works.

On Tuesday, the foundation stone of a new church was laid at Avon Dassett, Warwickshire, to be built on the old site, the old one being both unsound and unfit for public worship. The new church is designed by Mr. C. Buckeridge, of Oxford. The cost will be for building £2,500.

A new Baptist Chapel has been opened at York. The style is Early Decorated, and the building will seat 700 persons, at a cost of £5,000. Mr. W. Penchey, of Darlington, is the architect.

A new Methodist Chapel has been opened at Monkwearmouth. The style is Gothic, and it is built of white brick, with stone dressings. The chapel will seat 1,000 persons, at a cost of £2,300. Mr. Joseph Potts, of Sunderland, is the architect.

On Friday last, the Bishop of Chester consecrated a portion of the new cemetery at Bebington, set apart for the interment of members of the Anglican Church. There are three chapels within its precincts for the respective use of Dissenters and members of the Roman and Anglican communions. The chapels are erected in the Gothic style, from the designs of Mr. G. W. Hamilton, architect, of Liverpool, by Mr. J. Dobson, contractor, of Rock Ferry.

The ancient church of Lutterworth is now being restored under the superintendence of Mr G. G. Scott, R.A. The fund raised, notwithstanding all the exertions of the committee, that is at present available, will barely complete the work of the nave, chancel, and north aisle. An earnest appeal has been made by the minister of the parish for funds to enable the committee to complete the restoration of this old church, which remains as a monument to John Wickliffe, the champion of the Reformation.

The laying of the foundation stone of the church, crypt, mortuary chapel, &c., to be attached to St. Mary's Mission Home and Retreat, now in course of erection upon the western slope of Kinnoull Hill, and on the east bank of the River Tay, Scotland, took place on Tuesday week. The site of the Retreat is an elevated one, and, having a front to the west, commands a splendid view. The Retreat consists of four storeys, and the style of architecture is Early English. Mr. Helton is the architect.

At an adjourned meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held at the society's house, No. 7, Whitehall, S.W., on Monday, the Lord Bishop of Oxford in the chair, in addition to other important business, the laws and regulations of the society were amended, and the report of the sub-committee with reference to the memorial of the London Free and Open Church Association was received.

On Saturday last the corner stone of a new Methodist Chapel was laid at Longwood, near Huddersfield. The building will be of stone, and rather plain, the only ornament being in front in the shape of pilasters and moulded semicircular projections. The chapel will seat 250, at a cost of about £1,100. Mr. J. Balmforth, of Milnsbridge, is the architect.

On Saturday last the foundation stone of a new Wesleyan Methodist Chapel was laid at Whalley Range, Lancashire. The style of the building will be thirteenth century Gothic, and it will seat 750 persons, at a cost of £7,300, including schools attached to the chapel. Mr. J. Webster, of Manchester, is the architect, and Mr. Clay, of Audenshaw, the contractor.

BUILDINGS.

A new terrace, consisting of twenty-five houses, is about to be commenced at Aberystwith, on the north, facing the sea, beyond the Queen's Hotel, behind the new sea wall. J. P. Seddon is the architect.

A block of model buildings for artisans is being built at Fulham by the Bishop of London to replace a number of dilapidated small houses, on the side of the road, near the entrance to the Bishop's palace. The houses will accommodate twenty-eight families, each with sitting rooms, two bedrooms, and scullery. The contract was taken by Mr. Thomas Williams, of Canton, near Cardiff, for £4,400. J. P. Seddon is the architect. The houses are calculated to pay 7½ per cent. We intend to publish the plans.

A block of workmen's cottages is about to be built at Dytchley, Oxfordshire, for Lord Dillon. J. P. Seddon, architect.

The inauguration of the new Congregational Institute, Nottingham, took place on Wednesday last week. It is to accommodate from 80 to 100 students. Mr. R. C. Sutton, architect, prepared the designs. Messrs. Bell and Wood executed the stone work, and Messrs. Stevenson and Weston the woodwork. Mr. Sutton has adopted the Gothic style of the fourteenth century.

The new fortifications at Hurst Castle, at the entrance of the Solent, are nearly completed.

A block of new buildings for the labouring classes has just been erected in the parish of St. Thomas, Oxford, under the superintendence of Mr. E. Bruton, architect. The block consists of 30 sets of dwellings, each a complete house in itself. They are approached by four staircases, and all of them have a sitting-room, one, two, or three bedrooms, a scullery, a water-closet, a coal place, and a larder. They have a distinct water service unconnected with the closet supply, and a shaft runs from each scullery, into which dust and other refuse may be swept. The Prince of Wales, during his recent visit to Oxford, visited and carefully examined the buildings.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—J. T.—S. and W.—R and C.—B. F.—T. P.—W. H. B.—W. and B.—F. H. J.—W. T.—T. D.—R. and S.—J. B., jun., with photograph of ship—W. H. B.—Professor I. C. C.—B. J. T.—G. T. R.—I. F.—M. A.—B. and Co.—T. W. J.

E. S.—With M.S. on "Lincoln Cathedral," too late for this week. We go to press every Thursday afternoon.

Correspondence.

USE OF ASPHALTE.

To the Editor of the BUILDING NEWS.

SIR,—In reference to your article III. on the use of asphalte for roofs, your readers must be warned that the greatest care must be taken in regard to the article employed, for the original substance, if diluted with other matters, may be deteriorated to a very great degree. Acting on the faith of the name of a well-known concern, who largely advertise their article, I employed it over a study and library of the late Lord Palmerston, at Broadlands, but it proved so unsound and rotten that by his lordship's own instructions, founded upon his official experience, I applied to the Seyssel Pyrimont Company to replace it, and we had every reason to be satisfied with the manner in which they did their work, as to the quality of the material and the mode of laying it down. It lies upon a thickness of concrete supported upon wrought-iron joists similar to Fox and Barret's principle of construction, adopted in order to keep out the heat of the flat. In regard to the incombustibility of asphalte, I think that requires rigorous examination. When in Switzerland in 1866 and passing from Neufchatel to Dijon, I saw a village, which had just been burnt down, and where the flames had communicated from house to house and street to street by the foot pavement covered with asphalte. Whether any quantity of bitumen had been mixed with the asphalte in undue proportion, and thus caused the conflagration, I know now, but the fact of the communication of the fire by the foot pavement was a matter of well-known publicity.—I am, &c.,

TH. L. DONALDSON.

21, Upper Bedford-place, Russell square,
June 20.

[The material noticed in the Professor's letter was probably a gas tar composition, which is inflammable. That which gives the chief value to Pyrimont rock asphalte is the peculiarly solid quality of its bitumen, and its intimate combination with carbonate of lime. The analysis of the rock proves it to be composed of bitumen from 9 to 10 per cent, the remainder being pure carbonate of lime. When made into mastic, from 10 to 20 per cent. of grit is substituted for a similar proportion of the carbonate of lime, and only 5 per cent. more of the same bitumen is added. Thus manufactured it is uninflammable, and it is evident that it is the preponderance of the two latter materials over and above the bitumen that endows it with this distinguishing property. The experiments referred to in our article III. fully bear out this statement. For further particulars we can refer our readers to practical observations on the cement of Seyssel, by F. W. Simms, C.E., late of the Royal Observatory, Greenwich, published by Weale, of Holborn.—ED. B. N.]

MR. MOORE'S DECORATIONS.

SIR,—Being well acquainted with the Queen's theatre and its decorations, I have read the letters on the subject with much interest. I find it stated in Mr. Moore's letter that certain alterations, viz., altering the ceiling, obliterating the colour on the backs of the boxes, and changing the colour of the seats, had been made without his knowledge. Now, reading Mr. Phipps' letter carefully through, I cannot find that he denies one of these points. It is true, indeed, that he begins by talking of an "unequivocal denial;" but he immediately modifies this by admitting the alteration in the colour of the seats, which he somewhat evasively calls "three tiers of galleries." Your correspondent, "A Painter in Water colours," has more correctly described them as "dress circle and upper boxes;" in fact, the chief seats above the floor of the house. Then, as regards the charge of obliterating the delicate colour which the same correspondent assures us once covered the backs of the boxes, Mr. Phipps is totally silent. But as regards the alterations in the ceiling, he quotes a letter, which he does not produce, but states that he has received from the very person who executed the alterations. Surely it would have been more satisfactory, and certainly more in accordance with the usual custom in such cases, if Mr. Phipps had published this letter instead of giving his own account of its contents; but, according to his own reading, what is this truly important piece of evidence? Why, simply a corroboration of what Mr. Moore said in his own letter—that the alterations were made without his (Mr. Moore's) knowledge!

Mr. Phipps, having thus confirmed Mr. Moore's statements, might well have ended his letter here. The concluding portion certainly contains some ideas capable of discussion, such as whether theatre decoration really is "more lasting and higher work than simply easel pictures;" also, the problem of joint composition between the architect and painter has, for me, being an architect, much interest; but what has this to do with the question of exhibiting, as Mr. Moore's suggestions, drawings which have been, on his own admission, so much tampered with? I cannot say that the intention in introducing fresh matter of discussion was to shelve the original question, but truly it looks like it. But what I have most to complain of in Mr. Phipps' letter is, the general tone of insinuation and use of expressions calculated to mislead a casual reader. I have already noticed the false impression conveyed by the term "three tiers of galleries." Such expressions as "the young man, *a friend of Mr. Moore's*," who carried out the suggestions, "as he now asserts," are certainly not courteous, and have the effect of implying a doubt of his truthfulness. It is gratifying to hear that Mr. Phipps does, like every one else, deplore the utter want of harmony between the general decoration and Mr. Moore's picture. The expressions used in his preceding sentence (viz., that artists must work with the architect who employs them) would imply that the blame in this case rests with Mr. Moore. Now, as the existence of these drawings appears to point out that he actually did suggest a system of decoration in harmony with his picture, I cannot see the justice of such an insinuation.

I do not think that any apology is necessary from me for introducing myself into this discussion. The question is not one simply between Mr. Phipps and Mr. Moore, but one in which at least every one connected with this branch of art is interested and which was, indeed, originally raised by a third person; and, as an architect, I should be unwilling that Mr. Moore or any other artist should imagine that *all* architects consider themselves entitled to supervise and make alterations in works which they have entrusted to them to design. Whatever truth there may be in the theory that an architect should claim the supervision of such decoration, at any rate he should be a man of undoubted artistic ability. Mr. Phipps thinks that a satisfactory solution may be arrived at by the withdrawal of Mr. Moore's name; I doubt whether anyone else will see it in that light.—I am, &c.,

D.

SIR,—May I beg you kindly to insert the following answer to Mr. Phipps' communication of the 15th inst.? Mr. Phipps admits the change in the colour of the seat covers (for I suppose the expression "three tiers of galleries" is a professional mode of describing the dress circle and the upper boxes), but thinks that to complain of the introduction of this discord is "the veriest nonsense," and denies that the colour of the seats has anything to do with the decorations of the theatre. Are we to understand by this that he wishes frankly to confess that harmony of colour is to him a dead letter? Mr. Phipps' statement, that "a young man" prepared the drawings under my directions, partly at my chambers and partly at his, is incorrect in a very important particular, and calculated to mislead; for my supervision over Mr. Hart (*i.e.*, the young man referred to) and over the drawings entirely ceased when they were transferred to Mr. Phipps' office; and the changes that were afterwards effected in the designs—complete when they left me—were not even ever mentioned to me; so that the daily discussions between myself and Mr. Hart, referred to by Mr. Phipps, came to an absolute end before the alterations were thought of. The publication of Mr. Hart's letter would have been more desirable than the vague description of it that is afforded us.

What is one to understand when Mr. Phipps says that he should never have dreamed of appropriating a line of the sketch to himself, and then immediately after, that it is a simple matter to erase my name from the drawing altogether. Now, as there was certainly not a single line or shade of colour due to Mr. Phipps in the design as originally completed, I am quite unable to follow him in his suggestions.

Having got through the part of Mr. Phipps' letter which purports to be an answer to mine, I will venture (as some time has elapsed since my statement appeared in answer to "A. Z.") to recall what assertions I made in it, and to point out to what extent Mr. Phipps meets them. I said in my letter of the 3rd inst., "In the drawing of the ceiling, the squares and the outer belt of the fan-shaped part have been entirely changed. And in the other drawing, although no light and shade is used elsewhere, the backs of the boxes have been shaded so as quite to obliterate the colour originally placed there, and, not least, the seat covers have been changed to a colour that necessarily destroys the whole scheme. I have been so little consulted with respect to these alterations that I was not even aware of their existence till I saw the drawings the other day at the exhibition." Now, Mr. Phipps, though he announces an unequivocal denial, admits having recoloured the seat covers, is quite silent about the backs of the boxes, and makes a statement about the patterns in the ceilings which, confused as it is, will, I hope, be entirely disposed of by Mr. Hart.

I see no reason for following Mr. Phipps through his general remarks as to the relations of the architect to the painter, but as it rests with him at present to explain why an architect has freely altered an artist's drawings without consulting the artist, it is difficult to perceive what pertinence he conceives in his axiom that the aspiring artist "must, in a measure, work with the architect."

I must here observe that Mr. Phipps, at the time the drawings were undertaken, and while they were going on at my chambers, did not advance any scheme as to the decorations, but left the matter entirely to me. Nay, further, that he expressed his approval of my design when finished, and put it into the decorators' hands, who actually executed a small portion. It was not till afterwards, when a third party had stepped in and objected to the decorations, that he began to express any doubt about carrying them out. I may as well mention here that I did this design gratuitously for Mr. Phipps on his telling me that the matter would have to be left entirely to the decorators unless I considered it worth my while to undertake it merely for the sake of having the decorations carried out in keeping with my proscenium picture. So that an adequate idea may be formed of my recompense for making this design when I say that Mr. Phipps has never even gone through the form of thanking me, but freely allowed himself the expression of such insinuations as the one contained in his letter, that I took no interest in the general harmony of the decorations.

When Mr. Phipps talks of the want of harmony in the existing decorations of the Queen's Theatre he again appears to forget the questions at issue. However, as he has introduced the subject, I beg to say that if he wishes the history of this matter also to be made public I shall be most happy to oblige him.

Finally, in denying Mr. Phipps' italicised statement that Mr. Hart is a friend of mine, I wish it to be understood that I have the greatest respect for the latter gentleman, but that my acquaintance with him is founded entirely on professional or business relations, so that the term "friend," used in its usual acceptation, is not correctly applied.—I am, &c., A. MOORE.

17, Fitzroy-street, Fitzroy-square, W.,
June 23.

RYDE CHURCH.

SIR,—In your remarks on the drawing in the Architectural Exhibition last week, you again refer to Ryde Church competition, and state:—"We have been told that the cost of the selected design for this church at Ryde having proved beyond the estimate, it and its author have been set aside, and that the work has fallen into the hands of Mr. Gilbert Scott." In justice to the author of that design perhaps you will allow him a small space to state what are the facts. In the first place, as you may be aware, Mr. Scott was asked by the committee to give them a design for the proposed church; he did so, and obtained tenders for its erection, the lowest tender being £15,000. This the committee thought too high, and Mr. Scott made some alterations, and reduced it by £1,000. Ultimately the committee set Mr. Scott aside, and advertised for designs. Fifty-seven sets were, I believe, sent in, and I will do the committee the justice to state that they took a great deal of trouble to arrive impartially at what they considered the best design, and mine was selected, having doubtless many imperfections—at least you think so. However that may be, it was selected, and I was asked by the committee to get tenders for the erection, with the position of the tower altered and the chancel lengthened. Tenders were advertised for and a great number received; therefore, to show you that the design and its author have not been set aside solely because the tenders were too high, I quote the following separate tenders, mostly different men, but men who would undertake to do the work:—£8,204 12s. 7d.; £8,269 5s.; £8,424 5s.; £8,513; £8,805 10s. 7d.; £8,857 6s. 6d; £9,271 11s. 10d.; £9,426 11s. 10d.; £9,807 17s. 5d. The competition drawings were faithfully worked out in detail to obtain the tenders, quantities, with numerous lithographed sheets of illustration, were supplied, so that no contractor could be deceived. The committee agreed to accept the one £8,857 6s. 6d., provided sureties were forthcoming for the fulfilment of the contract. These were provided, the contract and bond prepared, and submitted to the committee for approval. Further, the clerk of works was engaged, the times at which I should visit the works, and the amount to be charged for journey for travelling expenses. You will see, then, that the reason you have stated is not the reason why I am set aside. What is it, then? You shall judge. When I was in Ryde the committee told me that Mr. Scott had been employed, and had been set aside for the same reason you state in my case; and that as soon as the advertisement appeared he sent them in his account, £700. They inquired if this was the usual charge, and if Mr. Scott could compel them to pay. I answered in the affirmative, unless, under the circumstances narrated, they could compromise the matter with him. Now I infer that the committee have not been successful in their negociations with Mr. Scott, and have come to the conclusion that it is easier to set me aside than a man in Mr. Scott's position. I do not so much find fault that they have gone back to Mr. Scott. He is undoubtedly entitled to the work; but the committee ought not to have put fifty-seven competitors to the needless trouble and expense of preparing elaborate drawings, and then pass them by.—I am, &c., W. PEACHEY.

LEGAL TENDERS.

SIR,—There was a building advertised to be let by tender, worded thus: "Tenders to be delivered on the 4th. Any tender after this date will not be accepted." My tender was the only one that was sent up to the date. There was, however, another sent on the 9th and accepted. I want to know if I cannot claim compensation for my tender.—I am, &c.,

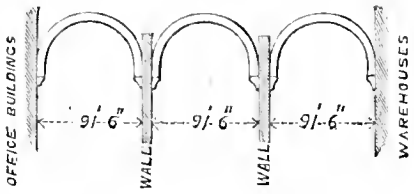
A CONSTANT READER.

Harrogate, June 23.

Intercommunication.

QUESTIONS.

[890.]—SEMICIRCULAR IRON ROOF.—I am designing a semicircular iron roof in three spans, and am at a loss for a formula to work it out. The transverse section will be thus:—



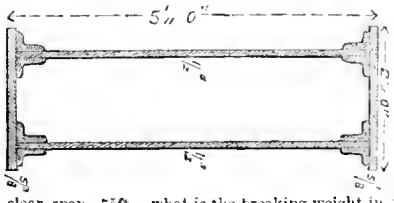
Will you kindly help me by stating my want in your "Intercommunication"? Also, will you say what, if any, advantage I may derive by having it in wood ribs, laminated, like the riding-school at Moscow?—A YOUNG ENGINEER.

[891.]—WIDENING AND DEEPENING A STREAM.—Can any of your readers assist me in the present case? I want to widen and deepen a stream for about a furlong in length. I want the extreme depth in the middle to be 5ft. 6in., and the breadth at bottom about 11ft. What kind of cross section ought I to give to it; and how shall I make the sides watertight?—MILLER.

[892.]—GEOLOGICAL SURVEY OF ENGLAND.—I should be obliged if you will let me know whether the geological survey of England is completed, and where I could obtain the maps. Also what towns are surveyed to the 1-500 scale?—INQUIRER.

[893.]—SPIRIT LEVEL.—Will you allow me to ask, through the medium of your "Intercommunication" column, what description of spirit level I had better buy? Some of my friends recommend the Y, some Gravalt's dumpy level, and others that of Troughton. I am quite puzzled by the different recommendations, and do not know which to go by.—A BEGINNER.

[894.]—BREAKING WEIGHT OF BOX GIRDERS.—Given a box girder, as in the cut—breadth, 2ft.; depth, 5ft.; thickness of plates, ⅝in.; angle irons, 3in. by 2½in. by ⅜in.;



and clear span, 75ft.—what is the breaking weight in the centre under a uniformly distributed load?—J. J

[895.]—A TAPERING ROOF. Will you, or any of your correspondents, be good enough to inform me of the best mode of roofing a building which in a length of 81ft. tapers from 25ft. 3in. to 21ft. 6in., so as to halve the ridge level? An architect has directed me to put the back wall off the level. I do not wish to do this, as both front and back are equally exposed, and each have a range of windows.—A BUILDER.

[896.]—WATERING THE STREETS.—A few months ago it was announced in the BUILDING NEWS that several of the Vestry Boards of London were about to water the streets with a solution of water and chloride of calcium, a mixture patented by a Mr. Cooper. Any information as to how it is answering, as well as the patentee's charge for royalty, would much oblige.—H. R.

[897.]—ARCS OF DIFFERENT RADII.—Having a long piece of wood, say ¾in. square, I want to form with it arcs of different radii. Could any of your readers inform me

if there is any rule by which the piece could be bent to form a true curve, A A being the width and B the height.—HOWELL.

[898.]—WELL DIGGING.—Will any of your readers inform me the price per foot deep for digging a well 30ft. deep and 4ft. diameter, everything found?—A. B. C.

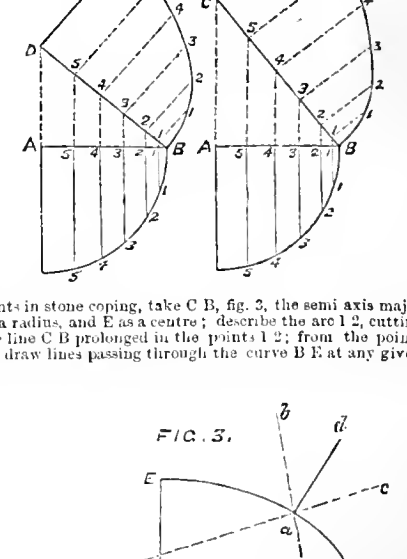
[899.]—QUERIES.—Will any of your subscribers be kind enough to tell me if it is usual to measure the portions occupied by enrichments when giving the girth of plaster cornices? and what sizes of wood are termed plank, and when does timber size commence? Also, if tar or asphalte will make the joints of glazed earthenware pipes watertight in exposed positions, which so frequently leak now when bedded in clay?—T. L. P.

REPLIES.

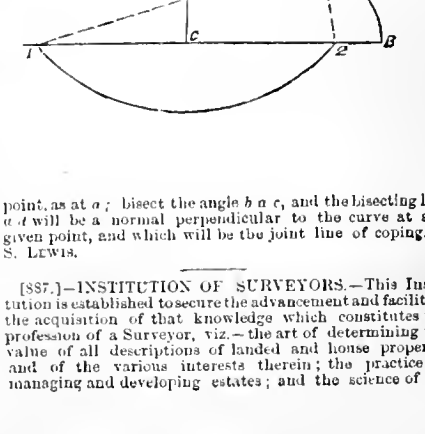
[831.]—WHITWORTH SCHOLARSHIPS.—The conditions attached to the competition for the Whitworth Scholarships are as follows:—All candidates must be English subjects, not above twenty-six years of age, and of sound bodily constitution. The examination will comprise elementary and the higher mathematics, practical plane and descriptive geometry, elementary mechanics, and mechanical and freehand drawing, physics, chemistry, including metallurgy. The candidate must also have a practical acquaintance with the ordinary tools of the workshops, and have worked at smith's work, turning, filing, and fitting, pattern making and moulding. It is proposed to make the greatest number of marks obtainable in the theoretical portion of the examination to equal the greatest number that can also be obtained in the practical part.—AN INTENDED CANDIDATE.

[831.] The conditions depend entirely upon the various local bodies to whom the nominations for the £25 exhibitions have been given. Some of these, we believe, intend to hold special examinations, others not. The Society of Arts will probably give the three scholarships entrusted to them to the students who have best distinguished themselves in the society's own examinations. For more accurate information "W. L." should apply to the institution or corporation holding the scholarship for which he intends to compete.—K.

[838.]—RAMPING TWIST AND JOINTS IN STONE COPING.—In reply to "Amateur Foreman," I have shown in the accompanying diagram, figs. 1 and 2, how they are worked out in two different heights, which I think he will see clearly without any further description. The figs. 1 1, 2 2, &c., apply as in the former diagram. To find the



joints in stone coping, take C B, fig. 2, the semi axis major as a radius, and E as a centre; describe the arc 1 2, cutting the line C B prolonged in the points 1 2; from the points 1 2 draw lines passing through the curve B E at any given



point, as at *a*; bisect the angle *b a c*, and the bisecting line *a d* will be a normal perpendicular to the curve at any given point, and which will be the joint line of coping.—S. LEWIS.

[887.]—INSTITUTION OF SURVEYORS.—This Institution is established to secure the advancement and facilitate the acquisition of that knowledge which constitutes the profession of a Surveyor, viz.—the art of determining the value of all descriptions of landed and house property, and of the various interests therein; the practice of managing and developing estates; and the science of ad-

measuring and delineating the physical features of the earth. Also to promote the general interests of the profession, and to maintain and extend its usefulness for the public advantage. The Institution consists of three classes, viz.—Members, Associates, and Honorary Members, with a class of Students attached. The following are the rates of contribution to the funds:—

	Annual Subscription.	Admission Fee
Student	£1 1 0	—
Associate	2 2 0 ...	£3 3 0
Member	3 3 0 ...	5 5 0

An Associate may compound for his annual subscription for twenty guineas, and a Member for thirty guineas. Country surveyors may become members.—A Member.

[888.]—Resistance of Stone to Frost.—A method was practised by Mr. Brad, and it is stated with success, to prove the above. It has, however, been spoken slightingly of by some; but it is the only method with which I am acquainted. The pieces of stone to be tested should be sawn into cubes of about three inches. A large quantity of Glauber's salt should be dissolved in hot water and then left to cool. This solution should be heated to boiling point in a saucepan, and in it the pieces of stone must be suspended for exactly half an hour. They are then to be removed and hung up over a vessel containing some of the above cold solution. In the course of twenty-four hours, if the air is not very damp or cold a white efflorescence will appear on the stones. Each piece must then be immersed in the liquor in the vessel beneath it till the crystals disappear, and again suspended. The dipping must be repeated whenever the dry efflorescence forms. According to their tendency to exfoliate by frost, the different stones will show in about five days alterations on the edges and angles of the cubes. The results may then be estimated by the weight of the disintegrated fragments compared with the known weight of the cube in its original state, both being taken equally dry.—Lapis.

WAGES MOVEMENT.

The operatives of Liverpool are henceforth to be doubly armed for their own protection against the combination of the masters, by turning capitalists themselves. An association, suggested by the circumstances of the strike, has just been formed, under the name of the "Co-operative Building Association, Limited." The capital is provided by 50,000 shares, of £1 each, of which 2s. 6d. is paid on application and 2s. 6d on allotment, and it is said that the project has been well taken up by the operatives in the building trade generally. Messrs. Duncan, Squarey, and Co. are the solicitors to the association, and among the promoters are Mr. James Samuelson and Mr Joseph Boult. The association has already undertaken several good contracts in Liverpool and the neighbourhood, and the enterprise is stated to give promise of very good success, many of the shares having been readily taken up.

BUILDING AND LAND SOCIETIES.

On Monday week, the fourth annual meeting of the Hanley Mechanics' Permanent Benefit Building Society was held at the Potteries Mechanics' Institution, Mr. William Stubbs presiding. From the report of the committee we learn that the society is capable of paying, in addition to the ordinary interest, a clear bonus of not less than 7 per cent. per annum on all investment shares. The current amount of applications for advances was stated to be greatly in excess of any previous year, and the position and prospects of the society were considered highly satisfactory.

LEGAL INTELLIGENCE.

Is Westminster Abbey a Royal Palace.—Mr. Poole, a mason, and Mr. Tyler, a builder, appeared before Mr. Arnold by their counsel to receive the judgment of the court in a summons taken out against them by Mr. James Tolley, district surveyor of St. Margaret, St. John, and St. Peter, Westminster, for neglecting and refusing to give him certain notices required under the act. Mr. Philbrick prosecuted; Mr. Vaughan Richards appeared for the defendants nominally, but in reality for the Dean and Chapter of Westminster. Mr. Arnold said—These were two summonses taken out by the district surveyor of the district of St. Margaret, St. John, and the close of the Collegiate Church of St. Peter, Westminster, complaining that the defendants, respectively the builders engaged in doing certain work in a building within the close of the Collegiate Church of St. Peter's, Westminster, did neglect to give to the complainant, as such district surveyor, two days before such work was commenced, due notice in writing, stating the situation, &c., of the building, &c., and the particulars of such proposed work, &c. These summonses were taken out under the 38th and 41st sections of the Metropolitan Building Act, which make it imperative on a builder to give such a notice and impose a penalty not exceeding £20 for neglecting to do so. The building under consideration is Westminster Abbey, and the question is whether that building comes within the operation of the Metropolitan Building Act. The defendants, or rather the Dean and Chapter of the Abbey, who, in fact, resist the application, contend that the abbey is, by the 6th section of the act, exempt from its operation, as being either "one of her Majesty's Royal Palaces," or a "building employed for her Majesty's use or service." The worthy magistrate then gave a lengthened and very interesting review of the facts, and said he felt bound to come to the conclusion that Westminster Abbey was not exempt from the operations of the Metropolitan Building Act, either as a Royal palace, or as a building employed for her Majesty's use or service, and consequently that the defendants were bound to give the notice required by section 38, and having failed to do so had incurred the penalty under section 41; but as the case had been brought into the court solely for the purpose of raising an important and curious question of law, he considered that a nominal penalty of 1s. in each case would be sufficient, and for the same reason he did not make an order as to costs. He was glad to see that under section 106 a power was given to the defendants to appeal to any of the superior courts of Westminster, and they would, of course, exercise it in the manner pointed out by section 107. Mr. Vaughan Richards thanked Mr. Arnold for the attention he had given the matter, and on behalf of the Dean and Chapter said he should avail himself of the 106th section to appeal.

Our Office Table.

The arrangements for the meeting of the British Association at Norwich are in a forward state. Among other papers will be read, by Mr. C. S. Read, M.P., and Mr. F. S. Corrance, M.P., on the "Progress of Agriculture and the Condition of the Labouring Classes;" and by Sir W. Jones and Mr. Harding, on the "Drainage of the Fens and the state of the Rivers of Norfolk."

The town surveyor of Northampton desires to make known the fact that the fourth crop of Italian rye grass grown this season will be cut in a day or two. Each crop has produced about twelve tons to the acre. The plot is generally flooded on Wednesday, and Mr. Pidcock, the surveyor, will give any information to anyone who may visit the works on that day.

A catastrophe to art has occurred at the Palace of the Luxembourg in Paris. The plaster-work of the fine dome of the library, painted by Eugene Delacroix, has fallen down, and broken to pieces. The fragments have been carefully taken up and conveyed to one of the studios of the Louvre, where Count de Nieuwerkerke is having them placed together again.

A meeting was held at Kennington, last week, at which Mr. Thomas Hughes, M.P., presided, for the purpose of obtaining an expression of the opinion of the people of Lambeth, on the proposed erection of a South London market in that locality, the private bill for which has passed both Houses of Parliament. A resolution approving of the scheme was proposed by Mr. Haddon, the architect of the market, seconded by Mr. Thomas Connolly, and carried with only one dissentient.

A novel sale took place at the auction rooms of Messrs. Debenham and Storr, in Garrick-street, on Monday. The rooms were hung round with ecclesiastical vestments of every description, and of the most costly character. There were copes, stoles, dalmatics, albs, tunicles, maniples, chasubles, cassocks, berettas, banners, and everything else required for carrying out in the most complete style the various offices of the Church. The novelty of the sale attracted a considerable number of clergy and laity, and good prices were realised for some of the articles more generally used.

The extensive premises occupied by the London (City) Baths, Laundries, and Dwellings Company (Limited), situated in Golden Lane, St. Luke's, are announced for sale by auction. This extensive establishment is said to have cost nearly £40,000, and was opened about three years ago. Should it be diverted from its present philanthropic purpose the deprivation will be severely felt in the neighbourhood.

We have received the following:—"I think it is now about four or five years ago that I first drew attention to Queen Anne architecture and furniture, with the result of bringing down the curses of Gothic indignations upon my head. To those who like myself believe that a square arched window is the want of the age, it will be a great pleasure to know that in the new houses now erecting in London, by Mr. P. Webb, he has developed a distinctly constructive square arched method of building.—Warrington Taylor."

The annual excursion of the Liverpool Architectural and Archæological Society will take place to-morrow. The excursionists will proceed to Wrexham, and then visit some of the most interesting parts of the neighbouring country.

Some doubts have arisen as to the effects of spreading large volumes of sewage over areas in the immediate vicinity of populous places. Norwood, with its irrigation area close to the inhabited district, during the three years that the system has been applied to the land has had a mortality of 18.17 per 1,000 in 1865; 15 13 in 1866; and 14 21 in 1867; while the same area, inclusive of more distant localities, has had during the same period the respective mortalities of 21.26, 20.04, and 16 60, so that it appears that in the rapid growth of the plant under cultivation the assimilation of nitrogenous and carbonaceous matter, and the elimination of large volumes of oxygen by the plan, we have the antidote for what might have been thought to prove baneful in its effects.

We see from the audited accounts of the Liverpool Architectural and Archæological Society that during the past year £4 4s. were spent in students' prizes, and £32 17s. 10d., in coffee, &c. We do not know what the "&c." means, but we suppose such things as biscuits and bread and butter. If the society, which in other respects is one of the most useful provincial societies in existence, would in future spend a little more in "students' prizes," and a little less in "coffee, &c.," their balance sheet would present a more creditable appearance.

We are requested to say that the circumstances alluded to in our last number, in reference to the new church at Ryde, are as follows:—Mr. Scott, on the first undertaking of the church more than two years ago, had been appointed the architect, though some members of the committee had desired to go to competition. He had made a design and working drawings, and building tenders had been received, which being higher in amount than the committee thought they could venture upon, the idea of competition was revived and carried. Against this the architect strongly protested, and has never been settled with as to his claims. The committee having subsequently disagreed with the architect whom they chose by competition, came to the unanimous resolution to ask Mr. Scott to resume his original position, which he only consented to do on being assured that the architect in question had been formally closed with before the idea of returning to him had come under consideration.

The first portion of the Bolingbroke Park property, Clapham Junction, having been entirely disposed of, the second took place on the 24th inst., at the offices of the Conservative Land Society, and a large sale thereof was effected. The competition for special plots was so great that as high as £50 was paid for a right of choice to secure priority of selection. Some notion of the high prices which suburban freehold land will fetch near a railway station is afforded, when it is stated that the 113 plots sold at the first allotment ranged in price from £58 up to £1,000 per plot, and plots on the second portion were sold from £58 up to £410 each.

The vestry of St. George's, Hanover-square, has at length determined to have a re-valuation of the whole of the property in the parish made for the purposes of the Poor Rate, in accordance with the act 6 and 7 William IV., cap. 96, and Mr. Charles Lee, of 3, Whitehall-place, has been appointed to make the same in time for the next rate. This is the largest and most wealthy of London parishes, and it has not been valued throughout for many years.

Baron Haussman, Prefect of Paris, has issued his report on the financial situation of the city. The report admits that since 1853, when Haussman became King of Paris, the enormous sum of 1,865,770,086f. (£74,603,803) has been spent in demolishing houses and building new streets on their sites, and that only 1,399,994,890f. have been paid, so that there remain due 465,775,196f. (£18,635,200).

On Wednesday the excavations at the Emporium Romanum on the banks of the Tiber brought to light a noble archæological and historic relic, in the shape of an enormous block of Carrara marble, measuring 585 cubic metres, and bearing a long inscription. The block was uncovered in the presence of the Senator of Rome and a number of distinguished persons.

The excavations which are being carried on at Pompeii have brought to light two fresco portraits situated under a portico of the Via Stabina. It is believed they represented the master and mistress of the house. The man wears a magistrate's toga; the woman is in the attitude of a person reflecting about what she is to write; for she has a stile in her right hand, and is about to carry it to her lips, while in her left she holds writing tablets. Both these portraits are well executed.

The Marquis of Townshend has presented a bill before the House of Lords to amend the Metropolis Local Management Acts. The bill, which is confined to one clause, simply proposes that every vestry or district board shall provide and maintain sufficient and proper steam or horse rollers for the purpose of levelling every street in which broken granite or flint has been laid for the making or repairing of the carriage way.

Yesterday, to-day, and to-morrow a *fête* is held at the Royal Botanical Gardens, Regent's Park, in aid of the building fund of the Female School of Art, which, under the management of Miss Louisa Gann, has long maintained a very good position among the art schools of London. We trust that the patronage of the Queen, and the combined attractions of the gardens and the bazaar will secure a large attendance, and a handsome result in a pecuniary point of view.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3246 R. HEATHFIELD. IMPROVEMENTS IN MACHINERY FOR THE MANUFACTURE OF CUT NAILS. (A communication.) Dated November 15, 1867.

This improved mechanism consists, essentially, of a hollow cylinder having guides through which the nail plate or strip passes, the said hollow cylinder being carried by a table, or rest, or slide, and having a reciprocating rotary motion communicated to it (which motion is communicated to the nail plate or strip) substantially in the ways described and illustrated. Second, the invention consists in the combination with, or the adaptation to, the said turning over mechanism, of mechanism for feeding or advancing the nail plate or strip to the cutter, substantially in the manner described.—Patent completed.

3300 W. BLUNDELL. IMPROVEMENTS IN COWLS OR GUARDS FOR CHIMNEY, AND OTHER LIKE PURPOSES. Dated November 21, 1867.

The primary object of this invention is so to construct cowls or guards as to prevent all draught down the chimneys or shafts to which they are applied. The invention mainly consists in the employment of a conical cap, which, no matter how frequently the wind changes, always protects the chimney or shaft on the windward side, but allows free passage for the smoke on the leeward side. The conical cap is fitted or balanced on a spherical bearing or point ball and socket or other suitable joint on the top of a vertical rod carried up from the centre of a crossbar or frame at the upper part of the chimney or shaft, and the length of this rod, and the size of the cap, are so proportioned that the lower part of the cap comes on the windward side below the level of the top of the chimney when acted on by the wind. The cap being balanced on the top of the rod, the side of the cap acted upon by the wind is forced against the side of the chimney, thereby preventing the wind getting down the chimney, or by the pressure of its velocity hindering rapid discharge from the orifice of the chimney, while the opposite side of the cap at the same time rises, leaving an ample opening at the top of the chimney for the egress of smoke.—Patent completed.

3305 H. JAMES and E. DREWETT. IMPROVEMENTS IN WATERCLOSETS. Dated November 21, 1867.

In waterclosets as at present constructed, the pan is necessarily open at the top when the valve at the bottom of the pan is open, and, consequently, an escape of foul air results from the opening of the valve. Now, according to this invention the patentees arrange the handle, by which the valve of the pan is opened, at one side of the closet, so that it can be acted on when the flap or lid which closes the pan is shut down air-tight, and so as to prevent the escape of any foul gases. In order that the flaps or lids may close perfectly air-tight, an india-rubber seating is provided. Also, according to the invention, immediately under the seat of the closet, and fitting closely to it, and around the pan, they arrange a trough for containing disinfecting material, which at once deodorises any gases which may issue from the pan on the opening of the valve. Also they ventilate this trough, which, when the flap or lid is shut, forms an enclosed chamber by means of inlet and outlet air pipes, one or both of which may be fitted with valves in connection with the flap or lid, so that when the flap or lid is open, and the closet in use, the air-pipe or pipes may be closed, but, when the flap or lid is shut down, the air-valve or valves are open to ensure the thorough ventilation of the enclosed chamber around the pan.—Patent completed.

3311 A. MUNRO. IMPROVEMENTS IN BORING OR CUTTING ROCKS, STONES, &c. Dated November 22, 1867.

This invention relates to an improved tool to be used for cutting rocks or other similar substances in mining and engineering operations, and in hewing or cutting stone for building and other structural purposes, and it consists in the application of chilled cast iron, or iron compounded with other substances as the material of which the tool themselves are made. The tool consist of flat discs, with the edge bevelled, or of a bell-mouth shape, so that a sharp or cutting side is left all round them; the tools are retained in holders fixed to the boring head of a boring or cutting machine, and they are manufactured by running cast iron into properly shaped drills in the ordinary manner. In place of forming the tools of a disc shape, they may be made oblong with round or semicircular ends. They may also be made of an elliptical, angular, or other form, a dovetail or other shaped projection being formed on the back for retaining them in the holder.—Patent completed.

3319 W. BOULTON. AN IMPROVED METHOD OF TRANSMITTING MOTIVE POWER TO POTTERS' WHEELS, LATHES, AND OTHER SIMILAR MACHINERY FOR THE MANUFACTURE OF POTTERY. Dated November 23, 1867.

This invention consists, principally, in an endless band (made of cotton, hemp, india rubber, or any other suitable material), to be driven from a grooved or other pulley in either a horizontal, vertical, or oblique position, as may be best suited for the machine to be driven, and to be direct-acting without the aid of discs or long shafting, and to have a number of potters' wheels, lathes, jiggers, or other machines in connection with the making of pottery at one and the same time, and so that the speed of any or all of them can be varied at pleasure, or reversed, and, in order to accomplish this, the patentee takes the belt from the first driving pulley in the most convenient manner, and passes it near to a grooved pulley in connection with the machine to be driven. He then fixes a small friction pulley attached to a lever or treadle, or any other convenient appliance, and, when the machine is required to move or revolve, the friction pulley is caused to bring the belt in contact with the driving pulley, and when the speed is required to be reduced, the belt is partially removed from the driving pulley in order to allow a little slipping, or a hand wheel or brake may be attached, in order to vary the speed, or the belt may be removed to another pulley of a larger size by a lever, treadle, or other convenient arrangement. If the motion is required to be reversed he moves the belt to the contrary side of the pulley, or brings the return belt in contact with another pulley on the same shaft or spindle. By this means the reversed motion can be varied in speed according to the size of the second pulley. In order to keep the belt at an uniform tension he introduces a balance or tightening weight that will move with the variation of the belt.—Patent completed.

Trade News.

TENDERS.

BRACKLEY.—For building a new Parsonage House, for the Rev. L. H. Thicknesse. Mr. C. Buckeridge, architect. Quantities supplied by Mr. Tanner:—

Dover	£3240	0	0
Baker	3227	0	0
Franklin	3165	0	9
Kimberley	3000	0	0
Davis	2995	0	0
Hedges	2991	10	0
Selby	2976	0	0
Orchard	2897	0	0
Claridge	2896	0	0

BRIGHTON.—For alterations and new front at No. 41, Western-road. Mr. Tuppen, architect:—

Anscombe and Newnham	£485
Lockyer	435
Bruton	375
Kemp (accepted)	354

ESSEX.—For building St. Mary's Church, Mistley, Essex. Messrs. Wadmore and Baker, architects. Quantities by Messrs. Goodman and Vmall:—

	Cost of Church.		Additional for Spire.
Runnacles, Halstead, Essex	£5899	...	£1238
Mansfield and Price, London	5620	...	850
Patman and Fotheringham, London	5550	...	850
Dove Brothers, London	5500	...	820
E. Gibbons, Ipswich	5300	...	1040
G. Myers and Sons, London	5250	...	785
Grimes, Colchester	5260	...	1056
Saunders and Son, Dedham, Essex	4950	...	970
Luff, Ipswich	4361	...	1028
Hawkins, Monk's Eleigh, Essex	4307	...	789
Holland, Sudbury, Suffolk	4322	..	789

HAYWARD'S HEATH.—For erecting house, offices, and stable at Hayward's Heath, for Mr. Thos. Bannister. Quantities supplied by Mr. Henry W. Broadbridge:—

	House.		Stables.		Total	
Rowland and Aldridge	£1190	...	£415	0 ...	£1605	0
Hall	1170	...	415	0 ...	1585	0
Fuller and Longley	1120	...	405	0 ...	1525	0
Stanbridge	1090	...	380	10 ...	1470	10
Godsmark	1060	...	370	0 ...	1460	0
Pannett	1095	...	290	0 ...	1385	0

KILBURN.—For the erection of a Wesleyan chapel, Kilburn. Quantities supplied. John Tarring, architect, 69, Basinghall-street, E.C.:—

Browne and Robinson	£7385
Myers and Sons	7116
Dove Brothers	6875
Hill and Sons	6721
Nutt and Co.	6630
Higgs	6333
Bracher and Son	6304
Kilby	6275
Mann	6235
F. Saunders	5980
Bishop	5975

LEEDS.—For the erection of the New Offices at the County Court. Mr. T. C. Sorby, architect:—

Garland and Son	£5197	0	0
Whiteley	5140	0	0
Pounder	5100	0	0
Thorp	5093	15	0
Johnson	5087	0	0
Huddleston	4853	0	0
Robinson and Marshall	4710	0	0
Boothman and Broomhead	4710	0	0
Nicholson and Son	4550	0	0

LONDON.—For Works at St. Marylebone Almshouses. C. Eales, architect:—

Mitchener	£300	0	0
Clark and Mannoch	297	0	0
Shaw	231	0	0
Harris	220	15	0

LONDON.—For erection of premises, Plough-court, Lombard street. J. Ebenezer Saunders, architect. Quantities supplied by Messrs. Osborn and Russell:—

		Extra for cellars in front.
Little	£6838 ...	£327
Lawrence and Sons	6264 ...	334
Gammon and Sons	6137 ...	403
Webb and Sons	5980 ...	340
Myers and Sons	5970 ...	395

LONDON.—For rebuilding No. 1, Wood street, Cheapside, E.C., with portland stone front. Herbert Ford, architect. Quantities supplied by Messrs. Hovenden and Heath:—

Webb and Sons	£3743
Lawrence and Sons	3732
Ashby and Sons	3732
Myers and Sons	3712
Browne and Robinson	3687
Henshaw	3576
Conder	3509
Piper and Wheeler	3365
Pritchard	3313
Brass (accepted)	3274

PENGE.—For new hotel and four houses adjoining, at Penge, Surrey. Mr. Henry M'Calla, architect. Quantities furnished by Messrs. Leaning and Nicoll, 1, Guildhall Chambers, E.C.:—

Fish	£5526
Lidbetter	5045
Elhingham	4681
Little	4658
Browne and Robinson	4573
Killby	4493
King and Sons	4350

WILMSLOW (Cheshire.)—For Parish Schools. Medland and Taylor, architects. Quantities by Mr. H. Breary:—

Thompson	£2446
Robinson and Son	2000
Hawe	1995
Warham	1968
Lane	1960

WITHINGTON (Lancashire).—For enlargement of Withington Parish Schools. Medland and Taylor, architects:—

Hoyland	£812	10	
Clark	785	0	
Dawes	778	0	
Darnborough	738	0	

WOOLWICH.—For alterations, additional offices, &c., to Townhall, Woolwich:—

Vickery	£197	0	
Lorrigan	175	0	
Williams	152	19	
Bloom	150	0	
Woodford	138	0	

COMPETITIONS.

ABERGAVENNY, MONMOUTHSHIRE.—July 7. Designs, plans, &c., new townhall, corn exchange offices; also for reconstruction of a general market place and erection of public slaughter houses. Premiums, £50, £20, and £10. J. T. Rutherford, clerk to company.

HERTFORD COTTAGE PRIZE COMPETITION.—September 1.—Design for model cottages for agricultural labourers. Premium £50. R. Dimsdale, Esq., M.P., 9, Queen-square, Westminster.

INDIA OFFICE.—Forty appointments in Engineer establishment of India, open to competition in July next. Application to Under Secretary of State for India, India Office, S.W.

LIVERPOOL.—July 1.—Plans for the conversion of property in Redcross street, Strand-street, &c. Griffith Davies, Esq., manager and secretary, Liverpool Financial Association (Limited), 32, Castle street.

LIVERPOOL.—July 21.—For plans and specifications for erection of new hospital on the site of present Everton Hospital for Infectious Diseases. Mr. J. J. Still, 17, Water-street.

SCARBOROUGH, YORKSHIRE.—Designs, plans, and estimates for new pier. Premiums, £50 and £30. W. E. Woodall, secretary to Commissioners, Queen street, Scarborough.

ST. MARYLEBONE.—July 7.—For particulars or information of any site suitable for public baths and washhouses. Mr. Foot, clerk to the commissioners.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ALDERSHOT.—July 11.—For painting, paper hanging, &c., at Cavalry Barracks. Royal Engineer Office, Aldershot.

BELFAST.—June 28.—For a turret clock. J. Guthrie, town clerk, Townhall.

BROMFIELD (SHEFFIELD).—July 14.—For the erection of the new church of St. Mark. W. H. Crossland, architect, 21, Park square, Leeds.

WAR DEPARTMENT.—Netley, Southampton.—For external painting, colouring, &c. W. C. Hadden, Colonel-Commanding, Royal Engineer Office, Portsmouth.

CARMARTHEN.—June 30.—For building St. Peter's School Church. Rev. Latimer Jones, Vicarage.

For completing a gap in a wall about 10,000 yards. Johnson and Raper, solicitors, Chichester.

ANGLESEY UNION.—July 6.—For the erection of new workhouse, infirmaries, &c. Plans, &c., Mr. R. G. Thomas Menai Bridge.

BLACKHEATH.—For the erection of two semi-detached villas at the Manorway. Mr. Moreing, 11, Carlton street, Waterloo-place.

STOGURSEY, NEAR BRIDGEWATER.—June 29.—For the erection of a vicarage house. Mr. J. Norton, architect, 24, Old Bond-street, W.

BROMLEY-BY-BOW.—July 10.—For the erection of a chapel in Devon's-road. Messrs. Hovenden and Heath, 181, Bishopsgate-street Without.

June 30.—For the erection of a country residence. J. P. Spencer, architect, Wantage.

HURSTPIERPOINT, SUSSEX.—July 7.—For the erection of national schools. Messrs. Goulty and Gibbins, architects, 12, Union-street, Ship-street, Brighton, and 40, Torrington square, London.

METROPOLITAN BOARD OF WORKS.—July 4.—For draining, forming paths, mounds, &c., in Finsbury Park. J. Pollard, clerk to the Board of Works, Spring Gardens.

ASTON UNION.—For erection of new workhouse at Erdington. Mr. G. Thomason, architect, Wellington chambers, Bennett's hill, Birmingham.

HEREFORD.—July 11.—For taking down and rebuilding St. Andrew's Church. Architect, Mr. J. Johnson, 35, Moorgate street, E.C.

NEWCASTLE-ON-TYNE.—June 29.—For erection of a new drill shed. Thomas Oliver, F.R.I.B.A., architect.

ROYAL ARSENAL, WOOLWICH.—August 1.—For supplying and depositing dry rubbish or dredger stuff on the foreshore. Inspector of Works, Royal Arsenal.

BRIGHTON.—For the erection of married soldiers' quarters and boundary wall. J. S. Robertson, Royal Engineers' office.

ST. LUKE, MIDDLESEX.—June 30.—For the jobbing work of the parish. Messrs. Parsons and Hayne, Vestry Hall, City-road.

June 30.—For the construction of new brick and pipe sewers. J. Douglas, 10, New-end, Hampstead.

For the erection of four iron and brick, and two brick bridges. J. B. Badock, 7, Staple-inn.

LEEDS.—July 11.—For the construction of offices at London and North-Western Central Station. H. Morgan, Esq., London road station, Manchester.

ST. ALBAN'S.—July 1.—For the erection of St. Peter's church. Mr. T. Hill, 14, Bedford row.

MERTON SEPARATE DRAINAGE DISTRICT.—July 6.—For the execution of about 550 yards of outfall sewer. Mr. B. Latham, 6, Westminster-chambers, Victoria street.

July 8.—For the erection of about 1,200 feet of enclosure walls, iron gates, &c., at Hampstead. W. F. Jebb, 37, Norfolk-street, Strand.

TWICKENHAM.—July 10.—For removal of dust, ashes, and other refuse. Surveyor, Local Board of Health, Twickenham.

NORTHAMPTON.—July 1.—For the erection of a dwelling house. Messrs. Godwin and Crisp, 197, Albany-street, Regent's park.

BRIGHTON.—July 9.—For the erection of two new groynes, &c., in front of the Marine Parade. Mr. P. C. Lockwood, Townhall.

CITY OF PEST.—July 31.—For excavating trenches, laying the pipes, and making them entirely watertight. Hon Moritz von Szentkirályi, Ober Burgermeister, President, City Waterworks Company, Pest.

DARLASTON.—July 3rd.—For the erection of new schools, in connection with the Parish Church. James Slater, Hon. Sec. to the Committee.

STOURBRIDGE.—July 16th.—For the erection of a new church at Stamber Mill, near Stourbridge. Thomas Smith, architect, the Mount, Stourbridge.

WAR DEPARTMENT.—For painting, &c., at Pimlico, Millbank, and other places in London. Lieutenant Colonel E. B. Ewart, Royal Engineer Office, St. James-street, Buckingham-gate.

CHESHIRE NEW COUNTY ASYLUM.—July 27.—For the erection of Cheshire New County Asylum. R. Griffiths, architect, 3, Martin street, Stafford.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry Colton, Stratford, Essex carpenter, July 9, at 11—John Evans, York-street, Barking-road, builder, July 15, at 12—John William Sanders and William Alfred Saoders, Guildford street, Gray's Inn-road, builders, July 6, at 11—Thomas M'Mahon, Sidney place, Notting Hill, builder, July 1, at 2—William Munro, South Sea House, City, railway contractor, July 6.

TO SURRENDER IN THE COUNTRY.

William Evans, Llandudno, builder, July 6, at 12—Griffith Griffiths, Llandudno, builder, July 6, at 12—Albert James Hart, Thorrington, Essex, carpenter, July 4, at 12—David Higginbotham, Bradford, Yorkshire, plumber, July 7, at 9.15—Edmund Hughes, Bedwardine, Worcestershire, builder, July 8, at 12—Frederick Woodward, Swindon, Wilts, builder, July 4, at 11—Henry Spunk, Swineshead, Lincolnshire, builder, July 1, at 10—William Thompson, Darlington, sawyer, July 3, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

July 16, H. J. Barnes, Little Chester-street, Pimlico, builder—July 16, G. H. Read, Old Kent road, jobbing builder—July 13, J. Eve, Maidstone, builder—July 16, G. Newton, Notting-Hill, builder—July 20, J. J. Sibley, Yorkgrove, Peckham, surveyor—July 23, T. Cross, Croydon, carpenter—August 4, J. Raby, East Ham, building contractor—July 21, F. H. Green, Merrick-road, Battersea, builder—July 21, H. Bagge, Speldhurst road, South Hackney, builder—July 10, A. Ormerod, Heaton Norris, joiner—July 3, J. Griffiths, Liverpool, slater—July 15, S. L. Tindel, Reading, engineer—July 22, E. B. Herbert, Leicester, builder—July 31, H. Eyers, Portsea, plumber—July 9, W. Lawrance, Penge, builder—July 13, A. Best, Bolton, engineer—July 15, G. Reece, Harborne, Staffordshire, painter and glazier—July 15, J. Ross, Birmingham, engineer—July 24, L. Worrall and T. Hargreaves, Wathupon-Dearne, builders—July 6, T. E. Glenister, Bovingdon, builder—July 23, H. Newton, Chesterfield, joiner.

PARTNERSHIP DISSOLVED.

Dean and Yeoman, York, architects.

DIVIDENDS.

July 15, W. Stevenson, Wednesbury, builder—July 10, G. B. Ramsay, Smethwick, builder—July 1, J. Pearson, Repton, brickmaker—June 30, H. Barrett, Bradford, painter.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11	0	£12	0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0	12	0
" yellow pine		2	13	4	5	Finland	7	0	8	0
St. John N.B. yellow		0	0	0	0	Memel	0	0	0	0
Quebec oak, white		5	5	5	10	Gothenburg, yellow	8	0	9	10
" birch		4	5	5	0	" white	8	0	9	0
" elm		3	15	5	10	Gefle, yellow	10	0	10	10
Dantzic oak		4	0	6	0	Soderham	9	0	10	10
" fir		2	0	3	5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	14	0	20	0
Memel fir		3	0	4	5					
Riga		3	0	3	3	Oeck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	3
Swedish		2	5	2	8					
Masts, Quebec red pine		5	0	6	10	PUMICE STONE per ton	6	0	8	0
" yellow pine		5	0	6	0					
Lathwood, Dantzic, fm		6	10	7	10	OILS, &c.				
" St. Petersburg		8	10	9	10	Seal, pale...per tun	36	0	0	0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Sperm body	88	0	0	0
						Cod	38	10	0	0
Quebec, white spruce		13	0	20	0	Whale, Sth. Sea, pale	36	0	0	0
St. John, white spruce		13	10	15	10	Olive, Gallipoli	70	0	73	0
Yellow pine, per reduced C.						Cocoanut, Cochin, ton	53	0	55	0
						Palm, fine	40	0	40	0
Canada, 1st quality.		17	0	18	10	Linseed	32	0	34	0
2nd do		11	0	12		Rapeseed, Eng. pale	34	0	0	0
						Cottonseed	32	0	33	0

METALS.

IRON:—

Welsh Bars in London	per ton	6	5	0	6 5 0	3
Nail Rod	do	7	5	0	7 12 6	2½
Hoops	do	8	5	0	9 0 0	
Hoops, Single	do	8	0	0	9 0 0	
Staffordshire Bars	do	7	5	0	7 15 0	
Bar, in Wales	do	5	10	0	6 0 0	3
Nailrods	do	7	5	0	7 15 0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2 17 6	net.
Swedish Bars	do	10	0	0	10 10 0	2½

STEEL:—

Swedish Keg, hammered	per ton	15	0	0	15 10 0	2½
Swedish Faggot	do	0	0	0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolt	per ton	85	0		0	
Hammered Bottoms	do	97	0	0	0 0 0	3
Flat Bottoms, not Hammered	do	92	0	0	0 0 0	
Cake and Tough Ingot	do	81	0	0	83 0 0	
Best Selected	do	84	0	0	85 0 0	
Australian	do	83	0	0	0 0 0	
Yel. Metal Sheathing & Bods	per lb	0	0	7	0 0 7½	

LEAD —

Pig, English	per ton	21	5	0	0 0 0	2½
" Spanish Soft	do	18	10	0	0 0 0	
Shot, Patent	do	22	10	0	22 15 0	5
" best	do	20	0	0	20 15 0	
White	do	27	0	0	30 0 0	

REGULUS OF ANTIMONY

French	ton	43	0	0	0 0 0	

ZINC:—

English Sheet	per ton	26	0	0	26 15 0	2½
Devaux's V. M. Roofing Zinc	do	26	10	0	0 0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20	0	0	0 0 0	nett
QUICKSILVER	per btl	6	17	0	0 0 0	

TIN:—

English Block	per ton	96	0	0	0 0 0	2½
do Bar	do	97	0	0	99 0 0	
do Refined	do	67	0	0	0 0 0	
Banca	do	94	0	0	97 0 0	nett
Straits	do	91	10	0	92 0 0	

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 3, 1868.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

Third Notice.

SPANISH PAINTING.

THE history of Spanish painting is emphatically the history of her politics and religion, for in it is written the record of the two great influences which were always at work upon her rulers, and from Rome or Flanders sprang every action of this once great country. Her art history betokens this in all its early works, and until the united pressure of these two opposing countries had forced into existence a school of her own, the art of Spain had two distinct phases. Of her earliest efforts we have no exhibition here; indeed, as we have noticed in our first review of this collection, the early art essays of the various schools are, as a rule, wanting at Leeds.

In the exposition of Spanish art the names of Sanchez de Castro, Nuñez, and Gallegos, with their followers, are missing, and the earliest name we find is that of Luiz Morales, who lived in the early part of the sixteenth century. Attributed to this artist are two works here, but we doubt if either of them belongs to him. Until attention had been of late years called to the early artists of Spain every head of Christ which did not offer a pretext to be deemed a Murillo was as a sort of natural consequence conceived to be a Morales, and thus it is that so many works of opposite character bear this artist's name, confusing his work and rendering it somewhat difficult to judge of that which he really did. There is here (43) a "Head of Christ at the Pillar," attributed to him, which is undoubtedly an early Spanish work, and bears upon it the impress of that love of severe and painful emotion which is so pre-eminently manifest throughout the whole course of Spanish art. It is an attractive painting from its representation of human suffering; the contracted eyebrows, the lacerated brows, and the bruised and scourged shoulders tell of human agony, but there is nothing here which would warrant the artist's title to that soubriquet of "El Divino" which distinguished him. Nor is the other work which bears his name, (82) "Our Saviour with Simon of Cyrene," more like his work: it is of a much later period and is far more Italian than Spanish in feeling, and is wanting in that Flemish character which is so visible in the works of Morales. A fine specimen of the influence of Italian art upon that of Spain is found in No. 358a. in the second edition of the catalogue, entitled "Franciscans adoring Christ;" the correct title should be "Dominicans embracing Christ." It is by a painter scarcely known out of his native city, Valencia—Juan Juanes, a painter who visited Rome and studied well the works of Raphael there, and who in doing so seems to have imbued himself with those earlier masters whom Raphael himself loved so well and learned so much from. The tender, loving treatment of the picture might be Angelico's, whilst the technical rendering is that of Raphael, and the reverent air with which the followers of St. Domenic embrace their Lord is, as a symbol of their profession, winning in the extreme, filling us with regret that we know so little of an artist who shows himself so good. By Alonzo Coello—not the Coello of a century later, and therefore more known, but that Coello whom Philip the Second called the Portuguese Titian, and to whom he addressed his letters as *Al muy amado hijo Alonzo Sanchez Coel o* "To my beloved son Alonzo Sanchez Coello"—we have good and interesting portraits here. By him are "Isabel de Valois" and "Anne of Austria," who succeeded our Queen Mary "of bloudie memorie," as it was once the fashion to call her, in the affections of Philip of Spain, whose natural brother, the brave Don John of Austria, the victor of Lepanto in 1571 and the aspirant to the hand of the unfortunate Mary Queen of Scotts, is here also represented by him.

His pupil, Pantoja d la Cruz, is represented by three portraits, each of these of Margaret of Austria, the wife of Philip III. To the costume of 432, where the ornamentation of her robe is composed of the heraldic bearings of Castille, Leon, and Austria, and a complex monogram of her own and her husband's initials, we commend the attention of those interested in the arts of design, and the antiquary rather than the artist will the more admire his works.

Of Juan Fernandez Navarette, who from his being deaf and dumb acquired the title of "El Mudo," we have an interesting specimen, (330) his own portrait. Dark and gipsy-like of visage—really Bohemian—the eyes of this picture tell of its author's infirmity, for never have we seen the watching, wistful look which is so painfully the characteristic of those whose eyes have thus to do treble duty so truthfully rendered, and the face is one which haunts our memory. The designation of El Mudo is, however, not confined alone to him—for strangely, two other Spanish artists are known by this record of their infirmity, namely, Diego Lopez and Pedro el Mudo, neither of whom, however, equalled Navarette, who was largely employed by Philip II. in decorating the Escurial and whose epitaph was written by Lope de Vega.* About the middle of the last half of the sixteenth century, Spanish art received a notable accession in the person of Theotocopuli—a Greek by birth, but who had settled at Venice, and where, it is said, he was employed by Titian to engrave his pictures. He was not only an admirable painter, but was also an architect, and designed the Casa de Ayuntamiento at Toledo, where he lived. By him we have a beautiful portrait of his still more beautiful daughter (325), whose graceful Hellenic features greet us from under a white hood, which enhances the soft carnations of her face, and adds to the charm of one of the most pleasing portraits in the exhibition. Attributed to "El Greco," for, from his native country, he is generally so called, is a dark uninteresting portrait of Pompeio Leoni—a sculptor, and the son of a sculptor, both of whom were extensively employed by that Augustus of Spain, Philip II.

Juan del Roelas, the artist prebend of Olivares, whence his cognomen of El Clérigo, is also represented by his own portrait (328), and from his contemporary, Juan del Castillo, the master of Murillo and Cano, we have an oblong canvas (373), containing the heads of St. Augustine, St. Domenic, and St. Jerome, broadly painted, but not of remarkable merit. By Zuraban, Roelas' pupil, and contemporary of Velasquez, we have a fine figure of St. Justa, once the potter's daughter in, now the patron saint of, Seville (356). This is well and broadly painted, and she bears in her hand those *alcarazzas* or water jars which her refusal to sell for Pagan purposes led to her martyrdom; but far the finest specimen of this master is the noble "Annunciation" (2,933 in the Dudley Gallery. Gabriel the Archangel kneels before the Blessed Virgin, and announces his heavenly mission, which she "full of grace" receives with that humility so beautifully told in her "Magnificat," whilst from a choir of cherubs the Spirit of the Lord descends upon her. Beautiful in conception and colour, this is one of the finest examples of Zuraban we have ever seen.

We have now reached the palmy days of Spanish painting, the days of Velasquez, who is represented here by no less than thirteen examples, chiefly, however, portraits. Of his higher efforts in historical and religious painting, by which we could read his mind and study his grouping and composition, we have scarcely anything. Amongst his portraits we find an interesting one of that powerful statesman, the Count Duke Olivarez, to whose political fame may be added the glory of being the first to befriend the young Sevillian, to receive him into his own house, and to introduce him to the King. Two other works of his present to us his royal patron and his wife,—or rather, as regards the Queen, a copy from the work of her tirewoman, who had been long engaged with her brush upon her most Christian Majesty's face, before Velasquez took up his, and well may Madame d'Aulnoy say "I never saw a crayfish of a finer red," so rouged is she. Velasquez evidently didn't like the work of copying, and the painting is an inferior one. There is a fine head of Don John of Austria,—not the Don John above referred to as the natural brother of Philip the Second, but Don John, the natural son of Philip IV. by the beautiful actress Maria Calderona; indeed, it is somewhat surprising to see in so conventional a country as Spain then was, what a large amount of naturistic feeling existed. There must be much of his mother's beauty in this upturned young face, and, as a specimen of Velasquez' mode of painting, it is highly interesting, but his brightest bit of colour here is seen in No. 336, "A sleeping peasant boy," which is extremely luminous. His technical handiwork is admirably set forth in a wonderful study of a mastiff's head (No. 341), where each dexterous turn of the brush reveals a power of representation and an amount of observation perfectly wonderful, meriting the remark of Sir Edwin Landseer, "I never saw so much large art on so small a scale," a remark made not of this picture, but of the boar hunt in the National Gallery, for some of the dogs in which this was probably a study. Of the grouping of Velasquez, we have one original specimen, and a copy we shall refer to bye and bye. This single specimen of his own composition is a representation of the miracle of St. Anthony (316), when the Saint restores the fishes he takes from the cook's plate to life and the water. The figure of St. Anthony is very nobly conceived, but the picture is not one of the best specimens of this master. His better arrangement of a subject is seen in the copy we refer to—a copy having, strange to say, a great and distinctive merit—it is the work of John Philip, our recently lost great painter of Spanish subjects; and still more strange to say, being a good picture and valuable in art history, it was bought for a long price by the Royal Academy. The subject is the celebrated "Las Meninas," or the maids of honour—the last work of note which he did, and in which Velasquez' own portrait occurs. It was this work which made him Don Diego—for on its being exhibited to the King, the artist demanded if it wanted anything further to please his Majesty! Yes, replied the monarch—this; and, taking a brush from the hand of Velasquez, he, with his own, painted, on the breast of the artist's portrait, the bright red cross of Santiago, "the highest honour of Castille and Spain." It was all very well for a King to do this, but though the King could make a noble yet he could not make grandfathers, and, as Velasquez had not quite enough of them according to the rule of the order, he had to wait till the Pope supplied the deficiency by a dispensation, and was not formally invested till three years after.

Another interesting copy of this master, by Philips, is the portrait of Alonzo Cano, the fellow pupil of Murillo and Velasquez, distinguished equally as a sculptor, a painter, and a hater of the Jews. It is a fine, squarely-painted, impetuous-looking head, and the touch of Velasquez is wonderfully imitated in it.

Of Cano's work in painting we have a

* No quiso el ciel que hablase
Porque con mi entendimiento
Diese mayor sentimiento,
A las cosas que pintase
Y tanta vida les di
Con el pincel singular,
Que como no pud? hablar,
Hice que hablasen por mi.

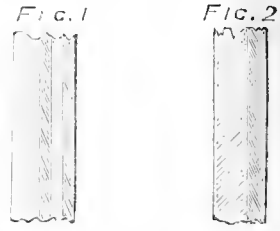
glorious "Assumption," in No. 95. Simply posed, almost statuesque, the Virgin ascends to heaven, the moon under her feet, and surrounded by rays of heavenly light, with a crown of stars about her head, represented in a most wonderful manner, showing great knowledge of both form and colour. Another very fine painting here, (358) "St. Theresa penetrated by Divine Love," is attributed to him, but is unlike him in sentiment. The expression of the face of the saint is very admirable, and the hands are beautifully painted; but a little Cupid, with a red-hot arrow, is scarcely the way of symbolising Divine love the painter of the poetic Assumption would have chosen. To Murillo upwards of twenty works are ascribed here, and a large part of them we are inclined to think original. First in the catalogue we find Mr. Staniforth's "Holy Family," a picture well-known by Boydell's engraving, and full of exquisite pathos. St. Joseph brings his infant Lord to His mother, who is seated on the ground beside His cradle, and the loving manner in which He stretches out His hands towards her is childlike and pure in the extreme. The weakest point in the picture is the figure of the Blessed Virgin herself, which is not equal to Murillo's usual conception. Lord Warwick's "Laughing Boy" (329) is not a good specimen of the master; the drawing is admirable, and the foreshortening of the hand pointing out from the picture is wonderful in drawing, but the difficult expression which decides the point between laughing and crying is not well caught, and it lacks the full rich *impasto* of Murillo's best work. The finest example here is one of unusual brilliancy and merit: it is a large picture, and will be found in the Dudley Gallery (2,901). This is the death of Santa Clara, painted for the Franciscan convent of Seville, about the year 1644, and consequently an early work of the master. It is pure as a Greek bas-relief in its arrangement, and from its admirable architectonic character of great decorative quality. On a pallet, surrounded by her dark-clothed brothers and sisters of the Franciscan order, lies the dying saint, the foundress of the "Poor Clares" of to-day, her face radiant with the light of that Vision she saw, and which Murillo has demonstrated to our eyes; for, attended by white-robed saints, our Lord and His Mother come to receive her parting spirit, and, as her soul leaves its earthly tenement, angels spread upon her bed the mantle brought from heaven as a token of their visit. The contrast between the dark earthly side, where Death reigns triumphant, and the etherial beauty of the one leading to Life Eternal is poetic in the extreme, and, saving that the artist found his hand stayed and his power fail him when he essayed to portray the features of his Redeemer, the work is perfect. In this portion of the exhibition will also be found Lord Dudley's exquisite St. John and the Lamb, from the Salamanca collection, a work of world-wide and well-merited fame. That Murillo could paint the seen as well as the unseen world, Lord Godolphin's "Beggar Boys" (383), and Lord Dudley's "Old Gipsy Woman" (2,926), show, and if further proof were needed, we could point to the five pictures forming a portion of the series of the Prodigal Son (2,917-2,921), where the parable is told with all the force of the vernacular, being related as incidents in the life of a young man of Murillo's own time. The sixth of this series was presented to the Pope by the King of Spain, and is now in the Vatican, but there is a replica of it in England, in the gallery of Stafford House, and if not too late we should still be glad to see it here, in juxtaposition to these other chapters in this history. Perhaps the most interesting work from Murillo's hand is his own portrait, taken shortly after his recovery from an accidental fall from a scaffold whilst painting the large picture of the espousals of St. Catharine, over the altar of the Capuchins there. It (324) presents to us a thoughtful face, sallow, and still bearing traces of recent illness, and, as it looks out to us from its frame surrounded by the implements of the craft he loved, we feel that the portrait of a man not only great but good is before us, and we can understand his works the better from having seen it. His St. Francis (348) and his St. Anthony (362) are admirable specimens of his work, but the other contributions are many of them very doubtful, some of them poor copies, and some of them too bad for that. With Murillo ends the exhibition of the Spanish school of painting, and we have not the pain, as in the Italian school, of seeing the struggles of its decadence. It is a school short in duration, but very vigorous whilst it lived, and one which impressed itself strongly on the artists who laid the foundations of our own. Indeed, it is somewhat singular that one of the earliest painters we read of as working in England was Petrus de Hispania, who wrought at Westminster in 1253, and the later schools of Spanish reacted on those of the Netherlands, and thus greatly influenced the establishment of our own.

ZINC AS A CONSTRUCTIVE MATERIAL.—II.

FROM what has been previously stated, it is evident that in order to prevent the accumulation and subsequent growth of vegetation upon the bottoms of vessels, it is indispensable that the sheathing should be susceptible of gradual dissolution in the water. The whole theory of the arrangement depends upon this preliminary proviso, and vessels can be covered with both copper and zinc in accordance with its dictates. Where the former material is employed, the iron outer skin of the vessel is first covered with a preparatory coating of some non-conducting mastic or varnish. Over this is laid a thin layer of sheet lead, which receives the copper sheathing. There are therefore no less than four outside layers, including the iron skin, as represented in the section in the cut. By these means the copper is completely isolated from the iron, and behaves itself in the water as laid down by the theory. This method has been advantageously applied to armour-plated vessels in the French navy, and has arrested the corrosion of the plates. Theoretically regarded, this system of sheathing leaves nothing to be desired, but in practice there is room for doubt. Omitting the question of cost, which, it is needless to say, is excessive, let us examine a little into the construction. A glance at fig. 1 will show that the copper is separated from the iron by two thin coatings, one of a metallic and the other of a resinous description. So long as the separation or discontinuity of the two dissimilar metals is preserved, so long does the arrangement continue perfect, but if by any sudden shock or violent concussion the insulation be broken through, if the smallest rent, or even a mere line of communication, be established between the iron and the copper, a galvanic action is at once set up. Of all examples of construction a ship of war is the last one we would select as likely to be free from the effects of impactive force. The intercommunication once effected, the copper becomes the electro-positive and the iron the electro-negative element, and the corrosion and destruction of the latter proceeds with all the rapidity and vehemence characterising all operations of an electrical character. Beyond the loss of the metal, and the cost of repairs the corrosion of the iron plates would not signify, provided the vessel was built of wood, but if she were altogether of iron it might lead to dangerous consequences in the shape of serious leaks. The cost of sheathing a vessel in the manner described is reckoned at about £3 the square yard, and six years may be fairly taken as the period it will last without renewal.

The theoretical conditions governing the sheathing of vessels are equally well fulfilled when zinc is the metal chosen as with the preceding material. Fig. 2 represents a section of the zinc sheathing over an iron skin or plate, and we at once perceive that the construction is much simpler than that of fig. 1.

FIG. 1 FIG. 2



Instead of four, only two layers are required, and, contrary to what is necessary in the case of copper, they must be in contact instead of being insulated. Moreover, the zinc sheathing need not be watertight; in fact, the reverse must take place, and the iron come into contact with the water in order that the current may be established. The action is very simple. The zinc becomes positive with respect to the iron, and is slowly dissolved, while the other metal remains intact. The price of bottoming a vessel by this method is about 12s. the square yard; and if the thickness be ⅛in. the metal will last about the same time as copper. This method of utilising zinc is due to M. Daft, who tested the principle at Portsmouth by immersing in sea water for a period of a year and a half a number of iron sheets coated with zinc. These sheets were subsequently raised out of the water in the presence of an Admiralty commission, and were found to be altogether free from every trace of marine vegetation. It was in consequence of the undoubted success attending this prolonged experiment that it has been determined to apply the process of zinc sheathing to some of the iron ships in our own navy. The annual expense per ton incurred by zinc bottoming may be put at about 3s. 5d., while the cost is exactly double when copper is the material employed. A difference in the annual expense must be noted accordingly as the vessel is built of timber or iron. A vessel that is built of wood will exceed in annual cost one that is built of iron by 25 to 30 per cent., as the zinc sheathing is not affected under the most favourable circumstances. It must be borne in mind that the annual cost, or what amounts to the same, the annual wear and tear, of the zinc sheathing is independent of the number of voyages, or of the work done by the vessel. The operation of dissolution proceeds equally as fast in the harbour as in the open sea, and forms a powerful inducement to the owners of vessels to abridge their stay in port as much as possible by employing every means to facilitate the unloading and reloading of their cargo, and also to reduce the length of each voyage to a minimum, so as to obtain the maximum number in the same year. There is scarcely any nation, if we except our own, which has a sufficient number of dry docks to accommodate its commerce, and vessels requiring to be docked have frequently to wait some time before they can get in, owing to the place being occupied by a previous tenant. An iron vessel, zinc bottomed, which requires to be docked only once in about six years, enjoys an immense advantage over its neighbours, which have to undergo the operation three or four times during the same period.

For roofing purposes zinc has been in use now for some years, and it unquestionably possesses the merits of lightness and cheapness. All metallic roof coverings enable a much lighter description of framework or trussing to be employed than with slates or tiles. An exception must be made in the case of cast-iron sheet roofing, which was applied to the Houses of Parliament, although the exact object of selecting it in preference to a lighter material is not quite evident. In this description of roof there are no inter-

mediate rafters, the cast-iron sheets being sufficiently large to span the entire distance between the principals, and are secured to them by screws. A very good example of the application of zinc to roofing generally may be seen at the Museum of Building Appliances, in Maddox-street, where the Vieille Montagne Company exhibit their method of uniting zinc with slates. There is one piece of advice we would offer to all those who patronise metallic roofing, and that is not to choose the thinnest description. If gutters or ridges be selected of too small a gauge, they will never keep their proper lines, and nothing looks so bad as a broken and uneven ridge or gutter. If a very thin and light gauge of metal be chosen, additional care must be observed in the fixing, and extra timbers must be introduced in the framing to obviate the liability to sag. It will be more economical in the long run to select metal of a thickness that will never get out of line, and will require the least amount of timber to support it. Owing to the facility with which zinc can be worked after having been once subjected to the kind of annealing process we alluded to at the commencement of our last article, it is exceedingly well adapted for ornamental work, as it bends itself readily to any shape that may be given to it. The ornamental portion of the roof of Charing Cross Hotel is of Vieille Montagne zinc, and it has also been used in the new mansion upon the Marquis of Westminster's estate at Pimlico. For scroll and ornamental work this metal is perhaps better adapted than any other. There are obviously many substances—asphalte, for instance—which, while they admirably fulfil all the duties of their position with respect to solidity, strength, and imperviousness to water, yet would be manifestly out of place when applied to what might in comparison be termed "filagree work." Zinc roofs will answer in almost any situation, except where they are exposed to corrosive action. We should not advise their adoption in the case of an engine shed, or where the fumes of sulphur were likely to attack them. The same argument also holds against the employment of galvanised iron in similar situations. Against the ordinary effects of atmospherical influence, both these descriptions of covering constitute admirable protecting agencies.

ART PRACTICE AND ART SOCIETIES.

IN venturing to follow up somewhat more into detail, without which nothing practical can come, this great subject of art action and practice, it must be borne in mind by the reader that we are speaking at present to a very limited audience, the guild of professional artists—the public knowing nothing whatever about it further than this, that fine art is not to be had except out of a curiosity shop or from an auction room. "It would seem impossible," says the leading journal, "to produce, in these modern days of ours, a building thoroughly fit for its purpose, or expressive of modern wants and feelings." This opinion the general public instinctively endorse; they cannot get what they think they want—they know not why, and if they ask this emphatic "why," it is as much as we can expect from them. It is for the artist himself to both ask and answer. But before this is done it is necessary to bear in mind that the whole of the institutions now so busily devoting themselves to art and its diffusion and so-called improvement, divide themselves into two distinct kinds—viz., those which take upon themselves in some way or other to teach, and those which place before the public or exhibit the results. The antiquarian and archæological societies, the architectural societies, and a number of others, teach and endeavour to propagate art by lectures, book-lending, exhibiting collections of art objects, and other ways; but all having in view the one common object—the diffusion of art knowledge. Nearly all our art societies are of this kind; it is only here and there, almost by accident, that the second kind of influence, and the one thing needful, has any existence at all—the exhibiting of art results. If the Royal Academy could sell all its pictures every year before they were painted, then it may well be doubted whether there would be any annual Academy exhibition of paintings or results. The public would know nothing about it, any more than they do of the proceedings and doings of the Royal Antiquarian Society. Cabinet oil painting is all that is to be seen of genuine *bonâ fide* art work, for neither sculpture nor architecture is ever to be found as the results of personal artistic power. It is only within the last year or two that another society, the "Society of Arts," has practically attempted anything in this direction of art results; and, judging from this year's annual "report" of that society, it would seem to be about to abandon it, for the report says:—"The time has arrived when animation might be given to future competitions by a considerable change of programme. Especial prominence might be given to evidence of ability in processes not commonly practised in this country—such as several of those involved in the manufacture of Venetian glass!" and again in the process of "damascening both after the Milanese and Oriental systems!" Surely if our dull, stupid, and uneducated workmen cannot be interested in, and induced to contribute towards, exhibitions of specimens of work they do understand and work at day by day, what sort of chance can there be of such people, in such a state, manually and mentally producing objects so difficult as these, and of which they know nothing—not even the names! Our ordinary workmen, as things are, do nothing; no evidence of their ability to produce the most ordinary and common things artistically is anywhere visible; how, then, can they be expected to even distinguish between things so out of the way and utterly foreign to them? It may be interesting to note that of all fine art in metal, perhaps the best now produced by our workmen is the engraving or chasing on gun-locks. It is mere matter of routine, and consists of scrolls and dots, and means nothing whatever, but still is sometimes very well and cleverly executed; so that we can but imagine a workingman in some obscure attic being taken from such a work as this, and then ordered to "damascene the gun-lock after the Milanese system, but at the same time not to allow his knowledge of Oriental damascening to interfere with its purity." It seems to me not a little unkind, not to say cruel, to ask of such men work impossible for them to understand or to execute, and then to complain of failure, and abandon the scheme as impracticable, or, what perhaps is worse, give the prize to a foreigner, to whom the work is not altogether strange, and then tell the world that "as compared with the French art workman, the English artificer is somewhat deficient." How can he be otherwise? If, then, any one will be at the trouble of considering this important subject, not only as regards the workman but the artist—the distinction between them consisting mainly in social position—he will but too soon find out that the societies now devoted to art fail in the very first requisite of an art society, if founded on natural and reasonable principles—viz., that it should be the medium through which the art energy and capacity of the time and country are made manifest to the public eye. It is one thing, and a comparatively slight one, to collect and help to the appreciation of old and obsolete forms of art; it is another and infinitely more important one, to help and adequately show forth the existing and living art of the time, and the individual artistic power of each artist. It will be useful to sketch out roughly what such a society should be, and its proper mode of action in accordance with the principle above-named. It can do no harm if it does no good, and will be at least a single protest against the present universal system of art action through subordinates, whereby the public never will or can, while it lasts, see what the artistic power of the time and country is, and what it is worth; and at the same time lose entirely the power and work of what are now called the inferior artistic powers—of those who now destroy each other's work, whatever it may be, in the very act of working together as subordinates. It is one of the most curious of modern problems. The Pugin and Barry controversy, and the Law Courts competition, by pointing to individual art power, and to the giving to the working artist his natural and inalienable right—the credit of his own work—have directed public attention to it in a way that cannot be mistaken.

C. B. A.

THE GROWTH OF LIVERPOOL AND ITS ARCHITECTURAL RESULTS.*

THE growth of Liverpool has been among the marvels of the age. Scarcely less wonderful has been the carelessness of the authorities as to the manner of its growth, and the quality of its accretive matter. The wealthier classes having for many years past resided outside the town, its extension in every direction has been mainly by the erection of dwellings for the poorer classes; and this having been left to men profoundly ignorant of art and with hardly an idea in their heads, art has not only been left out, but a degree of meanness and wretchedness has crept in that would not have been thought possible in a place originally so beautiful—wretchedness which I sometimes fancy may not be quite innocent of some of the suicides that have been so frequent of late. This is still going on, and though the business part of the town is constantly improving, yet Liverpool, as a whole, is daily growing uglier—increase of builded area being proportionate decrease in art, till the leaven of real architecture amongst us will be as nothing compared to the size of the place—"One poor halfpenny worth of bread to all this intolerable deal of sack." But let me give you some idea what the town was once, which I can best do by quoting from an article which I furnished to the BUILDING NEWS some two or three years ago.†

I should not, however, have brought the matter before you but for the impression that these things have been growing worse of late, and that at no former period have such houses been built as are now obtruding themselves on the pleasantest and most respectable neighbourhoods. Assuredly, a more melancholy contrast was never presented in architecture than is at this moment presented in the locality from which I write (Everton) between the character and quality of the buildings they are demolishing and those they are constructing. The former were among the finest brick buildings in the land, the pride and ornament of the place; the latter would be a disgrace to the South Sea Islanders. I am quite sure the New Zealanders at least would build for themselves, with the same means and materials at command, more pleasant-looking, less heart-sickening habitations than those now rearing in the new streets leading off from Church-street, Everton, which have been built on the upper soil or mud, without the ceremony of trenching for the walls, and which appear, from the short distances at which I viewed them, more like a superior class of pigsties than abodes of humanity. A walk along the street just named—Church-street, now called Heyworth-street—which is one scene of desolation from end to end, will convince you that I am not exaggerating. The evil is not confined to Everton. Every beautiful and retired spot of private residence, in whatever direction in the town—north, east, or south—is in course of destruction; and there is not a private house, or private neighbourhood anywhere, however fashionable, if there be any unbuilt land about it, but is in danger of being at any moment made valueless for quiet and genteel abode by the invasion of the Welsh builder and the Cambrian style of architecture. Though it is a relief to me to give vent to my feelings on this subject, yet I have but little hope

* Read by SAMUEL HUGGINS, Esq., before the Liverpool Architectural Society.

† Vide BUILDING NEWS for 1865, page 402.

of any effectual remedy for the evil being forthcoming. A new building act may do something: but nothing less than the extension of legal protection to certain neighbourhoods will be effectual —protection by laws, which would be no more inimical to the proper and rational liberty of the subject than those that are enacted against theft. Without this classification, the hope of anything like equal and uniform architectural beauty in town or suburb is vain. The remedy I mention has not been, and probably will not be for some time, applied, owing to the ignorance of and indifference to architecture that everywhere prevails, and which pervades all classes alike, from the highest to the lowest, and is operating prejudicially on the character of most of our towns and cities. A striking instance of them is exhibiting at Chester, which has lately exchanged some of its characteristic and best Italian buildings for the direst abortions that ever insulted the eye. I allude, in reference to the former, to the Royal Hotel in Eastgate-street, to another hotel in Bridge-street, and to a noble brick mansion approached from St. John's Churchyard, all of which have been destroyed within the last two or three years; the two former to make way for buildings which are actually painful to behold, and the latter in the process of providing a new palace for the present bishop. This is not the worst; the cathedral itself seems in danger of some injury, and has been already roughly handled by the new dean, in the course of carrying out some new preaching arrangements. Dr. Howson, I am quite sure, will in other ways do honour to his new appointment and to the Church; but, from what has already occurred, the friends of art have reason to tremble for the material church in his hands. It is under the impression that it is the duty of these to raise their voice against the profanation that I now venture a word in behalf of the venerable pile, the nave of which, hitherto unbroken by bench or pew, is dotted all over with a myriad of little bedroom chairs of the meanest and slimmest description, furnished by the maker, I am told, at 1s. 9d. apiece. If the choir and south transept called St. Oswald's Church, both of which are very spacious, do not furnish sufficient accommodation, and the nave, all unfitted as it is for Protestant worship, must be used for the purpose, surely it might nevertheless have been treated with a little more of the respect that is due to every genuine example of art. There is talk of restoring the cathedral, which to the ear of an artist, as it will probably involve the entire recasing of the building, simply means destroying; destroying its antiquariau and historic interest, and picturesque beauty.

But we must return to our good old town; not to the part we left, but to that other more favoured portion of it on which the hand of improvement may be traced. The most important operation in the central part of the town has of course been the erection of the new Exchange building. In a former notice of this I blamed it for its departure from the style of its predecessor and the Townhall. But on a review of it the other evening, I was glad to perceive an advantage resulting from the altered style which had escaped me before, namely, an assimilation with the chief buildings around it, which was wanting in the old one, and by which the several hitherto dissevered blocks of commercial buildings are united into one continuous series. The new Exchange links, for instance, Mr. Cockerell's block on the east of it with Messrs. Picton and Sons' on the west; and so of others at the northern extremities, till there will, when it is finished, be a complete district of fine commercial structures, all in perfect accord, and unmistakably commercial in character, that I should think the metropolis could alone parallel in this country. The effect I have pointed out struck me as a very important and happy result of this great change in the heart of the town, though obtained at the expense of leaving in widowed loneliness the Townhall. The decrease of unity or harmony of style in the Exchange area is compensated by increase of architectural truth.

The widening of Church-street is an improvement worthy of the cost, however great that may be, and was becoming inevitable. Let us hope that the new side of the street will emulate the example opposite of the renewed Compton House, which it is only just to say is an excellent specimen of shop or commercial architecture. I would only add on this subject that the church, though rendered more prominent by the alteration, will be no eyesore, if its back and side grounds receive the needful attention. Its venerable appearance will be sufficient apology for its prolonged existence. This reminds me that there is one class of public structures in which Liverpool has made less advance than in any other—I mean the ecclesiastical; for some of the earliest churches and chapels are to this hour the finest. Such are St. Paul's in St. Paul's-square, and St. Nicolas's, as far as the steeple is concerned. It is remarkable that these buildings, both of singular merit and beauty, should have been inoperative on the composition and character of subsequent edifices. St. Nicolas's steeple has an aerial lightness and grace which is highly befitting, and which no spire since erected in Liverpool at all approaches; and shows a more correct appreciation of the true nature and aim of fine-art architecture than any other object of its class in the town.

It is still more remarkable that St. George's Hall should have had so little influence on Liverpool architecture. In contemplating the exquisite beauty and capability of the Greco Roman architecture of that building—which, by the way, begins to exhibit something of the softening hand of time—I have felt surprised at this till I have remembered that it requires highly educated taste to appreciate such architecture. But if the architects of Liverpool had been true to their instincts —if art, and not fashion, had been their mistress —such an example before their eyes, of a style of the perfections of which our ideas have been greatly raised of late years, would have had a very traceable and happy effect on their works. Assuredly, no man who has really felt the beauty of the architecture exemplified in this building could tolerate, much less perpetrate, the coarse, cheap modern applications of the Gothic that we see daily rising up around us—a style beautiful in its enriched and sculpturesque examples, but incapable, at least in the state in which the mediævalists left it, of embodying beauty on other conditions. An unadorned column is, or may be, like beauty's self, when unadorned, adorned the most; but a naked buttress is a monstrosity, without relation to the beautiful in nature, and which no magic of position or combination could raise into the heaven of art. The sculpture and panelling of its best examples are but to disguise its ugliness. Our local art critics are ever discovering some new fault in the building in question. Faults it has, but its chief fault is that, standing where it does, it is not, nor ever can be, in full harmony with the busy neighbourhood and prosaic life about it. Such a building should be accompanied only by palaces, churches, and halls in its own grand style, and participating, more or less, in its own grand repose, and with glimpses between of the green, peaceful world of pure and beautiful nature stretching far around it.

I am more than ever convinced that the architect, to be true to his vocation, must, whatever style he affects, be inspired by the sure beauty of the Greek architecture and sculpture; which is to be his guide to the highest possibilities of his art. To pursue the Gothic style in the spirit of the times alone that produced it, and without reference to the higher standard of excellence presented by the glorious remains of Greece, is to ignore the noblest means of progress that the ages have bequeathed to art; and is as absurd as it would be for the engineer to turn his back on the mechanical powers, and trust to the unaided strength of his arm. It is the lever that is yet destined to move the architectural world. Let me express once more my belief, my deep conviction, that the true path of progress in our art is in the cultivation of an Anglicised and purified form—purified, I mean, by reference to Greek examples—of the style which we inherit from the Romans, through the Italians, and which never ceased to be practised in the art-home of Europe —Italy, whence it spread, along with other elements of civilisation, into the different countries of Europe.

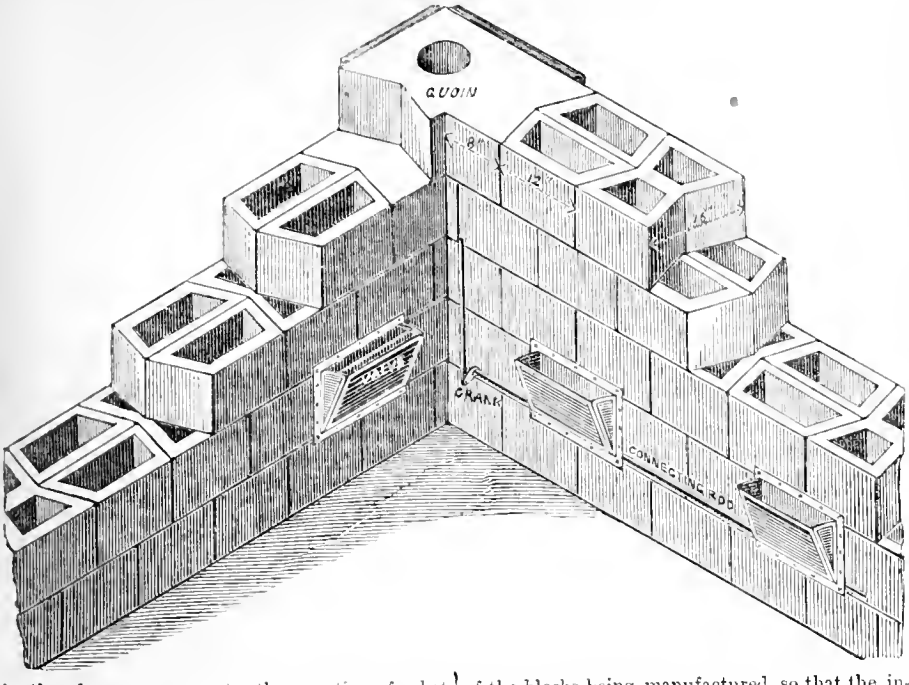
I have leaped from St. Peter's Church and Church-street to St. George's Hall. While there let me give a word or two to its surroundings. I think sculpture should not be strewed about the area while the building itself has need of it. The latter, I fancy, might legitimately receive statues of the Queen and Prince Consort as decorative features completing the design; indeed, such positions as the apex of a pediment or acroteria—positions decorated in ancient examples by gods and heroes, and in modern ones by prophets and apostles, would be very honourable ones for memorial statues. The two pedestals above the east portico might even receive equestrian statues At the demolition of the Railway façade we need, for obvious reasons, express no regret. It is only a pity the scheme of destruction had not included the Wellington Column, than which there is, perhaps, not among the relics of the tenth century, in the darkest corner of Europe, an object more truly barbarous. Whether the intended colossal hotel, with its some half score storeys and its thousand and one bedrooms, will be as innocent of injury to its *vis-a vis* as was its predecessor, remains to be seen. Law, music, the drama, literature, and natural history having now their part in this fine area, it is to be hoped the remaining portion at the north end will yet be given, as seems meet, to painting and sculpture in the proposed new Fine Art Gallery; which is, indeed, necessary to wipe off the reproach to Liverpool of being without an annual exhibition or Academy of Art.

THE WEST DERBY SEWERAGE DISTRICT.

THE West Derby Local Board having already expended £30,000 on sewerage works in laying out a system of mains within the township, have brought these mains to certain points from which either an outlet to the sea might be made, or some system of utilisation might be adopted. Before moving in the matter they very wisely this week convened a meeting for the purpose of meeting Mr. Rawlinson, C.B., C.E., and hearing his opinion as to the best course to be pursued.

Mr. Rawlinson said this sewerage question, as they were aware, was a very important one. He did not know whether they were tormented in this part of the country in discussing rival schemes of the dry-earth system and the water-closet system, and he did not want to enter into them unless he was questioned about them. At the same time he said that the dry-earth system did not stand a shadow of a chance compared with the other system. It was in operation in Wakefield gaol, where it was said to answer very well, and also at some asylums; but what was convenient at works or at a gaol, where everything was under regulation, was not applicable to private houses. He predicted wherever it was put into operation it would fail. Up to this time, in this country, we got rid of sewage by draining into the nearest watercourse if inland; and if the river was of small capacity and with a sluggish current, and it had to pass a population, an abominable nuisance was inflicted upon them. That might be seen all along the length and breadth of the West Riding of Yorkshire and in Lancashire, and nothing more abominable than the rivers and streams in these counties could be conceived. As they were aware, the utilisation of sewage was very much spoken about and beginning to be practised. He had served eight years as a royal commissioner to inquire into the utilisation of sewage, and he had served also three or four years as chairman of the River Pollution Commission, and he supposed should know something about it. West Derby was situated, he could not say under peculiar circumstances, but they were so far peculiar that they were much nearer to the river than to their outlet. There was a ridge of land running along between the river and the main portion of the township which shed the rainfall back inland. It was proposed in some cases to utilise the whole of the sewage upon land, but there were difficulties in this climate, as there were times and seasons when there was more rain than they knew what to do with. There was a difficulty of getting rid of the surface water at such times. It was quite true they might put the sewage on the land and even with some advantage, yet scarcely with the advantage that would pay the cost of pumping, and if they tied themselves up with the pumping scheme they must everlastingly pump. If they tied themselves up with the deodorising scheme or utilising scheme, they must see that in future there was very little chance of their being enabled to extend their operations beneficially; and if it resolved into a disinfecting scheme, then he had no hesitation in telling them that they might make a clean sweep of any idea of profit, and lay themselves out to a growing and annual cost. To take the solids out of the sewage—and he would not say disinfect the sewage, for no means had yet been discovered that would disinfect water turned into sewage, but they might use chemicals that would reduce the chance of fermentation to the minimum—would cost that township, with its present population, from £1,500 to £2,000 a year, and they would still have an intolerable nuisance at the point where it was carried on. With regard to the figures of the chairman, he had every confidence in them, and

RANSOME'S HOLLOW BUILDING BLOCKS.



he therefore now came to the question of what was best to be done. He then spoke in recommendation of the fourth line mentioned by the chairman, and said if they got an outlet to the sea at that point he did not believe they would ever be charged with polluting the river. He thought if they did that they would have solved the difficulties as regarded themselves, and they would be safe for all time to come.

Several members of the board expressed themselves in favour of Mr. Rawlinson's opinions.

It was also decided to call a meeting of the main sewerage committee at an early date, to report to the next board meeting, and, judging from the expression of opinion at the special meeting of the board, they will no doubt recommend that the outlet scheme should be adopted and at once commenced to be carried out.

RANSOME'S HOLLOW BUILDING BLOCKS.

THE above illustration represents a method of constructing outside walls for buildings. These blocks are manufactured by Mr. F. Ransome, the well-known patent stone manufacturer.

The advantages to be derived from this method of building may be thus briefly described:—In the first instance it would introduce a simple and most effective means of ventilation, for the wall, being hollow and partitioned in its thickness, would contain within it two distinct columns of air; it is evident, then, that the sun's rays, falling on the outside of the wall, would rarefy the air in the exterior flues, thereby causing an ascending current, and exhausting the vitiated air through valves placed near the floor line, or any other point which might be considered best to ensure good ventilation. At the same time fresh air would be admitted through the interior flues and near the level of the ceiling by means of valves placed in the exterior of the walls at a certain elevation above the ground line. These valves might be arranged so as to be perfectly under command from the inside of the building, and capable of simultaneous adjustment by an arrangement of rods and levers.

The description of valves shown may not be the most suitable, but they serve to illustrate the principle as well as any other. It may confidently be expected that there would always be sufficient difference between the temperature and specific gravity of the atmosphere within and without the building to maintain efficient ventilation. The area of the air spaces might also be under perfect control, so that violent and injurious currents could be obviated.

Secondly, by this method of construction, great facilities would exist for ensuring dryness and improved decoration. From the fact of the walls being hollow it is quite clear moisture could not be absorbed so as to pass through to the inner surface, and, as the nature of the material admits of the blocks being manufactured, so that the interior walls may present a perfectly smooth surface, it does away with the necessity for plaster; the only finishing necessary would be to rub down the walls with a piece of the same material, and wash them with clean water applied with a common whop stock brush.

And, thirdly, there may be claimed for it considerable strength, together with speedy and economic construction. It is evident the strength of a wall thus constructed can scarcely be exceeded, the quoin stones being set last, and forming at once the key and closure of the building; it would be impossible to remove a block without destroying it. This plan of dovetailing was successfully introduced by the author of the mode of construction we are now describing about ten years since, in the erection of the stone solitary cells of a large penal establishment in the colony of Victoria.

These blocks, from their uniformity and accuracy, could be set with great rapidity; they could be made of any size, suitable to the designs of the architect. Blocks of the size shown in the drawing are equal in cubic contents to fifteen standard bricks, and in all probability they would not take longer in setting, if so long. Presuming, then, that the first cost of production would not be excessive, that plastering and other finishing would be saved, whilst at the same time a simple and effective mode of ventilation would be introduced, this mode of construction, taken as a whole, recommends itself to notice on the score of its own merits, and, as we have before stated, it would appear especially applicable for India and other tropical climates.

This method of construction also offers the advantage of a durable stone building at a comparatively cheap cost, as a saving may be effected in the carriage of the blocks on account of their lightness. When desired the cells can be filled in with cheap concrete, either wholly or in part.

PORT ERIN BREAKWATER.

A CORRESPONDENCE has been published which passed between the Board of Trade, the Governor of the Isle of Man, and Mr Coode, the civil engineer, relative to the alleged failure of the great breakwater now in course of construction at Port Erin, Isle of Man. The principal statement in that correspondence was that the rubble mound at Port Erin had been so destroyed by the great gale of the 22nd of February last, that the cost of the construction would be increased from £58,200 (the original estimate) to £70,200, being an increase of £12,000. The subject is causing anxiety in the Isle of Man, inasmuch as the local legislature recently decided on expending close upon a quarter of a million of money in the construction of similar works at Douglas. It is now held that, if the rubble mound principle has failed, or say partially failed, at Port Erin, there is nothing whatever to prevent a similar catastrophe at Douglas; and, therefore, some other principle for the construction of the proposed works at the latter place will have to be adopted. Another batch of correspondence on this subject is also published. The first letter is from Mr. Quirk, the Receiver-General of the Isle of Man, and chairman of the Manx Harbour Commissioners' Board. This letter, after referring to the previous correspondence, states that the commissioners recently passed the following resolution:—"That before the board can form any opinion or come to any conclusion on the subject discussed in the correspondence, it is advisable that a diver be engaged, at the instance of the board, to examine the state of the rubble mound at Port Erin, and to report as to its state and condition, and the state of the ground in its vicinity." The diver (a Mr. Seldon) carried out the instructions contained in the above resolution, on the 19th ult., the diving operations being conducted personally by seven of the harbour commissioners. The diver's report was looked forward to with great anxiety by those interested in this matter. It is addressed to the Receiver-General, and is as follows:—"I have the honour to inform you that, according to your directions, I went to Port Erin harbour works on the 19th instant, and by means of the diving apparatus examined the breakwater now in course of construction. I dived from a boat moored over the rubble mound. The harbour commissioners were present, who instructed me from time to time as to my movements. I walked over the mound at several parts, and around the mound on the sand. I found the mound entire, with green seaweed grown over it, and the sand around the foot of the mound was clear of rubble." The concluding letter in the correspondence is from Mr. Coode. He expresses his satisfaction at the result of the diver's examination, and then goes on to state that, on the 27th of February last, the day on which the local legislature decided on the Douglas works, he did not know exactly the effect of the gale of the 22nd of February on the mound, but he fully believed that the sections submitted to the court (which showed the rubble mound comparatively uninjured) were "correct." "It was not until the month of April that the sea became sufficiently smooth to allow the taking of such a series of soundings as was necessary to make a complete set of sections; and it was only then discovered that the wave action had extended to the depth of 19ft. below low water in the gale of the 22nd of February last." The diver's report has been regarded by the harbour commissioners as so very satisfactory that Mr Quirk states that they have come to the following conclusion:—"That the current report of the rubble mound having disappeared from its position was an unfounded one, but that rather it was comparatively in a satisfactory state."

THE SOLID LEVER BRIDGE.

THIS bridge, in its essentially original features, is the invention of Messrs. Cottrell, Liscom, and Merrill. These features may be best explained by describing the mode of construction, as we find it in the *American Railway Times*, and which is as follows:—In throwing a span from one abutment to another, the first step of all is to lay down upon each abutment a timber projecting over the edge of the bank a short distance. The length of the portion of the structure projected over the chasm is to that portion upon the bank (which is the balance power) as ten to three. Upon the first layer of timber is placed another, extending further, and firmly trenailed to the first, each successive course projecting further outward over the chasm, and well secured by bolts and trenails, so that when by successive projections the final layer is brought to reach the middle of the span and unite with the corresponding lever from the opposite side, it presents a well-proportioned lever, nearly as solid as if sawn entire of one piece, its projecting weight balanced by that portion of the lever resting on the abutments, and the two united and strengthened by two or three additional courses laid over all. The two levers thus making the sides of the bridge are connected by girders, or floor timbers, on which the flooring is laid—the shore ends bound together to form a cradle for the reception of ballast. Thus completed, a span of 200ft. would reach back 30ft. upon each bank, and a span of 500ft. 50ft. back. Over this structure two wooden arcs are placed, of slight and graceful curve, united and securely

fastened to the main structure by upright iron rods, and abutting in the shore ends of the bridge.

The advantages of this bridge may be stated thus:—1. Economy and facility of construction. It is claimed that an almost unlimited length of span is attainable, and the building of piers, which in deep and rapid rivers are very costly, and which obstruct the navigation, is avoided, and the cost of scaffolding saved. The plan of construction is such that any carpenters and blacksmiths can furnish the materials and do all the work. 2. Strength.—From the peculiarity of the structure, being lightest in the centre, all the material bears its true proportion of strain, and there is no waste, and the distribution of the component parts makes them all act at the greatest mechanical advantage. The sides of the bridge being levers balanced by the shore end, the bridge is relieved of the necessity of sustaining its own weight in the centre, where an ordinary truss-work sags the most; and being very light in the centre there is no unnecessary strain upon the balancing or shore end. 3. The arch adds great compactness and increases the strength of the whole in a peculiar manner. Like any other arch it thrusts laterally against its abutments, but its abutments are the two ends of the bridge into which it is built, and it thus forms with the stringcourses of timber a wooden bow with a wooden string. In order to spread this arch, the chord or upper string timber would have to be dragged apart by longitudinal strain. Thus there can be no deflection of the bridge after it is well set together. It is this combination of the arch on the one hand, with the re-enforced lever on the other, which gives this bridge a strength immeasurably superior to that which the same amount of material would give when arranged in any other form.

In the Iron Bridge, patented by the same inventors, and involving the same principles, the strength attained is practically illimitable. A model of this, 32ft. in length, is exhibited at the office of the Solid Lever Bridge Company, 46, Congress-street, which illustrates this. The advantages of a cheap, easily constructed, and strong wooden bridge are manifest to all—but those connected with railways are best aware of the immense importance of cheap and strong iron bridges. The obstruction of the western rivers by piers is so serious an impediment to navigation that this invention becomes of the utmost importance, and comes just in time to solve the problem of how the railways are to cross the Upper Mississippi and Ohio rivers, without navigation being destroyed. This is a matter of national interest, and is now engaging the attention of Congress. The new invention promises to reconcile the objection, and provide at a moderate cost the means whereby river navigation may be preserved, and railway communication across them be attained.

TURNPIKE ROAD TRAMWAYS.

WE have received from Messrs. George Remington and Son, says *Engineering*, a brief description of their plan for laying down tramways along the turnpike and other direct roads from London to most of the principal towns of England, and a company is proposed to carry out the first division and to lay down tramways from Kilburn, by Edgware, to St. Alban's, and from Holloway, by Barnet, to St. Alban's, Dunstable, Fenny Stratford, Stony Stratford, Towcester, Weedon, following the Old Roman Watling-street, by High-cross, Atherstone, Wilincote, Fazeley, near Tamworth, to Lichfield, and thence by the most direct roads through Rugeley, Weston, Stone, Newcastle-under-Lyme, Sandbach, Middlewitch, Northwitch, Altringham to Manchester, and by Warrington and Prescot to Liverpool, with collateral lines from Lichfield, by Burton-on-Trent, to Derby, Nottingham, and the Midland coalfields, Sheffield, Halifax, and Leeds; from High-cross, by the Roman Fosse way to Leicester, Newark, and Lincoln to York; from Weedon, by Daventry, to Coventry and Birmingham, and thence joining the main line again at Lichfield, and from Stanmore, by Watford and Warwick to Birmingham.

There can be no doubt that if a system of tramways were established, heavy goods and minerals, as well as agricultural produce of all kinds, might be conveyed along common roads with much greater ease than at present, that where great speed is not an object passengers might be conveyed at very low fares, and that the facilities it would afford to the working population of the intermediate towns and districts would ensure very considerable traffic of its own without prejudice to the railways, and that it would be of great public utility. In some cases it might be necessary to construct new roadways in the neighbourhood of towns having narrow streets, and in others to widen present roadways; but in most cases there would be sufficient width between the hedges or fences to lay down tramways in such a manner as not to interfere injuriously with the ordinary road conveyances, as the tramway would be laid level with the roadway. The carriages may be drawn by horses or by traction steam-engines working at moderate speed; and as the system would establish a mode of conveyance something in effect between the present railway and canal, and the first outlay be comparatively small, it would, we think, be very useful to the public, and at the same time offer many inducements for the investment of capital.

SANITARY REGULATIONS FOR WORKSHOPS AND WORK PLACES.

SANITARY ACT, 1866, AND WORKSHOPS' REGULATION ACT, 1867.

THE following are among the more important requirements of the above acts, which are applicable to work places not under the operation of the Factory Acts. It is the duty of the vestry to see that they are observed in every parish.

1. Workrooms and work places must be kept in a cleanly condition.

2. They must be well and effectually ventilated, so as not to endanger the health of the persons employed therein.

[The Medical Officer of Health will regard any workroom as not sufficiently ventilated in which an unpleasant or animal odour is perceptible, or in which the temperature is found materially to exceed that of the external air in the warmer months, or 60 deg. in the colder months of the year.]

3. No overcrowding of workrooms is permitted—that is to say, the number of persons working in any room must not be so great as to endanger their health.

[The Medical Officer of Health will regard any workroom to be overcrowded, in which for the number of persons employed therein, a sufficient ventilation as above described cannot be constantly maintained without exposure of the workpeople to dangerous draughts; also, any room in which a floor space of at least 36 superficial feet cannot be allotted to each person, or in which the cubical space of the room is such as that at least 300 cubical feet of air are not allowed for each person.]

The superficial floor space of a room is found by multiplying its length by its breadth; and the cubical space of a room by multiplying the result of this by its height.

For example:—A room 25ft. long and 15ft. wide = 375ft. of floor space, may (if properly ventilated) be occupied by ten workpeople, provided that it is not less than 8ft. in height = cubical capacity of 3,000ft. If less than this in height, the floor space must be proportionally larger, or the number of occupants reduced.

An infringement of any of the above three regulations will render the master or mistress liable to prosecution under the 19th section of the Sanitary Act, 1866, and the Nuisances Removal Act.

ARTIFICIAL GRANITE.

A METHOD of manufacturing artificial granite, says the *Mechanics' Magazine*, has just been patented by Mr. P. M. Parsons, of Blackheath, well known by his system of converting cast-iron guns into rifled ordnance. The materials of this artificial granite are disintegrated natural granite mixed with clay, together with pounded glass, lava, or iron slags. The disintegrated granite is obtained by submitting fragments of natural granite to a strong heat, about 700 deg. or 800 deg. Cent., in an oven, by which, after a sufficient time, it becomes dissolved into a granite sand, the constituent parts of which, quartz, or felspar, possess great powers of adhesion. One part of this granitic sand is then mixed with about an equal quantity of pounded glass, or the constituents of glass, or lava, or iron slag, to which is added from twenty to thirty parts of refractory clay, or from thirty to fifty parts of ordinary clay. This mixture is thoroughly kneaded together with a sufficient quantity of water to make it of a pasty consistency. It is then moulded to any form required, and submitted to a degree of heat sufficient to vitrify the mass for about thirty-six hours, which converts it into a hard and durable substance resembling granite. The artificial granite thus produced may be moulded into any forms required to render it suitable for various kinds of buildings, fortifications, docks, and other engineering structures, and particularly for all kinds of pavements, for which its great hardness renders it particularly suitable. When very large blocks are required, it is preferable to make them hollow, and, after they have been baked or burnt, they may be filled with concrete, rubble, &c., to make them solid. Any kind of furnace in which the requisite heat can be generated will answer for dissolving the granite and baking or vitrifying the blocks or bricks; but Mr. Parsons finds Hoffman's annular furnaces perform this operation satisfactorily.

A NATIONAL SYSTEM OF IRRIGATION.

A PETITION is being signed for presentation to Parliament, showing "that the present drought throughout the country is, and not without cause, creating considerable anxiety, and that its effect upon the grass, clover, and permanent pasture and green crops is likely to be very serious, and productive of great national loss. That the Government 'agricultural returns' for the year 1867 show that the extent of land under grass, clover, and permanent pasturage and green crops exceeds 32,000,000 of acres; while that under corn crops does not reach 12,000,000. That your petitioners believe a national system of irrigation to be practicable over a great extent, if not the whole, of this large area, and that if established it would very greatly increase the production of the country, steady prices, and relieve the minds of the public from the alarming apprehension which the recurrence of such droughts as the present occasion, while it might be made to subserve the further purpose of preventing the damage which great floods frequently occasion in different parts of the country. That in countries where national systems of irrigation have been adopted the results have been very beneficial, and in consequence other countries are following the example. Your petitioners therefore humbly pray that your honourable house will cause inquiry to be made as to the practicability of establishing a system of national irrigation."

THE LUTHER MONUMENT AT WORMS.

THE inauguration of the monument to Luther by the King of Prussia was attended by an immense concourse of people. The monument consists of a combination of eleven statues, grouped around on a granite base, 40ft. square, open in front, but enclosed at the back and sides by a battlemented balustrade. Pre-eminent in the centre is the statue of Luther, on a syenite pedestal, 16ft. in height, the statue itself being 10½ft. high. The face is turned upwards to heaven, and its expression is calm and bold. On the front of the pedestal appear the closing words of his speech at the Diet of Worms, and under the legend are medallions of John the Constant of Saxony, and his son, who so well befriended the reformer. The lower slab contains scenes from Luther's life, in alto relievo. On four pillars projecting from the corners of Luther's pedestal are statues of Petrus Waldus, Wickliffe, Savonarola, and Huss. In the four corners of the balustrade are figures of Frederick the Wise, Elector of Saxony; Philip the Generous, Landgrave of Hesse; Philip Melancthon; and John Keuchlin. Between each of these are female figures, symbolising the three famous cities of Magdeburg, Augsburg, and Spires. The figure representing Magdeburg is doubtless the best. A female form sits all dishevelled and distracted, the very image of despair, too true a picture of many a woman of Magdeburg when the city was devastated by Tilly's ruffian bands. The representative of Spires stands protesting against Charles the Fifth's reactionary edict, but the attitude is too stiff and constrained. Augsburg is a queenly form holding a palm branch in memory of the peace concluded in that city. The four statues immediately round the centre pedestal are each 7ft. high, the corner statues 8½ft., and the figures of the towns 6ft. The battlements of the enclo-

sure are on the inner side decorated with the escutcheons of twenty-four other German cities. These are Brunswick, Bremen, Constance, Eisenach, Eisleben, Emden, Erfurt, Frankfort, Halle, Hamburg, Heilbronn, Jena, Königsberg, Leipsic, Lindau, Lubeck, Marburg, Memlingen, Nordlingen, Riga, Schmalkalden, Strasburg, Wittenburg, and Worms. It is generally regretted that Rietschel, who designed the work, should not have lived to finish it. He received his commission to make the model in 1856, but had only completed the statues of Luther and Wickliffe when he died. The rest have been modelled from sketches by his three talented assistants, Herren Schilling, Dondorf, and Kietz.

BILLINGSGATE MARKET.

A PROPOSAL is now before the Corporation of the City of London for the removal of this ancient market to some central part of the city, where it can be brought into direct communication with the various railroads by which fish are now regularly conveyed to the metropolis from some of the remotest parts of the kingdom, and in larger quantities than are now brought to the market by the Thames. The Markets Committee of the Common Council have reported that the most eligible situation for a new fish market would be in connection with Farringdon-market, or some spot adjoining, or near the new meat and poultry market at Smithfield. They state that all the railway companies and other parties engaged in the land carriage of fish are in favour of the removal of the market, but the salesmen and those engaged in conveying fish by water are of opinion that it should continue in its present situation. All parties, however, agree in thinking the present area of the market wholly inadequate for the business carried on there. The committee estimate that about three-fifths of the whole quantity of fish consumed in London are now brought by railway, in which proportion, they say, there will in all probability be such a progressive increase as to render it essential that the fish market should be placed in immediate connection with railway accommodation. In 1862, the improvement Committee of the Corporation submitted to the Common Council three plans for remedying the evils then alleged to be occasioned, and since augmented, by the increased traffic in the locality of Billingsgate-market, one of which plans was for widening Lower Thames-street, at the estimated expense of £300,000: another for the formation of a new street from Eastcheap to Lower Thames-street, at the expense of £102,000; and the third, for the construction of a street from the Monument to Lower Thames-street, at the expense of £88,000. It appeared from evidence brought before the committee that in addition to the large increase in the fish trade, a rapid and considerable increase had of late years taken place in the immediate vicinity of Billingsgate-market, which had added very materially to the obstructions in its approaches caused by railway and other vans. The committee are of opinion that the only effectual mode of removing the obstructions would be to widen Lower Thames-street, and form a new street either from the Monument or Eastcheap to Billingsgate; but they consider it very undesirable to attempt to carry such an arrangement into effect, having regard to the great expense it would involve. They are also of opinion that the enlargement of the market would have the effect of increasing rather than diminishing the obstructions, unless the approaches were widened and improved.

THE LIVERPOOL ARCHITECTURAL SOCIETY'S EXCURSION.

WREXHAM and its neighbourhood were this year chosen by the council of the above society for the scene of their excursion. Starting from Liverpool, at about 9:30 a.m., they first directed their course to Wynnstay Park, the well-known residence of Sir W. W. Wynn. The new hall, now in course of erection, has progressed so far as to allow of the main portion of the building being occupied by the family. The building, which is from designs furnished by Mr. Benjamin Ferrey, architect, of London, is in the French château style. Externally it possesses comparatively little of a specially attractive character; but the interior is rich and elaborate in design.

Having spent a short time in the inspection of the principal rooms of the hall, the visitors drove down the beautifully-shaded avenue of the park to Ruabon, whence they returned to Wrexham. Upon their arrival they partook of dinner at the Wynnstay Arms Hotel. The chair was occupied by Mr. F. Horner, the president, and the vice-chair by Mr. William Hay, one of the vice-presidents; and the company included the Mayor of Wrexham, Mr. Walker. The chairman, in his speech after dinner, said that some people affirmed that architecture in the present day was almost an obsolete art, and that the architects now simply reproduced what their forefathers produced, without having power to do anything themselves; but he entirely differed from that opinion. He thought that novelty and originality were very different things. A man might, for the sake of novelty, produce that which had nothing else to recommend it but novelty; but originality in art, properly so called, must have those beauties of form, proportion, and detail which former precedents possessed, and which should be capable of being compared satisfactorily with what has gone before it. He thought the clamour for novelty was very much overdone in the present day, and that a clever adaptation to present wants was in itself a very valuable test of originality in art. At the close of the dinner the party proceeded to visit the parish church of Wrexham, which is an interesting specimen of the sacred buildings of the period of Henry VII., and has a tower 135ft. high. The present edifice was built in 1472, with the exception of the tower, which was not finished until the year 1506. The interior contains several curious monuments—one, by Rysbrac, to the memory of a lady who died in the year 1747. The beatified spirit, represented as a female, is delineated as bursting the bonds of death at the resurrection and rising triumphantly. The interior of the church has recently been restored, but at the same time the original features have been carefully preserved. Several of the party ascended the tower, from the summit of which a most extensive view of the surrounding country is obtained. Shortly before ten o'clock the visitors left the Wrexham station, and returned by rail to Liverpool.

CENTRAL COTTAGE IMPROVEMENT SOCIETY.

THE annual general meeting of this society was held on Wednesday, at the Society of Arts, when Mr. Martin, the secretary, read the report, of which the following is an abstract:—"Although the object originally intended had reference chiefly to the agricultural classes, plans have been found applicable to the wants of the metropolitan artisans who now are conveyed from homes in the country to their labour in town by workmen's trains. An interesting instance of this kind occurs at Penge, where ninety cottages have been erected by the Metropolitan Association for Improving the Dwellings of the Industrious Classes. Every cottage is let, although the rent is as much as 6s. 6d. per week for those with four rooms, and 7s. 6d. those with five. The profit being encouraging the association has acquired another plot of ground adjoining, on which eighty more cottages are to be erected.

"Another interesting example of this application of the society's plans is to be seen at Limberstreet, Windmill-road, Croydon, where Mr. Rowbottom has erected eighteen pairs. These are faced on the other side of the street by one of the old-fashioned rows, and the preference given by the inmates was evinced by the fact that not a single cottage was to let, and there were persons who had put down their names in case of vacancies, while in the row opposite several were ticketed 'To Let.' In this row the rent is 6s. 6d. per week.

"The question of cost is one which presents great difficulties, and is liable to much variation from trade fluctuations in wages as affecting the expense of building and the price of bricks, and to these must be added great differences in the economy of builders and employers. Thus the Alexandra Cottages at Penge, although built in large numbers together, which is in itself an element of cheapness, are stated to have cost £210 the pair, while equally substantial pairs have been put up by Major Munn, of Faversham, Mr. Kibble, of Hadlow, and other gentlemen at £175. Again, Mr. Rowbottom's, at Croydon, cost £265 the pair, while Mr. Clarke's, at Walthamstow, cost but £225, and the pair put up by this society at the Great Exhibition of 1862 by contract was only £216. How far the adoption of concrete may reduce these figures does not yet appear, but the council have now, by the kindness of Mr. Fortescue, an opportunity of making some experiments as to whether it is possible, without decreasing the accommodation afforded to the occupiers, to lower the figures above quoted. Mr. Fortescue has liberally offered the society a suitable site and the means of erecting four cottages, so that the council hope before the end of the summer to have tested the cheapness and applicability of some of the better descriptions of concrete."

THE GUILDHALL IMPROVEMENTS.

THE restoration of the ancient Guildhall of the City of London, which has been progressing during the past five years, is at length approaching completion. In that time the Court of Common Council will have expended upwards of £53,000 upon the undertaking, the finishing stroke to which is being given by the erection of a fine carved oak screen and a dais at the eastern end of the hall, at a cost, included in that sum, of £2,400. The subject of the restoration was first mooted in the Common Council in July, 1862, on a recommendation, which was adopted, of the City Lands Committee, that the then roof of the Guildhall, which was flat and unsightly and had become much dilapidated, should be replaced by an open roof, in accordance with the original architecture of the hall, at an expense of £18,000, and a special committee was appointed for carrying out the work. From time to time the committee have asked for additional grants of money, and these have been voted ungrudgingly by the Common Council until the cost has reached the large sum already mentioned. At the outset a mistake occurred, which, however, was soon rectified, but not before considerable and needless outlay had been incurred. The committee found that the roof contracted for was neither an open one, nor in accordance with the architecture of the period of the erection of the hall itself. Upon this discovery, acting under the advice of Mr. Digby Wyatt and Mr. Edward Roberts, the committee directed that the design for the roof should be so modified as to be strictly in accordance with the first instructions of the Court and the original architecture of the hall, and that the roof should be constructed of oak, instead of fir. They also recommended that the ancient windows, then blocked up, should be opened, and other alterations made, at an estimated expense of £5,900, to which the Common Council assented, and voted the money. Again, in May, 1865, in addition to grants previously made, the Court voted £1,200, at the suggestion of the Improvement Committee, for the erection of a lantern and spire to the roof, and authorised the additional expenditure of £1,800 odd in rebuilding four of the turrets of the hall and two of the pinnacles, and £3,080 in restoring and repairing the internal stonework of the tracery under the windows. The Minstrels' Gallery, constructed of oak at the western end of the building, has cost £1,200; and the construction of the staircases in the turrets to afford access to it £280. The ancient figures of Gog and Magog have also been placed on fresh pedestals at an expense of about £100. The necessary works for lighting and warming the building have cost upwards of £2,430. The repairing of the hall and other incidental works have involved an outlay of £1,358 odd, and the lowering the monuments of Nelson, Wellington, Beckford, Pitt, and Chatham, which had become necessary, about £470. The Fishmongers', the Haberdashers', and the Weavers' Companies have presented each a handsome painted window, and three others have been given by Alderman Wilson, Alderman and Sheriff Stone, and Mr. Cornelius Wilson. On this part of the subject the committee refer with pride to the stained glass window now being placed at the eastern end of the hall as a noble and magnificent expression of gratitude on the part of the Lancashire operatives for the liberality of the citizens of London towards the relief of the distress during the Cotton Famine. The adaptation of the several windows for the reception of the stained glass has been attended with an expense of £855. The contractors from the first have been Messrs. Myers, the well-known builders, and the works have been executed from designs by Mr. Horace Jones, the city architect.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Wednesday evening last the annual *conversazione* of the Royal Institute of Architects was held at the rooms at Conduit-street. Mr. Tite, the president for the year, received the visitors. There were between 500 and 600 persons present. The rooms presented an unusually brilliant appearance. Amongst the things exhibited were several early editions of Shakspeare, lent by the president, who also sent several paintings by Stansfield, Roberts, and Cooke. Mr. Leighton sent some curious specimens of Oriental ware, and also some pictures from old masters. There were two pictures, "A Windy Day," and a landscape by George Mason, which attracted attention; and some clever Italian landscapes by John Moore, brother of Albert Moore. Andrew Donaldson, nephew to Professor Donaldson, sent some studies of Venetian subjects; and Mr. Brewer, son of Professor Brewer, contributed several water colour drawings of German architecture. Mr. E. W. Cooke sent some really fine paintings of Venetian architecture. But the picture of the evening was one contributed by Mr. Sandys, the subject representing "Medea." The mythological story of the Golden Fleece is worked in the background. This remarkable picture, which is of itself sufficient to make an ordinary reputation, was all the more examined because it was rejected by the Royal Academy. The Arundel Society sent some drawings, which at some future time will be published. The Architectural Exhibition was, by the courtesy of the committee, thrown open to the visitors, who freely availed themselves of the privilege.

LIMBURG CATHEDRAL.

ONE of our lithographic drawings this week represents Limburg Cathedral. On March 20 last we gave an interior view and small plan of this cathedral, accompanied by an elaborate description from the pen of Mr. J. P. Seddon. Having so recently described it there is no necessity to do so on this occasion.

DETACHED LABOURERS' COTTAGES.

IT is very commonly stated that improved dwellings for the labouring class will not pay. Even Mr. Baily Denton, who may be supposed to be an authority on such matters, intimated at the Society of Arts, in a paper "On the Condition of Agricultural Labourers," that the reason why more dwellings of an improved character are not erected was that they would not yield a fair return. Mr. J. K. Fowler, of the Prebendal Farms, Aylesbury, said it was impossible for an agricultural labourer to pay, as rent, interest at £140, as he had, through his landlord, to build one or two cottages, and he found they cost from £130 to £140 each. This statement was endorsed by Mr. William Hawes, the chairman of the council of the Society of Arts, who said that the society had again and again considered the matter; "They had plans prepared, and every scheme suggested for reducing the cost, but they could not bring it within £130." If anyone has a right to speak with authority on this question, it is the chairman of the Society of Arts, as that society has paid much attention to the best mode of erecting at a cheap cost substantial labourers' dwellings. We venture to say that Mr. Denton and Mr. Hawes are not well informed on the matter, that their statements are misleading and injurious, that good labourers' cottages can be built at a less price than they say. It is however, not very surprising that there should be much lukewarmness on the part of capitalists when men of authority speak positively, and at the same time inaccurately, on this question. In the BUILDING NEWS, No. 696, we gave several instances where cottages had been erected at a much cheaper rate than £130 each.

The Central Cottage Improvement Society in 1866 offered a prize for the best plan of a cottage, consisting of good living room, scullery, pantry, &c., and three bedrooms, which could be erected for £105. The prize was won by Mr. J. T. Smith, of 8, Windsor-terrace, The Grove, Ealing. His design bore the motto, "Can more be done for the money?" We give this week illustrations of front and back elevations, section, ground and chamber plans, as submitted by Mr. Smith; and we also give a minute specification and estimate of the work. Let us hope that Messrs. Denton, Fowler, Hawes, and others will in future be more careful in giving currency to statements which will not admit of verification.

SPECIFICATION (COPY).

Excavate the ground to the depths required for the footings and foundations, also excavate the ground underliving room to the level of top course of footings, and cut away superfluous rubbish to a distance not more than 100 yards. The brickwork to be executed after the manner of "Old English Bond," with good stocks. The arches and bonds (tinted red) are to be of the best red brick, tuck joint pointed. The remaining portion of the brickwork throughout to be neatly pointed with lime and hair mortar. Flush, stop, and whiten the walls (internally) not described to be plastered. The mortar for walling to be of good lime and sharp sand in the proportion of 1 of lime to 2 of sand. No place bricks to be used externally. Pave the scullery, pantry, W.C., and entrance lobby with 2in. York paving, closely set in mortar and bedded in dry rubbish. Provide York stone hearthstones for boarded floors, and 7in. by 3in. sills for front windows. Stone sink 3ft. long on proper bearers, put bell grating and waste, and connect with drain. Lay on service from cistern to sink, and provide and set an 18in. copper, with fire place, &c., complete. Put York stone chimneypieces to living-room and bed-rooms to correspond with drawing. Fit up W.C. with Doulton and Watts's stone closet pan and trap apparatus. Lay on service from cistern and finish complete with pull-up handle &c. Put drains as described on plan. Cover the roofs with 18in. by 9in. or 10in. by 8in. good slate, firmly nailed to 1¼in. by ¾in. battens, each slate fastened with two zinc nails, and to have not less than a 2½in. lap. The ridge and hips to have 1½in. slate roll and slate cheeks. Lath, lay, float, and whiten the whole of the ceilings on the ground floor, the soffit of stairs over entrance doorway, and the ceilings, coves, and partitions on the bed-room floor, and render set the walls of living-room and bed-rooms. The plastering to be done with good lime and hair mortar, in the proportion of 1 of lime to 2½ of sand. The whole to be finished off in a good and workmanlike manner, and to be left white and clean at the completion of the works. Run cement skirting 3in. deep round all the boarded floors. Provide 10s. for hoop iron band to be used as may be directed. Provide and fix over W.C. a good and substantial slate cistern to contain 70 gallons.

CARPENTER AND IRONMONGER.

The timber generally to be of the best yellow deal of the scantlings figured in the drawing. The flooring, shelving, stairs, and W.C. fittings to be of good white deal ¾in. thick, the whole to be wrought and neatly finished. The floors to be closely jointed, the contractor being answerable for shrinkage. The internal floors to be of good yellow deal 1¼in., four panelled, hung with 3in. batts, and fastened with good thumb latch and screws. The living-room door to have a brass handled spring latch. The windows and frames and the three external doors and frames to be of good sound Memel, free from large or loose knots or other defects. The door frames, of 3in. by 3½in., to be rebated and chamfered, the jambs tenanted into stone sills. The front door of 1¾in. frame and ¾in. battens, framed and braced, hung with 4in. batts, and fastened with good 7in. iron rim lock and an 8in. bolt. The scullery and W.C. doors to be ¾in. ledged, ploughed, tongued and beaded, hung with good strap hinges and fastened with good Norfolk latches; put small bolt on W.C. door, and an 8in. bolt on scullery door. The sashes to the front windows to be 1¼in. ovoli, to be double hung with good pulleys, lines, and weights and brass sash fasteners. Put inch wrought window boards and inch beads round all window and door frames, to be fair with plastering when finished. The back windows to have 1¼in. casements (one hung in each window), and solid rebated, beaded, and chamfered frames. Put all necessary iron stays, 2½in. batts, and casement fastenings. Fit up cupboard and put shelves on each side of living-room fireplace (as described on plan). Neatly cut the large boards and put chamfered mould under slate. Put 4in. iron eaves gutter to all eaves and 2½in. drain pipe with cistern head, &c.; the whole to be twice painted. Paint all the wood and ironwork (usually painted), both external and internal, three times with good white lead and oil paint, to be finished in colours as may be directed. Provide and fix 3 fire lump grates P.C. each 7s. 6d. Provide and fix one cottage range P.C. each, £1 5s. Provide and fix ten air bricks. Provide and fix six cast iron regulating ventilators. Provide and fix chimney bars to all fireplaces.

ESTIMATE FOR DESIGN—"CAN MORE BE DONE FOR THE MONEY."

	£	s.	d.
6 yds. cube excavation to surface (9d.)	0	4	6
5 yds. " " " trenches (1s.)	0	5	0
24ft. run 4in. pipe drain (6d.)	0	12	0
2 bends (1s.)	0	2	0
20ft. run 9in. main drain (1s.)	1	0	0
1 bend	0	1	3
3 rods 16ft. super reduced brickwork in mortar, including pointing and all finishings (£9 15s.)	29	18	6
50ft. super red brick in bands and arches (2d.)	0	8	4
19 yds. super 4½in. brick partition (small portion cement) (2s.)	1	18	0
9ft. run brick flat in cement round ashbin	0	1	0
Fire-brick hearth in scullery	0	1	4
11 yds. super brick on edge in mortar (1s. 6d.)	0	16	6
Trimmer arches to three fireplaces (2s.)	0	6	0
Finishing to chimney tops and setting in cement 6 slate divisions (1s. 4d.)	0	8	0
15ft. run brick in cement window sills (extra) (2d.)	0	2	2
6 chimney flues parqnetted and coved (8d.)	0	4	0
1 18in. boiler and setting	0	12	0
1 stone sink, on proper bearers, complete	0	9	0
1 "Doulton and Watts" closet pan and trap apparatus (and fixing)	0	5	0
1 slate cistern complete	1	15	0
Four hearthstones	0	10	0
94ft. super 2in. York paving, jointed in mortar and bedded on dry rubbish (6d.)	2	7	0
10ft. run 3in. by 7in. York sills (7d.)	0	5	10
3ft. 6in. run solid doorsteps to front door (1s.)	0	3	6
1 chimneypiece for living-room (10s.)	0	10	0
1 deal shelf on brick corbels	0	1	6
3 York stone chimneypieces	0	15	0
4 square yards super 9in. by 18in. or 10in. by 20in. slating, with nails and battens (30s.)	6	0	0
21ft. run ridge and slate cheeks	0	5	4
94 yds. super, render, set on walls (10d.)	3	18	0
84 yds. super, lath, lay, float, and whiten (1s.)	4	4	0
136ft. run 3in. cement skirting (extra) (1d.)	0	14	2
42ft. run eaves gutter, including painting (6d.)	1	1	0
32ft. rain-water pipe, including painting (6d.)	0	16	0
2 cistern heads (2s. 3d.)	0	4	6
2 ends of rain-water pipe made good to drain (1s.)	0	2	0
18ft. cube, fix in ground-floor joists and sleepers (2s.)	1	6	0
34ft. cube, fix to chamber floor (2s. 2s.)	3	13	8
21ft. cube, fix to partitions and lintels (2s.)	2	14	0
27ft. cube, fix in roof (2s. 2d.)	2	18	6
Partition on landing (framed or batten, including door)	1	8	0
3¾ square yards (bare) white deal flooring (¾in.) (15s.)	2	12	6
43ft. super 1¼in. sashes and frames (double hung, and including glazing) (1s. 6d.)	3	4	6
57ft. super 1¼in. casements and solid frames (double hung, and including glazing) (1s. 6d.)	4	5	6
15ft. super shelving in pantry (4d.)	0	5	0
166ft. run bead round door and window frames, (5d.)	0	7	0
5 door frames on ground floor (6s.)	1	10	0
4 four-panelled doors and fittings (12s.)	2	8	0
1 four-panelled door and fittings, with 6in. rim lock (14s.)	0	14	0
Ledge doors to scullery and water-closet	1	1	0
Door frame and door to entrance and fittings	1	8	0
Cupboard and shelves in living-room	1	3	0
Stairs and framing under (ash or deal)	3	5	0
Herringbone strutting over living room	0	4	0
Barge boards to front and moulded edge to wall plate	0	12	0
Deal fittings to water closets	0	12	0
PROVISION.—Stoves, &c., as provision	2	7	6
Air gratings (ventilators)	0	7	6
Hoop-iron bond	0	10	0
Chimney coves (No. 2)	0	6	0
Painting	3	5	0
Sundries (fixing stoves, &c.), and limewhiting to scullery, &c.	1	4	11
Total	£105	0	0

These cottages can be built in pairs; the cost would then be £100 each.

Memorandum.

I will undertake to erect one or any number of these cottages, to be built within two miles of my dwelling, for £105 per cottage.

(Signed) THOMAS HILL,
Grove-lane, Wanstead, W.C.

I will undertake to build, within two miles of my dwelling, one or any number of these cottages for £105 per cottage.

(Signed) EDWARD HAWKINS,
Vauxhall Bridge, S.W.

I will undertake to build any number of these cottages above four at £105 per cottage.

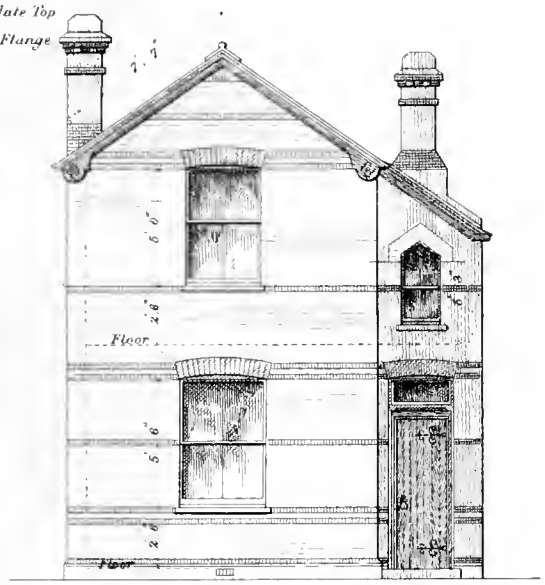
(Signed) PITTS,
Walham Green, W.

The celebrated Dutch sculptor, Louis Royer, has just died at Amsterdam at the age of seventy-five.

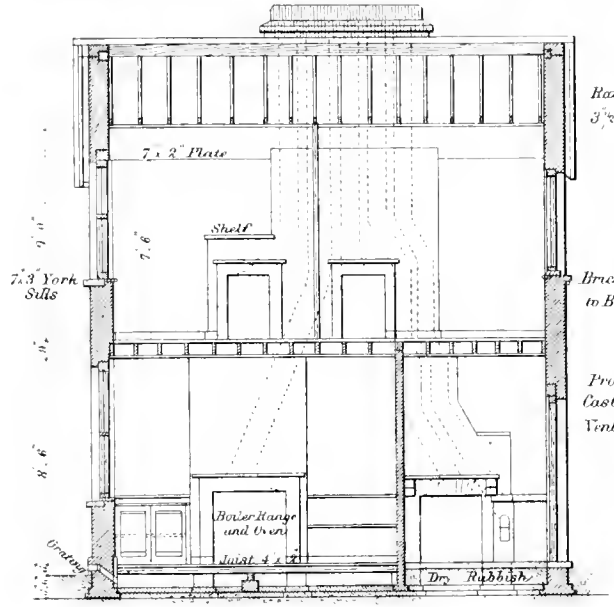
CENTRAL COTTAGE IMPROVEMENT SOCIETY'S COMPETITION MAY 1866.

1st PRIZE DESIGN FOR A DETACHED LABORER'S COTTAGE TO COST £105.

BY J. T. SMITH, EALING.



FRONT ELEVATION.



SECTION ON A.B.

BACK ELEVATION.

Top Course in Cement round Dust

Stone Sink 3 ft. Long.

18in. Copper with Fireplace &c. Complete.

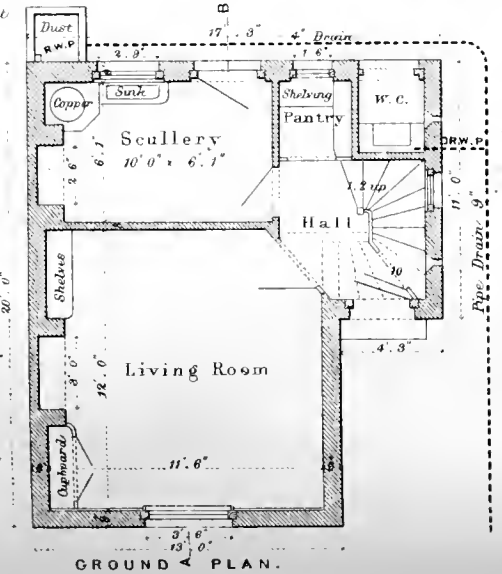
2" York Paving in Scullery, Pantry, Hall, & W.C.

No Stove in Scullery, Hearth Paved with Fire Brick

2" Deal Shelves in recess.

Boiler, Range & Oven P.C. £5

Cupboard framing 3'.2" high



GROUND PLAN.

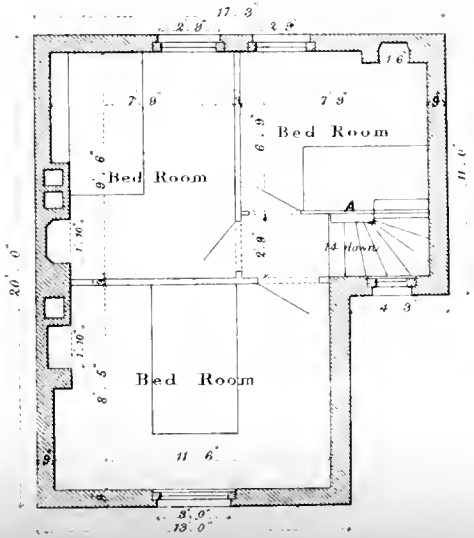
15 ft. Sup.r Shelving in Pantry

Cistern over W.C. to contain 70 Gal.ns

R.W.P. turned into W. Closet

Wall round W.C. in Cement

Stairs Enclosed for Coals

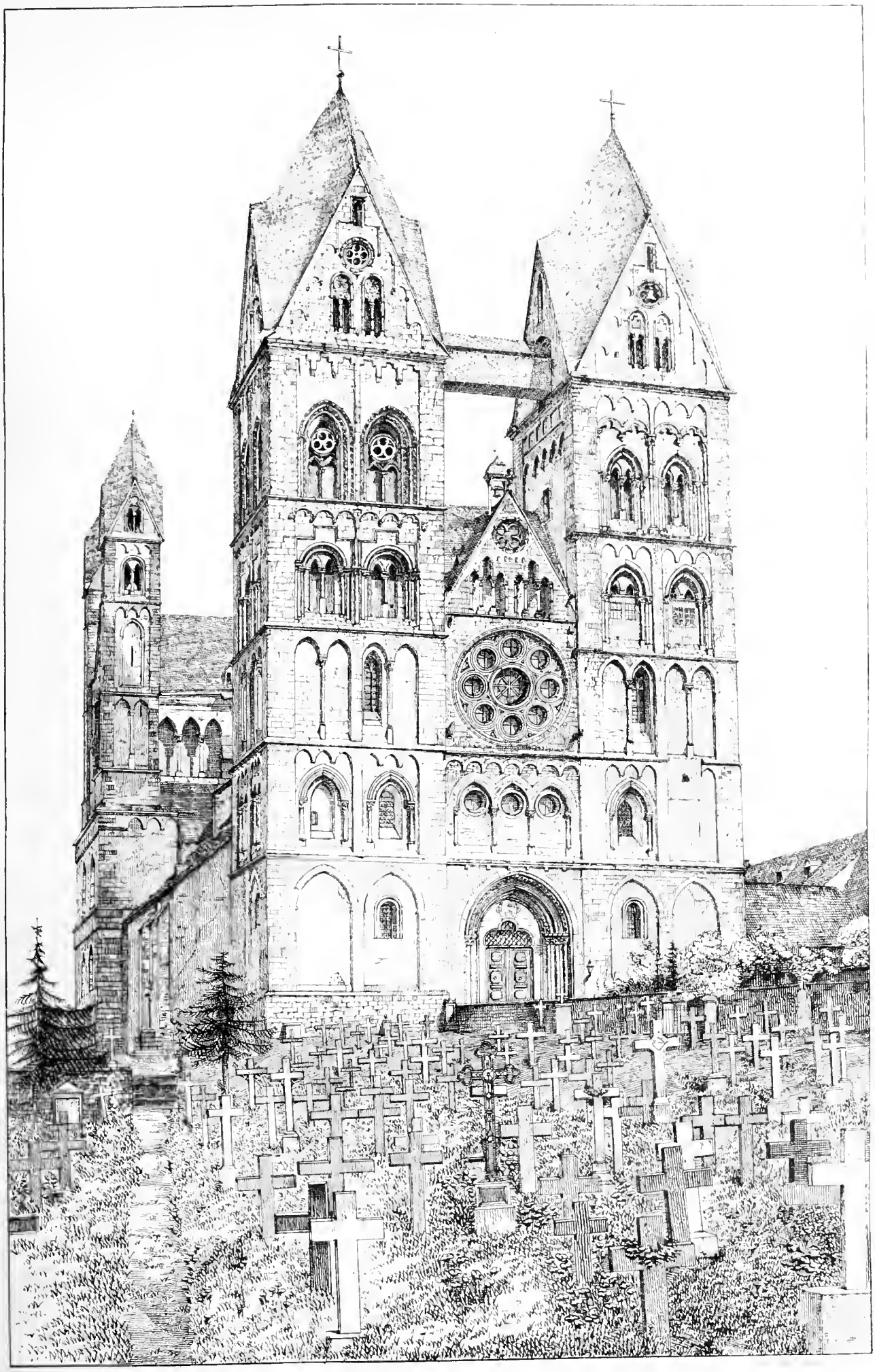


Splay for headway 1½ Framed Partition at A.

CHAMBER PLAN.

H. Abbott Lith.

Printed by Whiteman & Bean



Limburg · Cathedral.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE annual general meeting of this society was held at the Whittington Club on the 24th ult., when the council's report, statement of accounts, and other matters were presented and considered.

The election of the council and officers for the next session resulted in the following gentlemen being appointed to serve:—Mr. Benjamin Haughton as president; W. Forsyth Black and Walter Rutt as vice-presidents; as members of council: Messrs. Robt. M. Bancroft, Frederick E. Cooper, William Meakin, George W. Usil, George Waller Willcocks, G. J. Crosbie Dawson, honorary treasurer; and Mr. Frederic H. Roberts as honorary secretary (being his seventh year of office).

This society was originally established in 1859 for the discussion of engineering and scientific subjects, principally among the pupils and assistants of both civil and mechanical engineers. Considerable progress has been made since this time both in the number of its members and its general efficiency. The list of honorary members included several men of considerable eminence in the profession.

It is the intention of the members of the society to institute an annual dinner, which is shortly to take place for the first time. The honorary secretary is Mr. F. H. Roberts, 10, Adam-street, Adelphi, W.C.

GLASGOW INSTITUTE OF ARCHITECTS.

AN application has been made to the Board of Trade for a license for the formation of a new society, under the name of the Glasgow Institute of Architects, to be registered with limited liability, without adding the word "limited" to its name.

The objects for which the association is proposed to be established are—

1. The advancement of the art and science of architecture.

2. The consideration and discussion of all subjects and questions connected directly or indirectly with the profession of architects, and the concentrated expression of opinion upon the same.

3. The elevation of the attainments, the promotion of the efficiency, and the protection of the interests of the architects of Glasgow.

4. The acquisition of profit by the members of the association is not one of its objects.

5. The establishment of a uniform rate of charge by the members for professional business, in cases where no special agreement as to remuneration is made by the parties.

6. The doing all such other things as are incidental or conducive to the attainment of the above objects.

THE CONSTRUCTION AND FITTING-UP OF METROPOLITAN WORKHOUSES.

THE Poor Law Board have just issued a circular letter informing the guardians of the poor in London that they have prepared instructions for the guidance of architects in the construction of workhouses and workhouse infirmaries. These instructions are intended "as a general guide to the architect employed by the guardians, and are not designed unduly to fetter his discretion in the preparation of plans for the consideration of the guardians, or to apply to every detail connected with the construction of the workhouses," but the Poor Law Board say that "they will generally be guided by these instructions when considering plans which may be submitted them for their approval." With regard to the fittings the circular says:—"It appears to the board to be desirable that there should be a nearer approach to uniformity in the mode in which workhouses are furnished, and they are of opinion that whilst, for the ordinary wards, only a few conveniences—and those of a simple character—are required, the sick wards should be more carefully furnished, and all the necessary medical appliances supplied. It is the duty of the medical officer, under the regulations of the board, to suggest the number of articles that may be required from time to time, and they do not doubt the guardians will duly consider such suggestions, or that they will be made by the medical officer with all reasonable discretion, and with due regard to economy."

SOCIETY FOR IMPROVING THE DWELLINGS OF THE LABOURING CLASSES.

ON Friday last this society held its twenty-fourth annual meeting at Willis's Rooms, with Lord Shaftesbury as chairman. The The society is doing a vast amount of decided good, without making half the noise which Mr. Torrens and his party are making in their attempts to carry a questionable measure. This society has a house in Streatham for 54 families; Moods-buildings, in Grays Inn-road, for 20 families, and 128 single women; public washhouses, with an annual number of washings amounting to 15,899; another house in George-street, St. Giles, for 104 single men; another in Hatton-garden for 54 single men; another for 82 single men in Charles-street, Drury-lane, beside renovated dwellings in Clark's-buildings, dwellings for families in Wild-court, Drury-lane, and Tyndall's-buildings, Gray's Inn-road. The whole of these houses, with the exception of those for single men, have been well tenanted, and have yielded a fair balance. We have always maintained that there are wealth and will enough in London to erect a sufficient number of houses for the labouring classes. What is wanted are prudence and honesty in the administration of funds. Improved houses for the working classes might be able to pay better than the thousand and one joint stock companies which have floated in the City during the last twenty-five years.

LIGHTING AND REFLECTORS.

A LARGE ball-room, designed or rather supervised by the late Sir Charles Barry, has three chandeliers. The intention of the end chandeliers is for one to light also a long lateral suite of rooms running at right angles, and for the other to light a lateral corridor and a room which is a prolongation of the ball-room. So far the two chandeliers do yeoman service, and the mansion, when lighted up for entertainments, has a fine effect, but not the full effect. It so happens that the ball-room has likewise three windows in one of its sides, and the windows face respectively the three chandeliers, and the two doors and the chimney piece opposite. There are magnificent glasses over the chimneypiece and in the two bays, and the cost of glass was of no consideration to the late owner. When lighted up the only glass reflecting the light is that over the chimney-piece, reflecting the central chandelier. But the reflection even of this is not repeated. Had the room been designed with two windows and three bays on that side, instead of three windows and two bays, the arrangement would have been unobjectionable in the day time, and at night the illuminations of the three chandeliers would have been repeated, adding greatly to the brilliancy, as also improving the room whenever used without full lights in the chandeliers.

COMPETITIONS.

A SHORT time since a limited competition for designs for a memorial church to be erected in Lichfield was invited. Nine competitors entered the field. The design submitted by Mr. James Fowler has been selected by the committee.

In a limited competition for designs for the new Catholic Church of St. Kevin, Harrington-street, Dublin, the designs by Messrs. Pugin and Ashlin have been pronounced the best.

Designs having been invited for a new penitentiary building to be erected near Belfast, the one submitted by Messrs. Sherry and Hughes has been adjudged the first place, and the design by Mr. T. Hevey, of Dublin, the second.

ARCHÆOLOGY.

THE remains of an ancient Syracusan colony have just been discovered at Cassaro, in Sicily. The surrounding wall was 2,000 metres in circumference and three in thickness. The researches made show that the town was divided into several quarters. In one of them the remains of a fine temple have been found.

The most ancient stone buildings as yet identified are those in the village discovered in the island of Scutorin, in the Greek Archipelago, during the great excavations of Hozzolana for hydraulic cement for the works of the Smyrna and Aidin Railway and the Suez Canal. These remains were disclosed just at the time the French Scientific Commissioners were investigating the effects of the late volcanic commotion. They found that the village consisted of a number of houses built of blocks of stone with the interstices filled in with vegetable substances. As we understand, this stone is lava, but it must belong to a period before the breaking of the great cone, and that is prehistoric. The roofs were found supported with wild olive wood, which cannot grow on the present islands. The village had been buried for thousands of years, like Herculaneum and Pompeii, and preserved to us with its relics. The utensils belong to what is called the stone age, but the knives of obsidian were of exquisite finish. In the houses were found beads of hammered gold, and a better kind of pottery, supposed to have been obtained from the continent.

An archæological discovery of some interest has been made at Namur, in Belgium. A portion of the flooring of the stables of the Military School gave way, discovering a chasm about 10ft. deep. Some of the pupils descending found subterranean passages branching off in various directions. These are proved to be the vaults of the former abbey of St. Jacques of Candenberg. In a remote corner was found a mausoleum bearing the date of 1481, and a Latin inscription showing that it had been raised to the memory of Archduke Francis, son of the Emperor Maximilian and Marie of Burgundy. At the foot of the mausoleum, which was of white marble, was the leaden coffin containing the body.

ARCHITECTURAL SOCIETIES.

THE second general meeting of the Architectural and Archæological Society of Durham and Northumberland has been held in the neighbourhood of Dunstanborough and Bamburgh. Favoured with a continuance of bright sunny weather the early morning ride to Alnwick on Thursday week was not the least pleasing part of the undertaking. Driving through Rock and Rennington the party alighted at the village of Embleton, and proceeded to view the ruins of Dunstanborough Castle. The reasons for supposing the old fortress to have originally been a British stronghold were discussed, as also were the evidences of its subsequent usurpation by the Romans; after which the company re-entered their conveyances, were quickly transferred to North Sunderland, and spent the next half hour in the church dedicated to St. Paul. Onward they proceeded to Bamburgh Castle, standing on its triangular rock of basalt high above the ocean, and once more related the many legends connected with its name. After visiting the church of St. Aidan, the party eventually returned to Belford for the night. Early next morning they resumed their journey in the direction of Old Bewick, staying to inspect the square structure of Chillingham Castle; the old chapel, the British camp, and the rocks marked with concentric circles were each visited in turn, and had their history and peculiarities explained by the Rev. W. Greenwell, of Durham, and Mr. Ralph Carr, of Hedgeley. This terminated the excursion, and the party returned to Newcastle.

BIRMINGHAM ARCHITECTURAL SOCIETY.—The annual meeting of this society was held on Thursday, June 25, the president, Mr. John J. Bateman, in the chair. The report of the council was read, from which it appears that during the past session six papers had been read upon various subjects of interest, and that the present number of professional members is thirty-seven. Votes of thanks were awarded to the retiring officers for their services, and the following gentlemen were elected officers for the ensuing year:—President, Mr. A. B. Phipson; vice-president, Mr. Y. Thomason; treasurer, Mr. J. J. Bateman; honorary secretary, Mr. B. Corser.

PARLIAMENTARY NOTES.

ON Tuesday night, on the motion of Mr. Hankey, the House of Commons ordered a return of the public statues or public monuments in London belonging to the nation, exclusive of those in palaces other than St. Stephen's Hall or in other parts of the Palace of Westminster, or cathedrals, and now under charge of the Chief Commissioner of Works; specifying the dates of erection and names of artists, if known, and from what funds purchased or erected (in continuation of Parliamentary paper No. 366, of session 1862).

Mr. Goldsmid moved, and Mr. Gregory

seconded, that a committee be appointed to inquire into the appointment of Mr. Street as architect of the new Law Courts. Mr. Gladstone thought that under the circumstances, it would hardly seem possible that the Government could arrive at a decision to which there would not be a plausible, and perhaps something more than a plausible, objection. For his part, he expressed his regret that his party failed in rendering the aid which they desired to the Government in this matter. The Government had come to a decision which it would be wrong for the House to interfere with. The appointment of a committee would be a rude instrument of interference with a delicate process. It would be recommending an operation extremely laborious, and with less hope of any satisfactory result than had been already arrived at. He could not concur in any such opposition to the decision arrived at by the Government—a decision arrived at after much care and deliberation. What they had to consider were the design and the cost of the structure. The design had been approved of by the judges, and the cost, which was first stated to be £750,000, was declared to be inadequate, and three times that amount would now be required. He thought the whole question should be left in the hands of the Government. Sir Roundell Palmer was convinced that the Government had not any evidence before them that could lead them to the conclusion that Mr. Barry's plans as to the internal arrangements were the best that had been submitted; and, on the whole, and under all circumstances, the Government, in his opinion, had made the best selection in their decision that could be. Mr. Beresford Hope was of opinion that no advantage could arise in a great and important object like the present—an object that related not only to internal arrangements, but to that which was also most important, and which should not be lost sight of—in point of classic taste and architectural beauty, from the appointment of a committee. He hoped the Government would be firm, and decline to accede to the appointment of a select committee. Mr. Tite suggested that as the site proposed for the new Law Courts was not sufficient, the Courts of Chancery should be erected there, and that the other courts should be built on the land reclaimed from the Thames, each communicating with the other across the Strand. If this were agreed upon he would give the erection of one set of buildings to Mr. Barry and the erection of the other to Mr. Street. This scheme, he believed, would be agreeable to the rival architects, and he thought there was a pretty general feeling in its favour. Mr. Montagu Chambers hoped the Government would postpone the matter in order to erect a grand and useful building, and the proper site for it was in front of the River Thames. Lord J. Manners said the proposal for a select committee would lead to great and unnecessary delay. Some honourable gentlemen were of opinion that the Government ought not to appoint two architects; but the Government notwithstanding, in their judgment, and looking at the plans, and acting upon the opinions furnished to them, deemed it advisable to appoint two architects, namely, Mr. Street for the erection of the new Courts of Law, and Mr. Barry for that of the new National Gallery. As to the opinion of Messrs. Shaw and Pownall, he did not see why the Government should be guided more by that than by the opinion of the joint committee of barristers and solicitors. The Government had taken all the opinions of the judges into consideration, and acted with the utmost impartiality; but if they were to take the mere *ipse dixit* of the hon. member for Calne, then they would be bound to abide by the award of Messrs. Shaw and Pownall, and that was a position which the Government thought untenable. The judges, looking at the plans of the architects, gave their opinion in favour of the elevation of Mr. Street; whereas, with regard to the internal arrangements of the Courts, the plan of Mr. Barry seemed most to meet their approval, but they left the Government to decide between them. The Government, however, had been furnished with the opinions of gentlemen, who, from their business in the offices of the various Courts, and their experience, did not approve of the internal arrangements, as set forth in the plan and report of Mr. Barry; and he (Lord John Manners) would refer in particular to the opinion of the gentlemen connected with the Court of Probate and Matrimonial Causes, as disapproving of that plan. The Government, in that case, thought the best course they could pursue was to appoint Mr. Street and Mr. Barry in the manner he had indicated. The latter gentlemen had expressed their dissent from Mr. Barry's report in a protest, numerously signed; and the Government were bound to consider the opinions of those and other experienced officers. The noble lord read the opinions and protest of the officers of the Court of Probate and Matrimonial Causes. He believed, looking at all the considerations and requirements, that the public and the profession would be of opinion that the Government, in appointing the two architects, under the circumstances, had acted prudently. The House, after a few words from Mr. Goldsmid, divided, when Mr. Goldsmid's motion was rejected by a majority of 15.

On Thursday week, in the House of Commons, on the motion for going into committee of supply, Lord Elcho rose to move that the statue erected to the memory of the late Sir R. Peel be removed from its present site in New Palace-yard. That statue was first placed outside of the yard wrapped up in a dirty sheet. Then it suddenly disappeared, but after a lapse of about a fortnight it reappeared where it now stands—not in all its beauty, but in all its deformity. The best thing that could be done with it would be to put it into the smelting pot, and erect another that would be worthy of his fame. The noble lord concluded by moving that the statue should be removed from its present site. Mr. Beresford Hope, in supporting the motion, would not say more than that the friends of Baron Marochetti ought to take steps to remove the statue of that distinguished statesman the late Sir Robert Peel. As the statue presented itself to the view, it appeared to be more like the statue of a commissioner of police than of the great statesman whose memory was held in high esteem by his country. The country should have a strong Minister of Art, supported by a council; and if that were so, the Metropolitan Board would become subordinate, and the Peel statue and the Leicester-square scandal would no longer be cause of dissatisfaction to the public. Mr. Cardwell, in explaining the manner in which the Peel statue was originated, enumerated the names of the committee of noblemen and members of Parliament who constituted the committee, of whom only one member, the right hon. gentleman, Colonel Wilson Patten, now survived. He (Mr. Cardwell) was secretary to the committee, and they selected the late Baron Marochetti to execute the statue. Mr. Layard said he had had the honour of acquaintance with the late Baron Marochetti, who was a most amiable man and a great artist, and it was therefore with great pain that he must in sincerity condemn the present statue. The statue was first placed on another site, and was shifted from that to its present situation. It was now on an inclined ground, and a greater mistake could not be in the placing of a statue than to set it up on a sloping ground. In his opinion, before a statue was erected, a model of it should be set up on the intended site for inspection, and if approved of, then let the statue be erected on that site. Lord John Manners trusted that the statue would be permitted to remain, as the public faith had been pledged to the subscribers that the statue should be placed in Palace-yard. Several other members joined in the discussion, when the House divided, and Lord Elcho's motion was carried by a majority of 111.

Mr. Bentinck asked her Majesty's Government whether they would obtain, by purchase or otherwise, the materials of the tower of St. Mary Somerset Church, Upper Thames-street, now advertised for sale by tender, with a view to the re-erection of the tower in some fitting locality. Lord J. Manners said that, after the decision just arrived at by the House, the Government would be very careful in accepting works of art even as a gift, and he could not recommend the House to expend money upon the object named by his hon. friend.

WATER SUPPLY AND SANITARY MATTERS.

ON Friday last the River Pollution Commissioners were at Rochdale, and, along with the Mayor and the members of the council, visited Messrs. Kelsall and Kemp's large manufactory, where they took samples of the "wash;" next Mr. Whipp's oil manufactory; then the River Roach, as it entered the town; and from there to Messrs. Bright's extensive carpet manufactory, and other manufactories round the town.

At the meeting of the Metropolitan Board of Works on Friday last the following very satisfactory letter was read:—"60, Threadneedle-street, June 26, 1868.—Sir,—Herewith I have the honour to sent you duplicate specimens of the samples of our crops, which we are exhibiting at the show of the Essex Agricultural Society this day. Some of the samples are quite unprecedented. The sample of wheat is grown on a piece of land which bore the same crop last season. The oats, which are perhaps the most extraordinary ever seen, have been produced by the unexhausted manure left on the land by the application of 4,000 tons of sewage per acre last year to a piece of land from which we got last season 71 tons of grass per acre. This is a conclusive refutation of those enemies who pretend that sewage farming exhausts the land. I trust that these samples will be interesting to the board, and remain, sir, yours very faithfully, W. HOPE. Sir John Thwaites, &c." Some specimens of wheat, barley, oats, potatoes, and strawberries accompanied this letter, and were of extraordinary size and quality.

Building Intelligence.

CHURCHES AND CHAPELS.

The town church of St. Helier's, Jersey, has been restored under the direction of Mr. John Elliott, architect, at a cost of £4,501. The edifice has been re-pewed in oak, the stonework restored, a new transept built, and the nave extended, and various other works done, painted windows inserted, &c. The contractor was Mr. Westway; and the clerk of the works Mr. Frank Le Sueur.

On St. John Baptist's day the church dedicated to him at Enderby was consecrated after enlargement. The nave has been lengthened, the chancel enlarged, and a new organ chamber and vestry added; the cost of the restoration is about £5,000. Mr. Birchall, of Leeds, is the architect.

The foundation stone of a new Wesleyan Chapel was laid last week at Dunnington, Yorks. The building will be of red stock brick, plastered inside. Mr. E. Taylor, of York, is the architect; the cost of the building, which is of a plain character, will be £600.

On Thursday week the foundation stone of the new church of St. Ann, Cato-street, Birmingham, was laid. The building, which will seat 820 persons, at a cost of £2,170, has been designed by Mr. J. A. Chatwin, Mr. J. Briley being the builder. The plan consists of nave, with three galleries and a small chancel.

St. Peter's Church, Walsall, was reopened on Sunday last after restoration. The church, which is externally of a very meagre appearance, is Early English, and built of brick. It has been entirely re-pewed, re-paved, and decorated. Mr. G. B. Nichols, of West Bromwich, was the architect, and Messrs. Taylor, of Walsall, the contractors. The decorations were executed under the direction of the architect, by Mr. Gee, of Stafford.

On St. John Baptist's day the parish church of Wentworth, Cambridgeshire, was reopened, after extensive restoration, at a cost of over £1,000, under the direction of Mr. Preedy. An open timber roof has been substituted for the plaster ceiling of the nave, the tower wholly restored, and a new porch erected.

BUILDINGS.

The new Foreign Office was opened for the transaction of public business on Wednesday last.

On Saturday last Mr. M'Cullagh Torrens, M.P., laid the foundation stone of the new Assembly Rooms, Defoe-road, Stoke Newington. The building will comprise on the ground floor an assembly-room capable of holding from 400 to 500 persons, and another hall partially below ground, but well lighted and of but slightly smaller dimensions than the upper. The building will not occupy the whole of the frontage, leaving space for further additions, whenever needed. The style is Italian, with a front of white brickwork relieved by red brick.

On Saturday last public baths, which have been built by the corporation of Rochdale, at an expense of about £8,000, were formally opened, with great ceremony, by the Mayor. The building is situated in Smith-street, and is two storeys in height; it is built of brick, with stone dressings. The swimming bath is 44ft. long by 23ft. wide. The private baths are fitted up with hot and cold water apparatus. The first-class swimming bath, on the right, is 66ft. long by 39ft. wide, and is capable of holding 44,000 gallons of water.

The façade of the Hôtel Carnavalet, formerly the residence of Madame de Sevigné, but now destined to contain the Museum of the city of Paris, has been completely restored, and the scaffoldings removed. The sculptures by Jean Goujon have been treated with care, and present excellent examples of his style; they consist of a group of two children, in a medallion, supporting the arms of the original proprietors of the mansion, three trophies of arms, a winged figure with the feet on a mask and a cornucopia in one hand, and two lions. The repairs of the interior are also proceeding rapidly.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—G. T. S.—W. W.—G.T. R.—W. P.—J. H. B.—I. C., with photo. of villas.—I. H.—E. W. P.—I. C.—F. S. S.—S. F.—I. M. B.—I. T.—T. C. E.—I. and Son.—H. S.—E. W. G.—E. D.

Correspondence.

"THE USE OF ASPHALTE IN CONSTRUCTION."

To the Editor of the BUILDING NEWS.

SIR,—I have read in your paper of the 12th ult. an article on the "Use of Asphalte in Construction," in which you recommend it for covering roofs, and mention that the authorities of the British Museum made some experiments to test whether or not it was combustible. I have also read, in your paper of the 19th ult., Professor Donaldson's letter. I trust you will accommodate this company with space for the following statement, in reply to the latter part of the Professor's letter, for the purpose of satisfying your readers of the incombustibility of *Pyrimont* asphalte. The late Mr. Braidwood, of the Fire Brigade, had charge of the British Museum building, and doubted, from motives of security, the propriety of using asphalte for roofing the snow gutters and other portions of the new reading-room roofs, then under construction by Messrs. G. Baker and Son, of Lambeth; Mr. Henry Fielder, the managing partner of the firm, arranged for an experiment which was made on November 6, 1855. There were present:—Sir Henry Ellis, Sydney Smirke, A. Panizzi, G. W. Baker, G. Baker, and Henry Fielder, Esqs., with Mr. Superintendent Braidwood, and two clerks of works.

A mass of fire, 3ft. diameter, formed by the combustion of thirty-four faggots of wood, with coal and coke, was maintained for the space of one hour upon a portion of the asphalte that had been laid down to form the roofing portion of the snow gutters. At the expiration of the above period the soffit of the arch beneath became too hot for the hand to be held upon it. It was observed that the fire did not spread farther than the space above mentioned, and beyond fusing that part of the asphalte no damage was done to the adjoining portions of it, thereby satisfactorily proving to the minds of all present its perfect incombustibility. The details of this experiment were taken by me, with Mr. Fielder's permission, from his notes made at the time.

I beg, further, to add, that upon the occasion of the fire that about thirteen years since destroyed the greater part of Messrs. G. Baker and Son's buildings, a roof formed of this particular asphalte over their engine-house did not take fire, notwithstanding the intense heat, and it was so little injured that only a few corrugations, caused by the burning fragments falling upon the material, were noticed. It showed no tendency to ignite.—I am, &c.,

J. FARRELL, Sec.

Seyssel Asphalte Company,
5, Parliament-street, S.W., July 1.

MR. MOORE'S DECORATIONS.

SIR,—I am sorry to be obliged to trouble you with any further correspondence on this subject, as it seems to have degenerated into a personal squabble between Mr. Moore and myself, which I have no wish to prolong. Nor should I ever have exhumed these drawings from the oblivion they had sunk into had I not been asked by gentlemen connected with the exhibition to send them, as they have formed the subject of several criticisms in your journal, indirectly blaming me for not urging more strongly their adoption.

I owe Mr. Moore an apology perhaps for not writing on the drawings a memorandum to the effect that the colour of the seating behind the fronts of the balcony, upper circle, and gallery, had been altered from the "delicate flesh tint" Mr. Moore originally suggested, but for nothing else that I am aware of—this "delicate flesh tint," by-the-bye, coupled with the unmitigated ugliness of the detail referred to, being the very points which made the scheme ridiculous in the eyes of those for whom the theatre was built.

I can only re-assert that in no other particular has a single line, colour, or shade been altered by me since the drawings came into my possession. What Mr. Hart states he did at my instance is, I dare say, quite correct, though most certainly I have not the smallest recollection of it, nor does it in any way alter my assertion. Mr. Moore had ample thanks from me when he first offered to give his suggestions; the understanding was perfectly explicit that I could offer him no remuneration. I have had none myself for all the time I spent on the matter. I bore all the expenses for the time Mr. Hart was engaged in the preparation of the drawings, and was not aware that Mr. Moore required any formal thanks. It was simply for the sake of his picture that I asked him at all, he having prepared his sketch without consultation with me as to what I wanted, and before the decoration was thought about. Those present at the time the matter was discussed and abandoned will bear me out when I state that had Mr. Moore acted with good temper, or even common politeness, his scheme or a modification of it might have been accepted. As it was I had the greatest difficulty in preventing, not only his decoration, but also the picture, from being cast aside altogether.

CHARLES J. PHIPPS, F.S.A.

26, Mecklenburgh-square, June 30.

[We can insert no more letters on this subject.]

ART BY THE MULTIPLICATION TABLE.

SIR,—I read with pleasure, in your last number, that a design for a lamp pillar, of somewhat vigorous and artistic character, has been designed to ornament the Thames embankment, and I trust sincerely that the editorial brush has not been unduly dipped in *couleur de rose* prior to its description. It is delightful to think that the figures of the little-boy torch-bearers "compose with the shaft in a manner so successful as to present in *every view* an effective system of lines and *quantities*." The only misgiving one can have on the subject (for without having seen the models it is impossible to question the admiration thus expressed) is with regard to these *quantities*, and the consequent presentation in *too many points of view* of cherubs, even though "less fleshy than those of Rubens and Murillo, and more graceful than those of Correggio." Thus, though the lions' heads on the pedestals may be, "when examined, admirably designed," unless I am greatly mistaken the public is beginning to weary of them before half are fixed, and to dread the notion that it will have to endure them by the mile.

So, therefore, however "happy the idea as applied to a pillar for supporting a light" may be that of "two boys clinging round a central shaft, the higher holding a torch with which he is about to light the lamp above, while the lower supports and lifts him on his shoulders," it is one to the repetition of which there must be a limit. Are we, then, to have as many lamps as lions' heads, and double the number of naked little urchins, ever striving, but never succeeding in getting to the top of a pole? If so, I cannot but fear that the result of many a moonlight walk by the silver Thames will be nightmare visions of a "thousand thousand slimy things," and that we shall find that it is quite possible to have too much even of a good thing, such as I am quite willing to believe from your description the design in question may prove to be.—I am, &c.,

Louth. J. P. S.

LINCOLN CHURCH COMPETITION.

SIR,—I beg to send you the enclosed letter from the incumbent of St. Swithin's, Lincoln, which will explain the reason why my design for this church was accepted.—I am, &c.,

JAMES FOWLER.

[COPY.]

St. Margaret's Lodge, Lincoln, June 26.

DEAR SIR,—In answer to your inquiry I can only give you what I *believe* to be the reasons why the majority of the committee preferred your design to that of Messrs. Giles and Robinson. In your design the nave and aisles were 108ft. long by 61ft. broad; in that of Messrs. G. and R. the nave and aisles were (if I remember right) 91ft. long by 72ft. broad. The greater breadth of the latter design was produced by a double aisle on the north. Many of the committee felt a strong objection to this feature and the second row of pillars which it involved. Had it not been for this, I believe Messrs. Giles and Robinson's plan would have been selected. After the selection had been made, the architect* who was professionally employed to report upon the plans, wrote, under date of April 8, as follows:—"I heartily congratulate you on the happy result and settlement of the selection of an architect, for although No. 10 is in no wise to be compared to No. 11 as a work of *art*, still it is so far beyond all the rest in the competition that you acted very wisely in accepting your committee's resolve." (No. 10 was your plan; No. 11, Messrs. Giles and Robinson's.) You are at liberty to give any publicity to this letter you please.—I am, dear sir, yours faithfully,

G. H. PEATT.

J. Fowler, Esq.

RYDE CHURCH COMPETITION.

SIR,—These competitions are so singularly muddled, and at the same time their mismanagement is so fatal a thing to the profession, that I must ask you to allow me to express an opinion partly formed from reading Mr. Peachey's letter in last week's BUILDING NEWS. In the first place it appears that Mr. Scott was called in by the committee, prepared plans, obtained a tender, altered his design, and, in short, performed such work that he could legally claim £700 for it. The committee afterwards publicly advertise for designs, and it is generally known that fifty-seven sets are sent in for their approval. Now it is an established rule amongst respectable practitioners that if a properly qualified architect has been called in upon a job no other architect can take it up unless the first has been discharged for some sufficient reason and paid his claims. Amongst the fifty-seven sets of designs sent in there were several from Ryde and its immediate neighbourhood. The fact that Mr. Scott had been employed must, therefore, have been known to them; and I think that it was the duty of any architect who knew of the circumstance to make it generally known through the medium of some one of the professional newspapers, and I cannot, therefore, think that they are free from blame in the matter. I do not say it is, but it looks much like the conduct of the jackals, who follow the lion that they may devour the prey he has relinquished.

Mr. Scott's time must be very much occupied, but if in his exalted position he can hear the murmurs and whispers of what is going on in the lower world of architecture, surely he might have given a word of warning to the profession as to the forthcoming bill for £700, which appears to have had such a bomb-like effect upon the committee that when it came amongst them

* Mr. R. J. Withers.

their only thought was as to how they must shell out! The moral of all this appears to be that if we only did our duty by one another committees would ask in vain to have designs showered upon them gratis, and would at last begin to see that an architect's time is of some value, and that he spends something beyond the price of the paper, paint, and strainers in their preparation.

Not very far from Ryde, where there has been another competition, I heard the other day that the committee had already chosen their architect, but one of the members proposed to advertise for designs, "as he did when he built his house in the City:" he "chose an architect, then advertised for designs, and got quite a respectable number, then having consulted with his man they chose what they considered the best bits, and returned the several sets to their authors with many thanks." I believe this story to be true, but if not it is well found.—I am, &c.,

F. ROGERS.

P.S.—I ought to have said at the commencement of my letter that I am not a competitor for any work at the Isle of Wight.

9, Buckingham-street, Adelphi, July 1.

SIR,—I am sorry to have again to trouble you on this matter. Your correspondent states that "the committee having subsequently disagreed with the architect whom they chose by competition, &c." If this is so, it is without my knowledge or consent; the disagreement is "all on one side."—I am, &c.,

WM. PEACHEY.

Northgate, Darlington, June 30.

Intercommunication.

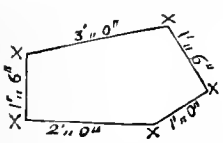
QUESTIONS.

[900.]—BOLTED GIRDER.—Setting aside prejudice and preconceived notions and ideas, which is really the stronger—one piece of timber, 12in. by 9in., or the same sawn into two pieces, each 12in. by 4½in., and bolted together at every 4ft. or 5ft. by ⅞in. screw bolts?—F.

[901.]—VENTNOR HOSPITAL COMPETITION.—The public—even the BUILDING NEWS perusing public, and their name is legion—still lack a desideratum, *i.e.*, the cognomen of the chosen one in the above competition. Can you, or will "the powers that be," supply the above? and oblige, amongst others, yours pertinently and respectfully—F.

[902.]—STRENGTH OF CYLINDERS.—Allow me to ask for a rule for determining the strength of hollow iron cylinders of a circular form, as I have not been able to find a rule in any book.—P. S.

[903.]—CONTENTS OF CISTERNS.—Will any of your contributors to "Intercommunication" solve the following question for me? I have a cistern, irregular in plan,



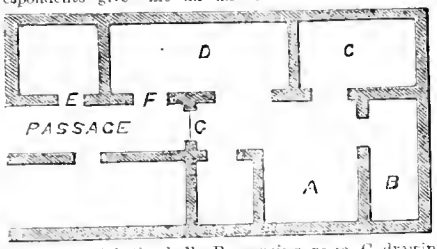
as shown in the figure, and of a depth of 4ft. How much water does it hold when full?—INQUIRER.

[904.]—MOIST WATER COLOURS.—I should be much obliged if some one would inform me what is used with which to mix the above. I have mixed them with water, and added a little gum, but that did not answer.—E. F.

[905.]—GAS TABLE STOVES.—The advantages of gas stoves, especially in warm weather, are too obvious to require any comment. When gas is laid in a house they can easily be made use of; but there are many houses, both in town and country, into which gas has not been introduced, and there they are unavailable, unless an apparatus be attached to them for generating gas. This can easily be done, as is shown by the great variety of portable gas lamps for lighting purposes now manufactured; but I have not been able to find any gas stoves with such apparatus, and I will feel much obliged if you, or any of your correspondents, would inform me where an article of the kind is to be had. Spirit lamps answer the purpose so far; but they are too expensive for general use; and, besides, they do not admit of the flame being regulated according to the degree of heat required. I have spoken about this to several gas engineers, but none of them appeared to see the importance of it, though I feel satisfied that if an article of the kind, not too expensive, were brought out it would command a very large sale.—A LODGER.

[906.]—STATUES NEAR THE FOREIGN OFFICE.—At each of the angles of the Park side of the Foreign Office are statues of four very elegant and unusually tall men, whom I take to be statesmen, dressed in flowing robes, such as George the Fourth, gentleman and king, is generally represented as wearing. Might I ask who these are supposed to be? Also, alongside of them, but somewhat ungallantly shelved upon the cornice of the wings, are being fixed four ladies, in a costume with which I am not familiar; two of these are facing the Park, and two are just round the corner. Are these the wives of the gentlemen in the niches beneath? and are they dressed in court costume? Excuse this inquiry, but not having had the honour of being presented myself, I am ignorant upon the point. If the ladies and gentlemen are not so connected, I am at a loss to understand their juxtaposition.—A YOUNG MAN FROM THE COUNTRY.

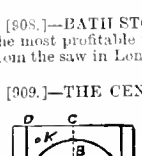
[907.]—DOOR JAMBS.—Could you or any of your correspondents give me an answer to the following



question? A is the hall, B morning room, C drawing room, D dining room, E and F are two doors into the dining room, one in the principal hall and one in the passage to the kitchen, and G is a door dividing the hall and passage. Now as all the doorjambs leading into the hall are pitch pine, framed, panelled, and stop chamfered, I wish to know whether the doorjambs at E ought to be pitch pine, framed, panelled, and stop chamfered the same as F; or ought they to be the same as the jambs to the other doors in the passage, which are plain red deal.—CLERK OF WORKS.

[908.]—BATH STONE DUST.—I wish to know what is the most profitable way to dispose of Bath stone dust made from the saw in London, I having no use for it.—SAWYER.

[909.]—THE CENTRE OF GRAVITY.—Will any correspondent kindly inform me through the "Intercommunication" column of a simple method of finding geometrically and mathematically the centre of gravity K of half a semi arch, A B C D? At page 833 in "Rutherford's Mathematics" is given a good way of finding the thickness of the pier when the position of K is known, but it does not



show how to find K.—X. + Y.

[910.]—ASPHALTE AND GRAVEL.—I have to superintend the laying of a barn floor, which is to be composed of asphalte and clean gravel, and finished with a layer of asphalte ¼in. thick. Will anyone kindly inform me what are the proper proportions of asphalte and gravel in the under stratum; and whether it should be laid down while the asphalte is hot? Also whether the thin upper layer should be of pure asphalte, or mixed with small stones in any proportion, and at what temperature it should be laid down? Of course the upper surface is required to be perfectly smooth and even.—Y. O.

[911.]—STAINING BRICK.—I have in course of erection a number of cottages built of red brick. Could you or any of your readers give me the recipe bricklayers use for colouring and pointing the bricks, so as to give them the bright tint so usually given to tuck brickwork.—TOM.

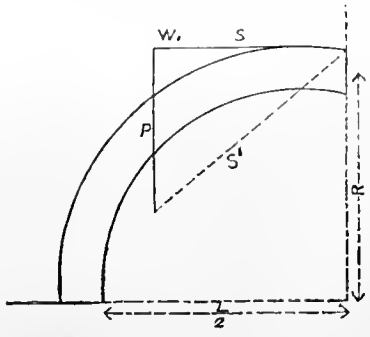
[912.]—FRESCO.—I have painted a picture on a wall in the summer-house, which I find is being damaged by damp. Will some one kindly inform me of the most effectual way of preventing it? I have soaked the wall with boiled oil, and sized it.—H. L. G.

REPLIES.

[886.]—MAKING A POND.—I do not quite understand the question of "S. W." Does he intend lining the whole of the bottom and sides of his pond in bricks or tiles laid in cement? If so it will cost a round sum. He would find it much cheaper to do as they are doing with the ornamental waters in Regent's Park and line his pond with a layer about 3in. or 4in. in thick-

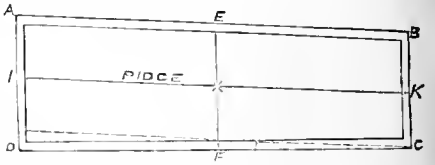
ness, of cement concrete. Let him make his pond in section as shown in the annexed cut, with the side slopes at a batter of 2 to 1, or 2½ to 1, according to the nature of the ground; or he might line it with Seyssel asphalte instead of concrete.—A. W.

[890.]—SEMICIRCULAR IRON ROOF.—"Young Engineer" would not gain anything by using timber laminated ribs for his roof, in an economical or constructive sense, and would, moreover, expose his roof to the chance of fire.



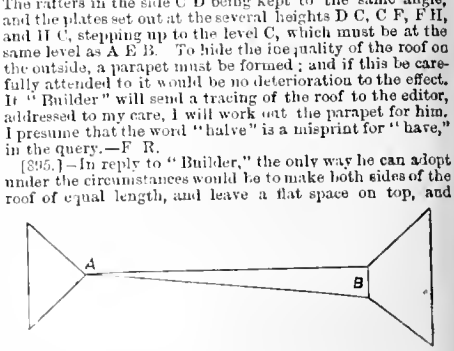
He had better make it of iron, and may calculate the strain by the aid of the annexed diagram, which represents an elevation of one half the arch, the strain upon the other half being identical and counterbalancing. If we put W to equal the total load brought upon the arch, including that of the arch itself, R to equal the rise to the centre of the depth, and L to equal the span, then calling the strain at the centre S, we have $S = \frac{W \times L}{S \times R}$. To find the strain at any other point, such as at P (see diagram), let W_1 equal the weight of that portion of the arch and load between P and the centre. The actual strain at P is equal to S', and is manifestly by the diagram the hypothenuse of the right-angled triangle, of which the other sides are equal to W_1 and the central strain S. Consequently $S' = \sqrt{S^2 + W_1^2}$ which gives the strain at any other point of the arch, except the centre.—CALCULATOR.

[895.]—A TAPERING ROOF. In answer to the query of "Builder," the best way to set out his tapering roof, so as to keep an apparent level, would be as shown on diagram.



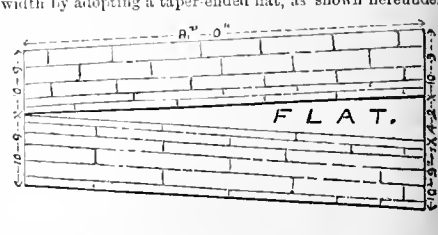
Let A B C D be the size of hall; bisect the length at E F, and set E × F truly on the wall as the centre truss; then set out the ridge I × K parallel to the raking side A E B; The rafters in the side C D being kept to the same angle, and the plates set out at the several heights D C, C F, F H, and H C, stepping up to the level C, which must be at the same level as A E B. To hide the inequality of the roof on the outside, a parapet must be formed; and if this be carefully attended to it would be no deterioration to the effect. If "Builder" will send a tracing of the roof to the editor, addressed to my care, I will work out the parapet for him. I presume that the word "halve" is a misprint for "have," in the query.—F. R.

[895.]—In reply to "Builder," the only way he can adopt under the circumstances would be to make both sides of the roof of equal length, and leave a flat space on top, and



cover it with lead or any other metal, A being the narrow and B the wide end of the building. I have seen this method adopted without in the least injuring the effect of the building.—HOWELL.

[895.]—I should say the difficulty might readily be overcome by keeping plates level as desired, and rafters of equal length, in the usual way, overtaking the difference of width by adopting a taper-ended flat, as shown hereunder.



This secures a general uniformity, with the exception of the wide gable, the coping of which may easily be continued to a point. Where the difference of width is great, queenpost construction would be necessitated at the widest part; but, if trifling, simply blocking off the purlin from principals, framed at somewhat less pitch, would overcome the difficulty, especially if the framing was invisible internally.—F.

[897.]—ARCS OF DIFFERENT RADII.—The best way for "Howell" to proceed would be to lay out the curve he wants by means of offsets upon a platform, and then bend the stick to it, and keep it in its place by a tie, and if necessary by some small kind of bracing or trussing.—A. Z.

[898.]—WELL DIGGING.—Under the above title, I conclude your correspondent means the cost of actually constructing the well, and not merely excavating the stuff, which would be but a very inconsiderable item, as may be easily shown. In the example given the depth of the well is 30ft., and the diameter 10ft. The number of cubic yards in the whole well would be represented by the equation, putting N for the number: $N = \frac{\pi d^2}{4} \times \frac{30}{27}$ equal to $\frac{0.7854 \times 16 \times 30}{27} = 14$ cube yards. To find all materials and steen the well would cost about 8s. 6d. per foot, as an average estimate.—W. W.

[898.]—Your correspondent wishes to know the price of sinking a well 30ft. deep. I would suggest that he have the quantities taken out, and ask a dozen respectable firms to give him tenders for the work. He may get the information required in this way.—D. E. F.

WAGES MOVEMENT.

THE operative joiners of Crieff, after being out for a week, have returned to their work at the former wages. The advance asked was 1s. 6d. a week, which the employers unanimously refused to give; and, owing to the want of unanimity on the part of the men, the strike has terminated.

The bricklayers and others engaged in the building trade at New York are at loggerheads with their employers. The

bricklayers refuse to work more than eight hours a day, and the masters express the most fixed determination to oppose them in this action, resolving not to employ any bricklayers who are unwilling to work ten hours a day.

STATUES, MEMORIALS, ETC.

FROM 8,000 to 10,000 persons were present on Saturday at the inauguration of the Cobden memorial statue at Camden Town. Speeches were delivered on the occasion. Mrs. Cobden and three daughters witnessed the ceremony.

LAND AND BUILDING SOCIETIES.

THE seventeenth annual meeting of the Perpetual Investment and Building Society was held on Wednesday evening at Radley's Hotel, New Bridge-street, Blackfriars; Mr. Daniel Pratt in the chair. The report, which was unanimously adopted, stated that the business of the past year yielded a much larger divisible profit than in any previous year. 1,609 new shares having been issued. The amount invested on realised shares, inclusive of capitalised interest, to the 30th of April last, was £102,407 17s. 6d., while the balance remaining invested on subscription shares, with the accumulation of interest and bonuses, was £146,339 6s. 2d. The deposits with the society at 3 per cent. were £18,689 1s. 4d. The advances of the year amounted to £72,338 19s. 6d., making the total since the commencement of the society, £702,305 8s 2d. The sum of £15,871 1s. 11d. was received for interest upon loans during the year, and the balance remaining due upon loans was £224,678 12s. 7d. fully secured. Considerable attention had been paid to the improvement of the estates at East Dulwich and Benhill, and estates had been secured at Beddington, Epsom, and Muswell-hill, portions of which will be offered from time to time. The members were congratulated from the chair upon the solidity of the society, which for the past four years had divided 10½ per cent. in bonuses and interest, and upon the fact that its business was as well managed and as safe as the Bank of England.

LEGAL INTELLIGENCE.

PRESERVATION OF HAMPSTEAD HEATH.—At the Court of Chancery, on June 24, before the Master of the Rolls, the case of Hoare v. Sir Thomas Maryon Wilson, Bart, came on for hearing. This case was instituted by Mr. John Gurney Hoare, Mr. Richard Ware, and Mr. Isaac Solly Lister, on behalf of themselves and all other copyhold tenants of the manor of Hampstead, against Sir Thomas M. Wilson, Bart., the lord of the said manor, for the purpose of obtaining a declaration by the Court that the copyhold tenants of the manor are entitled among other things to common of pasture upon Hampstead Heath and the adjoining waste lands, and to use the said heath and waste lands for enjoyment and recreation by walking, driving, riding on horseback, and carrying on lawful sports, games, and pastimes therein at all reasonable times. The plaintiffs also sought to restrain the defendant from selling, carrying away, and digging up, except for the proper use of the demesne of the manor, any turf, sand, &c., and from proceeding with the messuage and buildings now in course of erection thereon, and from suffering the said buildings to remain thereon, and from erecting any other houses or buildings upon the heath, and from in any manner interfering with the rights of the copyholders. The plaintiffs also sought to make the defendant account for sand, loam, gravel, and other materials which he had dug up and sold from the heath in derogation of the rights of the copyholders, and if necessary to have a proper scheme settled to regulate the exercise of the copyholders' rights in the heath and waste lands. Sir R. Palmer, Mr. Joshua Williams, and Mr. Speed were for the plaintiffs; and Mr. Jessell, Mr. Bagallay, and Mr. Eddis, for the defendant; Mr. Bedwell and Mr. Burt were for the trustees of the will of the late Sir Thomas Wilson. The case was only part heard when the Court rose.

WHAT IS JOINER'S WORK? — BEDFORD *v.* DAVIES.—The plaintiff, who is a carpenter, residing at Hereford, sued the defendant for a sum of £7, for work done to a cottage in the possession of the defendant. The work was originally agreed to be done for £7, but on commencing it he found more required to be done than he supposed, but the defendant told him to go on, as "he should not lose a penny by it." The plaintiff had his work valued by Mr. Morgan, builder, who assessed it to be worth £9 18s., including the extra joinery work. The defence was, first of all, that the work he would have to do was clearly pointed out to the plaintiff prior to the agreement being signed; and, secondly, that the joinery was to be included in the lump sum agreed upon. Professional witnesses, both builders, were called, and proved that all the work performed by the plaintiff came legitimately, in a cottage of the size, within the scope of the carpenter, and could not in any way be said to be joinery. After a long investigation the judge found for the defendant.

Our Office Table.

The new Law Courts business may now be regarded as finally settled. After the decision in the House of Commons this week it will be useless for Mr. Barry or anyone else in or out of Parliament to attempt to disturb the arrangement. Had the matter been remitted to a select committee, as moved by Mr. Goldsmid, it must not be supposed that, if it resulted in displacing Mr. Street, the name of Mr. Barry would be substituted. In all probability the whole matter would be reconsidered—not merely who should be the architect, but what should be the site. There is no denying that the Thames Embankment is the favourite spot, as far as public opinion is concerned; and if the question were reopened before a select committee, the newspapers would be advocating that site as the best; and if that site were chosen a new plan must be provided. Who would provide that plan? Mr. Street is selected, not because his plan is best, but because, in the opinion of the Government, he is the best architect for the purpose. The best thing now to be done is for Mr. Barry and Mr. Street to shake hands and wish each other good speed in the erection of the works they are respectively chosen to superintend.

We have received the following in answer to a paragraph in our last number:—"Sir,—I see in last week's BUILDING NEWS a little bit of virtuous sarcasm as to the balance-sheet of the Liverpool Architectural Society, and the disproportion between the sum paid for "coffee, &c.," and that expended on students' prizes. Permit me to explain that the four guineas appearing for the latter item does not represent all that has been spent, as there are prizes given by individual members also, and that the sum mentioned for the "&c.," which seems to have shocked you so much, extends over nearly two years, and stands for refreshment necessarily provided for members who mostly live out of the town and cannot go home before attending the meetings. The attendance at our society being, I believe, much larger than in most similar societies in the provinces, the "provision bill" is necessarily in proportion.—Yours respectfully, H. H. STATHAM, jun., Hon. Secretary of the Liverpool Architectural Society."

The arrangements have been made for beginning the new East London Museum at Bethnal Green, and the foundation is to be laid in three weeks with much display. An endeavour is being made by the supporters to obtain the presence of the Prince of Wales. There are to be cheap refreshment rooms and reading room, with every requisite to make the museum a working man's evening institute to compete with the pot-house.

The buffet exhibited by Messrs. Graham, of Oxford-street, at the Paris Exposition, is not yet complete. Workmen of all nations are still engaged upon it, and its total cost, it is said, will exceed £5,000, of which the design counts for £700.

A curious and good practical exhibition could be got up at South Kensington if the authorities could obtain working drawings from the great cabinet makers, silversmiths, &c. Such houses as Hunt and Roskell, Lambert, &c., could show drawings from leading painters and sculptors. The collections of some firms have cost large sums of money.

At the last meeting of the Architectural Association, on the 19th ult., the following office bearers were elected for the ensuing session of 1868-9:—Mr. William White, F.S.A., President; Vice-Presidents, Messrs. Ridge and T. H. Watson. Committee: Messrs. Carpenter, Henman, jun., H. Jarvis, jun., H. W. Lonsdale, Perry, R. Plumbe, R. P. Spiers, E. J. Tarver, Aldridge, and G. R. Redgrave. Honorary Secretaries: Messrs. J. D. Mathers and J. Quilter. Curators and Librarians: Messrs. G. Birch, R. Armstrong, and T. E. Munday. A paper was afterwards read by Mr. T. Wells on "The Influence of Eastern on Western Art, as seen in the Art Results of the Crusades."

A new officer is about to be appointed by the corporation to make periodical and systematic surveys of the City property. The selection of five from the candidates who apply will rest with the joint committees of City Lands and Bridge-house Estates. The salary is £100 per annum.

The third portion of the Thames embankment on the Middlesex side of the river was commenced on Monday under the direction of Mr. Cooke, who manages the contract for Mr. W. Webster. The work extends from the Temple to Blackfriars Bridge, and although there are many engineering difficulties in the way, the undertaking must be completed in a year, according to the terms of the contract. The section of the embankment in the neighbourhood of Hungerford Bridge seems to be much more backward than recent official promises led the public to believe it would be.

S. Taylor, Esq., member for St. Pancras, has been unanimously elected deputy chairman of the Building Act Committee of the Board of Works, and W. Newton, Esq., member for Mile End, deputy chairman of the special gas committee.

The new street forming the western approach to the New Meat and Poultry Market has been opened for traffic as far as Farringdon-road, parallel to which, with a slight incline, a temporary macadamised road runs to the bottom of Holborn-hill and Farringdon-street.

In the division in which Mr. Goldsmid's motion for referring the claims of Messrs. Street and Barry to a select committee was rejected, the members of the Government voted in the majority. In fact, it seemed to have been made a ministerial question, for Messrs. Noel and Whitmore acted as tellers. Several Liberals voted with the Government. The minority was composed mostly of Liberals. Mr. Pease, a relative of Mr. Waterhouse, acted as co-teller with the hon. member for Honiton.

A meeting has been held at Leighton Buzzard, under the presidency of Lord Charles Russell, for the purpose of taking steps to establish an institution in memory of Sir Joseph Paxton, who was born at Milton Bryan, a village in close proximity to the town. A subscription list was opened, and a resolution passed stating the opinion of the meeting that the building should "present some decided architectural features," and it was suggested that ornamental ironwork might be effectively employed in its construction, so that its general character might accord with the ideas by which the genius of Paxton was illustrated. The building is to contain a museum, a library, a reading room, and rooms suitable for lectures and classes.

A few old New Zealand colonists now resident in England assembled at No. 37, Eaton-square, on Wednesday afternoon, for the purpose of presenting a pastoral staff to the Bishop of Lichfield (who sailed for New Zealand yesterday). The staff, designed and executed by Messrs. Cox and Son, of Southampton-street, Strand, is of massive silver, with the top crocketted and jewelled, the knob below the crook pinnacled and richly chased, and the stem of polished ebony, with silver bulb and base.

On Saturday last the two last girders of the viaduct across the Solway Firth, which forms the chief engineering work on the Solway Junction Railway, were laid by Mr. Brogden, of Ulverstone, the chairman of the directors. The bridge is 1,910 yards in length, and, with its sea embankments at each end, forms a road across the sea nearly two miles in length. 1,800 tons of wrought iron and 2,900 tons of cast iron have been used in its construction. The bridge is formed upon iron piles screwed and driven into the subsoil, and the work is one of great solidity. This new railway bridge will form a new connecting link between England and Scotland.

The results of the recent examination of the works executed in the Kidderminster school of art are of a most satisfactory nature, and prove that this school has done far better than any other in the kingdom, taking the number of students into consideration. Out of fifty students, five national awards were taken, four free scholarships, and seven third-grade prizes. The drawings of fifteen students were commended, and thirty-four students obtained prizes and certificates in the second grade. Ninety per cent. of the students obtained some mark of success, and it is also worthy of note that the principal national awards were taken each year by different students.

The forty-second anniversary dinner of the United Society of Ironmongers was held on Monday evening at the Freemasons Tavern. About 150 gentlemen sat down to dinner. In the course of the evening Mr. Tidd Pratt, reply-

ing to the toast of his health, said that some friendly societies were good and others swindles. Among the latter were to be classed more particularly some burial societies which insured people from one day to eighty years old. They had agents throughout England, Scotland, Ireland, and Wales. One in Liverpool bragged that it had 500,000 members, and the expenses of that society were enormous. It received yearly in shillings and pence £130,000. The committee consisted of eight members, and, according to the return made to Parliament, each of those gentlemen received £454 a year (sensation), or 29s. a day, for his services. That statement had since been corrected by a gentleman, who said that that amount had been increased to £520 a year, or £10 a week. The treasurer received £650 or £670; and he (Mr. Tidd Pratt) considered this a downright swindle of the poor man, because it was utterly impossible that if the society's affairs were wound up the various members could receive what they were entitled to. The Society of United Ironmongers contrasted favourably with this; for out of the 24,000 societies, which were all going concerns, and were, he might say, in his office, there was not one could show such a balance-sheet as the Society of Ironmongers.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3327 F. BROWN. Improvements in Kitchen Ranges. Dated November 25, 1867.

This invention is more particularly applicable to what are known as close fire ranges when the range is made with an oven on one side of the fire and a boiler at the back; or when made without any boiler the patentee heats the oven or ovens by two distinct flues from the fire. First, the top of the oven is heated by a flue from the fire passing over it; this flue has an outlet into the chimney, and the draught is regulated by a damper in the usual manner. Second, the bottom, back, and side of the oven farthest from the fire are heated by a flue passing, by preference, from the bottom of the fire, or from the side of the fire close to the bottom; this flue passes under the oven, and rises at the back or side, or both, and then up the same outlet to the chimney as the flue which passes over the top of the oven; or it may have a separate outlet or outlets to the chimney, and the draught may be regulated by an independent damper or dampers. The side of the oven next the fire is heated in the ordinary manner by its close proximity to the fire, and is protected as usual with a firebrick or iron shield to prevent it becoming overheated. —Patent completed.

3354 C. COATES. Improvements in Machinery for Cutting or Dressing Stone, and in Apparatus connected therewith. Dated November 27, 1867.

This invention consists in improved machinery for cutting and dressing stone by means of circular discs or tools, or their equivalents, the discs being mounted and working in the manner described and shown in the drawings, and constituting a dressing stool or instrument of a new character. The stone intended to be dressed is placed on a movable table to which a reciprocating motion is given, so as to bring the stone under the operation of the dressing stool. In some cases the stone may be supported upon a table, and a reciprocating motion is given to the dressing stool in the manner described. The invention also relates to apparatus for sharpening the operating edges of the discs forming the dressing stool by grinding them in the manner described. The invention is not fully described apart from the drawings.—Patent completed.

3355 J. H. JOHNSON. Improvements in the Construction or Arrangement of Piles or Faggots for Wrought-iron Beams, Girders, or Bars of Different Forms. (A communication). Dated November 27, 1867.

The patentee claims, first, the construction and use of a pile or faggot composed of one or more bars for the web, and any appropriate number of bars for the flange or flanges, the said bars being arranged and permanently secured together by rivets or bolts, substantially as described and illustrated in the drawings. Second, the construction and use of a pile or faggot composed of one or more bars for the web for each flange, the whole being held together by rivets or bolts, substantially as described and illustrated in the drawings. Third, the construction and use of a pile or faggot composed of one or more bars for the web, and any desired number of bars for the flange or flanges, the said bars being arranged and permanently secured together by rivets or bolts, substantially as described and illustrated in the drawings. Fourth, the construction and use of a pile or faggot (for cruciform and other shaped beams or girders) composed of bars arranged and secured together by clamps, substantially as described and illustrated in the drawings. Fifth, the construction and use of a pile or faggot composed in part of a solid bar or bars with a rib or ribs, and in part of bars riveted together and wedged to the said rib or ribs, substantially as described and illustrated in the drawings. Sixth, the construction and use of a pile or faggot consisting of a solid bar or bars having a rib or ribs confined between bars by riveting the same to any desired number of intervening bars whose aggregate thickness is less than the said rib or ribs, all substantially as set forth in the specification and drawings.—Patent completed.

3361 J. S. SMITH. Certain Improvements in Apparatus for Ventilating Buildings and other similar purposes. Dated November 27, 1867.

The patentee claims the use and application of a movable cap, cover plate, or equivalent for opening and closing the upper end of air shafts used as ventilators, for the purpose of excluding dust, dirt, and extraneous matters, irrespective of the form thereof, or of the mechanical means employed to effect their rise or fall. Second, the general construction, arrangement, and combination of the apparatus for the purpose, as described.—Patent completed.

3377 J. H. JOHNSON. An Improved Hollow Brick or Block to be used for the Floors, Ceilings, and other parts of Buildings, and Apparatus for Moulding or Manufacturing the same. (A communication). Dated November 28, 1867.

According to this invention it is proposed to construct, in suitable moulds, hollow bricks or tiles of plaster, cement, or other suitable material, of a square, rectangular, or other form. These blocks are perfectly closed up on all sides, although made cellular or hollow internally; consequently, the plaster employed in setting them in their place, between the joints cannot possibly obtain access to the interior of the blocks. Ribs or projections are moulded along the several sides or edges of these closed hollow blocks, in order to afford a better hold to the plaster or cement, which is introduced between them when setting the same, and the top and bottom faces of the blocks are roughened or made uneven to form a key or holding surface for the adhesion of the coating or plaster employed in furnishing the floor or ceiling.—Patent abandoned.

3397 J. J. PARKES. Improvements in the Means of Ventilating Rooms and Buildings, and in Apparatus for the same. Dated November 29, 1867.

These improvements are chiefly applicable to such houses or buildings as are provided with a circulation of hot water. In carrying out the invention the patentee encloses a tube or series of tubes in a casing forming an air space, and placed above the chamber to be ventilated, the said tube or series of tubes being heated by the hot water circulating through them. The casing is placed in communication with the chamber to be ventilated by means of a tube terminating in a grating placed in the wall of the chamber. The upper end of the outer casing is connected with a pipe leading out into the open air, where it is surmounted by a cowl. The rarefaction of the air surrounding the heated tube or tubes, and contained in the outer casing, causes the air to ascend and escape into the atmosphere by means of the pipe and cowl above mentioned, thus forming a partial vacuum in the pipe below the heated tubes, the air in the chamber being drawn off through the grating to supply its place—thus effecting a continual ventilation of the chamber, so long as the tubes are kept heated.—Patent completed.

3404 S. E. STEANE. Improvements in Globes and Glasses for the Transmission of Artificial and other Light. Dated November 30, 1867.

Here the inventor makes the globe of a double thickness of glass, presenting a convex form both on the outside and inside, and having a hollow space between to contain water or other liquid or fluid for increasing, by its refractive and reflective power, the light encircled by said globe.—Patent abandoned.

3413 J. C. WOOLFIELD. Improvements in Boilers for Supplying Hot Water to Apparatus for Heating Buildings. Dated December 2, 1867.

This boiler may be cleaned internally without disturbing the outer shell, or any of the pipes or other apparatus attached thereto. It is formed by an outer shell and an internal flue tube connected together, or cast in one piece. The union between the shell and flue tube is at the end nearest the fire doors; the flue tube is closed at the end furthest from the fire doors, called by the patentee the "back end;" on the "back end" of the shell is a flange, to which is attached by bolts a lid, and on removing this lid the interior of the boiler may be cleaned. The flue tube is divided into three divisions, namely, first, the ash-pit or lowest division; second, the furnace, or middle division, which is enclosed by fire doors and contains the grate and deadplate; third, the return flue or highest division which is in direct communication with the funnel or smoke pipe. When of a circular form, the boiler is supposed to be horizontally in a line parallel to its longer axis.—Patent completed.

Trade News.

TENDERS.

Banbury.—For new chancel, spire, new oak roofs, and new seating, and restoring the church of St. Mary, Warkworth, near Banbury, for Miss Horton, The Holt, Middleton Cheney. C. H. Driver, Esq., architect:—

Jackson and Shaw	£4180
Orchard	3888
Kimberley	3790
Davis Brothers	3693
Franklin and Son	3150

Belfast.—For St. Stephen's Free Church, Belfast. Mr Thomas Drew, architect. Surveyors, Messrs. Fetherston and Banks:—

John Lowry and Son (tender on plans altered from those formerly tendered on)	£3453

Cardiff.—For building warehouse for Messrs. Turner, Nott, and Strong, at West Bute Dock, Cardiff. J. Hartland, architect. Quantities supplied:—

Gassie and Co. (limited), Gloucester	£2394
Webb Brothers, Birmingham	2390
Cooper and Day, Cardiff	2325
Lock, Cardiff	2284
Shepton, Cardiff	2280
Seager, Cardiff (accepted)	2200

Chatham.—For erecting memorial synagogue, Chatham. Mr. H. H. Collins, architect:—

Naylor, Chatham (accepted)	£4000

Cutsey.—For farm buildings at Cutsey, near Wellington, Somerset, for T. Blake, Esq. Mr. John Watson, Torquay, architect. Quantities supplied by Mr. F. S. Smith, Torquay:—

Shewbrooke and Son	£5267 0
Harvey	5178 0
Goss	5100 0
Pollard	4900 0
Gibson	4800 16
Call and Pethick (accepted)	4800 0

Erith (Kent).—For a lodge at Erith (Kent). Herbert Ford, architect. (No quantities):—

Relph	£187
Gumbrell	180
Willis	167
Catchpole (accepted)	164

Forest Hill.—For building new public house, in Herschell-street, for Messrs. Day and Noakes. Mr. Robert Walker, architect:—

Williams	£1147
Tarrant	1138
Mavers	1079
Killby	1074
Fulley	1058
Stoner	1050
Eustace (accepted)	1039

Fulham.—For Guernsey or Jersey granite for the Fulham Board of Works:—

	s.	d.	
Benthall	13	10	per cubic yard
Beavis	13	9	,,
Ross	13	4	,,
Lavington	12	7	,,
Griffin	12	7	,,
Tillsley and Son	12	3	,,
Turner	11	11	,,
Mannel (accepted)	11	9	,,

Huddersfield.—For the erection of a brewery for Messrs. Bentley and Shaw, Huddersfield. Messrs. Davidson and Scannell, architects:—

Excavator, bricklayer, mason, and drains.—Mallinson, Brenmar, and Gledhill, £2520

Carpenter, joiner, and ironmongery.—J. Rushworth, £362.

Ironfounder and smith.—Harrison and Bedford, £1690

Plumber and glazier.—Hy. Taylor and Co., £147.

Slater.—W. Goodwin and Son, £127 9s.

Painter.—C. Brighouse, £48 10s.

Plasterer.—T. Longbottom, £7 5s.

London.—For alterations to Star Life Assurance Office, Moorgate-street, City:—

Weekes	£3600
Dove	2950
Clemmens	2900
Bennett	2880
Clough	2875
Nixon	2795
Colls	2550

New Swindon.—For new school and additions to the Baptist Chapel, New Swindon, Wiltshire. Mr. Thos. S. Lansdown, architect, Swindon:—

Drew, Chelford	£1605 0 0
Walters, Abingdon	1487 17 0
Beaven and Son, Bristol	1262 9 0
Barrett, Swindon	1219 9 6
Sheppard, Reading	1200 0 0

Rathfarnham.—For building a chancel at Whitechurch, Rathfarnham; Mr. Thomas Drew, architect. Quantities by Mr. W. Stirling:—

James Scanlan	£425 0 0
Matthew Gahan and Son	418 8 9
James Freeman	380 0 0
Patrick Callan	360 0 0

Reading.—For rebuilding the Star Inn, Reading, for Messrs. Langton, Barrowes, and Co. Messrs. W. and J. T. Brown, architects:—

Wheeler Brothers (accepted)	£500

Sheerness.—For the erection of the Sheerness Public Rooms. Messrs. Jeffery and Skiller, architects, Hastings:—

	Contract No. 1. For hall and offices.	No. 2. Tower.
G. Hall, Brixton	£5299 0 ...	£320 0
F. C. Jeffery, Lambeth	4444 0 ...	310 0
J. G. Naylor, Rochester	4327 0 ...	267 5
H. Miller, Sheerness	4218 5 ...	254 15
Dover and Co., Upper Norwood	4056 0 ...	367 0

Stamford Hill.—For alterations and additions to a detached house at Stamford Hill. Herbert Ford, architect. (No quantities):—

Hayworth	£703
Flint	696
Lewis	682
Crabb and Vaugher	584
Preedy and Son	498

Worcestershire and Gloucestershire.—For the London and Eldersfield drainage:—

Webb and Wintle	£7127 0 0
Leach and Co.	6974 0 0
Lee and Meredith	6389 0 0
Wood and Edwards	6047 0 0
Lean	5400 0 0
Dixon	5337 15 5
Jackson and Co	5070 19 0
Strixon	5055 0 0
Abell and Co.	4983 0 0
Davies	4209 2 0
Mills and Watson	3621 0 0

COMPETITIONS.

Abergavenny, Monmouthshire.—July 7. Designs, plans, &c., new townhall, corn exchange offices; also for reconstruction of a general market place and erection of public slaughter houses. Premiums, £50, £20, and £10. J. T. Rutherford, clerk to company.

Hertford Cottage Prize Competition.—September 1.—Design for model cottages for agricultural labourers. Premium £20. R. Dimsdale, Esq., M.P., 9, Queen-square, Westminster.

India Office.—Forty appointments in Engineer establishment of India, open to competition in July next. Application to Under Secretary of State for India, India Office, S.W.

Liverpool.—July 21.—For plans and specifications for erection of new hospital on the site of present Everton Hospital for Infectious Diseases. Mr. J. J. Still, 17, Water-street.

Scarborough, Yorkshire.—Designs, plans, and estimates for new pier, Premiums, £50 and £30. W. E. Woodall, secretary to Commissioners, Queen street, Scarborough.

St. Marylebone.—July 7.—For particulars or information of any site suitable for public baths and washhouses Mr. Foot, clerk to the commissioners.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ALDERSHOT.—July 11.—For painting, paper hanging, &c., at Cavalry Barracks. Royal Engineer Office, Aldershot.

BLACKHEATH.—For the erection of two semi-detached villas at the Manorway. Mr. Moreing, 11, Carlton street, Waterloo-place.

BROMFIELD (SHEFFIELD).—July 11.—For the erection of the new church of St. Mark. W. H. Crossland, architect, 21, Park square, Leeds.

BROMLEY-BY-BOW.—July 10.—For the erection of a chapel in Devon's-road. Messrs. Hovenden and Heath, 151, Bishopsgate-street Without.

BRIGHTON.—July 9.—For the erection of two new groynes, &c., in front of the Marine Parade. Mr. P. C. Lockwood, Townhall.

BRIGHTON.—For the erection of married soldiers' quarters and boundary wall. J. S. Robertson, Royal Engineers' office

CITY OF PEST.—July 31.—For excavating trenches, laying the pipes, and making them entirely watertight. Hon Moritz von Szentkiralyi, Ober Burgermeister, President, City Waterworks Company, Pest.

For the erection of four iron and brick, and two brick bridges. J. B. Badock, 7, Staple-inn.

For completing a gap in a wall about 10,000 yards. Johnson and Raper, solicitors, Chichester.

HEREFORD.—July 11.—For taking down and rebuilding St. Andrew's Church. Architect, Mr. J. Johnson, 55, Moorgate street, E.C.

July 8.—For the erection of about 1,200 feet of enclosure walls, iron gates, &c., at Hampstead. W. F. Jebb, 37, Norfolk-street, Strand.

LEEDS.—July 11.—For the construction of offices at London and North-Western Central Station. H. Morgan, Esq., London road station, Manchester.

ROYAL ARSENAL, WOOLWICH.—August 1.—For supplying and depositing dry rubbish or dredger stuff on the foreshore. Inspector of Works, Royal Arsenal.

STOURBRIDGE.—July 16th.—For the erection of a new church at Stamber Mill, near Stourbridge. Thomas Smith, architect, the Mount, Stourbridge.

TWICKENHAM.—July 10.—For removal of dust, ashes, and other refuse. Surveyor, Local Board of Health, Twickenham.

WAR DEPARTMENT.—For painting, &c., at Pimlico, Millbank, and other places in London. Lieutenant Colonel E. B. Ewart, Royal Engineer Office, St. James-street, Buckingham-gate.

WAR DEPARTMENT.—Netley, Southampton.—For external painting, colouring, &c. W. C. Hadden, Colonel-Commanding, Royal Engineer Office, Portsmouth

HIGH WYCOMBE, BUCKS.—July 8.—For the erection of a storehouse at Frogmore Brewery. Mr. C. Carter, architect, West-street, Great Marlow.

HEREFORD COUNTY AND CITY ASYLUM.—For making bricks for the above-named building. R. Griffiths, Martin-street, Stafford.

CHESHIRE NEW COUNTY ASYLUM.—July 27.—For the erection of the above-named building. R. Griffiths, Martin-street, Stafford.

BOARD OF WORKS, FULHAM DISTRICT.—July 8.—For constructing a brick sewer. W. Lovely, clerk to the Board, Broadway House, Hammersmith.

FILEY, YORKSHIRE.—July 13.—For the erection of a new church. Plans at the parsonage, Filey. Messrs. Blackmoor and Mitchell, Withers, Sheffield, and Rotherham.

For building villas at Dulwich. Mr. P. B. Lee, architect, 89, Warwick street, S.W.

LEICESTER.—July 21.—For laying about five miles of cast-iron socket pipes. J. E. Williams, secretary, Leicester Waterworks Company.

METROPOLITAN BOARD OF WORKS.—July 17.—For the construction of a brick sewer. J. Pollard, clerk, Spring Gardens.

TEMPLE GRAFTON, COUNTY OF WARWICK.—July 8.—For the erection of a pair of cottages. Mr. T. Allen, architect, Stratford-upon-Avon.

ST. IVE'S, HUNTS.—August 6.—For supplying and lighting the streets, roads, and other places with gas, for a period of three years. Messrs. Fisher and Ginn, clerks to the Improvement Commissioners, St. Ive's.

FULHAM.—July 9.—For supply of best unbroken blue Guernsey granite. T. A. Marsh, clerk, Fulham, Workhouse, Hammersmith.

WEST HAM LOCAL BOARD OF HEALTH.—July 13.—For supply and delivery of gravel. July 13.—For laying and connecting house drains to the public sewers. July 13.—For the purchase of ashes and house refuse. July 13.—For masons and paviours day and jobbing works. July 13.—For the hire of horses and carts. C. Wilson, clerk, Rokeby House, Stratford.

ASHBOURN.—July 18.—For the alteration and enlargement of the chapel and the rebuilding of the schools of the Countess of Huntingdon's connexion. Mr. W. Sugden, architect, Leek.

DORKING.—July 10.—For an additional aisle and other works to St. Paul's church. Benjamin Ferrey, Esq., F.S.A., architect, 1, Trinity place, Charing Cross, London.

For a detached house and a pair of detached villas on the Kenley estate. J. Foley, Kenley House, Croydon.

NEWCASTLE-ON-TYNE.—July 14.—For renewing the boarding, slating, lead-gutters, &c., in B range of barracks. Colonel W. G. Hanbury, R.E. Office, Manchester.

PROPERTY SALES.

JUNE 25.

AT THE MART.—By Messrs. Rushworth, Jarvis, and Abbott.—Freehold estate, known as Chase Farm, Bramshott, Hants, comprising a cottage and outbuildings, with 62 acres of arable land and plantation land; also the manor (or reputed manor) of Chase, believed to extend over about 60 acres of heath land—sold for £2,080.

Leasehold residence, No. 27, Grosvenor-street, Grosvenor-square, term 16 years unexpired, at £60 per annum—£1,200.

Leasehold residence, No. 38, Canonbury-road, Islington, let at £42 per annum, term 50 years unexpired, at £6 10s. per annum—£440.

By Messrs. Gadsden, Ellis, and Scorer.—Leasehold two houses, Nos. 71 and 72, Harrison-street, Gray's Inn-road, producing £78 per annum, term 90 years from 1838, at £14 per annum—£620.

Leasehold residence, No. 2, The Cedars, Putney, term 99 years from 1854, at £80 per annum—£810.

Leasehold residence, No. 3, The Cedars, let at £80 per annum, term and ground rent similar to above—£810.

Leasehold residence, No. 16, The Cedars, let at £100 per annum, term and ground rent similar to above—£810.

Freehold residence, No. 26, The Cedars, let at £81 per annum—£920.

By Mr. Newbon.—Freehold residence, known as Crescent Villa, Prince's-road, Buckhurst Hill, and piece of land adjoining—£750.

Leasehold residence, No. 180, St. Paul's-road, Canonbury, annual value £55, term 81 years unexpired, at £8 8s. per annum—£510.

Leasehold two residences, Nos. 6 and 7, The Limes, Lewisham, let at £28 per annum, term 61½ years unexpired, at £6 12s. per annum—£500.

Leasehold two houses, No. 26 Chalk Tree Shot road, and No. 1, Alder-street, Peckham, term 39 years from 1861, at £6 4s. per annum—£350.

Leasehold residence, No. 41, Allen road, Stoke Newington, let at £30 per annum, term 52 years from 1870, at £5 per annum—£300.

By Mr. Frank Lewis.—Leasehold house, No. 59, Mortimer-street, Marylebone, let at £45 per annum, term 27 years from 1875, at £36 per annum—£175.

Leasehold house, No. 8, Bentinck street, Marylebone, let at £120 per annum, term 52 years from 1870, at £50 per annum—£850.

Leasehold house, No. 18, Bentinck street, let at £50 per annum, term 40 years from 1869, at £30 per annum—£260.

Leasehold premises, No. 10, Crown street, and Lloyd's-court, Soho, let at £130 per annum, term 11 years from 1859, at £48 per annum—£140.

Leasehold eight houses, Nos. 1 to 8, Crown terrace, Kentish Town, producing £62 2s. per annum, term 99 years from 1848, at £9 per annum—£400.

Leasehold nine houses, Nos. 4, 5, 8, 10 to 12, 14, 17, and 18, Palace-street, Kentish Town, producing £2 4 11s. per annum, term 99 years from 1848, at £9 1s. per annum—£1,860.

Leasehold two houses, Nos. 7 and 8, Harmood-street, Prince of Wales road, Kentish Town, producing £75 per annum, term 74½ years from 1846, at £26 per annum—£370.

Leasehold two houses, Nos. 10 and 11, Orchard-street, Kentish Town, producing £57 12s. per annum, term 79 years from 1851, at £10 per annum—£405.

Leasehold two house, Nos. 7 and 8, Cross-road, Kentish Town, producing £62 per annum, term 28 years from 1851, at £14 per annum—£460.

Leasehold two houses, Nos. 38 and 39, Oak-village, Kentish Town, producing £63 14s. per annum, term 90 years from 1858, at £16 per annum—£540.

Leasehold house, No. 122, Prince of Wales-road, Kentish Town, let at £40 per annum term 99 years from 1850, at £6 per annum—£350.

By Mr. Dale.—Leasehold house, No 56, Clinton-road, Grove-road, Mile-end, let at £26 per annum, term 74½ years unexpired, at £4 per annum—£230.

AT THE GUILDHALL COFFEE HOUSE.—By Mr. Marsh.—Freehold cottage, with barn and yard, situate in Thames-street, Hampton—£185.

Freehold two cottages, situate near High-street, Hampton—£200.

Freehold 2a. 2r. 26p. of land fronting Broad-lane, Hampton—£560.

Freehold plot of land, situate at Lessness Heath, Kent—£175.

Freehold plot of land, situate at Lessness Heath, Kent—£295.

Leasehold residence, with stabling, known as Gloucester Villa, Green lane, Stoke Newington, annual value £130, term 98 years from 1868, at £26 per annum—£1,500.

By Mr. George Beckett.—Leasehold residence, No. 11, Park road, Brompton, let at £50 per annum, term 89 years unexpired, at £8 per annum—£455.

Freehold plot of land, situate at Twickenham—£25.

Policy of assurance for £250, effected in the Law Life Assurance Society, on the life of a gentleman aged 55 years—£65.

Policy of £100 in the above office on the life of a gentleman aged 51 years, £34.

JUNE 26.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Freehold property, comprising two shops, offices, and business premises, Nos. 36 and 37, Poultry, and 13, Grocers' Hall-court, City—£10,750.

By Messrs. Wallen and Chum.—Freehold 15a. 3r. 33p. of arable and meadow land, and sixteen houses and shops and piece of garden ground, situate at Hornchurch, Essex—£2,490.

By Messrs. Cobb.—Freehold 528a. 1r. 19p. of woodland, situate in the parishes of Birtham, Upper Hardres, and Kingston, East Kent—£8,600.

Freehold 375a. 2r. 15p. of wood and arable land, in the garish of Westwell, East Kent—£5,250.

Freehold 6a. 3r. 20p. of pasture land in the parish of Challock, East Kent—£90.

Freehold 7a. 1r. 26p. of woodland, known as Church Wood, Westwell, East Kent—£500.

Freehold estate known as Parsonage or Vicarage farm, containing 24a. 1r. 28p. of arable, pasture, hop, and woodland, with farm house and premises, situate in the parish of Ticehurst, Sussex—£1,250.

By Messrs. White and Sons.—Freehold, Scallows Farm, Worth, Sussex, with farm house, buildings, and 50a. 2r. 28p. of land—£3,020.

BATH STONE OF BEST QUALITY.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Robert Stephen Bridges, Cotton street, Mile End, paviour, July 13, at 12.—Charles Clarke, North Kilburn, plastering builder, July 13, at 1.—David Davies, Tufnell park road, and Hornsey road, builder, July 15.—Jonathan Watson, Bludgrove road, Notting hill, builder, July 15, at 12.—William Baker, King land road, Kingsland, plasterer, July 15, at 11.—Thomas Borras, Ransford place, Plough road, Rotherhithe, brick merchant, July 6, at 12.—Charles Edward Cotton, Broad street, Market street, Stratford, carpenter, July 8, at 2.—James and Henry Coyle, late of Great Marylebone street, builders, July 8, at 1.—Thomas William Gravely, jun., decorator, Taylor street, Woolwich, Kent, July 8, at 12.—Richard Hart, senior, Hope cottage, Wellington avenue, Hammersmith, plasterer, July 8, at 12.—Alfred Powley, Warren street, Tottenham court road, plumber, July 6, at 12.

TO SURRENDER IN THE COUNTRY.

Henry Petty, Southampton, carpenter, July 15, at 12.—William Winterflood, Brighton, painter, July 14, at 11.—Edwin Sharp, Child Okeford, Dorset, carpenter, July 11, at 3.—Abraham Scott Butler, Union street, Smethwick, Staffordshire, plumber, July 6, Oldbury.—George Lamb, late of South Stockton, Yorkshire, builder, July 8, Stockton.—Thomas Moorcroft, Stapenhill, Derbyshire, joiner, July 7, Burton-upon-Trent.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

July 28, W. Johnson, Sittingbourne, cement maker.—July 28, R. Campbell, Beaufort buildings, Strand, civil engineer.—August 4, W. Lloyd, Symens street, Chelsea, builder.—August 11, P. Porter, George terrace, upper Clapton road, contractor.—August 11, F. Taylor, Teddington, carpenter.—July 13, T. Allcock, Sandiacre, Derbyshire, brickmaker.—July 24, T. Batchelor, Luton, carpenter.

DIVIDENDS.

July 15, G. Holmes, Church passage, Guildhall, City, builder.—July 10, J. Russel, Birmingham, bricklay.

SCOTCH SEQUESTRATIONS.

A. and R. Sommerville, Wishaw, Lanarkshire, joiners.—Thomas Cochrane, Leith, plumber, July 3, at 12.

PARTNERSHIP DISSOLVED.

R. and R. Pontifex, Upper St. Martin's lane, hot water engineers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12 10	Archangel, yellow	£11	0 £12 0
Quebec, red pine		3	5	4 15	St. Petersburg, yel.	10	0 12 0
,, yellow pine		2	15	4 5	Finland	7	0 8 0
St. John N.B. yellow		0	0	0 0	Memel	0	0 0 0
Quebec Oak, white		5	5	5 10	Gothenburg, yellow	8	0 9 10
,, birch		4	5	5 0	,, white	8	0 9 0
,, elm		3	15	5 10	Gefle, yellow	10	0 10 10
Dantzic oak		4	0	6 0	Soderhamn	9	0 10 10
,, fir		2	0	3 5	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir		3	0	4 5	yellow	14	0 20 0
Riga		2	10	3 3	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15 1 3
Swedish		2	5	2 8	PUMICE STONE pr ton	6	0 8 0
2½ sts, Quebec red pine		5	0	6 10	Oils, &c.		
,, yellow pine		5	0	6 0	Seal, pale, per tun	36	0 0 0
Lathwood, Dantzic fm		6	10	7 10	Sperm body	96	0 0 0
,, St. Petersburg		8	10	9 10	Cod	34	10 0 0
Deals, per C., 12 ft. by 3 by 8 in., duty 2s per load, drawback 2s.					Whale, 8th Sea, pale	35	0 0 0
Quebec, white spruce		13	0	20 0	Olive, Gallipoli	48	0 73 0
St. John, white spruce		13	10	15 10	Cocoanut, Cochin, ton	53	0 55 0
Yellow pine, per reduced C.					Palm, fine	39	0 40 0
Canada, 1st quality		17	0	18 10	Linseed	32	0 34 0
2nd do		11	10	12 10	Rapeseed, Eng. pale	34	0 0 0
					Cottonseed	33	0 38 0

METALS.

IRON:—

Welsh Bars in London	per ton	6	5 0	6 5 0	3
Nail Rod	do	7	5 0	7 12 6	
Hoops	do	8	5 0	9 0 0	2½
Hoops, Single	do	8	0 0	9 0 0	
Staffordshire Bars	do	7	5 0	7 15 0	
Bar, in Wales	do	5	10 0	6 0 0	3
Nailrods	do	7	5 0	7 15 0	2½
Foundry Pigs, at Olaeg, No. 1	do	2	12 3	2 17 6	net.
Swedish Bars	do	10	0 0	10 10 0	2½

STEEL:—

Swedish Keg, hammered	per ton	15	0 0	15 10 0	2½
Swedish Faggot	do	0	0 0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolt	per ton	85	0	0	0
Hammered Bottoms	do	97	0 0	0 0 0	
Flat Bottoms, not Hammered	do	92	0 0	0 0 0	
Cake and Tough Ingot	do	81	0 0	83 0 0	3
Best Selected	do	84	0 0	85 0 0	
Australian	do	83	0 0	0 0 0	
Yellow Metal Sheathing & Rods	per lb	0	0 7	0 0 7½	

LEAD —

Pig, English	per ton	21	5 0	0 0 0	
,, Spanish Soft	do	18	10 0	0 0 0	2½
Sheet, Patent	do	22	10 0	22 15 0	
Best	do	20	0 0	20 15 0	5
White	do	27	0 0	30 0 0	

REGULUS OF ANTIMONY

French	ton	43	0 0	0 0 0	

SPELTER, ZINC:—

English Sheet	per ton	26	0 0	26 10 0	2½
Devaux's V. M. Roofing Zinc	do	26	10 0	0 0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20	0 0	0 0 0	nett
QUICKSILVER	per btl	6	17 0	0 0 0	

TIN:—

English Block	per ton	96	0 0	0 0 0	2½
do Bar	do	97	0 0	99 0 0	
do Refined	do	97	0 0	0 0 0	
Banca	do	94	0 0	97 0 0	net.
Straits	do	91	10 0	92 0 0	

CONTRACTS.

TO BUILDERS, CONTRACTORS, and Others.—The Metropolitan Board of Works Hereby Give Notice that they will meet at the office of the Board, Spring Gardens, S.W., on Friday, July 17, 1868, at twelve o'clock at noon precisely, and will then be prepared to open TENDERS by parties who may be willing to CONTRACT for the CONSTRUCTION of a certain intended BRICK SEWER, 1,78 ft. in length, or thereabouts, with other works in connection therewith, on Brook Green lane, between Brook Green and Broadway, in the parish of Hammersmith, in the county of Middlesex. Parties desirous to submit tenders may inspect drawings and, upon payment of 5s., obtain specification, form of tender, and other particulars on application to Mr. J. W. Bazalgette, engineer of the Board, at the office, Spring Gardens, between the hours of nine a.m. and four p.m., or on Saturdays between the hours of nine a.m. and two p.m., until Thursday, July 16, 1868. The tenders, which must be on the form supplied from the office, and addressed to the clerk of the Board, are to be delivered at this office before four o'clock on the last mentioned day, and no tender will be received after that hour. The parties tendering must be in attendance at the Board at twelve o'clock on the day appointed for opening tenders, and any tender which is not fully filled in in every particular will be rejected. The Board do not bind themselves to accept the lowest or any tender.

JOHN POLLARD, Clerk of the Board.

Spring Gardens, S.W., June 27, 1868.

METROPOLITAN BOARD OF WORKS. To BUILDERS, CONTRACTORS, and others.—The Metropolitan Board of Works Hereby Give Notice that they are prepared to receive TENDERS for the ERECTION of a FIRE BRIGADE STATION in Renfrew-road, Lower Kennington-lane. Parties desirous to submit tenders may on and after Monday, July 6, upon payment of 30s., obtain drawings and specification, form of tender, and other particulars on application at the office, Spring Gardens, between the hours of nine a.m. and four p.m., or on Saturdays, between the hours of nine a.m. and two p.m. The tenders must be upon the forms supplied from this office, and sent under cover addressed to the Clerk of the Board marked on the outside, "Tender for Fire Brigade Station, Renfrew-road, Lower Kennington-lane," and no tender will be received after four o'clock p.m. on Monday, July 20, 1868. The Board do not bind themselves to accept the lowest or any tender.

JOHN POLLARD, Clerk of the Board.

Spring-gardens, S.W., July 1, 1868.

NORTH-EASTERN RAILWAY.—DARLINGTON SECTION.—To BUILDERS.—TENDERS are required for the ERECTION of a GOODS WAREHOUSE and OFFICE, at Redcar, and two Dwelling-houses, at Saltburn-by-the-Sea. Plans and specifications can be seen at the offices of Mr. Wm. Peachey, architect, Darlington, from Monday, June 29, to Saturday, July 11, 1868. Tenders to be delivered on or before Monday, July 13, addressed to the secretary, and endorsed "Tender for Works." No pledge is given that the lowest or any tender will be accepted.

(Signed) T. MACNAY, Secretary.

Darlington, June 25, 1868.

TO BUILDERS and CONTRACTORS.—CHESHIRE NEW COUNTY ASYLUM.—Persons disposed to TENDER for the ERECTION of the above-named building, at Parkside, near Macclesfield, may inspect the plans and specifications at my offices, in Stafford, or duplicates of the same at the Clerk of Works office on the site, on and after Monday, June 29, until Saturday, July 25, 1868. Bills of quantities may be obtained at my office, on payment of a deposit of £5 5s. for each copy, which will be returned on receipt of a *bona fide* tender for the works. Part of the foundations are already laid, and will be counted up to ground line by the present contractor. Tenders, on the lithographed forms only, must be delivered at the office of the Clerk of the Peace, Chester, by ten o'clock a.m. on Monday, July 27, 1868. Sureties will be required for the due completion of the works, but no pledge is given that the lowest or any tender will be accepted.

ROBT. GRIFFITHS, Architect.

3, Martin-street, Stafford, June 20, 1868.

FULHAM UNION. — GRANITE SUPPLY.—Notice is Hereby Given that the Guardians of the Poor of the above-named Union are willing to receive PROPOSALS for the SUPPLY of 1,000 tons of the BEST UNBROKEN BLUE GUERNSEY GRANITE, to be delivered, free of charge for delivery, into the Stone Yard of the Union Workhouse, before September 29 next. The contractor will be required to enter into a contract and bond, with two sureties, whose names and addresses must be stated in the tender. Tenders, sealed and endorsed "Tender for Granite," are to be sent to my office on or before July 8 next, and parties making proposals, or their agents, are expected to be in attendance at the meeting of the Guardians at twelve o'clock at noon, on Thursday, July 9, when the tenders will be opened. The Guardians do not bind themselves to accept the lowest or any tender.

By Order,

T. APLIN MARSH, Clerk to the Guardians.

Clerk's Office, Fulham Union Workhouse,
Hammersmith, W., June 18, 1868.

MANCHESTER NEW TOWNHALL.—TO CONTRACTORS.—TENDERS, by Schedule of Prices, are required for the EXCAVATOR'S WORK on the site of the new Townhall. Lithographed forms of tender can be obtained at the office of the architect, Royal Insurance Buildings, Manchester. Tenders to be delivered at the Townhall, Manchester, addressed to the Chairman of the Building Committee, and endorsed, "Tender for Excavations of the new Townhall," not later than ten a.m. on Thursday, July 9, 1868.

July 2, 1868. ALFRED WATERHOUSE, Architect.

IMPORTANT SALE of BRICK and TILE WORKS.—The well-known and extensive works at Bishop's Waltham, Hants, now in full operation, and producing blue bricks, stable paving, and odd stuff, equal in quality to the best Staffordshire, as well as all kinds of red, white, and buff goods, and now supplying the facing bricks for the Metropolitan Main Sewers (south London) are for SALE by TENDER. The works comprise one of Hoffman's patent German kilns, in addition to eight others. Forms of tender (which are to be sent in before August 15), together with conditions of sale, and full particulars, may be obtained of Richard Hall, jun., Esq., 37, Great George-street, Westminster; J. N. Brown, Esq., 56, Union-passage, Birmingham; and Messrs. Parke and Pollock, 63, Lincoln's Inn fields, W.C. London depot, Nine Elms Station.

MAIDSTONE LOCAL BOARD.—BROKEN GUERNSEY GRANITE.—The Local Board of Maidstone are prepared to receive TENDERS for 4,0 tons of BROKEN GUERNSEY GRANITE, to pass through a 2in. ring, to be delivered alongside the Board Wharf at Maidstone. Further particulars (if required) may be obtained on application to Mr. E. Buckham, Borough Surveyor. Sealed tenders endorsed "Tender for Broken Granite," and addressed to the Chairman of the Board, to be sent in on or before Tuesday, July 28, 1868. The Board do not bind themselves to accept the lowest or any tender.

EDWARD HOAR, Clerk to the Board.

Maidstone, June 30, 1868.

LYNTON ST. MARY.—TENDERS are required for the first portion of work in RESTORING ST MARY'S CHURCH, Lynton, near Barnstaple—namely, the erection of a new chancel. Drawings, specifications, and conditions of contract may be seen on application to the Rev. W. L. Lawson, at the Parsonage, and copies of same at my office, where all tenders are to be sent by, or, before July 11 inst.

EDWIN DOLBY, Architect.

8, St. Helen's, Abingdon, July 2, 1868.

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NOTICE to Bargemen, Lightermen, and Others.—Parties who may be willing to SUPPLY and DEPOSIT DRY RUBBISH or DREDGER STUFF on the eastern foreshore of the ROYAL ARSENAL at Woolwich, are invited to send in terms to the Inspector of Works, Royal Arsenal, on or before August 1, 1868. Every information will be given on application, either by letter or in person, at the Office of the Inspector of Works, Royal Arsenal, Woolwich, daily (excepting Saturdays and Sundays), between the hours of eleven a.m. and three p.m.

War Office, Pall Mall, June 8, 1868.

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WILLIAM J. VIAN, Secretary.

CAUTION.—BLAKE'S PATENT STONE BREAKER.—IN CHANCERY.—"BLAKE v. ARCHER." November 12, 1867.—His Honour the Vice-Chancellor Wood having found a verdict in favour of the plaintiffs in the above cause, establishing the validity of Blake's Patent, and made a decree for an injunction to restrain the defendants, Messrs. Thomas Archer and Son, of Dunston Engine Works near Gateshead-on-Tyne, from infringing such patent, and ordering them to pay to the plaintiffs the costs of the suit, all persons are hereby cautioned against manufacturing, selling, or using any stone breakers similar to Blake's, which have not been manufactured by the plaintiffs. Application will forthwith be made to the Court of Chancery for injunctions against all persons who may be found infringing Blake's Patent after this notice.—Sole maker in England, H. R. MARSDEN, Soho Foundry, Meadow-lane, Leeds.

NOTICE TO INVENTORS.—OFFICE for PATENTS, 4, Trafalgar-square, Charing Cross. Printed Instructions (gratis) as to the cost of Patents for Great Britain or Foreign Countries. Advice and assistance in disposing of or working Inventions. Capital provided. Branch Offices and Agencies in every Continental State, and in America. Established 20 years. Full information as to Expired or existing Patents at home or Abroad.—Apply personally, or by letter, to Messrs. PRINCE and CO., Patent Office, 4, Trafalgar-square, Charing Cross, W.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 10, 1868.

A MINISTER OF ARCHITECTURE, SCIENCE, AND ARTS.

IT has long been felt by many of those who have studied the subject of fine art in its various bearings that, as far as the English Government is concerned, it is in a most unsatisfactory condition. The opinion expressed by Mr. Hope, in the late discussion, upon the absurd statue of Sir Robert Peel, commended itself, we are sure, to many of those who heard it, and will find an echo in the breasts of most of our readers. We want a minister who shall have the general supervision of art and science, and be responsible to Parliament for the way in which he uses his powers. There can be little doubt that it is a perfect absurdity that collections such as that at South Kensington should be isolated and treated as a sort of plaything in the hands of the heads of the Committee of Council upon Education; that the British Museum should be under its separate trustees, and the National Gallery under its separate management. Then, again, there is the Board of Works, with its enormous powers for good or evil, unrepresented in Parliament. One glaring inconvenience was pointed out by Mr. Hope in his letter to the *Times* of June 26, that the First Commissioner of Works and the Vice-President are by general usage both obliged to sit in the House of Commons; so that those in the House of Lords who care for art questions find themselves continually hampered from the constant absence of any member of the Government specially charged with such questions. This, as he observes, is especially annoying and injurious, inasmuch as the Upper House enjoys a learned leisure denied to the other to discuss art questions. Now appears to be the time for ventilating this important question, since it seems at last probable that the whole question, at least of national collections, will be considered and settled. The late debate upon the British Museum estimates shows that all parties are tired of the present state of confusion in which the matchless stores at the Museum are huddled away in corners and dungeons to the certain destruction of much that is capable of being destroyed, and, where that is not possible, hidden from the eyes of the public who have paid for their purchase. Those who want to get up any subject properly will not, we trust, much longer have needlessly to travel from George-street to the British Museum, from there to the National Gallery, and then, if time will allow, off to South Kensington. Before the National Gallery is rebuilt it ought certainly to be settled what it at least is to contain. At the risk of being somewhat tedious upon a subject about which so much has everywhere been said and written, we recur to it because of its immense importance and the manifest wisdom of coming to a decision as soon as possible. We have an unrivalled collection of mediæval art at South Kensington, but it is being so surrounded by other collections that it is difficult to see it, and almost impossible thoroughly to study it. To study it in conjunction with the classic art from which it sprung—the most valuable way of studying it—is of course out of the question. Then, again, there is a supplemental collection of the same sort of works, not nearly so extensive, but quite as important in its way, at the British Museum. It is simply absurd that these two, which together would form an assemblage of objects of mediæval art of double the value they possess separately, should be placed apart, so far apart as to be practically unavailable for the purpose of comparison. Now the facility given for comparing various works of art of the same master or period, and also of one period and country, with those of others, is one of the most valuable, if not the most valuable, result of the forming of great collections. Taste is only perfected by the discrimination and selection of the best work of each period, and this can only be done by comparison. At the same time there are hundreds of ways in which even the very worst work, especially of early times, may be interesting and instructive. What can be done in the matter to gain for our students the greatest advantages? Why clearly, unite those parts of the collections which have a close relation to or identity with each other. But as long as South Kensington is a sort of plaything in the hands of the President and Vice-President of the Science and Art Department, any such largeness of views, such national treatment of the subject, is out of the question. So far from there being anything like unity of purpose between the various bodies who are charged with purchasing for the nation, we have upon many occasions had actual rivalry, and the nation has had to pay threefold for its acquisitions, because the South Kensington authorities were bidding against the trustees of the British Museum or others. This absurdity, we believe, has now stopped, but there is no guarantee that under different heads of departments or by mere inadvertence it may not soon be renewed. If all the art collections were under one president, with a council, responsible to Parliament, such absurdity would be impossible. But it is not only in competition between the rivals that national money is lost; quite as much, if not more, may go in the purchase of duplicates. If we are to have a British Museum mediæval collection, and another at South Kensington, of course neither of the governing bodies will feel obliged to refuse the purchase of a costly work of art because there happens to be a similar example at one or other of the collections; and yet, as far as the nation is concerned, the money would be virtually thrown away. There can, then, for these and many other reasons, be no sort of doubt that amalgamation is necessary, both with a view to economy and efficiency. Here, however, we meet with a logical difficulty, for after all there is really no hard-and-fast line in art any more than in politics, and of course in a national collection all art of all periods and races should as far as possible be represented; and to a certain extent there is a continuity of line which cannot easily be broken without interfering with the historical interest of the subject. If it were possible that a perfect collection of all art could be gathered under one roof, there would be many advantages derivable therefrom, but this is out of the question. There is, however, no insurmountable difficulty in placing our art collection, viewed in its natural aspect as one, under one responsible minister. The classification, arrangement, and housing of the whole would then be more easily settled; for, though, as a mere matter of logic, there is no more reason for separating the modern from the mediæval than the latter from the ancient, yet practically, if division there must be, we can without much objection divide art into ancient and modern—by the latter meaning not that of any particular date, but that which was the production of the Renaissance; so that where mediæval forms and feeling remained to a later date, as not unfrequently occurred, sometimes from exceptional reasons, sometimes the habits of the people, as in the case of the Flemish oak carving, we should include the Gothic work, though later in point of date, in the ancient collection, as bearing a nearer resemblance and closer connection with it. For this reason, on account of the remarkable absence of change in most Eastern countries, and of the immense influence of the East upon the art of the middle ages, we should be inclined to exhibit all or nearly all our specimens of Eastern art—whether original, as in Persia or India, or borrowed in parts of Turkey or Moldavia—in the ancient department. But when the line of demarcation is settled there will still be the great difficulty of settling the location. We can hardly for a moment doubt that the old world stuff should go to the British Museum, where already the bulk of our Roman, Greek, Assyrian, and Egyptian treasures are placed. Of course as long as there is anything like a rivalry between it and South Kensington this will scarcely be done, but should it be found possible to bring about the harmonious arrangement which we are contending for, the matter will be easy enough. It may be wise in certain subjects, such as Glass, where the collection is never likely to be so extensive as to make the question of room a difficulty, not to separate the ancient from the modern, but to show the whole collection in as unbroken a series as is possible. The British Museum will have to give up much, and receive much, to the mutual advantage of both institutions. It will also be called upon to assist in the furnishing of the new National Gallery. Whatever may be decided upon with respect to prints and portraits, it is quite clear that the drawings ought to be shown along with the paintings of the great masters. Nothing more assists one in understanding and appreciating these works than a careful study of the mode of their arriving at the various degrees of perfection they attained. At present not only are the drawings at such a distance from the paintings as to preclude comparison, but they are, from want of room to exhibit them, and attendants to show them, really shut up from the mass of the people. If, as we trust, the exhibition of all that should be exhibited shall be decided upon, no time is to be lost in coming to the decision, for distinct space must be found for them in the new National Gallery. The best conditions for seeing drawings and oil paintings are essentially different. There still remain the portraits to be disposed of. Of these the nation possesses a more divided collection than even of works of art. That all should be collected into one building there is no doubt, but where? Not at George-street, Westminster. Shall they go to the National Gallery, or shall room be found for them in connection with the library at the British Museum? The interest of a large portion being merely historical it would seem, at any rate, to be wiser to keep them, or the greater portion of them, separate from the many artistic collections. If any feasible plan can be devised for showing them well at the Museum we cannot imagine a better home for them. But they might as well be at the top of St. Paul's as over the cases, as the Museum portraits are now placed. From what we have said now upon the art part of the question it is evident what great advantages might arise from putting all these matters under one art minister; and just as good a case can be shown from the architectural and Board of Works side of the question. We are certain that the whole matter is well worth the attention of art lovers. We wish Mr. Hope success in his attempts to move the House of Commons to take his view of the question.

THE ART OF BUILDING IN CONCRETE.—TALL'S APPARATUS.

FOR some time back much attention has been directed to the application of concrete, béton, and its many varieties, to those constructive purposes for which previously brick and stone were regarded as the only suitable materials. We are not now concerned with the employment that has been made of these substitutes upon a scale of magnitude, embracing the construction of sea walls, harbours, jetties, and similar works of corresponding dimensions. Our remarks at present are confined to those examples in which attempts have been made to supersede the use of brick and stone in ordinary dwelling-houses, warehouses, and stores, by the ap-

plication of concrete. The first principle that must be adhered to in all attempts to supersede any recognised and time-honoured system of construction is that the total cost of the proposed novel method must not exceed that of the old. The total cost obviously consists of two items—one, the price of the material, and the other, that of putting it together, the price of the workmanship. This first principle may be expressed mathematically in very simple terms. If Q represent the quantity of material required in one system, the older one for instance, and P the cost of the workmanship attendant upon Q, then P and Q represent the total cost of erection by this method. Let Q^1 equal the quantity of material demanded by the new system and P^1 its cost, then $P^1 \times Q^1$ will manifestly represent the total cost. In order to ensure a fair trial to any new method of construction the maximum value that may be given to $P^1 \times Q^1$ is, $P^1 \times Q^1 = P \times Q$. Unless this fundamental principle be adhered to, there is no practical use in endeavouring to introduce to the public any proposed new method of construction with the slightest chance of making it pay. Either of the two items, P or Q, may be separately greater or less than P^1 or Q^1, but there must be a collective equality in any case. A problem that has been for a long period presented to the architect and builder is, What is the minimum price at which dwellings can be erected for working men and their families? We do not ourselves consider that this is either a fair way of stating the question or a plan likely to solve the difficulty. We do not believe in what is commonly called "cheap work," although we do believe in a cheap principle of work, which is a very different affair. The question, then, resolves itself into the substitution of some material which shall be cheaper than those ordinarily used in all similar instances. Concrete has been employed from very early times in this manner, but its application has been not only hitherto confined to very narrow limits in the building house sphere, but it has never received that amount of investigation and attention which the importance of the subject demands. It has never been regarded in a systematic point of view, and the taking out of a patent by Mr. Tall is the first indication that success will attend its adoption, and render its utility not questionable, but undoubted, its application not transitory and fitful, but steady and permanent.

One of the constant and most shallow arguments urged against concrete walls is that they are not so strong as those built of bricks. It is excusable, although barely so, for amateurs and outsiders to put forward such utter nonsense, but when we witness the same statements supported by professional men, the reply to them becomes a species of absurdity. There are abundance of statistics with respect to experiments conducted with a view to testing the breaking weight of concretes and cements at the disposal of those who choose to search for them. We would advise those who are not acquainted with them to become so before they ignorantly draw comparisons between the two methods of construction. Without entering further into this matter, it will be assumed that a concrete wall built upon Mr. Tall's principle is much stronger than an ordinary brick wall built in mortar. It is not, however, taken for granted that it is any stronger than a brick wall built in Portland cement; they are probably of equal strength, and both after the lapse of a certain time participate more in the nature of solid rock than of an agglomeration of individual and component parts. The actual nature and constituency of Mr. Tall's concrete may be said to be of a double kind, fine and coarse, with many intermediate shades, as it were, depending upon the character of the gravel or stone to be found in the particular locality. The finest description is made from burnt clay, sand, and cement, and the coarsest includes in its composition stones sufficiently large to come under the designation of rubble work. Every professional man is aware that rubble work is one of the strongest descriptions of masonry that can be built. It does not depend for its solidity and inherent strength upon the insistent weight of each stone, similar to dressed ashlar work, but these qualities are imparted to it by the universality of its cementation, the reticulated nature of its union. The stones do not adhere to one another solely by the medium of vertical and horizontal joints, but are cemented together by joints running in every possible direction. Not the least meritorious feature in Mr. Tall's principle is that any kind of stones, the rougher and sharper the better, bats, old bricks, clinkers, glass, and almost any kind of hard refuse, can be safely and profitably utilised. Bulk for bulk, the cost or the value of Q^1 in our fundamental equation is evidently much less than that of Q, supposing it to represent an equivalent amount of brickwork; and since a less quantity of concrete will suffice to give the same strength as a greater quantity of brickwork, the saving in the cost of material is apparent. We now come to the other item P^1 in our calculation. In the first place, we will briefly describe the method of using the apparatus. It consists of a frame composed of uprights at the corners, and longitudinal panels fitting in between, and enclosing a space equal to the thickness of the intended wall. Where there is a long length of wall to be built, it is obvious that the panels, which consist of planks laid longitudinally, would sagg, were they not supported at intervals. This is prevented by the introduction of intermediate uprights, or stiffening pieces, as they might be termed, into which the ends of the panels slide. These stiffening uprights act precisely the same part as the T-iron stiffeners do to the sides of a plate girder. The frame being set up and truly levelled, the space between the panels is filled in with the concrete for a height of 21in. all round. Wood blocks, slightly tapering, are inserted in the material where joists, sills, and other work is to be placed, and the building carried up uniformly. So soon as the 21in. is finished the panels are removed and shifted up to their next position upon the uprights, and so on until about 6ft. in height is gained, when the uprights themselves are shifted up, and so on to the completion of the work. The frame is in separate pieces, and its putting together and taking asunder a very simple operation. We cannot, however, but consider that a large portion of the timber in it might be advantageously replaced by iron. By the skilful and judicious use of angle iron the whole arrangement might be rendered lighter and more permanent. It is easy to perceive that the apparatus is susceptible of improvement, which will doubtless be given to it as it comes to be more generally adopted.

Notwithstanding that one of the items in our calculation is so much smaller than the corresponding one having reference to construction in brick, it is evident that the other is much greater. In a word, it would not pay to employ Mr. Tall's apparatus to build one small house, any more than it would to employ a steam engine to lift one sack of coals, or a locomotive to draw one carriage. The framework may be regarded as plant which may be rendered serviceable for a number of similar jobs, but which is too expensive to be used upon a very insignificant scale. Any person desiring to erect half a dozen cottages or other small dwellings would find the first cost of the concrete apparatus more than repay itself. All concrete work in the walls of houses must be faced with stucco or plaster on the outside, and owing to the roughness of the material the "bite" obtained by the plaster is so good as to virtually incorporate it with the concrete. There would be no danger off it peeling of in patches, as is constantly the case when stucco is applied upon brickwork. On the other hand, there is no absolute necessity for plastering brickwork, provided the bricks are of a quality sufficiently good for facing bricks. All that is really necessary in labourers' dwellings is to strike the joints, and in a house of superior description to tuck-point them. It is alleged as one of the greatest advantages of this system that skilled labour may be dispensed with, and that a common labourer can build up the walls within the frame. This is a point we do not entirely concur in, for care and skill are necessary in building the walls. They cannot be exactly thrown together in heaps, and the materials left to arrange themselves in any manner they choose. Skilled labour may be reduced in amount, but it cannot be altogether dispensed with. We shall be glad to witness the further development of Mr. Tall's principle, as it appears to possess all the elements requisite within the limits we have mentioned to ensure the presence of soundness, solidity strength, and durability in whatever description of building it may be applied to. The manner in which houses are run up with scarcely a whole or sound brick in their entire composition has proved to what ordinary brickwork may come. Any regular systematic method of utilising concrete as a building material, if scientifically carried out, must attract the attention of both professional men and the public.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

Fourth Notice.

FRENCH PAINTING.

THE art of painting, as a separate school, had no early existence in France, and it is rare to find a French name amongst the artists previous to the sixteenth century. Glass painters and miniaturists she had, it is true, but rarely one of them rose, by his individuality and talent, sufficiently above the level of mediocrity to make a name for himself. Those Frenchmen who did so found a more congenial home in Flanders or in Rome, and may be consequently considered rather as labourers in the vineyard of Italy, or the fat lands of the Low Countries, than as cultivators in France. King René, of Anjou, who loved painting more than power, is almost the only name remembered as an artist; and so barren was the art soil in France that artists were obtained from Flanders or Italy for all the important works in painting which were needed in France during the middle ages. Charlemagne brought from Byzantium, Ravenna, and Rome a large train of artists in mosaic and painting for his works in the north. To the palace of the Popes at Avignon, in later years, came Giotto and Simone Memmi, but they left their record solely on the work they touched, and no local schools were founded by their labours or example. Even as late as the time of Francis I. the painters for his Palace at Fontainebleau had to be brought from Rome, and Andrea del Sarto, Sguazzella, Rosso, Caccianemici, and Primaticcio executed the works there. So great, in fact, was the number of Italians here employed that the prints alone of this school of Fontainebleau, in Marriette's collection, numbered 640. This great influx had some small result, and a few Frenchmen were imbued with a love of art, but, as yet, they found so small a response in France that they chiefly migrated to and stayed in Rome. The earliest illustration exhibited at Leeds of French painting in France is the work of Louis Lenain, or the dwarf—one of a family of artists who lived and died in obscurity at Laon. Of this family four members seem to have existed—one, whose Christian name does not appear to be known; Louis, Antoine, and Matthieu. These latter were three brothers, but in what relationship the other and elder Lenain stood to them is not known. Of Louis we have a fine truthfully painted little picture here, Flemish in character and handling. It is carefully painted, and represents the charitable action

of a peasant girl, who is giving a bowl of milk to a beggar family; it shows a considerable amount of skill, and, what was then still rarer, a very large amount of truth and observation of nature. Louis and Antoine died in their native place, in 1648, within a few days of each other; Matthieu survived them some thirty years, but we have none of his works here. Meanwhile, from Andely, in Normandy, an artist was coming who, more than any Frenchman of his time, left his mark upon the art, changing the character of contemporary painting and impressing his individuality on all who came after him. This was Nicholas Poussin. Educated in the first instance by an artist at Amiens, whose only glory is that he had Poussin for his pupil, he was further instructed in the art by Elle, the Fleming, and, as soon as he could, quitted his native country and settled at Rome, where for forty years he lived, and where he died. To him belongs the honour not only of being the first of his nation who rose to eminence in art, but of reviving in a great measure the decaying school of Italy by turning back its attention to the purer sources springing from the antique, and, above all, of laying the foundation of the modern school of landscape painting. Of both these phases of his labour we have examples here. In "The Massacre of the Innocents" (390) we find a well and classically composed group, worthy of a Greek cameo in drawing but browned in colour, as all his works are, and, by its thinness of painting and lowness of tone, foreshadowing the future characteristics of the French school. A later work from the Liverpool collection (415), called "A Poetic Landscape," is like most of the contributions from that gallery, of very poor character; it combines, in some measure, his two styles, but his power as a landscape painter is better seen in No. 394. Here a grand stretch of the Campagna, backed by the outspurs of the Apennines, and broken here and there by long lines of arcaded aqueducts, leads away the eye into a vast distance. Of course there is the usual cascade in the middle distance and the usual heavy trees in the foreground. A landscape was heterodox in those days unless it had them, and living in Rome he must do as Rome did. Moreover, it was then necessary that a landscape should have a subject, for as a landscape simply it could not be a picture, and the subject here is Hagar and Ishmael. Parched and thirsty, in a shady wood, beside a roaring cascade, they need an angel of large dimensions to lead them to water and to shelter, and they have it: Could anything more be desired? In spite of all this absurdity, which the taste, or the want of it, of the day forced upon the artist, we see here the first glimmering of a study of nature; and in No. 235, where he attempts the grandeur of a thunderstorm, it is even still more manifest, or would be if we could see the picture, which the wretched cross-lighting of the rooms renders impossible, except by an acrobatic performance this hot weather does not render exhilarating. By Gaspar Dughet, the pupil and brother-in-law of Nicholas Poussin, or, as from love to his master and relative he called himself, Gaspar Poussin, we have four examples. Gaspar, except by courtesy, can scarcely be called a Frenchman; born, living, working, and dying in Rome, his only connection with the country which claims him is that his parents were of French extraction, and he really belongs more to Italy than France. His work here is very good, and in No. 207, "Monks Reading," we have a good and careful work, still composed *secundem artem*, but breaking down some of the conventional barriers which hedged about the artist; and in No. 323 we have a yet finer example. Here we see the influence of Claude working upon him, and the fine open reach of low flat land stretching out to the sea, its long horizon broken only by a distant headland and the belvidere of a villa in the mid distance, and its low grey aerial tones, mark it as work of the highest class; but it is to Claude that we owe our further emancipation from those canons of art which had hitherto prevented the expansion of the landscape painter's power. By this Claude Gelle, or as from the district of his birth, he is usually known, Claude Lorraine, we have some very fine examples, showing how much at once of truth and poetry there was in this great painter, whose works it is so much the fashion, since Ruskinism was invented, to decry. One of his finest works here is Lord Dartmouth's "Dancing Dog," which has been engraved by Merriman, and exhibits in a marked degree Claude's knowledge and love of light. Lustrous and morning-like, the far distant hills, the middle distance trees, and the cows in the foreground pool are bathed in light, exhibiting the keen observance of nature and the refined quality of mind so pre-eminently observable in this painter's works. Another picture, from Lord Scarsdale's collection (No. 388), exhibits some tree drawing of a character so true and natural that Turner himself might have gloried in it. Lord Faversham's two examples (Nos. 2,929-2,930), in the Dudley Gallery, are very bright and fine, but injured by overcleaning; yet sufficient exists to show what Claude was, and to those who derive their knowledge of this old master from books alone and echo the pretty sentences of Ruskin we commend the study of these pictures here, when they will find that Claude Lorraine was the more truthful of the two and quite as pretty.

Sebastian Bourdon, the friend of Claude, is represented by two examples, showing well-directed study and great power in drawing, but at the same time most painfully exhibiting his inability to colour. In the first of these (No. 366) "A Repose," from Lord Faversham's collection, we have a composition of thoroughly Italian character, and exhibiting in the landscape portion the influence of his friend. The other of his works here is a nobly composed and ably drawn picture representing the lifting up the Brazen Serpent in the wilderness, contributed by Lord Chesham. The groups which surround the life-giving symbol are admirable in their pose, and the central one, of a young husband who has brought his loved wife, but just too late, to raise her eyes to the healing type, is most touchingly conceived and pathetically rendered, but the colouring is weak and flat, and as Bourdon's etchings show in light and shade, form and grouping, he was a master, yet in colour he always remained a tyro.

Attributed to that manufacturer of pictorial battles, Charles Le Brun, are four pictures, three of them being his stock subjects, the Triumph of Alexander, translated into French of the time of Louis Quatorze, and the fourth, a better painting, the meeting of Elizabeth and the Blessed Virgin—a subject, however, which required a man of feeling rather than a man of fashion, to translate. Le Brun had clever hands only—no heart, and failure is the consequence. We have another battle painter here of a different stamp, one who gave us the bold dash and vigour of the combat, and told his tale more like a soldier than a courtier. This is Jaques Courtoise, as the French call him—Jacops Cortese, as he called himself, but who is generally known by the name of Il Borgonone, having been born in Franche Contè. He had practical knowledge of both painting and fighting, and studied both of them in Italy, where he died a Jesuit father, in 1676. His fine confusion and bold colouring in No. 367, where the large masses of men and horse unite in deadly strife, are admirably depicted, and the more open skirmishing party in No. 384 is an exquisite bit of warfare, but there is not the slightest *soupcon* of French character in it all, and he really belongs to the Italian school.

This brings us to the time when French art impinged upon England, and when the Edict of Nantes, and the troubles which followed upon it, drove many Frenchmen, and amongst them some few artists, to England. Rosseau was one of these, and we have here by him an illustration of a class of painting now long passed away. We mean the architectural scenes which it was the fashion in the beginning of the last century to inlay into the walls of the staircases and larger rooms of the good old mansions they built then-a-days, and such as he painted for Montague House, the nucleus of the British Museum. The subject is a triumphal arch, with Corinthian column seen in very quick perspective, admirably drawn, but slightly insipid. By his fellow countryman and fellow labourer at Montague House—Cheron—we have two small examples of no great merit. The former of these (No. 404), "Boaz and Ruth," from the Duke of Devonshire's gallery, is the better of the two, and being in monochrome does not exhibit this artist's inability to colour as does his "Walk to Emmaus" (No. 416). Largillere, who also was much in England, is made known to us through his intelligent portrait of that "gardener of Kings," Le Nôtre, to whose skill and taste we owe those long lines of avenues which, "fine by degrees and beautifully less," lead away the eye into such distances at Versailles. From Le Nôtre's portrait our next step is to the works of that painter who peoples his glades and gardens—Watteau.

By, or attributed to Watteau, are no less than eight pictures exhibited here, a few of them perhaps genuine, but some most palpable copies, and some wrongly named, and even the genuine ones by him are, as a rule, but of second-rate quality. There are few men whose fame has suffered more by their success than Watteau. Fitting, as he did, so exactly the public caprice, reflecting so strongly by his painting the literature of his time, and writing in an universal language the pastoral prettinesses of the Strephons and Daphnes, the Colins and Chloes of his day, the demand for his works was so very great and so widely spread that whole manufactories of what may by courtesy be called decorative paintings were created to supply it. To the whole of the enormous mass of rubbish thus provided was the name of Watteau affixed, and though some few men arose who could give sufficient individuality to their works to make an independent name for themselves, yet even their works are very frequently given to this the greatest of the *petites maitres* of his day, and are duly catalogued as his. Nos. 374 and 388, belonging to Earl Catheart and Mr. Heywood Hawkins, are evidently companion pictures, now once again united under the same roof. Both represent those *fêtes galantes* Watteau created on canvas, and which were endeavoured to be carried into actual life in the rather queer times of Louis XV. and the early part of Louis XVI., when shepherds and shepherdesses were in high vogue in the quartier St. Germain, and who mistook the young wolves of the quartier St. Antoine for silly sheep. These two pictures are clearly and cleverly painted, with a light touch and a light heart, and, like a soap bubble, are brilliant albeit they are hollow; yet they are hardly good enough to be Watteau's, but are clever imitations. To our mind the only original specimen of this charming master here is Mr. Vaughan's "Fête Champêtre," a study for the picture now in the Louvre. It is remarkably clear and silvery in tone, and the soft delicious landscape shows what Watteau was capable of. In England this master is really unknown. The large amount of copies quite prevent his true genius being appreciated. We have seen him combine the two qualities of Claude and Rubens, but of his larger and more vigorous work we have no examples. Two out of a set of four seasons are here ascribed to him, but are by Lancret, and will be found amongst his engraved works. Lancret was Watteau's greatest imitator, and the one who rose to the greatest eminence; and besides these two, we have here, in his own name, a pleasant little game at Blindman's Buff (No. 403), worthy of study for colour and clearness. His coadjutor in decorative

work, Boucher, is but poorly represented, even in name, for there are but two works attributed to, and none by him, here.

Of Vernet, the father of the celebrated Carl and the grandfather of the still more celebrated Horace, we have several very fine truthful landscapes here—landscapes which show that the old days of composing by rule had passed away and that nature was now beginning to be studied for her own sake. The careful hazy morning scene upon the beach (No. 372), where the fishermen return home from their nightly toil upon the deep and where the sea fog shrouds each object with its mysterious halo, is painted in a manner Turner could not surpass. In No. 407 we find him in another mood, when the spirit of Claude was upon him and the soft sunset glow lights up the seaport with a calm serenity, offering a powerful contrast to his "Storm" (No. 388). This latter is a marvellous bit of painting; land, water, and sky all truthfully observed and well expressed, whilst his figures and accessories are most exquisitely rendered. Of his earlier work we have a fine foreground bit of Tivoli, where he still felt the influence of Salvator Rosa, but in which we see his own fine quality of light. Of Greuze, the connecting link between the past and the present, and who died in 1805, we have five or six pictures which bear his name, but in some of them we find, instead of his work, the most audacious and mendacious copies. The most unblushing of these is No. 387, for which, we believe, a long price was paid not long ago, and which is worth almost the cost of its frame. It is a morbid, bruised female head, presenting none of the rich qualities of this fascinating painter. Mr. Cholmondeley's charming specimen in the Dudley Gallery (No. 2,928) shows what his touch and treatment really were, and there is a very pleasing little bit lent by Mr. Knowles, but which is not yet included in the catalogue, and this closes the range of the "old masters" in galleries A and B and the centre or Dudley Gallery. In gallery C is a good collection of the German school, which we must reserve for our next notice.

AN INDUSTRIAL MUSEUM AND FREE LIBRARY FOR LONDON.

A SOCIETY named the Public Museums and Free Libraries Association, established for the promotion, the improvement, and the popularisation of scientific, artistic, and literary collections, and whose proposals were warmly commended to the encouragement and help of our readers several months since, has set itself to the task of obtaining, if practicable, better accommodation for the museum and library of the Patent Office. In this special work the council of the association are sustained by a number of eminent men. To large numbers of practical minds the promotion of museums and libraries generally may appear to be of far inferior moment to the fitting development of institutions which if they were properly cared for would place within reach of the skilled artisans and mechanics of the metropolis the means of gaining that knowledge the possession of which is so marked a feature in the training and qualifications of their continental competitors. The Museum of Patents, at South Kensington, has hitherto been regarded very much as a collection of mechanical curiosities. Placed at a distance from the dwellings of the hard-handed, clear-headed foremen and workmen in the engineering and chemical establishments, it is not to be expected that it could exercise any perceptible influence in diffusing a knowledge of the progress of science in its industrial applications amongst the classes from whose intelligence and ingenuity we get so many of our most practical inventions and improvements. Yet the purpose of the museum was declared nine years ago to be that of an historical and educational institution. Exact models of machinery in subjects and series of subjects, showing the progressive steps of improvement in the machines for each branch of manufacture, were, it was stated, to be exhibited. For example, it was intended to show in series of exact models each important invention and improvement in steam propellers from the first engine that drove a boat of two tons burthen to the gigantic machinery of the present day propelling the first-rate ship of war or commerce. The original small experimental engine that drove the boat of two tons was already in the museum. It was further averred officially on the part of the Commissioners of Patents that a large number of valuable models remained in their cases, for the reason that room could not be found for exhibition; the Commissioners have been also, and for the same reason, compelled to postpone the acceptance of many valuable models offered as gifts by manufacturers and inventors, and visitors to the iron shed, which reminds us, by the contrast it presents to the palatial structure near by, that art, the plaything of the affluent, is cultivated to the neglect of science and industry, the mainstay of our country's prosperity.

The Scientific Library of the Patent Office was reported upon together with the museum in very strong language by a parliamentary select committee in 1864. For purposes of reference or research there resort to Southampton buildings about 16,000 readers annually. The use that might be made of this library if greater space were allotted to it and it were opened after the ordinary daily labour of the wage-paid class ceased, may be inferred from the number of references to the publications of the Patent Office alone in the central library of the city of Manchester, where, in a single year, the total reached 38,000. In July, 1864, when the Commons' Select Committee reported, matters in the library were, perhaps, at their worst. The House was informed that the place used for the inspection of specifications and drawings was little better than a dark passage, in which there was barely standing room. The library was found to be of great value and utility, but its utility was seriously impaired by its crowded state and the want of sufficient attendants; the books were stowed away in a number of small rooms, or rather closets, some on floors, some on tables, some in passages, and some on shelves; while the store rooms were so overloaded that the floors had already sunk, and the surveyor of the Board of Works refused to allow them to be loaded any more, lest they should break down. At length, at a cost of £15,000, new rooms were built in the upper portion of the building, which the Patent Office was allowed to use for the purposes set forth in the Act of 1852, and these were opened in April, 1867. But they were far too small for the purpose; barely sufficient for the accommodation of the books which were in the library at the time the rooms were erected, they contained no provision for future expansion, and they are already completely filled, while there is no space in which new shelves can be placed for the additions which the library continually receives.

Several questions should be very plainly put to the Government. Why, we would ask, are the appeals for a building in a central locality, which the Commissioners have made, and repeated ten years successively, still ignored? Why has the Treasury received, in addition to the stamp duties which the Act of 1852 allows, £511,000, the surplus revenues of the Patent Office since 1852, while the museum and library, which the Commissioners were, by the act, expressly authorised to establish, remain a bye-word and a scandal to the metropolis? Why were the museum and the library ever placed at a distance of three miles one from the other, as though the utility of institutions depended on their being separated when of a kindred character, and likely to be popularly resorted to the more inconvenient of access? These questions embrace the points to which the Public Museums Association now ask the attention of the public. We trust that, supported by the voice of the people, and through such men of mark and authority as Mr. Austen Layard, Professor Leone Levi, Lord Ebury, Sir Robert Collier, and others, the aims of the Association will not be long in accomplishment, in obtaining, by the union of the Patent Office, museum, and library under one roof, a polytechnic institute worthy of comparison with the twenty-one states and colonies, which are in this respect at present our superiors.

LINCOLN CATHEDRAL.*

THE architectural history of Lincoln Cathedral has been already very ably and completely described by two most competent persons—namely, Professor Willis and the Rev. G. Ayliffe Poole. I am not aware that Professor Willis's remarks, delivered at the meeting of the Royal Archæological Institute at Lincoln, in 1848, have ever been published or made available in any form to the members of this society. Mr. Poole's were printed, together with a valuable appendix, comprising all the historical data bearing on the cathedral and connected with the see, in the volume of this society's Transactions for 1857. Mr. Poole's review of the building was based chiefly upon information derived from the light which this collection of historical facts threw upon the subject. It is, in every respect, a very interesting treatise. When, then, the committee of this society did me the honour to invite me to lecture to you here to-day, I had to consider from what new point of view the subject might be again presented in an acceptable form to the members of this society. I believe I am correct in assuming that at meetings of this kind the greater part of those present may be more correctly described as taking a general interest in the study of church architecture than as possessing a critical knowledge of the subject. It appears to me, then, that I shall best serve the purpose of the committee and the objects of this society, which no doubt are continually to enlarge the circle of those who interest themselves in the noble series of monuments that contain the history of our national architecture, by endeavouring to draw from the building before us a few practical hints on the subject of church architecture generally, and by pointing out the excellent illustrations which different parts of the structure offer of the several periods of this interesting history. And in doing this I intend, craving the indulgence of the more learned members of the society, to address myself more particularly to those whose knowledge of the subject is less advanced, and who consequently stand in greater need of help and guidance in their studies. Now, in order to render what I say useful or even intelligible to this portion of my audience, it is necessary that I should explain the few technical terms which I intend to use; and here I may remark, by way of parenthesis, that the fewer technical terms a lecturer uses to a mixed audience the better, and the more obvious and self-explanatory those terms are, the better.

It is just twenty years ago—at the meeting, in fact, of the Royal Archæological Institute at Lincoln, in July, 1848—that I read in this room a paper, a copy of which lies on the table, on certain parts of Lincoln Cathedral. This paper formed the basis of a work which I subsequently published, and in which I proposed what was then a new division and nomenclature of the styles of English architecture. As this terminology is the one which I intend to use to-day in the classification of the different works of Lincoln Cathedral, it is necessary that I should briefly explain it. There is one division of the architecture of Europe on which all are agreed—that, namely, which separates the buildings of the Middle Ages into two classes; the first comprising all those buildings that were erected during the prevalence of the circular arch, and the second those that were constructed during the prevalence of the pointed arch. These two classes have been, by common consent, called Romanesque and Gothic. Of English Romanesque buildings we have again two kinds, those

* Lecture delivered to the Members of the Lincolnshire Diocesan Architectural Society at their Annual Meeting at Lincoln, on Wednesday, June 17, 1868. By EDMUND SHARPE, Esq., F.R.I.B.A.

which were erected before and after the Conquest, and which may, therefore, be conveniently called Saxon and Norman. Of the buildings constructed during the Gothic period, the most natural division is that which is indicated by the several changes of form through which that prominent feature of every mediæval building, the window, passed during that time. These changes of form are exhibited in the four diagrams on my left. In the first half century after the complete adoption, in all parts of buildings, of the pointed arch, the lancet window was alone used; during the next half century, or thereabouts, the geometrical window, or that in the tracery of which that simplest of all geometrical figures, the circle, prevailed, was alone used. During the next half century, the window-heads were characterised by that peculiarly English feature, flowing tracery, in which the ogee, or curve of contra-flexure, was conspicuous. And during the last or fourth period of Gothic art, straight lines, both horizontal and vertical, formed the leading lines of the tracery of windows. I proposed, then, in the work to which I have alluded, to call these four periods of Gothic art respectively, Lancet, Geometrical, Curvilinear, and Rectilinear, terms which may be accepted as fulfilling the condition already laid down, and as being sufficiently self-explanatory. But there remains to be noticed a period during which many buildings were erected, of great importance and great originality, to the characteristic features of which sufficient attention has not even yet perhaps been sufficiently directed—I mean those that were erected during that prolonged struggle which was carried on between those two rival principles, the circular and the pointed forms of arch; in fact, during the interval that occurred between the first appearance of the pointed arch and the final disappearance of the circular arch. To this interval I gave the name of the Transitional Period, a term that has become now almost universally adopted as applied to these buildings.

We have thus seven periods of the history of church architecture in Great Britain, to the duration of which I assigned twenty years ago the following limits, which subsequent experience and study have not in the meantime led me in any respect to alter:—

	A.D.	A.D.
Saxon Period ...	—	1066
Norman Period ...	1066	1145
Transitional Period	1145	1190
Lancet Period ...	1190	1245
Geometrical Period	1245	1315
Curvilinear Period	1315	1360
Rectilinear Period	1360	1500

I have now only three other technical terms to define in order to enable me at once to enter, without further explanation, upon the examination of Lincoln Cathedral.

Almost all the great cathedral and conventual churches of this country are divisible in their entire length into three parts, forming the three branches of the Latin cross, namely, choir, transepts, and nave. They are also generally divisible laterally into three portions, namely, choir, or nave, and north and south aisles. Vertically also this tripartite division is again found; the entire elevation of the main interior walls being usually divided into three portions or storeys, separated and defined by horizontal string-courses. These three storeys I have named the Ground-storey; the Blind-storey, from its being usually dark, and opening into the roof of the side aisle; and the Clere-story—terms which also sufficiently explain themselves.

Now it will strike everyone that looks down the nave of a mediæval building that it consists of a number of exactly similar compartments, placed side by side, and tied together by three horizontal lines or stringcourses, which separate these three storeys; the same remark applies as well to the outside of these buildings. For the purpose, then, of comparing the architecture of one structure with that of another, with a view to trace the progress of the art of building through the middle ages, it will be sufficient if we take one or two of these compartments, and place such a representation of what may be called the *main idea* of a building side by side with two similar compartments of another, or of several other buildings. This is what I have done in the six large diagrams on the wall behind me, which represent each two interior and exterior compartments of six of the cathedral churches of this country, constructed during each of the six periods of British architecture from the Conquest to the Reformation. Of the seventh or Saxon period, the remains are so few and so incomplete that we have not the means of exhibiting an entire compartment of any building of that period. Of these illustrations I may observe that two, those, namely, of the Lancet and Geometrical periods, are taken from Lincoln Cathedral; and finer or more characteristic examples it is impossible to select.

Now, time will not permit me to lay before you in detail the characteristic features which distinguish these six periods of Christian architecture from one another. They are, however, sufficiently obvious to all who have paid any attention to the subject, or who will take the trouble to examine and compare these diagrams with one another; and to those who may be disposed to enter on this comparison, I would suggest that they should also examine and compare with one another the enlarged drawings of the different details of these several compartments, such as capitals, piers, and carved work, which are placed beneath these diagrams. And now let us proceed to consider how Lincoln Cathedral, one of the grandest of our national monuments, serves to throw light on the history of church architecture; to which of these several periods its different parts belong; and how far we may be able, by its works, to trace the progress of Christian art in this country during the middle ages. Professor Willis was the first to apply colour to the ground plans of churches, for the purpose of indicating the different periods of their construction. He applied his colours indiscriminately, and simply with a view to distinguish one part of a building from another. It appeared to me some time ago that this use of colour might be carried a point further, and, in fact, made much more useful, by attaching a fixed signification to the employment of different colours—by causing, in fact, a specific colour always to represent a specific period of architecture; and it occurred to me that no better basis could be taken for such an application of colour than the prismatic spectrum itself, which, in a twofold sense, is peculiarly adapted to represent and typify the gradual progress of art in the buildings of the middle ages; first, because, as in church architecture, that progress was so regular and so gradual as to be almost imperceptible, and to render it difficult for us to draw any exact line of demarcation between the buildings of one style and those of another, or to enable us to say, for example, where Norman art ends, and where English art begins; so, in the prismatic spectrum, it is difficult to say where one colour ends and where another begins. Yet inasmuch as we are obliged, for descriptive purposes, to call certain portions of this blended whole blue, green, yellow, and red, so are we, for the same reason, under the necessity of selecting and characterising, in the same manner, certain portions of the history of this continuous art, and of designating these parts by some such specific terms as those above proposed. And, in the second place, this adaptation of the prismatic spectrum to our wants in this respect, appears to me to be a peculiarly happy one, inasmuch as our national architecture, rising out of the deep gloom of debased Pagan art in the dark age of barbarous invasion, is thus fitly represented as brightening gradually into the glory and refulgence of Christian art in the Geometrical period of the thirteenth century, and as deepening again in its descent through the three following centuries into the dark age of Pagan revival in the seventeenth.

I have, therefore, already for some time, for my own purposes, made use of the following selection of colours to indicate on the ground plans of churches the particular dates of the construction of their different parts, and I think I can safely recommend it as a convenient one for general use:—

	A.D.	A.D.	
Norman ...	1066	1145	Black
Transitional ...	1145	1190	Blue
Lancet	1190	1245	Green
Geometrical ...	1245	1315	Yellow
Curvilinear ...	1315	1360	Orange
Rectilinear ...	1360	1500	Crimson

The ground plan of Lincoln Cathedral behind me and the elevation of its grand west front above it are coloured after this fashion, and you will see at once that every one of the six periods of English architecture are more or less represented in both.*

* To be continued.

ON FASHION IN ARCHITECTURE.*

"FASHION," says a pungent critic of the last generation, "is gentility running away from vulgarity, and afraid of being overtaken by it. It is a sign the two things are not very far asunder." This caustic observation of Hazlitt needs but the alteration of a word—the substitution of "affectation" for "gentility"—to apply with almost as much truth to fashion in art as in its original form it does to fashion popularly understood, as meaning the outward forms and garb of the upper ranks of society. Fashion in both cases is a capricious adoption of peculiarities dictated by no real necessity, and dependent generally on no natural cause or principle; and in both, while it may sometimes tend to what is suitable and graceful, it is in constant danger of leading its votaries to the extravagant and ridiculous. That in art, which is, or should be, the full display of the application of the principles of nature—the characteristics impressed on the visible creation by its Maker—to the purposes of human life and of the higher forms of human pleasure,—that in art such a system as can be called "a fashion" should ever be found intruding seems a strange anomaly, but that once invading such ground it should be found fastening most frequently on architecture is perhaps less strange. Architecture in its more familiar forms and objects is brought nearer to the bounds of the common-place needs and habits of civilised humanity than the other arts; and since it is certainly that of all the arts which is most constantly visible and prominent, the more reason seems to me to exist for guarding it jealously from what will lower its value and diminish its refining influence.

Fashion has often exhibited strange freaks in other fields than that of fine art, and the hold which, when once established, it has in some of these secured affords a ground of warning to all concerned with art against admitting within its charmed region an influence so destructive of what is real and true.

Some sixty or more years ago the forms of English printing type were by great study and labour, chiefly of a single individual, brought to the perfection—for such it may be called—of proportion, balance, and connection which we see exemplified in the best specimens of modern typography, and eminently in the various editions of the Bible and Book of Common Prayer, issuing from the University and other presses; and it needs but a glance at such, as compared with the forms of type in use during the two previous centuries, to see that, in respect of grace of form, ease of reading, and all other requirements of good printing, its superiority is immense.

Some years ago, in the publication of an elegant biographical fiction, the idea was adopted of producing it in a form of type similar to that in use at the time to which it referred, and this pretty conceit added popularity to what in itself took worthy rank among the most graceful contributions to the lighter literature of our day. The type had been cast and used, but not destroyed, and soon we found book after book published, many without the least relation to any special period, but all appearing in the obsolete garb which well fitted the work it first belonged to, but was senseless and worse as a matter of general application; for it led to a very common loss of the distinction in point of excellence between the old and later types, insomuch that I have heard some affirm that they considered the latter the worse and the old the better—an error which their eyes would not fail to convince them of should they prolong habits of reading into advanced life.

What has thus happened in printing may befal, nay, has befallen, art, and we have all witnessed the elevation into popular favour, as fleeting as it is groundless, of a school of painting which decried beauty and ignored all that had during centuries been attained in grace of composition, force of effect, or harmony of colour. The true and the beautiful will indeed again and again, through all time, re-assert their rightful supremacy and reign through periods which the brief terms of all caprices combined cannot equal; but each of us lives but one life in this world, and it is painful, through the folly and affectation of our contemporaries, to be deprived of a part of those graces of life which the really consistent and faithful labours of the artist never fail to furnish to his fellow men. Fashions in architecture are not a novelty; they have arisen again and again in this

* Read before the Liverpool Architectural and Archæological Society, by H. P. HORNER, architect.

and other countries, but are distinct from styles as fiction is from fact. Styles, be it remembered, grow out of use and experience; fashions spring up almost in a day, and are often but crude revivals by inexperienced hands. Styles rest on the principles of art and keep within its limits; fashions recognise no real principles, and, though they may contain them, it is not from preference but because of their prior existence in what fashion has seized. Styles are consistent in themselves; fashions revel in inconsistency; and thus might be multiplied distinctions between the two as wide as can be in what relates to the same art.

Deficient knowledge of style has much to do with fashion, and the latter very often consists in the misapplication of what are the essential characteristics of the former. Thus, in the first quarter of this century, very few were acquainted with what constituted the reality of the then recently explored style of Classic Greece, but the fashion prevailed of applying its features to all conceivable structures, caricaturing what was supposed to be imitated, and bringing into contempt what was most worthy of regard and admiration. Genoa exemplifies another phase of fashion; for there the graceful compositions derivable from combinations such as Palladio excelled in are travestied in painted façades, where all that constitutes architecture, save the flat outline, is wanting, and real buildings are dealt with like the surfaces of mere theatrical backgrounds.

When notice was first strongly recalled, after a lapse of centuries, to our native pointed styles, a fashion arose, too, of patching details like theirs on every kind of building and thus "Gothicked," as I have heard it gravely called, they were supposed to present examples of our native architecture; and I need scarcely say through how arduous a course of persevering study and illustration it was that we arrived at what brought us out of fashion into style in the use of our own national architecture. A senseless fashion of long, long standing, involving with our own another art in its folly, is that of exalting portrait statues on columns which, in their form and features, become utterly unmeaning unless supporting a spreading mass of architrave or archivolt, while for all purposes of portraiture a dummy model, varied in costume as desired, would equally well serve as any statue on which pains and thought have been lavished, to be lost, until the column falls away in decay, to all inspection except through a telescope. Begun after the decline of art and under the influence of imperial vanity in Rome, this ridiculous arrangement has been repeated generation after generation, and, in spite of protests by all good critics in architecture and sculpture, continues in adoption under the dictum, sufficient, doubtless, to the mere pedants in arts, though, unhappily, also adopted by some who ought to know better—"the ancients did it."

All that is the fruit of mere fashion in design must become obsolete so soon as the fashion itself is exhausted; and this I say, the last quoted example notwithstanding, while all that is designed on the true principles of art will endure under the lapse of time, because appealing to the apprehensions of cultivated intellect under all varieties of human society and institutions. Vulgar opinion alone is met and satisfied by what depends on fashion; and though, unhappily, its folly, as in the statue columns, becomes stereotpyed for posterity the better judgment derived from the study of art in its origin and principles survives to condemn it, and let us hope, even in so hard held a position as this, at length to expose and explode it.

It is true that in architecture, as in the other arts, some things may become fashionable, and merely fashionable (I mean chosen independently of art principles), and yet no harm be done, since non-essentials in art exist, as in theology, and modes of treatment and peculiarities of detail may become almost universal in adoption which involve no principle, and so are matters of indifference; but, at once, on the step being taken where a principle is sacrificed for a fancy, damage to art arises, and may be unhappily perpetuated. On the other hand, fashion may even, but alas! does rarely, assist art by recognising for favouritism some true principle of design; but even then the advantage is fleeting, since, with the next turn of the glass, the opposite may come into favour and all be reversed.

The parts of architectural works, however, which, by fixing themselves on the popular mind, become in fact fashionable, are chiefly those which exhibit peculiarity of detail rather than markedness of principle: and, as all fashionable peculiarities have a tendency to run into exaggeration, principles of form and chiaroscuro, though not directly touched by these caprices, become at length obscured and drowned under the prominence given to the very details which ought only to serve as accessories and supporters of the effects of these higher points of architectural excellence.

Fashion in architecture, as in other things, to a great extent dies out from time to time, and gives way to other "new things" (as they are supposed to be, though often but revivals of the obsolete), but unfortunately such fashion cannot, like that in clothing, be put away in the waste closet, but stands for generations, it may be, in sad evidence of the vapid caprices of its era.

When the Gothic revival in England, having passed its first period of mere patched-on detail, which I previously alluded to, led to the style being treated *systematically*, and especially as an ecclesiastical one, and that fastening so on the popular mind as to become a fashion, and in so far certainly not an unwholesome one, the acute gable was often carried to a pitch which it rarely attained to in ancient practice, and some devotees of the style, both critics and architects, asserted warmly that anything less than an equilateral pitch was out of the question if the true effect of the style as exemplified in old examples were to be obtained.

By collating old examples, however, it will be found that about 70 deg. rather than 60 deg. is the usual angle, the latter very seldom indeed occurring, and appearing always too sharp when adopted in any but very small gables.

This acute gable system, however, was pursued for a considerable time by several architects of extensive church practice, and marks their buildings, many of them very good in other respects, with a kind of caricature effect of Gothic, and quite wide of that belonging to the ancient ecclesiastical buildings which their authors were so desirous to emulate.

In like manner the fancy for bands of colour, plain or chequered, has been carried to an absurd excess in still later architectural practice; for, whereas in old works of a good class such bands were adopted generally only to break a large surface of monotonous walling, and often marked simply the introduction of a material used in binding courses of greater cost and rarity than that of the common walling, we see them now multiplied in such a way as absolutely to obscure and obliterate all ordinary effects of light and shade obtained from the use of projecting details.

A fashion akin to this, and it was no better than a fashion, and in great part the parent of the modern one, existed in interior church work in Italy in late Romanesque works, but I have heard no opinion from any architect of cultivated taste and independence of thought than that the harsh contrasts of light and dark bands destroyed the effect of the essential forms of the design, and broke up the general effect into stripes most unpleasing to the eye and mind.

The common tendency of fashion is not towards the adoption of what is remarkable for excellence, but for obtrusiveness and even eccentricity; and all such peculiarities made permanent in architecture constitute an almost unmixed evil.

The impressive effect of massiveness has led to its being absolutely caricatured in some late ecclesiastical works, and when leading men in our profession set such an example, it is only too readily followed and exaggerated by those of less note or standing.

"A little stronger than strong enough" was an excellent constructive maxim of our great engineer Smeaton, but beyond this he never carried it, even at Eddystone; while on the other hand, in some recently built towers, and even village churches, arches, piers, and buttresses may be seen, yea, and with many admirers, which simply make the buildings look ridiculous, like dwarfs indeed in giants' clothing.

What good reason, in regard to construction or effect, can be given for covering a window slit of 15in. or 18in. wide with an arch highly pointed of some two and a half or three bricks' length in depth, or for carrying an aisle arch reaching nearly to the wall plate on a pier which would well support ten times the weight? Yet such and other such are the characteristics of the style I allude to.

There is no architectural style which has ever gained a footing at all permanent among intelligent and really cultivated nations which will not be found to possess qualities of design well worthy of preservation and adoption in principle, if not in detail, and yet none of these styles are free from freaks and caprices of design, which, often attracting the vulgar eye much more than those higher qualities just referred to, will mar any design in which they may be repeated, while, unhappily, tempting a certain class of designers to such imitation by the fact of their serving to feed that popular appetite for mere novelty or peculiarity to which such artists (save the mark!) must purvey, or lose their one only line of so-called successful practice.

I have said that the styles of intelligent and really cultivated nations all afford points worthy of adoption in principle at least, and I purposely make the distinction between real and unreal cultivation, since semi-barbarous and spurious forms of art in architecture have often prevailed under the growth of nations in wealth and power when in these last respects they have advanced with more rapidity than marked their steps in the path of science and refinement.

Mexico, India, China, all present to our knowledge different phases of such half-civilised architectural art, and it can be little better than folly to argue, as some have done, and strenuously, that these styles can be worth the serious study for example or adoption of the modern architect in any civilised country, however interesting they may be and doubtless are to the ethnologist, the antiquary, and the archæologist. Constructive cleverness and massive boldness may be found even in the styles of such countries as I have just named, but the same will be found in shapes much better adapted to our purposes and much more worthy of attention in other styles of really civilised nations than in those where they are marred by association with forms and ornaments at once senseless and ungraceful.*

PRIZES OF THE PLASTERERS' COMPANY.

IT is not very generally known that the Plasterers' Company of the City of London offer annually £25 in prizes to advance the art of their company. The following are the results of the competition, as decided by the Science and Art Department, South Kensington, for the past year, 1867-8. The names of the prize-holders are placed against the respective objects competed for. There were two prizes for a model in plaster suitable for the ornamentation of a frieze; an original composition in the Italian Renaissance style, size 24in. long by 12in. wide, to be designed and modelled by the competitor, or the designer and modeller might combine and divide the prize:—School of South Kensington, for the best, £8 8s, A. Gibbons; School of St. Martin's, second best, £5 5s., George Jupp.

There were also two prizes for an original design for a centre ornament for a ceiling, in any style capable of being produced in plaster; the design was to be shaded in relief, either in chalk, or monochrome, and was to be drawn to scale, together with a portion of detail of full size, on an imperial sheet:—School of South Kensington, for the best, £7 7s., Mackaness; School of Exeter, second best, £4, M'Pinn.

These prizes were open to all students in the Provincial or Metropolitan Schools of Art, including artisan classes in those schools; but the first and second prizes in either case could not both be taken by students of the central school at South Kensington. All works sent in competition for these prizes were specially prepared and named as being in competition for the prizes of the Plasterers' Company of London. No student was to send in more than one design for each subject. There were fifteen portions of friezes sent in, and twenty-two designs for the centre ornament for a ceiling. These will shortly be exhibited at South Kensington, together with the other works of art sent up from the provincial and metropolitan schools.

We are happy to see that a suggestion long since offered in these columns is about to be carried into effect, and that the vegetation of Trafalgar-square is to be no longer confined to the struggling lichens of the Nelson podium. One row of stately plants in tubs has been placed in front of the northern retaining wall, and we limit our notice to a welcome of the beginning thus made. The botanical improvement of public places is certainly a noticeable feature of modern administration.

* To be concluded in our next number.

LABOURERS' DWELLINGS.

AT the present time a great deal is being said about the erection of new Law Courts, which may now be said to be finally settled; a new National Gallery, an illustration of which we shall give next week; new offices for the departments, which will absorb millions sterling; new buildings at South Kensington, a site which almost everyone has condemned, and many other public improvements; but little is said about a far more important question than either—namely, dwellings for our working population. It is, therefore, most refreshing to meet with a sentence like the following, which was uttered by the President of the Liverpool Architectural Association, in his closing address a few days since. He said, "It must be admitted that on one very important point, which till of late years has been much overlooked by architects and men of science, by philosophers and philanthropists, by legislators and by statesmen, but which tends more to promote the health, longevity, morality, and happiness of the majority of the human race than the erection of the most splendid and extensive museums of art and science, or the most magnificent cathedrals—I mean the erection of healthy, well-ventilated, comfortable, economically constructed dwellings for artisans and the labouring classes." No doubt many a man in the plenitude of his egotism will sneer at this statement. "What," he will say, "the moral condition of our working classes of more importance than our public buildings or our cathedrals—pooh-pooh, let the working-classes take care of themselves." But what if the same class should turn round and say, "You gentlemen have hitherto had matters pretty much your own way. You pass laws for the demolition of hundreds of tenements at Temple Bar, and dispossess many hundreds of families, and you send them you know not whither. You also determine by Parliamentary action that new Law Courts should be erected on the site, so that our judges may have more elbow room to administer the law, and you vote certain public funds for the purpose; but you appear to take small heed of the people. We, therefore, must imitate your example and have laws passed which shall tend to the securing of better house accommodation for the people. If you insist by Parliamentary power to pull down, we must also insist by the same power to build up." No one can deny that there would be some logical force in this argument. There are none so blind as those who won't see; and we look with apprehension on the manner in which members of Parliament and artists speak about our public buildings and public statues, and the comparative indifference with which they treat the infinitely greater question of providing superior house accommodation than that which now exists for the masses of the people. A Peel statue elicits a warmer debate in the *present* House of Parliament than Mr. Torrens's bill. Will it be so in the next Parliament and those which are destined to succeed it? This is a matter well worthy of consideration by our public men; and the President of the Liverpool Architectural Association merits thanks for his wise and courageous words.

ARBITRATION IN CASES OF TRADE DISPUTES.

A VERY important meeting was held, on the afternoon of Saturday, the 4th inst., in the lecture-room of the Society of Arts (Mr. W. E. Gladstone in the chair), to consider the desirableness of forming a committee for the purpose of diffusing information on the subject of capital and labour, and of considering the best means of promoting a better understanding between employers and the employed. The meeting was large and influential, and the objects sought to be accomplished cannot be exceeded in importance by any claiming the attention of the public. The opening remarks of Mr. Gladstone were pertinent and forcible. He said that if the committee which it was the principal object of that meeting to constitute were to be successful, the workmen must be approached in a spirit of conciliation; but more than that, they must be treated as reasonable men, as free agents who had a right to accept or reject the conditions of any contract to which they might be asked to become a party. Mr. Gladstone wisely abstained from entering upon any of the disputed points which have been so much discussed, and we cannot but think that, if the same sound discretion had been used by the gentlemen who drew up the resolutions, much useless discussion would have been spared, and the proceedings have ended in a more satisfactory manner. There was evidently a disposition on all sides to meet the question in the spirit manifested by the chairman, and it was the fault of the resolutions that the speakers were drawn away to defend or offer apologies for trades' unions and strikes, and to utter reproaches against the "greed" or "tyranny" of capital—a mode of treating the subject calculated to embarrass the proceedings and defeat the intentions of those who had most praiseworthily convened the meeting.

In justice to ourselves we must say that very much that was said in defence of trades' unions was a pure begging of the question. It was a line of argument similar to that which had been used to sustain the injustice of protective duties. It requires no lengthy argument to show that a powerful body of men may realise a temporary triumph or advantage by combination, by creating, in fact, an artificial scarcity, and if it be true, which we do not dispute, that wages have been kept up in certain districts by strikes, while they have fallen in others where no such strikes have been known, it is possible, nay probable, that the latter is the consequence of the former. It is a simple matter of history that certain branches of trade have been driven from particular districts by a policy of protection. These speeches must have reminded the chairman of the time when he was battling to obtain untaxed bread for the people, and to open the world's markets to their industry, for the same class of arguments are used. Is it always an advantage that a particular body of workmen should keep up a high rate of wages? What we have to regard is the welfare of the whole body of the working-men—the means to raise them up to a higher position. We believe that the way of doing this is now fairly before them, and that co operation and arbitration will bring the results that all good men desire. Great experiments are making in both directions, and the eyes of the whole country are upon them. It is not necessary, therefore, to enter into a conflict as to the abstract right of combinations to keep up the rate of wages. This much will be confessed on all hands, that a strike is a most undesirable method of establishing a claim or of disputing one, if other means can be employed and give satisfaction to both parties. There was not a person in the room who would not most cordially support that proposition, and that is a platform sufficiently broad and clear for pacific, vigorous, and beneficent action. We hope that the committee appointed on Saturday will become more than mere teachers on the subject of political and social economy, and that their conduct will entitle them to become an authority to which disputants will submit their case for decision. We have more than enough of organisations, but believe there is a great necessity for some body of men of character and intellect, who might become, by prudent and conscientious regard to a high trust, arbitrators in trade disputes; but such a body will be all the more useful and all the more powerful from eschewing all discussion upon the more abstract questions upon which so much disagreement exists. Mr. Mundella did not find it necessary to condemn trades' unions in order to carry out his scheme of conciliation. We confidently believe that the state of things will be so much altered that the next generation will look back with surprise that strikes should have been resorted to, to accomplish any legitimate ends, just as the present generation look back upon duelling as a foolish mode of vindicating personal character and honour. Duelling perhaps had its uses, or, what is much about the same thing, was thought to possess them, and a "strike" or "lock-out" is not a more natural mode of enforcing a just claim; it is a mere trial of force, success attending the strongest.

These are our views, and we cannot withhold the expression, but we think that the committee will best ensure the great purpose for which they are organised if they establish themselves upon a basis which all reasonable men will acknowledge—namely, the desirableness of establishing courts of arbitration for the settlement of trade disputes. A public opinion would soon be created in favour of such a conclusion, to which all litigants would ultimately be compelled to bow. We offer this counsel to the committee with the earnest desire to see their labours successful, and that they may attain the dignity of a court of arbitration.

OUR PUBLIC MUSEUMS AND GALLERIES.

OUR public museums and galleries only await proper management to become our most powerful aids in the cause of technical education. Not that we believe, as some seem to do, that you have only to turn an uneducated being loose into a museum to imbibe his mind with a knowledge of all the sciences, but that when a foundation has once been firmly laid in his mind, the advantage he may derive from these institutions is incalculable. Museums and galleries of art in this country are not well managed. Paid for by the many, they are open to the convenience of the few, and can only be visited by the working classes at a sacrifice of that part of their time which is to them emphatically money. We readily admit South Kensington to be an exception. Many bigots, and with them some few sensible men, are opposed to opening our museums on Sundays, but we believe that all concur in wishing them to be open during the evenings and Saturday afternoons. This, however, by itself, would not meet the requirements of technical education. Anyone who has visited South Kensington must have noticed among the intelligent faces directed towards the objects exhibited with evident interest many very stupid-looking ones—not really stupid faces, but faces turned listlessly towards the treasures they have perhaps come miles to see and cannot understand. It is seldom or never seen in the picture gallery. Pictures tell their own tale alike to the educated and the ignorant, but in the other portions of the Museum it is too often met with. How is it to be remedied? How are people to be instructed and interested who come ready and willing to be instructed and interested? We believe it might be accomplished by the delivery of descriptive lectures, at frequent periods of the day, by thoroughly good men on the objects in the various rooms. The suggestion is by no means a novel one, so that if we cannot claim the merit of suggesting it, the authorities need not be frightened at it as an innovation. It was tried at South Kensington, when the Museum was first started, with perfect success, and was only abandoned because the directors could not or would not provide a room in which the lecture might be delivered without disturbance from ordinary visitors. Mr. Buckmaster stated at the recent conference of the Society of Arts, that he was requested by Dr. Lyon Playfair to deliver short lectures on wool, silk, &c., of about twelve minutes duration, and that the visitors crowded to hear him. How much more would they crowd in the natural history room of the British Museum to hear Owen, or Layard, on the Assyrian remains? They would then look upon a Museum as an institution full of interest and information and not as too many of them do at present as a very convenient place in which to spend a wet holiday.

FONTS.

WE have no means of ascertaining at what period "immersion" fell into disuse, and, as a natural consequence, caused the introduction of fonts for baptismal purposes, nor would the cause of art be greatly aided were we able to fix the date, and our time might be more profitably spent in examining the examples which have descended to us than in scheming what might be called the rise and progress of baptismal art. In no other period were fonts so grandly treated as in Norman; thorough manliness of idea united to great boldness and variety of detail were its characteristics, while the mystic Scandinavian and Celtic influence, which had spread over all Europe, seems to have been present in the minds of the designers and workers, and peeps out in quaint interlacings and twisted and coiling dragons and monsters—

> The stony phantoms of a darker world.
> * * *
> By some quaint weird sagacity of art,
> Powerful to touch, e'en by its hideousness.

Though its lines lack the refinement of Early English, and its knot work the vigorous severity of Celtic, Norman still holds its own by the boldness and variety of its free thought, and, mixed and blended as it is with vestiges of old Rome, it gives us more piquant examples of what a font ought to be than any other style.

The most favourite form of font is octagon, and those learned in ecclesiastic symbols tell us that an eight-sided font is the emblem of baptismal regeneration, that a six-sided font is a dangerous heresy—a schism, in fact, in stone, and always to be eschewed. This is a refinement of ideal symbolism which I am not prepared to appreciate, and the chief requisites of a good font which I should like to insist upon are, that the *circular* bowl should be made apparent, or, at least, indicated externally, and that the carved emblems should pertain to the element it holds and the baptism which is celebrated by it. A book of "Illustrations of Baptismal Fonts," which is published by John Van Voorst, contains some very curious and many very good examples in nearly all periods. In the sketch, which forms one of the illustrations this week, an attempt has been made to induce in some parts a Norman or pre-Norman feeling, though in some details, and especially in the font cover, a much later character prevails.

J. M. S.

FREEMASONRY.

THE formation of a society for investigating the antiquities and history of Freemasonry was noticed in the BUILDING NEWS of June 12. The field of inquiry proposed to be entered upon has an undoubted interest for archæologists in general and architects in particular. There is reason to believe the confraternity enjoyed great favour under the Church of Rome, and that the best designers and constructors were among its members. The ancient lodges were probably in communication throughout the Christian countries of Europe, and thus arose the noticeable similarity between English and foreign works, but, as the legal existence and assembling of lodges terminated before the invention of printing, contemporary accounts of their proceedings, if not extinct, are exceedingly rare. Freemasonry was intimately connected with Gothic architecture, but there was a ruling mystery not favourable to personal fame, and the merit of individuals was carried to the common stock of the order. Mystery may have invested the craft at first with wonder, but early admiration gave place to suspicion that was only to be allayed by removal of the object. During the war with France the meetings of men whose proceedings were marked by the very ostentation of secrecy must have been particularly obnoxious to the rulers of the State, though understood and approved by the rulers of the Church. It must have been quite consistent with the position and policy of Henry V. (son-in-law of the French king, heir presumptive to his throne, and meanwhile regent of his kingdom) to foster artistic intercourse between the two countries, and it is by no means improbable that French masons were frequently accepted and enrolled as members of the English lodges. But after Henry's death the opposed bearings of the two kingdoms may have caused Parliament (the really absolute power of the time) to regard with distrust secret organisations within the realm, especially such as united advanced intelligence with the favour of the Church. The meetings of Masonic chapters were declared illegal in 1424, and thus when Gothic architecture was in the highest state of excellence and vigour the springs of its existence were abruptly stopped, a few splendid evidences of the glory to which it had attained serving but to mark its sudden and convulsive end. The subject has extensive ramifications; religion and learning, home and foreign polity, social and personal considerations influenced it. The effect of each must be traced, and the task, we doubt not, will usefully occupy and abundantly repay the combined effort of a special society.

SUPPORTS FOR ERECTIONS IN DEEP WATER.

THE principles of construction in deep water, always important, have at this time an especial interest, from the contemplated establishment of a roadway in some form or other between the French and English shores. Such a work is undoubtedly among the most colossal ever projected, and only to be removed from the chimerical to the possible by the accomplished feats of modern engineers. There are several conceivable methods for effecting such a purpose, as by a tunnel through the rock under the sea, a tunnel laid upon the rock or water-bed, and a viaduct raised far above the surface. To these may be added the notion of a still-way upon the bosom of the sea itself, but the great object is the same in all, namely, the continuous passage of trains from coast to coast without displacement or transhipment. As to a tunnel through the solid rock the experience of Sir Mark Brunel's example at Rotherhithe must not be lost sight of, and concerning the second plan it is certainly one thing to form a tubular way under Tottenham Court-road and quite another to form such a way through the Straits of Dover. In the third scheme, and yet more especially in the fourth, which may be found the most practicable of all, Mr. Thomas Morris* thinks submerged vessels of great ascensive power may become available. Compared with the rock-cut tunnel, the submarine tube, the bridge at a dizzy elevation of 150ft., the engineering difficulties of a still-way appear insignificant. Two continuous lines of pacificators with buoyant supports below the range of navigation might, it is presumed, be so contrived as to give to a belt of the Channel the placid surface of the Thames. There is an interesting novelty about the proposition, and the principle is easily understood. A watertight vessel, for instance, with a floating power of nine tons, has attached to it, by a cable of regulated length, a weight of ten tons, and both are cast into the sea. The weight descends till it rests on the bottom and is followed by the buoy at the distance of the cable's length, but at that distance the buoy stops, and, so far from sinking further, begins to exert its original ascensive force of nine tons, and is capable of sustaining a body or erection of approximately that weight. It is reasonable to suppose that the direct supports of such erection would be of very inferior sectional area to the main float, and this is a point of importance where agitation exists, because the submerged float remains unmoved and carries its load with a steadiness not to be approached by a vessel simply riding on the surface, while the cable is free from the destructive wear and tear to which ordinary moorings are subject.

* Provisional protection has been allowed to Mr. Morris for the application and use of buoys and submerged vessels for supporting objects and erections in deep water.

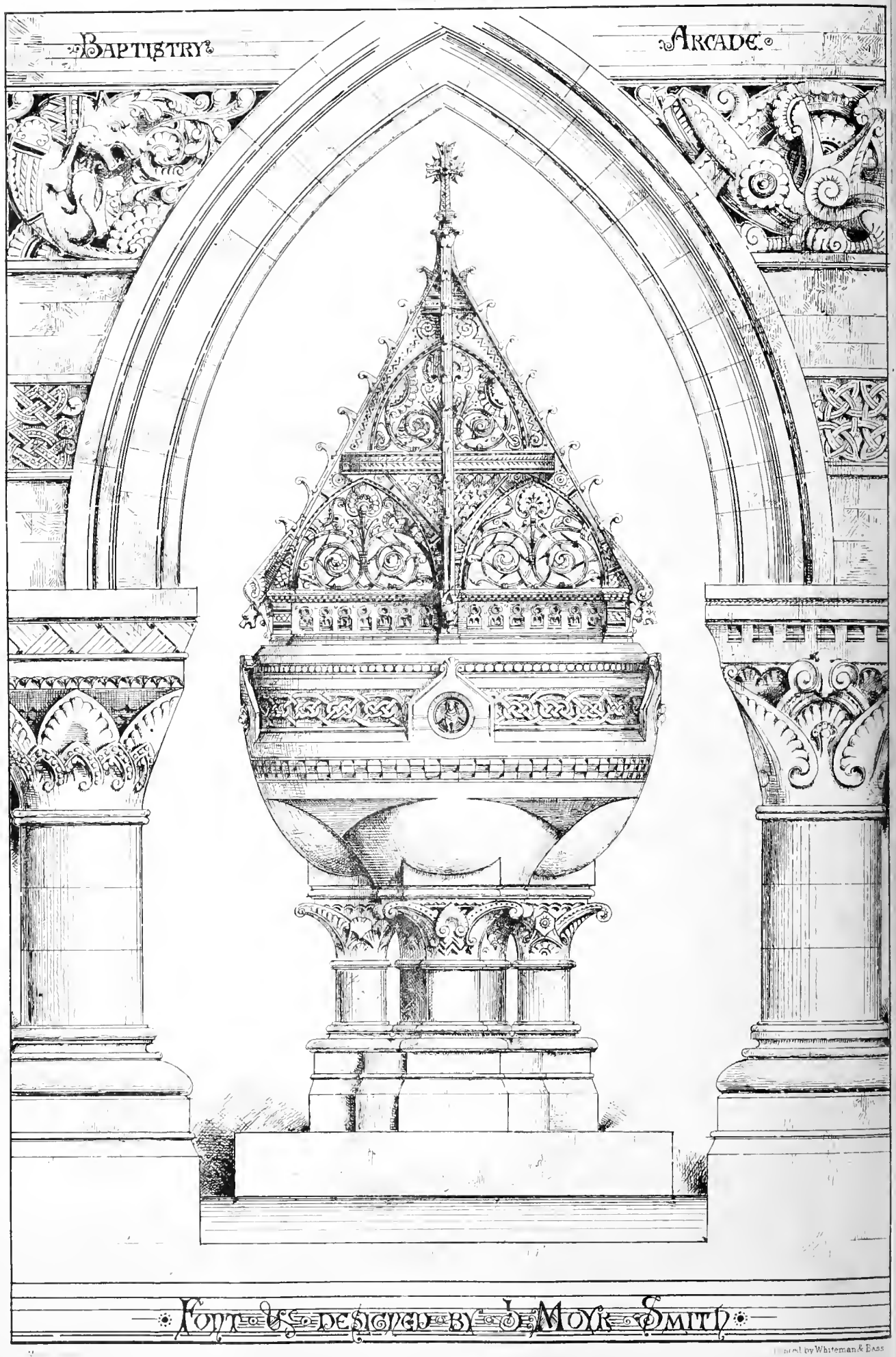
DESIGN FOR MANCHESTER TOWNHALL.

ON May 22 last we gave a double page illustration of Speakman and Charlesworth's design for the Manchester new Townhall. On another page we give an engraving of the Cooper street and Princess-street fronts.

TAKING OUT QUANTITIES.

THE President of the Liverpool Architectural Association, when speaking of the prize design which had been selected, estimated, and contracted for, and which is now being executed, said:—The estimates for these buildings, contrary to the usual practice of the Corporation, of the Government, and public bodies in general, when estimates for large contracts are wanted, the quantities were not furnished. The consequence was that each of the seven highly respectable contractors who tendered on this occasion was subjected to the expense and trouble in taking off his own quantities. It is only those in the profession who can fully know the care, difficulty, and labour that have to be encountered in taking off quantities, the practical knowledge required, and the numerous and complicated calculations that have to be made; and of these none will deny that builders should have the quantities furnished to them, particularly for large and important public works. The labour and the risk of mistakes, miscalculations, and omissions have been in this case increased sevenfold, and there is an unusual and startling difference in the amount of the highest and lowest tenders. Much misapprehension and ignorance have been recently displayed on this subject, and it has been imagined that an architect, in addition to his arduous task of designing and furnishing working drawings for, and superintending buildings, must also, without extra charge, furnish the contractor with a correct detailed bill of quantities. It cannot be too explicitly stated, nor too generally known, that the professional man who takes off the quantities, whether it be the architect himself or a surveyor mutually appointed, is entitled to a commission of from 1 to 2 per cent., according to the nature of the building to be contracted for. The risk of making serious omissions and mistakes in estimating is greatly augmented when a number of builders are required to take off their own quantities, and many such mistakes have been made, placing both the contractor and employer in a very painful position. No honourable man can wish to live in a house that he has not fairly paid for, though I have listened with disgust, disdain, and anger to the exultation of some who have acquired property in this manner. But no member of the Corporation of Liverpool, either in his individual or corporate capacity, would avail himself willingly of advantages gained by such a course.

An important case, as affecting the political status of the compound householder, has been decided by the Court of Common Pleas. A Mr. Lawson is the owner of a house in Queen-street, Sunderland, which contains six rooms, and each is let to a separate tenant. Neither the landlord nor any one representing him resides on the premises. Previously to the passing of the Reform Act of last year Mr. Lawson paid all rates, but since then the overseers have rated each occupier separately. The question was, whether this was right, and it depended upon the construction of the seventh section of the act, which is in effect that where any dwelling-house or tenement shall be wholly let out in apartments or lodgings, not separately rated, then the owner shall be rated. The court unanimously held that the occupiers were not entitled to be severally rated, and that the rate should be made out in the name of the landlord.

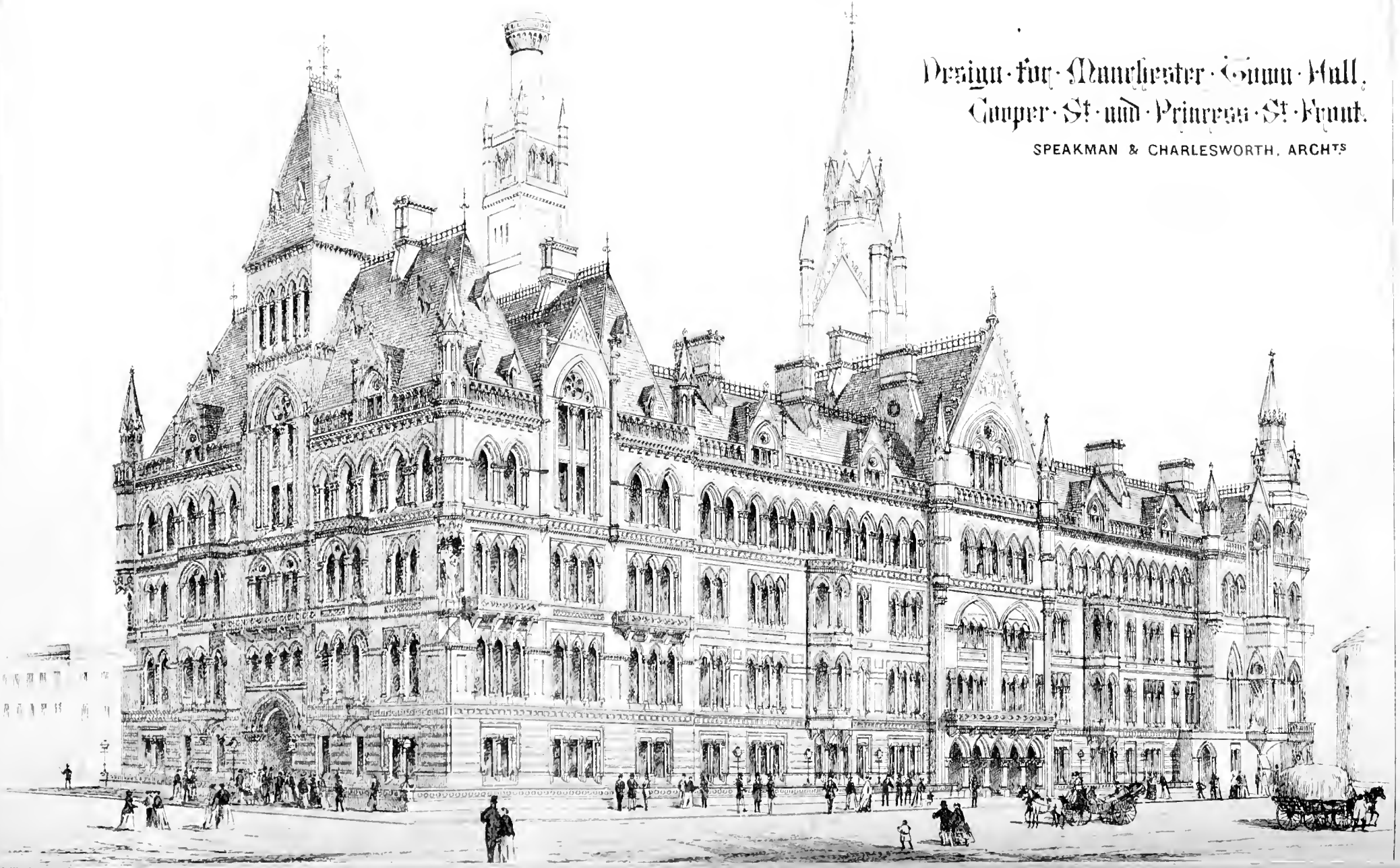


FONT AS DESIGNED BY J. MOYR SMITH

Printed by Whiteman & Bass

Design for Manchester Town Hall, Cooper St and Princess St Front.

SPEAKMAN & CHARLESWORTH, ARCHTS



LA BELLE FRANCE.*

THIS is an elegant volume containing a series of pleasant pen and ink sketches (here and there illustrated by the engraver) of a number of the most celebrated provincial towns of France, by one of the best known of English female essayists. Madame Parkes-Belloc has wandered leisurely through Burgundy, Brittany, and Touraine, Normandy, Picardy, and Provence, halting on the way to sketch the famous old world towns, with their grand old cathedrals and their quaint and picturesque street architecture—among the rest we have Bourges, Meaux, Rheims, Guingamp, Chartres, Lens, and Abbeville—and to narrate the memorable events and romantic episodes interwoven with their histories. Some of the scenes and spots described by Madame Parkes-Belloc have been described to us before, but there is a freshness and brightness about her pictures which cannot fail to make them welcome to English readers. "Composed," as she tells us, "from an antiquarian and poetical view only, they aim at nothing but the preserving for English readers some traces of that wonderful beauty which is yearly vanishing like a dream." The author has a fine appreciation of the beauties of the old French architecture, and among the best things in her book are the sketches of Bourges and Guingamp. The former place is celebrated for its cathedral, and one of the chief architectural features of Guingamp is its public fountain. We have given engravings of these taken from the work, which, we may add, is as admirably illustrated as it is interestingly written.

THE CATHEDRAL OF BOURGES

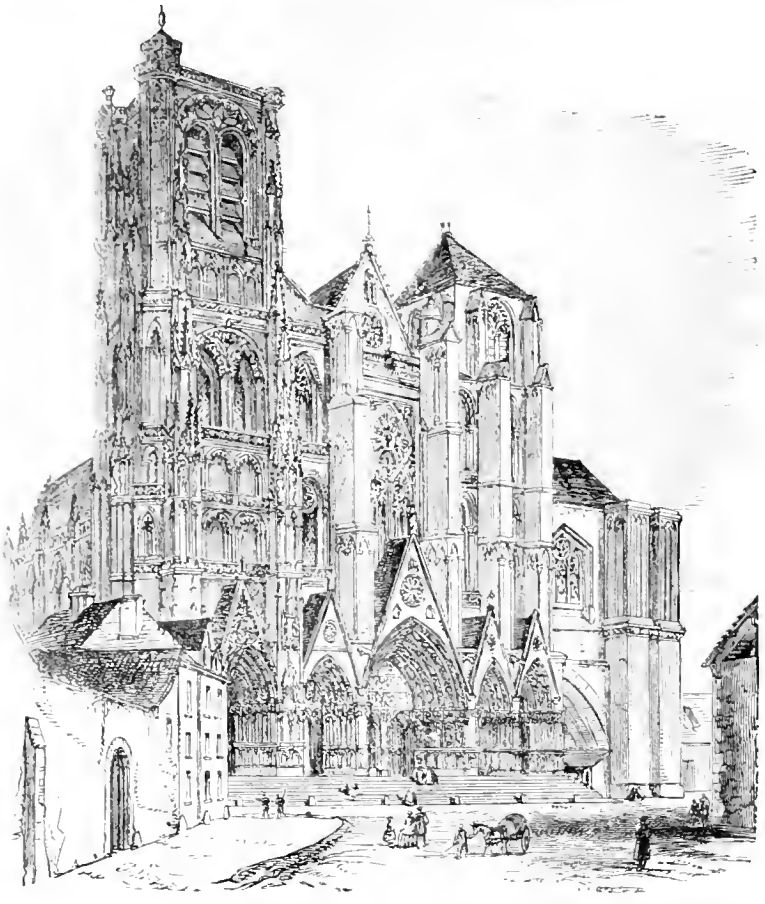
Is one of the four great cathedrals of France; Amiens, Rheims, and Chartres are the other three. The present edifice is the fourth of its name, the first having been built A.D. 250, in the days of Roman Gaul. It was rebuilt in 380, and again in the ninth century. Some fragments of this last erection yet remain, but the glorious church now called St. Etienne de Bourges dates from the early part of the thirteenth century. It occupies a picturesque situation high above the ramparts south east of the town. The building has no transepts, but a double aisle on either side of the nave. The perspective, says Madame Parkes-Belloc, flies away like that of Westminster Abbey, and is lost in a glimmer of painted glass. The pillars are remarkable for their great height, and they number, large and small, nearly three thousand. The capitals of the columns are beautifully designed and richly carved. The aisles are always dim, even at noon, so rich is the painted glass, which is considered among the most beautiful in the world. About the middle of the last century eighteen of the windows were sacrificed because the worshippers could not see to read their prayer books—a remote consequence, as the author remarks, of the invention of printing! There is a subterranean church or crypt containing some fine monuments, which were deposed from the upper church in the troublous times of 1793.

THE FOUNTAIN OF GUINGAMP

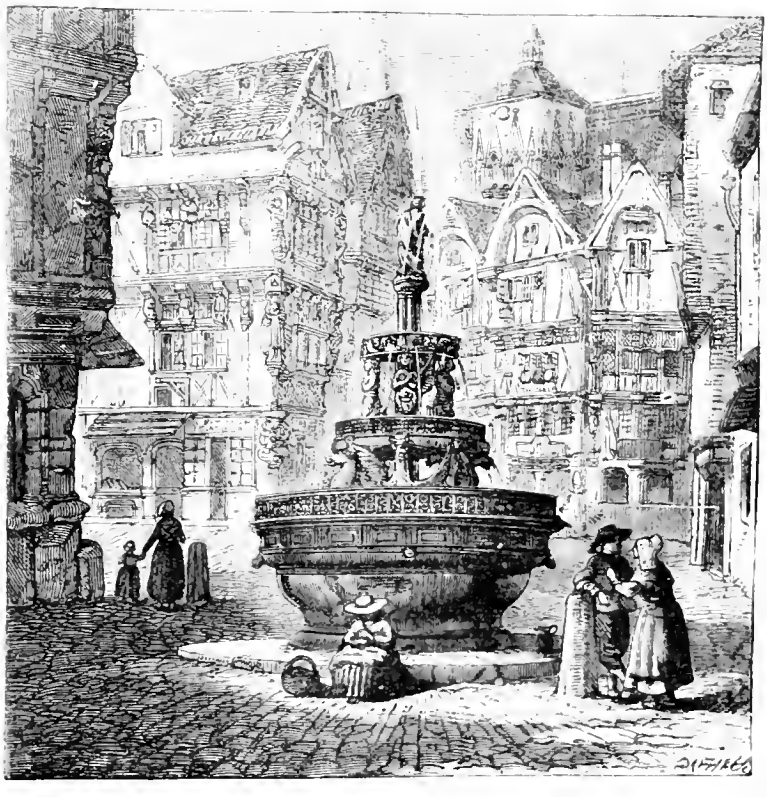
Stands in the marketplace of that ancient town of Brittany. It was erected in the year 1745, supplanting a similar structure which had been given to the town about three hundred years previously, by Duc Pierre, the husband of the pious St. François d'Amboise. The fountain comprises three basins of granite, the lowest being encircled by a railing of wrought iron; the second is upborne by four seahorses, and the third by four sirens, and ornamented by heads of angels and dolphins. The whole is surmounted by a statue of the Virgin, her feet resting on a crescent, and twenty jets of water are made to envelope her like a veil. This interesting monument is the work of Yoes Corlay, who, bred a carpenter, discovered in handling the tools that he was born an artist, and was afterwards known as the celebrated sculptor of Château Landron. Of Corlay and his fountain there is a charming story told. It is too long to give here, but the reader will find it, with many other good things, in Madame Parkes-Belloc's book.

*"La Belle France," by BESSIE PARKES-BELLOC, author of "Vignettes," &c. Strahan and Co. 1868.

LA BELLE FRANCE.



THE CATHEDRAL OF BOURGES.



THE FOUNTAIN OF GUINGAMP

VENTILATION OF THEATRES.

THE intense heat that has prevailed during the past fortnight, says the *Lancet*, must surely have caused managerial attention to be directed to the very bad quality and insufficient supply of the air in all London theatres. It appears, indeed, that in the matter of ventilation, as of acoustics, the architects of the present day are either utterly careless or profoundly ignorant. Five theatres have been built or rebuilt in London during the past twelve years, and it is evident from the thermal condition of their interiors during the hours of performance that very little improvement has lately taken place as to theatrical arrangements for ventilation. It is a fact that "Old Drury" is the coolest as well as the oldest metropolitan theatre; but this circumstance is due to the immense depth and width of space behind the curtain, from which currents of air proceed that frequently render the stalls untenable by any but cloaked enthusiasts of the drama, and the ardour of opera-goers must be somewhat chilled by the somewhat violent zephyrs that play around them on windy nights. The evils that afflict playgoers are patent to all who can be classed under that category: but it is as well to remind them that those who work behind the foot-lights for their amusement and edification are even worse off than the public. Soprano, first lady, tenor, and ballet girl can each and all give unhappy experiences on this head; and it is not too much to assert that many a good voice has been prematurely crippled by superlative carelessness as to draughts behind the scenes. Many diseases are far more easily prevented than cured, and notably those of the respiratory organs. It is a duty to the public to point out that such diseases are but too often engendered in badly ventilated places of public resort; and the managers of theatres are bound, in catering for the amusement of the public, to provide for that public such accommodation as shall not be antagonistic to the known laws of sanatory science.

POTTERY AND PORCELAIN.

THE fifth of the course of lectures promoted in illustration of the National Art Exhibition was delivered on Tuesday in the Leeds Philosophical Hall, by Mr. William Chaffers, superintendent of the Exhibition Museum of Ornamental Art. An interesting account was given of Greek and Roman pottery, and of the pottery produced in Britain and Germany and France during what were known as the Saxon and Frankish periods. The decorative pottery that was afterwards introduced was very fully described, reference being of course made to the heroic patience manifested by Bernard Palissy in his efforts to produce enamelled ware; and to the extremely high prices that were now paid for some of Palissy's productions, and the numerous and clever imitations of them that were often made, and frequently bought as the genuine workmanship of this great master in the plastic art. Previous to the sixteenth century he remarked that earthenware produced in England was rudely fashioned and devoid of ornamentation, although occasionally covered with glaze, and sometimes cast in moulds that gave peculiar forms. These productions were both expensive and badly burnt, and not very durable; and the consequence was that German stone-ware was eagerly sought for, and as early as the sixteenth century large quantities of it were imported into England. English pottery subsequently underwent great improvement, and he thought that a careful inspection of such specimens as were preserved would dispel any impression that the art in this country had, previous to Wedgwood's time, sunk to a very low ebb. There were examples to be found of English pottery of a date a century before Wedgwood's time that would have done credit to that distinguished artist himself. The lecture was brought to a close with a reference to English pottery manufactures of the eighteenth century, Leeds ware being specially mentioned.

SEWAGE EXPERIMENTS AT TOTTENHAM.

ON Tuesday afternoon the experiments for the purification of sewage by means of a particular preparation of alum, according to Mr. Lenk's process, were resumed at the sewage works of the Tottenham Local Board of Health, in the presence of several members of the board and their engineer, Mr. Marshall, together with numerous other gentlemen interested in the question. The experiments were conducted by Mr. Lenk, of Dresden, the inventor of the process, and Mr. Lennig, of Upper Thames street, the patentee for this country. A tank measuring about 50ft. in length by 20ft. in breadth, was filled with 26,000 gallons of sewage, very black in appearance and extremely offensive in smell. Forty-six gallons of the purifying "essence" were then sprinkled over the surface of the fluid by means of a hydropult, and afterwards stirred in by the aid of a wooden apparatus roughly improvised for the purpose. The fluid was then allowed to settle, and the action of the essence was at once apparent, a peculiar agitation taking place, caused by the chemicals combining with the impurities and precipitating them to the bottom of the tank. In about ten minutes, and at intervals afterwards, bottles were plunged into the deepest portion of the fluid, and on being brought to the surface and examined, the transformation was apparent, the fluid being perfectly transparent, though slightly tinged with blue. In half an hour the whole body of the sewage was in a very advanced state of purification. So far as could be judged by the eye and by the sense of smell, the fluid was perfectly fit to be discharged into the river. The materials employed in the purification are different combinations of alum, and the cost is understood to be very trifling.

THE DEBTS OF THE METROPOLITAN BOARD OF WORKS.

A RETURN has been issued showing all moneys owing at the time of the formation of the Metropolitan Board of Works, and the rates of interest thereon; the amounts borrowed since, the purposes for which they were intended, and the security given for the same; the amounts paid off, with the dates of payment, and the amounts owing by the Board on January 1, 1868. The total amount owing at the formation of the Board in 1856 was £425,300, and the amounts borrowed by the board since that time are for the Victoria Park approaches £42,000, of which £21,000 have been paid off; for the Covent Gardeu approach, and Southwark and Westminster communication, £400,000, of which £100,000 has been paid off; for the main drainage £4,200,000, of which £950,000 has been paid off; for the Finsbury Park £50,000, of which £5,000 has been paid; for repayment of Rock Loan £135,000, of which £40,500 has been repaid; for the Southwark Park, Whitechapel improvement, Holborn improvement, and main sewer, £616,000, of which £18,533 6s. 8d. has been repaid; for the Thames Embaukmeut and Mansion House-street £2,480,000, of which £385,000 has been repaid. The total amount borrowed up to January last was £8,073,000, of which £1,520,633 6s. 8d. has been repaid, leaving the sum of £6,552,366 12s. 4d. still outstanding. The rates of interest at which the money has been borrowed vary from 3¾ to 4½ per cent.

Building Intelligence.

CHURCHES AND CHAPELS.

Mr. A. Sussex Milbank has presented to the parish church of Barningham, York, a handsome illuminated corona with four lamps, enriched with ruby and crystal settings. It bears the inscription in mediæval characters, "Given by Sussex Milbank, 1868." There accompany it two lamps for the reading desk of corresponding pattern. The whole are from the manufactory of Messrs. Hart and Son, London. It is worthy of remark that the only other chandelier in the church was given by an ancestor of Mr. Milbank 130 years ago.

Christ Church, Camberwell, has been consecrated and opened for Divine service. The style of the church is based upon the Early French Gothic, having a very commanding tower and spire, rising to the height of 140ft. Accommodation is provided for 1,200 persons. The church has been built at a cost of about £6,000. The contractors were Messrs. Dove Brothers. The carving throughout has been executed by Mr. Sansom: the ornamental ironwork, from architects' own designs, by Messrs. Hart and Son Marble work was executed by W. H. Burke and Co. The architect was Mr. Bassett Keeling.

Sedgeberrow parish church has undergone extensive works of restoration. The church consists of nave and chancel, with an octagonal tower with spire, total height, 104ft. About two-thirds of this spire has been rebuilt, and the exterior walls have been rebuilt from the window heads upward. The total cost of the work was about £2,000. Mr. W. Butterfield was the architect employed.

The foundation stone of a new chapel at Broughton, near Kettering, was laid on the 24th ult. The chapel is to be built in the modern style of architecture. Mr. Charles Dawkins, of Broughtou, is the contractor, and Messrs. E. Habershon, Brock, and Welch, of London, are the architects.

The new Roman Catholic Church of All Saints, Barton-on-Irwell, was consecrated on the 18th ult. by Dr. Manning. The plan consists of nave, chancel, and aisles. The total internal length is 140ft., and the width 34ft., the nave and chancel being 20ft. wide. Accommodation is provided for 550 persons. Exterually the building is finished with Yorkshire pierpoints and Stourton freestone dressings. A large presbytery adjoins the church. The total cost of the works was £20,000. Mr. E. Welby Pugin was the architect and Mr. Glaister, of Liverpool, the contractor.

The report of the Leicester County Town Church Building Society was read at their annual meeting in that town on the 26th ult. Since the last annual meeting of the society the following grants have been paid, the usual certificate of the completion of the works in each case having been produced to the Central Committee, viz., Ashby Parva, £20; Illston-on the-Hill, £20; Glooston, £30; St. Matthew's, Leicester, £250; Arnesby, £50; total, £370. The balance in the treasurer's hands now due to the society amounts to the sum of £32 8s. 8d., exclusive of the sum of £200 in Exchequer bills.

BUILDINGS.

New national schools have been erected at Prittlewell, near Chelmsford. The cost of the building, including residence for master and mistress, was £1,500. Messrs. Wenham and Blake, of Westminster, were the architects, and Mr. Carter, of Rochford, the builder.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—I. S. B.—I. T—C. F. R—E. H.—M. and Co.—I. S. G.—I. F.—C. C., Paris, declined with thanks.—E. W. G.—I. P. S.—I. M. S.—A. S.—S. H.—I. G.—M. H. and Co.—I. F. H.—I. C.—H. and Co.—F. F. M.—I. L. H.—R. D. and Co.—G. I.—W. V.—W. W. and Bros.—C. R.—H. B. P.

W. H. T. (Ipswich.) Mr. Tall's address is Falstaff-yard, Kent-street, Southwark. By an oversight the address was not appended to Mr. Tall's large advertisement last week. The pamphlet on concrete building, by Tall's apparatus, can be had by enclosing twelve postage stamps to the above address.

ANDREW SCOTT.—We do not know the address of "Miller," who sent Intercommunication question 891.

C. C.—Of course you can. The curvature of an arch may very vary considerably. When the arch is low the circle it belongs to becomes very large, and the strength of arches varies greatly with their form; they may either be segments of a circle, a parabola, an ellipse, an hyperbola, or a catenary.

Correspondence.

THE SIDES OF WESTMINSTER HALL.

To the Editor of the BUILDING NEWS.

SIR,—An adage says there are two sides to everything—a good side and a bad, a right side and a wrong; a one-sided thing is, in fact, anomalous and repugnant. Some things have many sides, but these remarks concern exclusively the two grand lateral ranges of Westminster Hall.

The western may be called the statutory side, because lined by courts where the statutes are expounded and enforced. The eastern may with equal reason be termed the statuary side, because lined by statues of kings. These latter being on their trial a word may be said in arrest of judgment if the verdict has not been already recorded. As objects composed of statue and pedestal they want importance, but the want relates to elevation only. In the studio, probably, the figures would appear sufficiently raised for convenient contemplation, and a proper relation of figure and pedestal may be said to exist, but for the situation in which they now stand each mass requires an addition of four or five feet, and that addition might be given to the pedestal alone. Not, indeed, to the present eminently vulgar objects of the kind, but to properly devised supports, charged, it may be, with "predella" illustrations, armorials, or legends of the kings portrayed. The further question of congruity may be safely waived when the artistic necessities are fulfilled, since these figures are not in the nature of structural accessories, and are, therefore, free from the rules in such cases. Any attempt to incorporate them with the building would be absurd, but their introduction as detached works may be appropriate and desirable. Progression in style is as inevitable as it is welcome, and, therefore, while fully recognising the imperative nature of synchronism in the constituent parts of an edifice we are disposed, so far as regards merely adventitious ornaments, to insist rather upon fitness of subject, sustained proportion, and artistic value.—I am, &c.,

T. M.

DETACHED LABOURERS' COTTAGES.

SIR,—In your last number you published a plan of a labourers' cottage, designed by Mr. J. T. Smith, of Ealing. You state that "the Central Cottage Improvement Society, in 1866, offered a prize for the best plan of a cottage, consisting of good living room, scullery, pantry, &c., and three bedrooms, which could be erected for £105," and that "the prize was won by Mr. J. T. Smith." You then say, "we give this week illustrations of front and back elevations, section, ground, and chamber plans, as submitted by Mr. Smith." These statements are inaccurate, as Mr. Smith did not win the prize, and the plan you published is not "as submitted by Mr. Smith" for competition in 1866. It is true that Mr. Smith's plan was selected for the first prize conditionally, the condition being that it could be erected for the money stated, viz., £105. The council found that that could not be done, and the condition not being complied with the prize has been withheld. It was also found that by Mr. Smith's plan the staircase was so badly arranged with respect to headway as to destroy the usefulness of the third bedroom, which defect was concealed in the plan by the introduction of a bed. In the plan you have now published, that defect, no doubt, has been to some extent rectified, but the plan is not "as submitted by Mr. Smith" in the competition of 1866.—Signed on behalf of the council,

J. F. FORTESCUE, Chairman.

Central Cottage Improvement Society, 37, Arundel-street, Strand, July 8, 1868.

[We inserted the plan as sent by Mr. Smith, and a good plan it is for a £105 detached cottage. We were given to understand there was some dispute between Mr. Smith and the committee, into the merits of which we cannot enter.]

Intercommunication.

QUESTIONS.

[913.]—IRON SEMICIRCULAR ROOF.—Will you please allow me to ask your correspondent "Calculator" how he would get out the proper sectional area of the flanges and web of a semicircular roof of 70ft. span, either of the lattice or plate girder form? Also what depth of girder he considers right for such a span? Would he recommend a plate to be stronger than a lattice girder of this arched form.—AN ENGINEER'S PUPIL.

[914.]—ETCHING GROUND.—Far from satisfied with the etching ground sold by artists' colourmen, I want a recipe to make my own by. Will some reader oblige?—AN AMATEUR.

[915.]—DRY ROT.—Some of the floors and skirting of my house are falling a prey to the dry rot. I have made air openings under the floors, but have experienced no benefit. I wish some one would suggest a remedy. Possibly it was inherent in the timber. If so, how can such potential frailty be detected.—PATERFAMILIAS.

[916.]—STAINING WOOD.—I want to stain deal a mahogany colour. Can any reader give me a recipe for this purpose at once cheap and effective.—X. P., Penygelli, North Wales.

[917.]—FASTENING ZINC ROOFING.—I am about to use zinc as a roofing for a building. I am informed there are two or three ways of fastening the zinc. I should like to know something of the different plans adopted.—INSPERT.

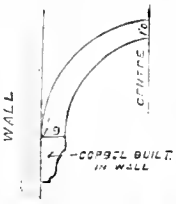
[918.]—FLUSHING HOUSE DRAINS.—Can any of your correspondents inform me as to the best means of flushing house drains. I find during this dry season a very offensive smell arising from my drain, no doubt caused by the diminished quantity of water running down it. Is there any cheap and efficient method of storing up the water and letting it off at intervals. I have heard of some self acting apparatus for that purpose. Where is it used, and with what success? All practical men will understand that a gallon of water thrown down a drain in the way that a bucket would deliver it is worth twenty gallons constantly flowing in driblets. I am satisfied that occasionally flushing a drain is of great advantage at all times. And that all houses should be provided with the means of doing it; therefore the importance of my inquiry.—TIM.

[919.]—PAINTING WOODWORK WHITE.—I shall be obliged if any of your readers can inform me the proper way to paint new woodwork white, and to varnish same after painting for inside work, so that it will keep its colour; and the materials used.—ENORAMUS.

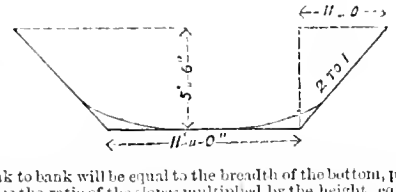
[920.]—RUBBING MONUMENTAL BRASSES.—In rubbing monumental brasses I am sometimes unable to prevent the heel ball going over the margin of the brass and taking an impression of the stone, and this injures the sharp outline that the rubbing would otherwise have. Can any of your readers inform me how best to remove the superfluous heel ball from the rubbings?—A. L.

REPLIES.

[890.]—SEMICIRCULAR IRON ROOFS.—I think "Calculator" is wrong as to the form of these roofs; instead of the intrados and extrados being parallel, they ought to be more as per sketch; or, as your readers will know better perhaps, if I say like the Kensington and King's Cross stations of the Metropolitan Railway, which appeared to me when I saw them as being of the dimensions I have written on the sketch. I have no doubt that "Calculator" could give "Young Engineer" an example of his working one of these arches out, judging from the way he starts; but I always thought it a difficult problem, and gave it up years ago, being no mathematician. I think "Young Engineer" could work out a laminated wood rib and render it fireproof by the method you described of Sir W. Burnett's in your paper some time ago on the preservation of timber. The new Midland station in the Euston road, London, has its slate boarding preserved so by this process, to render it incombustible. I consider your "Intercommunication" column as good as belonging to a discussion society.—J. RICHARDSON, Lincoln.



[891.]—WIDENING AND DEEPENING A STREAM. "Miller" should make his cross section, as in the annexed diagram. The total breadth of the stream at top from



bank to bank will be equal to the breadth of the bottom, plus twice the ratio of the slopes multiplied by the height, equal to 11 + (1 × 5.5), equal to 22ft. The slopes may be made watertight by puddling, or concreting, or asphalting. If good puddle can be had at hand, it will be the cheapest way of doing the job; but it must be well done or the banks will leak.—CONTRACTOR.

[892.]—GEOLOGICAL SURVEY OF ENGLAND.—Write to Stanford, of No. 5, Charing Cross, where you will obtain all information respecting the published plans of the Ordnance survey of the whole of Great Britain.—P.

[893.]—SPIRIT LEVEL.—I should advise "A Beginner" to purchase a Gravatt's dumpy level either at Elliott's, Charing Cross, or at Troughton's in Fleet-street. The Y level is cumbersome and heavy, and although its adjustments are made with greater facility than the other two, yet, on the other hand, they are also more easily deranged. A dumpy level once put in thorough and sound adjustment will remain so for years, unless subjected to wanton bad usage or gross carelessness, from both of which contingencies the owner ought to be able to secure it. Where very minute accuracy is required, the Y level is to be preferred for levelling; but for general practice the dumpy possesses advantages well known to every professional man. Troughton's instrument is one in which the bubble tube has no separate adjustment of its own, but is made by construction parallel to the optical axis of the telescope. It is rarely used now.—SURVEYOR'S CLERK.

[894.]—BREAKING WEIGHT OF BOX GIRDERS.—The general formula for solving the question asked by your correspondent "J. J." is that deduced from the elaborate series of experiments made during and previous to the construction of the Menai Bridge, and is as follows:—Let W equal the breaking weight of a girder applied at the centre; A the sectional area or number of square inches in the top flange; D the depth in feet; L the span in feet; and C a constant; then $W = \frac{A \times D \times C}{L}$. The value of the constant C depends upon the description of the girder, and in the case referred to may be taken equal to 80. To solve the problem put forward by "J. J.," we have, supposing two ¾in. rivets to be in the same line of plate, A = (22.5in. × ¾in. + (18.5in. × ½in.) = 23.31 square inches, and putting for D and L their respective values the calculation stands $W = \frac{23.31 \times 5 \times 80}{75}$. Solving, we find the breaking weight of the girder at the centre to be 124 tons; and, as a girder will always bear twice the weight uniformly distributed over it that it will at the centre, the one in question will require 248 tons to break it down. I trust this will afford satisfaction to "J. J."—L. R. D.

[898.]—WELL DIGGING.—"A. B. C." thinks he was not sufficiently explicit about the required information for the above. It should have been, "What is the price of labour only for digging and steining a well 30ft. deep, 4ft. diameter." "W. W." stated 10ft. diameter and 30ft. deep. The price he stated would be much too high for labour and materials, viz., 8s. 6d. per foot.

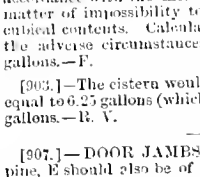
[899.]—QUERIES.—With your permission, I will answer a couple of the queries asked in your columns of June 26, by "T. L. P." Timber, strictly speaking, commences from the half balk; and when sawn into thinner lengths is denominated battens, when from 6in. to 7in. in breadth; deals when 9in., and planks when 11in. in breadth. The real reason why the majority of pipes leak at the joints is, that they are not properly bedded, as the least settlement is sufficient to cause the joints to draw. To prevent leakage, the joints should be well secured with clay, and plugged up tightly by men accustomed to the work, and there will be no necessity for the employment of either tar or asphalte. —PIPELAYER.

[899.]—Asphalte will make a watertight joint to earthenware pipes, glazed or not. The ends to be united should be made hot, to encourage the asphalte to flow. The labour upon this kind of work would be great, and seems to tell against the application of such a material. Why not try good Portland cement to make joints? It would not be so good as asphalte, yet might answer "T. L. P.'s" purpose. —W.

[900.]—BOLTED GIRDER.—In reply to your correspondent "F." who almost drowns his questions in a "sea of words," I should say that two pieces of timber 12in. by 4½in. bolted together at every 4ft. or 5ft. with ½in. screw bolts, would be stronger than one piece 12in. by 9in.; and by having the grain of the pieces bolted running in opposite directions, strength would, I think, be gained. I would also add, that "setting aside prejudice and preconceived notions and ideas" would not, in my opinion, in any way effect the strength of a girder.—PITER.

[903.]—CONTENTS OF CISTERNS.—Assuming the sizes given to be the size of cistern inside, it will contain 119 gallons of water when full. Common rule, cubic feet, × 6¼ = gallons.—R. P., Edin.

[903.]—"Inquirer" has omitted to give one dimension of his cistern, which is necessary for the correct calculation of its contents, and that is the length of the diagonal A C. If it be assumed that the angle A B C is a right angle, this diagonal will, of course, be 2ft. 6in. On this supposition, the quantity of water which the cistern is capable of holding will be 149.57 gallons; a gallon of water being assumed to contain 277.274 cubic inches.—R. L. B.



[903.]—"Inquirer" has not plotted his cistern at all in accordance with the measurements; consequently, it is a matter of impossibility to work out the exact area for cubical contents. Calculating as near as practicable under the adverse circumstances, it would contain about 125 gallons.—F.

[903.]—The cistern would hold, reckoning one cubic foot equal to 6.25 gallons (which I believe to be correct), 126.5625 gallons.—R. V.

[907.]—DOOR JAMBS.—If F on his plan is pitch pine, E should also be of the same material, as the doors on the opposite side of passage have no connection.—W. HUMPHRIS.

[907.]—"Clerk of Works" cannot possibly have stated his case correctly. E and B on sketch are not doorways into D evidently; neither does one open into the hall, as he states. However, taking his evident meaning from the letter-press, I should say the jambs in question should be of the superior class of work.—F.

[919.]—ASPHALTE AND GRAVEL.—All work in asphalte must be executed upon a solid foundation. Form one composed of clean gravel and lias lime, and bring the surface level and fair. Should the barn floor be for thrashing upon or hauling over, 1in. or 1¼in. of asphalte should be laid down. Where used for the storage of grain only, ¾in. or ⅞in. in thickness would be all sufficient. All the floors of the barns upon the Duke of Bedford's estate at Woburn were laid ¾in. in thickness upon concrete. Claridge's asphalte of Soyssel, from the company at Stangate, was the material employed.—W.

WAGES MOVEMENT.

A MEETING of the operative masons in the Halifax district has been held on the question of wages. The men have given notice of an advance of 2s. per week. The masters offer 7d. per hour on the 50½ hours a week, bringing the wages up to £1 9s. 3½d. a week, the present wages being 28s. The men are opposed to the hour system, and have decided not to accept it. The notice of the men terminates on the 22nd inst., before which date another meeting will be held.

The whole of the plasterers in Barnsley struck work on Monday last, for an advance of 2s. per week on the present wages, and a reduction in the working hours. The men have now 26s. per week, and they ask for 28s. and to begin at seven o'clock in the morning during five days in

the week, and give over at half past five; and on Saturday to be at the pay offices by four o'clock. It is said that the masters do not so much object to the advance of wages, but will not concede to the reduction of hours asked for.

It is stated that the master builders of Birmingham have now a sufficient number of non-society men to carry on all their works. The matters in dispute with the Union men were the worked stone question, piece-work, and sub-contracting. On these, and all other questions, the non society men accept the masters' rules. They have been engaged for twelve months certain.

The strike with the bricklayers at Walsall is at an end. They have commenced work according to the terms offered them by the employers, that is, no interference with regard to society or non-society men. Hours of labour to commence at seven o'clock on Monday mornings, and to one o'clock on Saturdays; sixpence per hour for the summer months, and sixpence-halfpenny the winter months, for skilled workmen. Six weeks before Christmas and six weeks after to be the winter portion.

STAINED GLASS.

A stained glass window has just been placed in Trinidon Colliery Church, Durham. The subject is Jesus blessing little children. Messrs. Cox and Son, of London, were the artists.

A stained glass window has been placed in the south side of the parish church of Kimbolton. The subjects are the Resurrection and the appearance of the angel at the tomb. Messrs. Avey and Sons, of London, were the artists.

LAND AND BUILDING SOCIETIES.

An order to wind up the Victoria Land and Building Society, Birmingham, has been made by the Court of Chancery, as it was found impossible to carry out any scheme for realisation without the sanction of the Court. The committee of investigation are actively engaged in preparing a report, which will be issued in a few days, and it will then depend upon the decision of meetings of the shareholders and creditors of the society whether the winding up is to go on, or whether some scheme can be arranged for an easier settlement.

The directors of the Sovereign Permanent Building and Investment Society have declared an interim dividend for the society's first half year, ending June 30, on all paid up shares, at the rate of 6 per cent. per annum.

On the sixty-third quarterly meeting of the sixteenth year of the members of the Conservative Land Society held on Tuesday, the 7th inst., Viscount Ranelagh in the chair, the report of the executive committee stated that up to midsummer the £50 shares issued were 30,047, representing a subscribed capital of £1,502,350. The quarterly receipts were £49,697 6s. 4d., and the grand totals to midsummer, £1,255,517 17s. 1d. The total withdrawals had been £321,532 12s. 8d. The sale of land amounted to £636,276 17s., and the reserve fund to £12,104 5s. 2d. The first portion of the Clapham Junction estate has been entirely sold, and a large quantity of the second allotment had been also disposed of. The board would offer before the close of the financial year at Michaelmas the Holloway estate, the Waterslade estate, Red Hill, and the Northampton estate. The report concluded by announcing that the advance department would be the main business of the society after Michaelmas, the land operations being carried on by the United Land Company (Limited), but both associations would work on the co-operative principle. Among the directors and members present were, Viscount Ranelagh, Colonel B. Knox, M.P., Hon. Robert Bourke, Hon and Rev. W. Talbot, Colonel Meyrick, H. W. Currie, Esq., J. Goodson, Esq., M.P., T. K. Holmes, Esq., C. E. Newcome, Esq., Henry Pownal, Esq., J.P., N. Winstanley, Esq., Captain Strode, Messrs. Sangster, Farquharson, Stewardson, Batchelor, Poole, Turner, &c.

At a meeting of the promoters of the Salford Improved Industrial Dwellings Company (Limited), held in the Townhall, Salford, on Monday, the memorandum and articles of association were finally adopted, and ordered to be signed and registered; and the Mayor (H. D. Pochin, Esq.) and Messrs. Oliver Heywood, Henry R. Greg, Charles E. Cawley, and Thomas Davies were appointed directors, and Mr. Samuel Tilzey, the secretary of the Company. Several sites, upon which to erect cottages, were brought under consideration and it is expected that the Company will at once begin to carry out the object for which it has been formed.

LEGAL INTELLIGENCE.

Peto, Betts, and Crampton's Bankruptcy.—On Monday Sir Morton Peto and Messrs. Betts and Crampton, whose bankruptcy took place about twelve months ago, appeared before Mr. Commissioner Winslow, passed their examinations unopposed, and received immediate orders of discharge. In the course of the proceedings it was stated that, although the London, Chatham, and Dover Railway Company suspended the prosecution of their claim of £6,000,000, they did not abandon their right to prove for that amount. The Commissioner, in granting the orders of discharge, expressed no opinion on the matters in dispute between the railway company and the bankrupts. The only observation he would make was that, although many long investigations had taken place, the bankrupts had had no opportunity of stating their version of the case in the slightest degree.

The Metropolitan Board of Works v. the Metropolitan Railway Company.—During the excavation for the defendants' railway near the Farringdon station, the Fleet sewer gave way and flooded the works. The question now raised for the court was whether the plaintiffs were entitled to compensation from the defendants for the damage done to the sewer. The Lord Chief Justice gave the judgment of himself and Mr. Justice Byles. The wall erected by the defendants would have been sufficient to support the adjoining soil, but not to support the sewer in the soil. It was not contended that the board had acquired any right of support from the adjoining land by length of user, because the sewer had been constructed within twenty years, but it was contended that such right to support was necessary for the works of the board, and that the right was to be implied from certain clauses in their Act of Parliament. It, however, could hardly be said that it was absolutely necessary that the board should have the right, because their Act gave them power to purchase any necessary rights in adjoining land; and if their right were to prevail, it would impose a very serious burden upon the owners of land adjoining to their works, who would not even be able to excavate for building purposes without incurring very serious responsibility. They were at a loss to discover any valid ground upon which the board could maintain an action of this sort; they did not think that any such right existed; and, therefore, there must be judgment for the defendants.—Mr. Justice Smith differed in opinion, he thinking that it was implied from the Act that gave power to construct the sewer that the board was entitled to support for that sewer from adjoining land. In his opinion, therefore, the plaintiffs were entitled to recover. —Judgment for the defendants.

A Paving Question.—On Tuesday, at the Clerkenwell Police-court, Mr. Henry Hill was summoned by the Local Board for the district of South Hornsey to show cause why he should not pay the apportioned amount of the expense payable by him as owner of the house, 14, Warwick-road, South Hornsey, as settled by the surveyor of the Local Board, for levelling, kerbing, and channelling, and making good the said road.—The defendant denied his liability.—Mr. Cooke, in delivering judgment, said: A notice to dispute was given, and it then became the duty of the Local Board to proceed by arbitration under the 123rd clause, 11th and 12th Vic., chap. 63, the amount being above £20, and the justices not having in such case jurisdiction until the arbitrator had determined the amount due; under the 123rd clause the amount could not be said to be disputed and due, and until that was ascertained, the six months' limitation did not begin to run. A document was produced before him by which the defendant agreed to the amounts due from him, subject to his liabilities upon other points, and he thought the effect of that document virtually was to withdraw his notice to dispute as to the amount claimed and the necessity for arbitration. He thought, therefore, from the date of that document the amount became definite and certain, and from that time the limitation of six months would begin to run within which the board must take proceedings. It followed, therefore, upon both points, that the board had a right to recover. Mr. Hill asked if the magistrate would grant him a case for the opinion of the Court above if he should require it.—Mr. Cooke said he would if it was applied for at the proper time. With regard to the question of costs, as they were not pressed for he should only order the defendant to pay the costs incurred by the complainant in taking out the summons.

Our Office Table.

A number of Welshmen have resolved to get up an exhibition of works of art at Ruthin, in Denbighshire. Ruthin has been fixed upon because the National "Eisteddfod" holds its annual meeting there this year, and the two "exhibitions" will be opened together, in the first week in August.

A munificent gift has been announced at a special meeting of the monthly board of the Huddersfield Infirmary. Mr. Chas. Brook, of Enderby Hall, formerly of Meltham, near Huddersfield, has offered to build and endow a convalescent hospital in connection with the infirmary, at a cost of £30,000. This handsome gift was, it need hardly be stated, most warmly accepted.

A few nights since, in the House of Commons, Mr. H. Major called attention to the danger that arises to life and property from the careless use of lucifer matches. In three years, he said, the Norwich Union Office had paid £13,600 for fires caused by lucifer matches, and on that basis the amount paid by all the insurance companies in the kingdom for fires caused by the careless use of lucifer matches was not less than £100,000 a year.

Tablets have been fixed in front of No. 16, Holles-street, and of No. 3A, King-street, St. James's-square, recording that Lord Byron once lived in the first-named house and the Emperor Napoleon III. in the second. Leave has been obtained to affix similar tablets in front of the former residences of Lord Nelson, Benjamin Franklin, James Barry, and other celebrated individuals, but the execution of the project has been delayed in consequence of certain experiments now making as to the best means of manufacturing the tablets required.

On Friday last six land engines and a large floating engine were engaged pumping water from the river to the length of the new Embankment roadway which runs in front of Somerset House. The object was to lay the loose dust and rubble some inches deep in water, so that they may be more readily solidified into something like a concrete road. After a day's soaking the steam rollers which have been recently used in Park-lane were set to work, and it is expected that the road will be levelled and made solid in a few more days.

An attempt is being made to establish a hospital in which diseases shall be treated without the aid of drugs or alcohol. The committee of the "Temperance Hygieon Hospital" wish first to test their system in some of the workhouse infirmaries, and a deputation from that body waited on Archbishop Manning on Saturday to ask his assistance to this end. The system has already been tried most successfully both in this country and in America. The archbishop said he considered the object the deputation had in view was highly satisfactory and commendable, and promised to give the committee all the aid in his power.

At the meeting of members and associates of the Royal Academy, which took place on Tuesday week, for the election of a member in the place of Baron Marochetti, deceased, Mr. Leighton was chosen by a large majority of votes. Mr. Frost was second in order. Mr. Leighton was elected A.R.A. in July, 1864.

The Italian sculptor Giovanni Bastianni has just died at Florence of typhus fever, at the age of thirty-eight. His name became celebrated in a brief space of time in consequence of the famous bust made by him in terra cotta of Benivieni, which was bought for a small sum by a Florence antiquary, and then sold for 13,000 francs at a sale by auction in Paris, and is at present placed in the Louvre. The authenticity of this bust is still disputed.

On Tuesday night Mr. Cowper asked the First Commissioner of Works when the public would be admitted to see the frescoes painted by the late Mr. Dyce in the Queen's robing room. Lord J. Manners said the frescoes could now be inspected by the public, and they would be deemed worthy of the great artist who painted them. Some arrangements as to the means of access had to be made, after which the room would be open to the public.

Some alarm has been created in the minds of Hyde Park *habitues* by the destruction of so many fine trees in the neighbourhood of the Albert Memorial, with the view probably of affording a better view of the monument. In answer to Mr. Beaumont, on Monday night, in the House of Commons, Lord J. Manners said that no more trees would be cut down this year, but he could give no other information as to what was intended to be done generally with that quarter of the park, except that next year there would be a vote for "relaying and reforming" the groundwork of the memorial.

The *Athenæum* states that the tomb of the poet Thomas Moore, who died in 1852, and was interred in the churchyard of Bramham, in Wiltshire, is in a very bad condition. It is not creditable to us that the resting place of the author of "Lalla Rookh" should pass into oblivion; and perhaps attention being drawn to the present condition of his grave may lead to its being put into an efficient state of repair.

An examination of persons desirous of obtaining a certificate of competency to perform the duties of district surveyor will take place at the rooms of the Institute of Architects, Conduit-street, on Thursday, the 30th, and Friday, the 31st inst., at ten o'clock a.m. Persons wishing to be examined must send an application to the secretary on or before the 23rd instant.

Mr. Alderman Lusk, in offering some remarks on the insufficient accommodation of the British Museum on Tuesday last, quoted, with apparent approval, a friend's remarks concerning the Elgin marbles, that they were "big stones and men without heads, and he did not think much of them."

Mr. Holmes, the archæologist attached to the Abyssinian expedition, has obtained a large quantity of Ethiopian manuscripts, the value of which remains to be ascertained, but which, it is hoped, may contain something worth having, as the Book of Jasher was in 1820 recovered from Abyssinia. Mr. Holmes bought Theodore's crown and a chalice for £4, and the Government, it seems, now propose that the British Museum should buy back their own collection for £2,000.

We have great pleasure in recording the handsome donation, by the Queen, of £500 towards the funds of the Incorporated Church Building Society.

At the corner of Gray's Inn-lane, where Middle-row formerly stood, a cast-iron fluted pillar, supporting four lanterns and a fifth central one, has been erected by the Metropolitan Board.

In consequence of dissatisfaction with the tenders for dusting and scavengering, the vestry of Bethnal Green have referred it to a committee to see whether they cannot perform the work themselves without contracting.

From a paper laid before the House of Commons' arrangement committee by Mr. Barry, it appears that among the chambers of four great capital cities—Paris, Berlin, Florence, and Washington—our House of Commons stands pre-eminent for the poverty of its accommodation. It is the shortest and the narrowest House, it has fewer cubical feet of space, and consequently of air, than any other of its fellows. Paris allows to a total number of 712 seats in her Corps Legislatif 277,000 cubic feet of space; London, to 691 seats, 127,000ft. only. Washington gives to 1,312 seats 400,000 cubic feet. Florence, more liberal, allots 467,000ft. to sitting room for 944 persons.

The Select Committee which was appointed some months ago to consider what alterations could be made in the arrangements of the House of Commons, have issued their report. It is acknowledged that the existing chamber is defective in the necessary extent of accommodation, and it is therefore proposed to construct a new house on the space now occupied by the Commons court and the dining-rooms. The new building would seat 141 more members, twelve more peers, fourteen more ladies, and sixty-seven more strangers than have hitherto been accommodated in the lower house. Mr. Barry's estimate of the expense is £120,000.

The Metropolitan Board of Works are seeking powers to compel railway companies to adopt some means of deadening the sound of railway bridges crossing the public streets, and we hope they will succeed.

A correspondent says:—"When the main drainage scheme of Mr. Bazalgette shall have been completed, the proper disposal of the house sewage will still have to be provided for, and the storm waters will still remain to be effectually disposed of or got rid of."

The St. Pancras Guardians at their last meeting selected Mr. S. Finney from among a number of other candidates to be resident engineer and clerk of the works at the new district school at Leavesden, Woodside, about to be commenced. He is to receive the handsome salary of £300 a-year, with house, coal, and gas.

A new kind of pasteboard roofing intended to supersede slate has been submitted to the inspection of the Emperor Napoleon. The invention is stated to be a coarse kind of cardboard highly impregnated with mineral substances, impermeable to damp and rain, and quite incombustible.

The thirty-fifth biennial meeting of the London Association of Foremen Engineers took place on Saturday; Mr. Joseph Newton in the chair. From the report and balance-sheet it appears that the association now numbers rather more than 150 ordinary and honorary members, composed mainly of foremen and employers of the engineering trade. The general fund of the society amounts to £13 2s., the superannuation fund to £903 18s., and the widows and orphans' fund to £12 4s., making a total of £1,347 4s.

Amongst the many metropolitan societies which have a special regard for the welfare of the poor, is that for promoting window gardening among the working classes in the united parishes of St. Margaret and St. John, Westminster. It has for its patrons the Very Rev. the Dean of Westminster, the leading clergymen of the district, and the Right Hon. Lord Justice Wood. The annual "show" took place on Wednesday afternoon, in the Dean's yard. Prizes were offered in three classes—the first being open for competition to working men and women; second, domestic servants; and third, children in parochial, national, infant, Sunday, and ragged schools. The pleasantest part of the meeting was the enjoyment which the poorer people and a large number of children obtained by being allowed to use the ground in the most unrestricted manner. In the evening the prizes were distributed by the Earl of Shaftesbury.

The Council of the Institution of Civil Engineers have just awarded the following premiums for original communications submitted to the institution, and read at the ordinary meetings during the session 1867-68:—1. A Telford medal and a Telford premium of books to George Higgin, M. Inst. C.E., for his paper "Irrigation in Spain, chiefly in reference to the Construction of the Henares and Esla Canals, in that country." 2. A Telford medal and a Telford premium of books to Christer Peter Sandberg, Assoc. Inst. C.E., for his paper "On the Manufacture and Wear of Rails." 3. A Telford medal and a Telford premium of books to Lieutenant-Colonel Peter Pierce Lyons O'Connell, R.E., Assoc. Inst. C.E., for his paper, "On the Relation of the Fresh Water Floods of Rivers to the Areas and Physical Features of their Basins." 4. A Telford medal and a Telford premium of books to William Wilson, M. Inst. C.E., for his paper "Description of the Victoria Bridge, on the Line of the Victoria Station and Pimlico Railway. 5. A Telford medal and a Telford premium of books to Charles Douglas Fox, M. Inst. C.E., for his paper "On New Railways at Battersea, with the Widening of the Victoria Bridge, and approaches to the Victoria Station." 6. A Telford medal and a Telford premium of books to John Wolfe Barry, M. Inst. C.E., for his paper "On the City Terminus Extension of the Charing-cross Railway." 7. A Watt medal to Edwin Clark, M. Inst. C.E., for his paper "On Engineering Philosophy; the Strength of Materials." 8. A Telford medal to William Jarvis M'Alpine, M. Inst. C.E., for his paper "On the Supporting Power of Piles; and on the Pneumatic Process for sinking Iron Columns, as practised in America." 9. A Telford premium of books to Thomas Login, M. Inst. C.E., for his paper "On the Benefits of Irrigation in India; and on the proper Construction of Irrigating Canals." 10. A Telford premium of books to Allan Wilson, M. Inst. C.E., for his paper on Irrigation in India." 11. A Telford premium of books to Wilfrid Airy, Assoc. Inst. C.E., for his paper "On the Experimental Determination of the Strains in the Suspension Ties of a Bow-string Girder." 12. The Manby premium of books to Andrew Cassels Howden, Assoc. Inst. C.E., for his paper "On Floods in the Nerbudda Valley, with Remarks on Monsoon Floods in India generally."

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3523 G. A. YOUNG. AN IMPROVED CURTAIN OR SCREEN FOR SEPARATING THE STAGE FROM THE AUDIENCE PART IN THEATRES AND MUSIC-HALLS, IN ORDER TO PREVENT THE SPREADING OF FIRE, ALSO APPLICABLE TO OTHER BUILDINGS WHERE IT IS DESIRED TO PREVENT THE SPREADING OF FIRE FROM ONE PART OF THE BUILDING TO ANOTHER. Dated December 12, 1867.

This invention consists in constructing a curtain or screen of wire gauze with fine meshes, which is by preference fitted on a roller, so as to be rolled up and unrolled as ordinary blinds or stage curtains. The above is one method described in the specification, but other arrangements are also set forth.—Patent completed.

3542 E. R SINTZENICH. A NEW OR IMPROVED TREATMENT OF GUTTA-PERCHA, INDIA-RUBBER, HONDURAS GUM, AND THE OTHER ALLIED GUMS, FOR THE PRODUCTION OF A PREPARATION APPLICABLE AS A VARNISH, CEMENT, PAINT, &c. (A communication) Dated December 13, 1867.

This invention consists in dissolving such gums in benzine or benzole, or its chemical equivalents, and in adding alcohol in sufficient quantity, in separating the purer portions of the gum from the barky, resinous, and other foreign substances, the gum rising and collecting in the form of a curd more or less solid (by the action of the alcohol). This curd is to be re dissolved thoroughly in benzine or benzole to any consistency for the finer use or uses to which it may be desired to apply it.—Patent abandoned.

3550 J. G SETTLES. IMPROVEMENTS IN DOOR BOLTS AND INDICATORS. Dated December 13, 1867.

The patentee claims combining a door bolt and indicator (as described) so as to indicate on the outer side of the door whether the bolt within is shot or otherwise. He also claims the general arrangement of the apparatus described. The details of the invention are too voluminous to be quoted here.—Patent completed.

Trade News.

TENDERS.

The Chelsea Vestry have accepted the tender of Messrs. Brown and Smith for painting the exterior of the Vestry-hall, and other works, for £62.

LANGTON AND ELDENSFIELD DRAINAGE, Mr. T. Curley, Hereford, engineer.—The tender of Mr. William Field, of Shrewsbury, for £51 13s 2d. has been accepted. Mr. Thomas Brassey, Westminster, surety.

BEDFORDSHIRE.—For the erection of Sandy national schools, Bedfordshire. W. G. Habershon and Pite, architects:—

Cowland	£1990
Pattinsons	1900
Carter and Son	1870
Canvin	1737
Twelvetrees	1678
Field	1595

BURSLEM.—For the erection of canal wharf shed for the North Staffordshire Railway Company. Mr. J. S. Forbes, canal engineer, Stoke-on-Trent:—

Bennett and Cooke	£1200 0 0
Wooldridge	1087 0 0
Blackhurst	1086 10 0
Brindley and Critchlow	1085 8 6
Bowden	889 0 0

COVENTRY.—For alterations and additions to the old Coventry and Warwickshire Hospital. Mr. George Steane, architect:—

Brown	£2640
Matthews	2337
Dutton	2325
Worwood	2315
Webb	2307
Barnsley and Sons	2208
Marriott	2220
Lovatt	2100
Makepeace	2090
Woof	2062
Hallam and Co. (accepted)	1953

GROVE HALL.—For additions to Grove Hall lunatic asylum. Messrs. Tolley and Dale, architects:—

Fawcett	£2449
Rivett	1873
Perry and Co.	1707
Pritchard	1697
Abraham	1696
Hill, Keddall, and Waldrum	1668
Hedges (accepted)	1596

HURSTPIERPOINT. — For erecting national schools at Hurstpierpoint, Sussex. Messrs. Goulty and Gibbins, architects. Quantities supplied by J. C. Lansdown, surveyor:—

Stanbridge, Lindfield	£2269
Lockyer, Brighton	2105
Chappell, Steyning	2075
Cheeseman and Co., Brighton	2070
Howell, Hastings	2058
Kirk, London	1970
Nash and Co., Brighton	1962
Nightingale, London	1883
Hall and Co., Brighton	1870
Holland, Hurstpierpoint (accepted)	1867
Thos Wadey, Hurstpierpoint	1643

LLANSAMLET.—For erecting a schoolroom and house at Maesybyar, Llansamlet. H. Francis Clarke, architect:—

	School.	House.
John Michael	£308 9 10	£158 8 0
Rees Roderick	304 0 0	183 0 0
Thomas Ley	286 0 0	233 0 0
Rees Llewellyn	282 0 0	235 0 0
John Rogers (accepted)	310 10 0	200 10 0
Isaac George	—	166 10 0

LONDON.—For alterations and additions to No. 240, Blackfriars road. Mr. George Perry, architect:—

Patman and Co.	£1225
Axford	1175
Gadsby	1015
Bishop	993
Bamford	970
Langmead and Way	970
Macey (accepted)	949

LONDON.—For alterations and additions to No. 19, Great Windmill street, for Mrs. Kemp. Messrs. Glazier and Son, surveyors:—

Corbet	£256
Nightingale	227
Batchelor	177

LONDON.—For alterations and repairs to the Rodney Tavern, Westminster Bridge road. Messrs. Bird and Walters, architects:—

Nixon and Son	£1240
Williams and Son	1245
Ebbs and Sons	1243
M'Lachlan	1209
E. Brown	1188
Newman and Manns	1175
Kelly Brothers (accepted)	1153

MUCKING.—For alterations and additions to the vicarage house, Mucking, Essex. Mr. Charles Innes, architect, 6, Whitehall:—

Carter and Sons	£949
Place	895
Rivett	893
Blake	795
Davey	769
Lilleystone	730

TILBURY (ESSEX).—For the erection of new farm buildings at Spring Farm, Bulphan, for Mr. J. Mitchell. Messrs. Shaw and Torkington, architects:—

Lewis	£545 0 0
Turner	533 15 2
Blake	380 0 0
Horscroft	380 0 0
Larkin (accepted)	280 10 0

TUNSTALL.—For alterations to a house for Mr. J. Johnson, brewer. Mr. R. Dain, architect, Burslem:—

Woolrych	£415 0 0
Blackhurst	407 12 0
Beech (accepted)	405 12 6

WANTAGE.—For country house at Wantage, Berks, for F. F. Bullock, Esq. Mr. J. P. Spencer, architect. Quantities supplied:—

Briant	£3213
Dover and Co.	3000
Nightingale	2727

WEST HAM.—For four cottages at West Ham, Essex. Messrs. Tolley and Dale, architects:—

Smith (accepted)	£550

COMPETITIONS.

LIVERPOOL.—July 21.—For plans and specifications for erection of new hospital on the site of present Everton Hospital for Infectious Diseases. Mr. J. J. Still, 17, Water-street.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

FINSBURY SCHOOL DISTRICT.—August 3.—Plans, sections, elevations, and estimate of costs for school at Upton, West Ham, Essex. W. W. Hayne, Vestry hall, City-road.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square, Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

BROMFIELD (SHEFFIELD).—July 14.—For the erection of the new church of St. Mark. W. H. Crossland, architect, 21, Park square, Leeds.

CITY OF PEST.—July 31.—For excavating trenches, laying the pipes, and making them entirely watertight. Hon Moritz von Szentkirályi, Ober-Burgermeister, President, City Waterworks Company, Pest.

ROYAL ARSENAL, WOOLWICH.—August 1.—For supplying and depositing dry rubbish or dredger stuff on the foreshore. Inspector of Works, Royal Arsenal.

STOURBRIDGE.—July 16th.—For the erection of a new church at Stamber Mill, near Stourbridge. Thomas Smith, architect, the Mount, Stourbridge.

HEATFORD.—July 20.—For taking down and rebuilding St. Andrew's Church. Architect, Mr. J. Johnson, 35, Moorgate street, E.C.

CHESHIRE NEW COUNTY ASYLUM.—July 27.—For the erection of the above-named building. R. Griffiths, Martin-street, Stafford.

LEICESTER.—July 21.—For laying about five miles of cast-iron socket pipes. J. E. Williams, secretary, Leicester Waterworks Company.

METROPOLITAN BOARD OF WORKS.—July 17.—For the construction of a brick sewer. J. Pollard, clerk, Spring Gardens.

ST. IVE'S, HUNTS.—August 6.—For supplying and lighting the streets, roads, and other places with gas, for a period of three years. Messrs. Fisher and Ginn, clerks to the Improvement Commissioners, St. Ive's.

WEST HAM LOCAL BOARD OF HEALTH.—July 13.—For supply and delivery of gravel. July 13.—For laying and connecting house drains to the public sewers. July 13.—For the purchase of ashes and house refuse. July 13.—For masons and paviours day and jobbing works. July 13.—For the hire of horses and carts. C. Wilson, clerk, Rokeby House, Stratford.

ASHBOURN.—July 18.—For the alteration and enlargement of the chapel and the rebuilding of the schools of the Countess of Huntingdon's connexion. Mr. W. Sugden, architect, Leek.

NEWCASTLE-ON-TYNE.—July 14.—For renewing the boarding, slating, lead-guttere, &c., in B range of barracks. Colonel W. G. Hanbury, R.E. Office, Manchester.

NEW BARNET.—July 15.—For the erection of a small pair of villas. J. Sargeant, surveyor, Victoria-road, New Barnet.

BARTON CLIFF, HAMPSHIRE.—July 17.—For the erection of a coast guard station. Admiralty coast guard office.

ST. HELEN'S JUNCTION, TOWNSHIP OF SUTTON.—July 14.—For construction of new roads and bridges. S. B. Worthington, Victoria Station, Manchester.

CROYDON.—July 8.—For the construction of about four miles of brick sewer, and one mile of earthenware pipe sewer. R. J. Cheesewright, Townhall, Croydon

MAIDSTONE.—July 28.—For 400 tons broken Guernsey granite. E. Hoar, clerk to the board, Maidstone.

INDEPENDENT GAS LIGHT AND COKE COMPANY.—July 15.—For the whole of the tar produced on their works. J. B. Coulson, 236, Kingsland-road.

BRIGHTON.—July 30.—For the construction of about 4,000 yards brick sewers, and about 22,000 yards pipe sewers. D. Black, town clerk.

July 17.—For the new tower and additions to Hurstbourne Church, Hants. Drawings, Mr. G. Lamb, Hurstbourne Priors; tenders to Messrs. Clark and Holland, Newmarket.

BATH.—July 23.—For the supply of glazed stoneware sewage pipes for twelve months. Mr. A. Mitchell, 3, Fountain-buildings, Bath.

REDHILL (SURREY).—July 17.—For the erection of a detached villa residence in Linkfield-lane, Messrs. Reee and Son, architects, Redhill.

METROPOLITAN BOARD OF WORKS.—July 20.—For the erection of a fire brigade station in Renfrew-road, Lower Kennington-lane. J. Pollard, clerk, Spring-gardens.

GRANTHAM.—July 24.—For the purchase of the whole of the materials except bricks and rubble-stone from the old Guildhall and Prison. W. Thomson, 11, Elmer street, Grantham, and W. Eve, 10, Union Court, Old Broad-street E.C.

WISBECH (CAMBRIDGESHIRE).—Cattle Market.—For wrought and cast iron cattle pens, fencing, &c.; and for paving, draining, &c. F. Jackson, clerk to Local Board.

PROPERTY SALES.

JULY 1.

At the Mart.—By Messrs. Driver and Co.—Freehold Blackney and Glitney-cum-Blackney farms in the parish of Stoke Abbott, Dorset, consisting of 233a. 3r. 28p. of arable and grass lands, with homestead, farm buildings, and five cottages—sold for £11,950.

Freehold estate, known as Monkwood, in the parishes of Stoke Abbott and Marshwood, Dorset, consisting of 92a. 0r. 8p. of arable and grass lands, with farmhouse and buildings—£4,300.

By Messrs. Dann and Son.—Freehold sixteen acres of plantation ground, situate in the parish of Bexley, Kent—£3,320.

By Mr. Robins.—Leasehold house, No. 20, Charlotte-street, Caledonian road, let at £22 per annum, term 79 years, from 1842, at £2 2s. per annum—£340.

By Messrs. Candy and Luckin.—Leasehold house, No. 13, Richmond-place, Russell-road, Holloway, annual value £36, term 86 years, from 1865, at £6 10s. per annum—£320.

Leasehold house, No. 10, Clipstone-street, near Fitzroy-square, let at £52 10s. per annum, term 86½ years, from 1789, at £5 per annum—£180.

JULY 2

At the Mart.—By Messrs. Debenham, Tewson, and Farmer. Leasehold three cottages, shop, and office, situate at the corner of Brown's-road, Surbiton hill, annual value £48, term 86½ years, from 1866 at £10 per annum—£300.

Leasehold house and shop, Nos. 366 and 368, Walworth-road, let on lease at £126 per annum, term 99 years from 1863, at £20 per annum—£1,510.

By Messrs. Terson and Son.—Freehold mansion, with stabling and pleasure grounds, known as "Brook House," Maison Dieu-road, Dover, Kent—£3,750.

Freehold 1a. 1r. 11p. of land, adjoining above—£1,550.

By Mr. W. H. Moore.—Freehold house, No. 59, Whitfield-street, Tottenham Court-road, annual value £60—£860.

Leasehold house, No. 208, Stanhope-street, Hampstead road, let at £63 per annum, term 90 years from 1844, at £8 8s. per annum—£810.

Leasehold residence, No. 2, Mornington-crescent, Hampstead-road, let at £50 per annum, term 91 years, from 1827, at £21 per annum—£360.

Leasehold residence, No. 17, Hawley-road, Kentish Town, let at £52 10s per annum, term 91 years from 1845, £2 10s. per annum—£605.

Leasehold two houses, Nos. 85A and 87, Great College-street, Camden Town, annual value £50 each, term 22 years from 1867, at £5 each per annum—£800.

At Garraway's.—By Mr. Briant.—Freehold residence, No. 88, Lothian-road, Camberwell New-road, annual value £34—£200.

Leasehold six houses, Nos. 10 to 15, Wickham-place, Kent-street, Borough, and a ground-rent of £2 per annum, arising out of No. 9, Wickham-place, producing £81 18s. per annum, term 24 years unexpired, at £11 per annum—£300.

Leasehold four residences, Nos. 22 to 25, Foxley-road, Camberwell New-road, producing £163 per annum, term 33¾ years, from 1867, at £60 per annum—£1 025

Leasehold two residences, Nos. 20 and 21, Holland street, Brixton road, producing £58 per annum, term 31½ years unexpired, at £20 per annum—£325.

Leasehold two houses, Nos. 4 and 5, Middle-street, Commercial-road, Peckham, producing £41 12s per annum, term 53¼ years unexpired, at £3 per annum—£255.

At the Guildhall Coffee house.—By Mr. Acocks.—Leasehold residence, No. 14, Lancaster road, Notting hill, annual value £30, term 78 years unexpired, at £10 per annum—£320.

JULY 3.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Freehold property, being No. 14, Austinfriars, City, occupying an area of upwards of 3,000 superficial feet—£11,000.

By Messrs. Farebrother, Lye, and Wheeler.—Freehold property, known as the "Harcourt Estates," situate in the parishes of Tring, Aldbury, and Wigginton, Herts, comprising about 847 acres of land, together with the manors of Pendley, Wigginton, and Bunstrux, the whole producing £1,200 a-year, sold in fourteen lots as follows:—Lot 1, £21,300; lot 2, £5,050; lot 3, £12,000; lot 4, £400; lot 5, £1,200; lot 6, £380; lot 7, £1,550; lot 8, £1,500; lot 9, £2,700; lot 10, £670; lot 11, £1,400; lot 12, £720; lot 13, £1,400; lot 14, £1,180.

JULY 6.

At the Mart.—By Mr. J. Taylor.—Freehold plots of land, fronting Powercroft-road, Clapton-road—£186.

A ditto, ditto—£186.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Hare, Sheerness, plumber, July 22, at 12—William Charlton, Brunswick street, Barnsbury, plumber, July 17, at 1—William Hutchinson, Lyme Regis and Wardrobe-place, cement manufacturer, July 13, at 12—Elijah Meadows, Plaistow, builder, July 15, at 2—John Watling, Everett-street, Brunswick-square, house decorator, July 15.

TO SURRENDER IN THE COUNTRY.

George Bloomfield, Reading, carpenter, July 18, at 10—Thomas Muttow Jenkins, Gloucester, timber merchant, July 20, at 12—Thomas Thomas, Aberaman, mason, July 21, at 11—John Crellin, Ireleth, Marsh, near Barrow-in-Furness, builder—Jeremiah Hobson, Windhill, Yorkshire, stonemason, July 14, at 9·15—Thomas Holme, Litherland, Lancashire, brickmaker, July 16, at 12—George Hull, Waterloo, near Liverpool, builder, July 13, at 11—Thomas Smitton, Seaforth, near Liverpool, stonemason, July 14, at 11—Andrew Spinney, Plymouth, house painter, July 15, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

July 29, D. Dunnham, Toddington, Beds., builder—August 5, G. Large, Hemsworth-street, Canning Town, builder—August 5, W Fenn, Woolwich, carpenter—August 5, J. W. Twemlow and C.F. Bush, Ladbroke-grove-road, Kensal-green, plumbers—August 5, T. M'Mahon, Sidney-place, Notting hill, builder July 20, C. Evans and T. J. Jones, Newport, Monmouthshire, timber merchants—July 24, S. F. M. Lindhard, Hartlepool, timber merchant—August 20, A. J. Hart, Thorrington, Essex, carpenter—July 24, E. Etheridge, West Horsham, builder—July 25, W. Price, Clarence-road, Bow, timber merchant—August 7, J. Paramor, Margate, builder—July 20, F. G. Smyrk, Guildford Chambers, Basinghall-street, asphalte contractor—July 27, B. Boots, Wadhurst, builder—July 30, J. L. Bellamy, Buckhurst-hill, Essex, builder—W. R. Simpson, Chester, plumber—August 7, W. Booth, Hartlepool, builder—July 16, J F. Lupton, Leeds, painter—July 16, G. A. Mellin, Holbeck, engineer.

DIVIDENDS.

July 23, C. Burtwell, Old Kent-road, and Norwood, plumber—July 22, T. Freeman, Spa road, Bermondsey, timber merchant—July 27, W. Powell, Leicester, plumber—July 27, W. Cooper, Leicester, joiner—July 23, W. Sheppard, Gloucester, builder—July 14, N. Olive, Truro, carpenter July 14, J. Stantan, Portscatha, Cornwall, builder.

PARTNERSHIP DISSOLVED.

Read Brothers, Buckingham Palace road, marble masons—Baker and James, Birmingham, glass merchants—Scott and Harper, Eagle-court, Clerkenwell, engineers—W and A. Kilby, Gustard Wood, Herts, carpenters—Roberts and Evans, Denbigh and elsewhere, timber merchants—Gilder and Hodgson, Dartford, plumbers—Axford and Cooper, Beckenham, builders—Carter and Wynd, Chester, joiners—Winter and Haines, Stoke Newington, stone masons.

DECLARATION OF DIVIDEND.

T. Eddisford, Heath Charnock, near Chorley, brick and tile manufacturer, div. 2s. 6d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11	0 £12 0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0 12 0
,, yellow pine		2	13	4	5	Finland	7	0 8 0
St. John N.B. yellow		0	0.	0	0	Memel	0	0 0 0
Quebec Oak, white		5	5	5	10	Gothenburg, yellow	8	0 9 10
,, birch		4	5	5	0	,, white	8	0 9 0
,, elm		3	15	5	10	Gefle, yellow	9	0 10 10
Dantzic oak		4	0	6	0	Soderham	9	0 10 10
,, fir		2	0	3	5	Christiania, per C., 12 ft. by 3 by 9 in.	14	0 20 0
Memel fir		3	0	4	5	yellow		
Riga		3	0	3	3	Deck Plank, Dantzic, per 40 ft. 3 in.	0	16 1 3
Swedish		2	5	2	8	Pumice Stone per ton	0	0 8 0
Masts, Quebec red pine		5	0	6	10			
,, yellow pine		5	0	6	0			
Lathwood, Dantzic, fm		6	10	7	10			
,, St. Petersburg		8	10	9	10			
Deals, prC., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.								
Quebec, white spruce		13	0	20	0			
St. John, white spruce		13	10	15	10			
Yellow pine, per reduced C.								
Canada, 1st quality		17	0	18	10			
2nd do		11	10	12	10			

Archangel, yellow		£11	0	£12	0			
St. Petersburg, yel.		10	0	12	0			
Finland		7	0	8	0			
Memel		0	0	0	0			
Gothenburg, yellow		8	0	9	10			
,, white		8	0	9	0			
Gefle, yellow		9	0	10	10			
Soderham		9	0	10	10			
Christiania, per C., 12 ft. by 3 by 9 in. yellow		14	0	20	0			
Deck Plank, Dantzic, per 40 ft. 3 in.		0	16	1	3			
Pumice Stone per ton		0	0	8	0			
Oils, &c.								
Seal, pale	per tun	36	0	0	0			
Sperm body		96	0	0	0			
Cod		38	0	0	0			
Whale, 8th. Sea, pale		35	0	0	0			
Olive, Gallipoli		68	0	73	0			
Cocoanut, Cochin, ton		53	0	55	0			
Palm, fine		39	0	40	0			
Linseed		32	0	34	0			
Rapeseed, Eng. pale		34	0	0	0			
Cottonseed		32	10	33	0			

METALS.

IRON:—						
Welsh Bars in London	per ton	6	5	0	6 5 0	3
Nail Rod	do	7	5	0	7 12 6	2½
Hoops	do	8	5	0	9 0 0	
Hoops, Single	do	8	0	0	9 0 0	
Staffordshire Bars	do	7	5	0	7 15 0	
Bar, in Wales	do	5	10	0	8 0 0	3
Nailrods	do	7	5	0	7 15 0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2 17 6	net.
Swedish Bars	do	10	0	0	10 10 0	2½
STEEL:—						
Swedish Keg, hammered	per ton	15	0	0	15 10 0	2½
Swedish Faggot	do	0	0	0	0 0 0	
COPPER:—						
Sheet & Sheathing, & Bolt	per ton	85	0		0	
Hammered Bottoms	do	97	0	0	0 0 0	
Flat Bottoms, not Hammered	do	92	0	0	0 0 0	
Cake and Tough Ingot	do	81	0	0	83 0 0	3
Best Selected	do	84	0	0	85 0 0	
Australian	do	83	0	0	0 0 0	
Yel. Metal Sheathing & Rods	per lb	0	0	7	0 0 7½	
LEAD —						
Pig, English	per ton	21	5	0	0 0 0	
,, Spanish Soft	do	18	10	0	0 0 0	2½
Shot, Patent	do	22	10	0	22 16 0	5
Sheet	do	20	0	0	20 15 0	
White	do	27	0	0	30 0 0	
REGULUS OF ANTIMONY						
French	ton	43	0	0	0 0	
ZINC:—						
English Sheet	per ton	26	0	0	26 10 0	2½
Devaux's V. M. Roofing Zinc	do	26	10	0	0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—						
On the Spot	per ton	20	0	0	0 0 0	nett
QUICKSILVER	per bll	6	17	0	0 0 *	
TIN:—						
English Block	per ton	98	0	0	0 0 0	2½
do Bar	do	97	0	0	99 0 0	
do Refined	do	97	0	0	0 0 0	
Banca	do	94	0	0	97 0 0	net
Straits	do	91	10	0	92 0 0	

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NAMES OF EXHIBITORS.	(SEASON 1868.)	WORKS REPRESENTED.
Antil, J.	... ...	Pat-nt Cast-lead Stench Traps
Arrowsmith A. J., and Co.	...	Solid Parquet Floors—Bent Wood Furnitur
Atkins, T. and Son	... ...	Moulded Carbon Filters.
Ayling, Stephen	... ...	Architectural Photography.
Baker, Rev. R. S.	... ...	Eagle Lectern in Carved Oak.
Barlow, Finja, and Co.	... ...	Moulded Bricks Tiles, &c
Bartlett G.	... ...	Cement and Plaster ornaments.
Beale, Montague, and Co.	..	Gas and Hydraulic Works
Blashfield, J. M.	... ...	Terra Cotta and Architectural Pottery.
Boote, T. and R.	... ...	Encaustic and other Tiles.
Bovey, J.	... ...	Varieties of Devonshire Marbles.
Boyd D. O.	... ...	Patent System of Ventilation.
Braby, F., and Co.	... ...	Zinc Roofing, Corrugated Galvanised Iron and Mouldings.
Broomhall Tile Company	...	Patent Roofing Tiles, Damp-proof Course, Concrete Walls
BUILDING NEWS	... ...	Architectural Journal.
Bullivant T.	... ...	Patent Airtight Noiseless Sliding Sash.
Barnett, Sir W., and Co.	...	Preserving Process for Timb r, &c.
Burt and Potts	... ...	Wrought-iron Watertight Casements.
Chatwood and Co.	... ...	Patent Safes and Locks.
Coalbrookdale Company	...	Ridge and Roofing Tiles, Crestings.
Cooper, J. K.	... ...	Roofing Tiles, Ridge Crestings.
Copeland, W. T. and Sons	..	Porcelain and Stoneware Slabs and Tiles.
Cornell, J.	... ...	Art Metal Works
Coulton, J. L.	... ...	Stained Glass Works and Decorations.
Curtiss, W.	... ...	General Building Works
Ceramic Art Union	... ...	Ceramic Statuary, Vases, &c.
Davies, C. H., and Co.	... ...	Genuine Solid Parquet Floors.
Doulton and Co.	... ...	Terra Cotta Panelling.
Engert and Rolfe	... ...	Asphalted Roofing Felt.
Farnworth, J. H.	... .	Patent Self lifting and Self-fastening Sash.
Fox, Robert	.. ..	Patent Fastenings, Zinc Roofs, Sashes, &c.
Gane, C., and Co.	... ...	Green Roofing Slates, Gane's Eureka Tint.
Gibbons and White	... ...	Patent Mortise Furniture, Iron Casements.
Glover G., and Co.	... ...	Improved Dry Gas Meters.
Godwin, W.	... ...	Encaustic Tiles, Pessulated Pavements.
Hall, M.	... ...	Ornamental Lead Work.
Hall, W.	... ...	Oxide of Iron Paint.
Hart, J., and Son	... .	Art Metal Works and Brasses.
Haward, J.	... ...	Wall Decorations.
Hogg, W. S.	... ...	Fireproof Doors and Columns.

NAMES OF EXHIBITORS.	(SEASON 1868.)	WORKS REPRESENTED.
Hopton Wood Stone Company		Fossil and other Marbles.
Johnson, G.	... ...	Patent Building Hoists.
Jones J., and Sons	... ...	Hot Water Apparatus, Boilers &c.
Lea, W. and J.	... ...	Patent Double carton Mortise Bolts and Locks.
Lethereu and Ruddle	... ..	Art Metal Works
Lizard Serpentine Company	..	Cornish Serpentine Marble.
Lloyd and Summerfield	.. ...	Crystal Sash Bar and Aquariums.
Lowther and Co.	... .	Patent Sun Blind, "Helio-Scene."
Macnaught, Robertson and Co.		Rolled Iron Girders and Joists.
Malkin and Co.	... ...	Encaustic Tiles and Mosaics.
Matthews, E.	... ...	Monumental Brasses.
Melwel and Son	... ...	Chiphum Down Building Stone.
Merryweather and Sons	...	Fire Engines, Hydrants, Fire Apparatus.
Minton and Co.	... ...	Encaustic and other Tiles and Mosaics.
Morris and Field	... ...	Sanitary Appliances Baths, Lavatories, &c.
Moseley and Hooker	... ...	Electric Bells and other Apparatus.
Moule	... ...	The Patent Earth Closets
Norris and Son	... ...	Moulded Bricks, Ridge Tiles, &c.
North Devon Pottery Company		Stoneware Closet and Apparatus.
Parnall strong	... ...	Patented Cellular Construction Hexagon Hollow Tubes
Potter and Son	... ...	General Building Works.
Ridgway and Bellerophe	...	Encaustic and other Tiles.
Rosher, F. and G.	... ...	Bricks Tiles, Portland Cement.
Sax, J.	... ...	Electric Bells and Indicators.
Scammell and Co.	... .	Door Furniture, Finger Plates.
Sidebotham, Banks, and Co.	..	Patent School Desks and Seats.
Smith, A. and Co.	... ...	Patent Double action Door Springs.
Smith and Turner	... ...	Patent Door Springs.
Standing and Marten	... ...	"Creeke's" Patent Capped Drain Pipes.
Tingey, W., and Son	... ...	Portland Cement.
Tuddenham and Co.	... ...	Patent Improved Twisted Iron.
Tyler, J. W., and Co.	... ...	Zinc Roofs Dormers, Mouldings, &c.
Walford and Donkin	... ...	Fret Carved Chairs.
Warren, G.	... ...	Seaghely for Architectural Purposes.
Water Purifying Company	...	Patent Syphon Cistern Filters.
Watson, Charles	... .	Double Current Syphon Ventilators.
Westminster Gas Meter Co.	...	Improved Registering Gas Meters.
Wheeler Brothers	... .	Moulded and Pressed Bricks.
Whieldon, Lesky, and Lucas		Spherical Hinges, Gate and Door Fittings.

This List will be rapidly added to, and it is believed that the Museum of Building Appliances is capable of almost indefinite extension. Exhibitors are urged to record the fullest information, and no trouble will be spared to procure for architects, *gratuitously*, any further information which may not already be recorded upon the books of the Museum. Architects and their clients are solicited to choose from the Specimen Works exhibited, and orders will be received for transmission to the exhibitors if desired. All applications to be made to THE CURATOR.

THE MUSEUM OF BUILDING APPLIANCES,
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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 17, 1868.

THE NEW FOREIGN OFFICE.

THIS building, as is generally known, was handed over to the Government Department of Works on the 17th of June. It is to be regretted that no opportunity has hitherto been offered the public for viewing the interior and assuring themselves that the whistle for which they have paid is not dear at the money. It must be borne in mind that the Foreign Office is something more than a public office. It is the place where Her Majesty's principal Secretary of State for Foreign Affairs holds his official receptions, where councils are held, treaties made, and where the great ones of all nations will at times assemble. In what may be termed the State apartments of such a building no amount of magnificence is out of place and no expense should be spared. With the exterior of the building the public have for some time been familiar; it is our present object to give a description of the decoration of the interior. Entering from Downing-street through gates of most elegant design, the visitor finds himself in what Dr. Johnson was pleased to call "outward rooms" devoted to the hall porter and "posts with packets." Exit thence is made by ascending a short flight of very badly lighted steps, and the grand staircase hall, ablaze with light and colour, is reached. Here the decoration of the building may be said to commence. In describing this building, or rather this portion of the huge structure which, when complete, will embrace the Home, Foreign, Colonial, and Indian departments, it may be as well to state that it surrounds a quadrangle at the north-western corner of the main block. The coloured decoration is confined to the principal or State apartments, but an air of solidity and truly national character pervades every portion of the structure. The State apartments occupy two sides of the quadrangle, the staircase occupies the third, and the corridor of communication the fourth. We are now in the staircase hall on the ground floor. This is beyond doubt the most imposing feature in the building. A noble staircase, branching right and left, panelled with the choicest marbles, well lighted, and rich in all the adjuncts of colour, can, for scenic effect, be with difficulty matched. The marbles which, without exception, are British, are splendid specimens, ranging from black to dove-colour. The black Derbyshire is used in the form of a string decorated with a Grecian honeysuckle pattern in gold. The balusters are of alabaster, and the rail of dove-coloured marble, the effect being, with one exception, harmonious. There are two columns of polished red granite supporting the corridor above; these ruin the effect. Polished red granite is, at the best of times, a risky element of colour, and mixed up with marble is disastrous. The architect, Mr. Gilbert Scott, seems to have realised the fact that it is impossible to fall over a staircase on the side next the wall, and therefore provided a balustrade on the outer side only. It may be remembered that the staircase of Dorchester House, costly as it was, is simply ridiculous from having a balustrade on each hand—for symmetry forsooth! Ascending these stairs a noble corridor is reached, communicating on the one hand with the rooms of the principal secretary and private secretaries, and on the other leading directly into the principal council chamber, or conference room as it is named. From this corridor, or from any part of the staircase, a good view is obtained of the ceiling of the staircase hall. This ceiling is vaulted and domed, the cupola being ornamented with female figures draped in white on a gold ground, and representing various nations. Signs of the zodiac, inscriptions, heraldic devices, &c., are introduced, the general effect of which—and the remark applies to the whole of the coloured decoration throughout the building—may be described by the word "delicate." It may, perhaps, be questioned whether a little more colour might not have been introduced with advantage. There is a trifle too much gilding, and some may object to the *gala* air which pervades the decoration, but of the taste displayed there can be no question. If a building is to be devoted to two purposes, business and pleasure, things at all times hard to reconcile, it is impossible to choose a line of decoration at once grave and jocund. Where the conference room does duty for a ball-room, the cabinet for a banquetting hall, and the smaller conference room for a drawing-room, the man must be indeed gifted who can hit upon a style of decoration suited to such diverse conditions. The attempt has, however, been made, and the result is as satisfactory as could be expected. Passing along the corridor, with its splendid columns of Devonshire marble, with gilded capitals and bases, we reach the apartment of the principal secretary. Sage green and gold are the colours used on the walls, with a black bordering. The ceiling is coffered in octagons, pale green and gold. The effect is good, light without being gay. Farther on are the rooms of the private secretaries, and at the end of the corridor the cabinet is reached. This is a noble room, used also as a dining-room. The walls are of an amber colour, and the ceiling is tinted in white and blue. In our opinion, there is an excess of white and blue, and we would willingly have seen a little red or even olive green. Opening into this room is the smaller conference room, which does duty as a drawing-room, and here the efforts of the artists have been most successful. The walls are of a sage green, relieved with delicate devices in gold, and the ceiling is decorated with gold, red, and green. From this room the principal conference-room is approached, a noble apartment, 66ft. in length, 33ft. in breadth, and 45ft. in height. The ceiling is wagon-headed, coloured turquoise blue, powdered with stars, and decorated with medallions. The walls are of a well-chosen salmon colour, decorated with exquisite Grecian devices in Indian red and gold. For a ball-room the decoration is appropriate, though for a council chamber the gilding is excessive, and the use of Corinthian capitals or *quasi* capitals as corbels is to the last degree unwarrantable. The frieze is somewhat coarse, having a gilt running ornament on a red ground. The friezes throughout the building are very similar, the ornament being the unmeaning Roman pattern which the late Mr. Pugin termed "in and out Sheffield eternal." There is so much that is excellent in the general decoration that it is to be regretted a single fault should be found in it. The dark colours in the dados are correct, the blues, whites, and gold in the ceilings are unobjectionable, but it cannot be maintained that dark red—Indian red, in short—in mass is fit colour for a broad continuous band such as a frieze, more especially when the wall lacks strong colour to lead up to it. Of the general devices of the coloured decoration it is impossible to speak too highly. Designed in the Grecian spirit by earnest students of the decorative art of all nations the ornamentation of the Foreign Office will long be pointed to as an example of the state of the art in England in the middle of the present century. That it is perfect, or that it will please all, would be saying more than is our wont; but that it will always give pleasure to the cultivated mind and educated eye we are certain. On quitting the grand conference room we again enter a corridor having made a complete circuit of the quadrangle, and, descending the staircase find ourselves passing through the dark lobby after a visit to the MS. library, and so into the courtyard or into Downing-street, as pleases us. In all criticism on the coloured decoration of this building it must be borne in mind that everything is designed for the night effect, when artificial light will be used. It is therefore impossible to do complete justice without seeing the rooms under those conditions. If they have as good an appearance by night as they have by day there is little with which the most captious could find fault. The mantelpieces are for the most part ancient, having at one time belonged to the old Palace of Whitehall. They are of great beauty, and harmonise well with the architecture and decorations. The metal-work, such as grates, fenders, sconces, and chandeliers, are of very elegant design. In these rooms a peculiarity will be observed. Owing to the necessity for fireproof construction iron girders have been freely used, and in all cases they form a visible portion of the ceiling. A girder of wrought iron is at no time an architectural object. In the present instance they have been rendered as little offensive to the sight as possible. Coloured, gilded, plated with majolica ornament of good design and well-chosen colour, the wrought-iron girder asserts itself in an unmistakable manner. There is no doubt that it is a thing for ever, but it is never a thing of beauty. It has hitherto defied treatment, and will continue to do so as long as we build our walls perpendicular and lay our floors horizontal. It would seem that all the resources of art have been lavished on these girders, and they are really pretty, but the building is not pretty. There are few structures above the pretension of a marquee at an archery meeting to which the application of the term "pretty" would be complimentary. The Foreign Office, inside or out, may be grand and imposing, or petty and weak, but it cannot descend to the depth of prettiness. The decorations are by Messrs. Clayton and Bell; the metal-work by Mr. Skidmore; the majolica ware by Minton.

ON THE SESSIONAL PAPERS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS—1867-8.

THOSE of our readers who are not members of the Royal Institute of British Architects are probably hardly aware that the papers read at the ordinary general meetings throughout the session are not only issued with commendable despatch in the form of a pamphlet so as to be in the hands of all the members within a few days after they have been read, but that, collected in the shape of a goodly volume at the close of the session, they are offered to the public as well at a moderate price. These papers are often profusely illustrated, and during the past year even more liberally than on former occasions, a boon which must be particularly appreciated by those members who reside in the provinces. Such a description, for instance, as that given by Mr. W. B. Scott, of the mural decorations executed by him at Wallington, would have been simply unintelligible to those who were prevented attending when he exhibited the paintings themselves had it not been for the complete manner in which they are rendered in the illustrations. Thus a general section of the hall for which they were designed is given, as well as the whole of the eighteen spandrels representing the old Border ballad of Chevy Chase. With regard to these there may fairly be difference of opinion as to whether they are sufficiently architectural in their character, and we have already criticised them from that point of view; but with regard to the completeness of the manner in which the scheme and work of the artist have been set forth in this volume there can be no question. The illustrations are absolutely his own handiwork, being translated by a new process invented by Mr. C. Hancock, by means of which they are reduced by photo-

graphy on to copper from pen and ink drawings. The process, like all new ones, is probably capable of great improvement. At present greater care seems to be requisite on the part of the printer than is needed in the case of woodcuts, together with some experience on the part of the artist, but it may be stated with certainty that the expense of any other method hitherto employed would have precluded the appearance of these illustrations at all.

This series of papers is fitly commenced by a memoir of the late Charles Fowler, one of the founders of the Institute, who had died during the recess. This is from the able and prolific pen of his comrade, Professor Donaldson. It is written in an affectionate and apologetic spirit, for the honesty of the biographer forbade his claiming for his old friend any very high niche in the Temple of Fame. Fate had been somewhat unpropitious to him, for his most important work, Hungerford Market, has been but lately swept away; that of Covent Garden, however, and some other similar buildings of his remain, of which the most that can be said is that they are simple, practical, and inoffensive. Lithographic views of the interior of Hungerford Market, and of the exterior of that at Exeter, accompany this paper, and will help to preserve the memory of a good if not of a great man.

With the next paper we confess to being disappointed. It is that by Professor D. T. Ansted, on "The Relation of Geology with Architecture," a somewhat slight handling of a grave subject. The origin of constructive materials, somewhat to the astonishment of the Hon. Sec. for Foreign Correspondence, is laid down as having been almost universally from deposition in water. Their several varieties, such as limestones, sandstones, granites, marbles, and slates, are rapidly sketched, and those in general use are referred to in their proper classification, and the method of their formation, according to the latest theories, is pointed out. The process of decay in weathering is explained, and some nostrums for its prevention are noticed, and cements are spoken of as being within the province of architectural geology. The Professor concludes with the assumption that architects, as using such substances on a large scale, desire to learn as much as possible of their history and nature to enable them to look for them in the right place, to use them in the right way, and to manipulate them properly and economically. The assumption is perfectly correct, but hardly needed so long a preamble to prove it. Architects are well aware of the importance of the subjects of its manifold branches, as was shown by many pertinent questions put by several members in the course of the discussion; such as, "Which are the stones that may best be relied upon to resist the atmosphere of London?" "Which have the strongest fire-resisting qualities?" "What green and grey slates can be relied upon?" These and other questions elicited some valuable replies from Professor Ansted, but as far as it has yet been carried by this paper and the discussion thereon, it has been but opened, and needs far more minute and careful consideration.

The very high importance which should be attached to attempts to introduce a better style of mural decoration is quite sufficient excuse for the opportunity afforded to Mr. W. B. Scott by the Institute, to explain those he has executed at the mansion of Sir Walter Trevelyan, at Wallington, and those at Pentill Castle, in Ayrshire. But with very high merit as paintings, they are unquestionably in error as mural decorations. They ignore the architectural forms to which they should be subservient; they turn solid spandrels into aerial spaces of mist, sunshine, and shade; their perspective sets the flatness of the wall in defiance, and the composition, ingenious as it is, is misapplied. Mr. Scott has lately had the opportunity of seeing some of these paintings placed in the same gallery with the beautiful drawings for the decoration of a church, by Mons. Lameire, and we trust that he has learnt by the contrast the principles which ought to be respected in such matters, not but that Mons. Lameire himself might carry them a little further than he has done, and give up the seductions of shading his mantles. It is strange that we should have to be propounding as novel truths what every old Byzantine or mediæval painter acknowledged by intuition; and if our own decorators would but study the old screens in Norfolk, we should be spared having thus to criticise their works.

Mr. Seddon, taking as his text the photographs of the Architectural Photographic Society for the year 1867, describes the difficulties encountered in obtaining them after the selection of the route—itself no easy matter, it would appear, from a racy letter on the subject, by Mr. Aitcheson, which is quoted in the paper. In spite of difficulties, however, some fine photographs were secured, such as the exterior and interior of Limburg Cathedral, which we have since engraved in this journal. Some short notes upon each building visited are accompanied by plans and sketches, which greatly aid the reader in grasping the necessary technicalities in such descriptions. The country thus explored is that of the Lower Rhine, the Lahn, and the Mosselle; but in a later paper, by Mr. H. W. Brewer, ably illustrated by sketches by that artist, the subject is taken up, and continued into Central and Southern Germany—particularly to the cities of Würzburg, Bamberg, and Ratisbon, and their neighbouring towns and villages—in a manner which, if we mistake not, will lead many a student to follow in the route suggested, full, as it must be, from his description, of objects of art, and rich in natural beauties.

We are led still further eastward in reading the paper by Mr. Edward l'Anson "On the Kremlin of Moscow," a region less richly endowed with art or architecture, but which boasts the greater interest of being comparatively unknown. We suspect that a more intimate acquaintance would leave it rather destitute of charms to the architect, and the rather naively confessed inability of the author to describe the style of its buildings would lead us to think that they hardly deserve any such classification. Still the multiplicity of towers and domes, and pinnacles, like half a dozen bluebottles with a bodkin run through them, glistening in green and gold, is a sight not sufficiently common to be contemplated without interest by the most rigid purist. The rich iconostasis which is the feature of all the interior of the churches must be exceedingly suggestive, although all the gold and jewels which excite our marvel in the description must fail to render it a work of art; and we read of these with much the same feeling as that with which we listen to the inventory of the vergers who describe the cornelians and opals, with an eruption of which the reredoses of our own cathedrals and churches have of late been so sorely afflicted.

In the description of the "Proposed School of Art at Bombay," by Mr. W. Burges, we have what we are most thankful for as an instalment of what should be the principal feature in the transactions of the Institute; we mean notices of the works of the members. This one is the more interesting as, having been designed for a distant country, we are never likely to see the structure itself, if it should be erected, which now seems to be doubtful. The requirements of the building were peculiar, and to meet them very great ingenuity was called for. This demand was well responded to, and every provision seems to have been made to exclude the heat of the climate, and to admit the air freely. The plan is simple and well-arranged, in the shape of the letter E, having projecting wings and a staircase tower, which is made the feature of the design in the centre; between them there are open corridors on each side of the building, and from the back projects from the centre a low building, leading to what Mr. Burges calls "a circular domed building, somewhat in the shape of a mediæval kitchen." We should say it was very much so; in fact, just as if it had walked out of the pages of M. Viollet-le-Duc.

A very well lithographed plate, by Messrs. Kell, shows a view of this back of the building, which seems strangely selected in place of the front, as if for the purpose of exhibiting the feature we have just referred to. For ourselves we are free to confess that, however archæologically correct this may be, we think it exceedingly ugly, and we believe that such kitchens in mediæval monasteries were not thrust so prominently forward. Such a one as that at Glastonbury or that at Durham may have been, but then they were buildings worth seeing. Such an example as this, like a beehive stuck all over with pipes, we feel pretty sure would have been kept well out of sight. Other points, against which we cannot but protest, are the manner in which this excrescence is attached to the main building, the squat proportions of the principal windows, and the manner the small circular turrets at the angles are thrust through the roof without springing properly above them. With these abatements the breadth and simplicity of the building is commendable, and it is with much regret that we learn that there is a probability of the work being put into the hands of military engineers, and of the consequent loss or mutilation of this original and striking composition. We expect they must have been frightened by the tower, which not being seen except in section in the illustration, is described by the author as designed upon the model of the celebrated specimen in the Château of Blois, which presents the same system of external balconies. Above the third storey it developes into a tower, and finishes with a dome, for which there is ample authority in the churches of Perigeux, Angoulême, &c. A short communication we need only notice, one from the President "On the Antiquities of Fréjus, in the South of France," and on the great roof over St. Pancras station, Midland Railway terminus, now in course of erection by Professor Donaldson, and we must postpone till our next number any notice of the remainder of the more important papers read during the session.

THE PLASTERERS' COMPANY'S PRIZES.

LAST week we called attention to the prizes offered by the Plasterers' Company, and gave the names of the successful competitors. Since then we have had an opportunity of seeing the designs at South Kensington. The competition is open to all students in the provincial or metropolitan schools of art, but the first and second prize in either case cannot both be taken by students of the central school at South Kensington. Altogether not more than a dozen models and sixteen designs have been submitted. Of the merits of the models of friezes it is impossible to judge, as many of them are placed horizontally on a table, some upright on a screen, all below the level of the eye, and in such a position that a spectator cannot get further from them than 4ft. Under these circumstances criticism is of very little value. The first prize has been awarded to A. Gibbons, a South Kensington pupil. It seems to us to possess no marked superiority over two or three others. The second prize falls to G. Japp, aged twenty-three, a professed modeller. This work is very cleanly modelled. The design is full of birds and little Cupids, eight or nine inches in height, and is suited for a wooden cabinet, or even a bronze panel. It is no more fit for a frieze than for a fender. It was absurd to give a prize for this work, as it must discourage those who stuck to the text and tried to model a frieze. It is excellently modelled, but it has an unpardonable fault for a continuous design. It will

not *repeat* satisfactorily. A model by J. Brooke struck us as vigorous and repeatable, and there is a clever piece of modelling, by G. Bradbury, aged nineteen, of Penzance. Another by G. Morgan, a South Kensington student, though not particularly novel, is good. Of the sixteen designs for centre pieces few possess any merit. W. Mackaness, South Kensington student, takes the first, and John M. Pinn, architect, the second prize. The design by John Brooke is, in our opinion, better than either, though of such a different character that it is difficult to institute a comparison. In the distribution of these and all other prizes the South Kensington authorities certainly take care that those of their own house shall suffer no wrong. The wisdom of fostering the head establishment at the expense of the schools throughout the country is at least questionable. To the works submitted by the local schools for national medals we could give but a passing glance. Next week we hope to notice them fully.

PROPOSED RAILWAY TUNNEL BETWEEN SCOTLAND AND IRELAND.*

SUBMARINE tunnelling bids fair to become one of the engineering questions of the day. It is about to be re-tried on the Thames, on a limited scale, by Mr. Peter Barlow, and on principles that seem almost to guarantee success. The various schemes for forming a tunnel beneath the English Channel are by no means despaired of by their originators, and now Messrs. Macassey and Scott come forward with a plan for connecting Ireland and Scotland by a tunnel extending from Glenstrone, in the Mull of Cantyre, to Cushendun, on the north-east coast of the county of Antrim, a distance of 14⅜ miles, to be connected at each end with the principal railway systems in either country. Their reasons for the selection of this route are that it is the shortest and that the bed of the channel in that part is peculiarly favourable for tunnelling operations, consisting as it does of mica shale with a comparative absence of running sand. They propose to construct the tunnel of a single line only, with an extreme diameter of 19ft., a depth of 21ft., and the clear width at level of rails 15ft. The invert is to be of the usual form, but with a deeper curve and of greater strength, and filled with ballast to the level of the sleepers, so as to deaden the vibration as much as possible. The side walls will vary in thickness, a maximum of 7ft. being proposed through the more dangerous ground, and 4ft. for the crown. The material to be used would be to a large extent sandstone, which abounds on the Irish side. For purposes of ventilation it is proposed to construct horizontal air drifts 2ft. 9in. in diameter in the sides, and similar drifts 2ft. in diameter in the crown of the tunnel, with openings in the centre at intervals of 50ft. Connected with these drifts would be air pipes attached to a hydraulic engine at the Antrim end, the power of which would be applied to exhausting the air in the drifts, and, by means of the openings, also, that in the tunnel. This rarefaction at the Irish end would, it is expected, produce a draught through from the Scotch side which could be modified to any extent. Three large ventilating shafts are proposed of the same sectional area as the tunnel, two at the Irish end and the other on the Scotch side, also a number of smaller shafts in the approaches to the tunnel. The cost of the work is estimated at £4,224,490, including the cost of connecting the rails with the nearest adjacent Scotch and Irish lines, and six years is named as a period within which it might be completed. A series of calculations have been prepared by the projectors to prove the probability of a return of at least 5 per cent. on the capital expended. The scheme is a bold one, but all the details have been carefully worked out, and present a possibility of success. The route itself seems to us the principal objection. It may be that it offers the least obstacle to the execution of the project; but who is going to travel by it when it is finished? Very little, if any, English traffic could be counted upon; as for mails and merchandise time would be lost by its adoption, and we think most passengers would prefer a short sea voyage to a railway journey to the south-west of Scotland, and then southward from the north of Ireland. It certainly might lead to the development of much mineral wealth on the Scottish and Irish coasts, but till that come to pass it must principally depend on Scotch and Irish traffic. We regard the project as Utopian. Supposing the engineering difficulties, which are enormous, to be conquerable, we don't see how the enterprise could pay. Mr. James Chambers's idea of making a tunnel under the sea between France and England has far more fascination about it than that of Messrs. Macassey and Scott, and there is scarcely a distant probability of Mr. Chambers's idea being realised.

* Report on proposed railway tunnel between Scotland and Ireland, by L. LIVINGSTON MACASSEY, C.E., and WILLIAM SCOTT, C.E.

A NEW ACADEMY.

IN the endeavour to help on a new and better system of art action and practice than that now in vogue, so powerfully supported and so universal, it is almost impossible to avoid noticing shortly, first, one or two principles guiding such system of art action, and the art societies founding themselves on it. No one will of course deny that the Royal Academy of Arts has always held, and still continues to hold, the very first place as an art influence; it would seem to be the last court of appeal in matters artistic, its annual exhibition the greatest of existing art results, and its schools models of artistic instruction and educational skill. So much is there to be said in its favour indeed, and so comprehensive is it, that we need to notice no other society, for all others have to a certain extent taken their tone as far as possible from this central art institution. No one ought to feel any prejudice against the Royal Academy, for has it not in its day done work when there was no other institution to do it or even attempt it? Those who belong to it think it well nigh perfect, and its late president, Sir C. Eastlake, is reported to have said that no one council meeting of the Royal Academy ever took place without its being taken into consideration how best to improve and perfect its mode of art action, its exhibition, and its schools. More than this cannot be said.

But let us consider for a moment what it is that this great and leading art institution of the time and country really does. First, the Academy as a body—and may it not be said individually?—has laid it down as a principle from which there can be no departing, that there are and can be but forty artists capable of finished high art work out of thirty millions of people—two or three architects, two or three sculptors, one or two engravers, and thirty painters. Of the vague term "high art" no definition has ever been given by the Academy. If there be one thing more than any other which distinguishes the present age and generation from the past, it surely is that the wall which then so strongly fenced round each nation and trade has been broken down. Protection has given way to Free Trade, and little perhaps do they think who have been so instrumental in bringing about this change that the last stronghold of that protection is yet to be sought and found in art! But this is the foundational idea of the Royal Academy.

Again, if the idea of the mere accidental figure of forty, forming the boundary not to be passed, be a matter, as it must be, of wonder, what shall be said of the fact that the mere *medium* through and by which colours are laid on canvas and paper is another wall of separation between those in and those out of this Academy. Painters in oil may be academicians, but painters in water may not be academicians! Yet, strange to say, the greatest works in the world by the hands of painters are in water colour—Raphael's cartoons, and the whole of M. Angelo's Sistine ceiling, together with the very curious circumstance that M. Angelo himself despised oil painting; yet can no water colour painter *as such* find entrance into the Academy. Indeed, he cannot even exhibit except as colourist of an architectural perspective, or in some other accidental and exceptional manner. Strange inconsistencies! but serving to show into what a state of artificial confusion art is at last got.

There are so many other principles of art policy appertaining to the Royal Academy and its management that I hardly know which to select, or how many; but I must content myself for the present, and for the main purpose of this note, with saying in the most distinct way, and after very considerable thought about it, that if another and a new art academy, on a national scale, and for the use of all gifted naturally with artistic power, ever comes to be founded, it will and must be mainly by the *reversal* of all those principles of art action on which the present central art institution of this country and time has been built and acts. This is saying a very great deal, but it may be proved. Let us look at one of them by way of commencement.

Any ordinary person, unprejudiced, and of common capacity, and without troubling himself about art mysteries, on being asked what he thought of landscape painting and landscape painters, would doubtless reply—that landscape painting was a very good thing, and quite as good in its way as historical painting, or portrait, or any other, and that quite as much capacity and natural talent and acquired knowledge must be needed for it as for any other, and that quite as long a training is necessary and must be gone through by the student of landscape as by the student of the antique, or for the purposes of historical painting, whatever that may imply. Certainly, and of course, says everybody. But, strange to say, it is all the reverse of this. Landscape painting is not *officially* recognised by the Academy; it is admitted on sufferance, and because it cannot be excluded. Landscape painting, as far as such an art *can* be taught, is altogether excluded from the Academy system of art teaching. It is quite impossible to imagine what would happen were anyone in authority to propose that some one student, with a natural liking and turn for it, should, by way of elementary commencement, copy and paint a *leaf* or a cluster of leaves. Such a revolution in Academy art could only be thought of in the very darkest times, and when every man had turned professed reformer. All political reformation and change is mere child's play, and quite innocent and harmless compared to it. It can serve one good we are quite sure, that of showing the state of art in this nineteenth century of the Christian era, and a century's space of Royal Academy existence. Leaves, flowers, trees, earth, and sky, are all equally unknown in the world of Academy life, and it is a little significant that on the spot to which the Academy is now banished there were noble trees on ground encompassed with brickwork, and the first thing, of course, done to make way for it was to cut them all down. We say a necessary but significant act.

To reform such an institution is impossible; another generation may see the end of it, but in the meantime it may be useful to try and awake attention to one means of art action on a new and untried but natural plan, viz.—that of encouraging the production and exhibition of drawings, paintings, and copies in material of the simplest natural forms, especially by the artists and workmen who now act as subordinates, not that such trial work is to be confined to such, for what could be more interesting than the presentment to the public by each individual artist of the results of his own mind and hand, and the

showing to the world how he saw the object before him, the same leaf or flower coming forth almost as a new creation from each artist, sculptor, and workman? All this has never yet been tried. No idea can now be formed of the interest and beauty to be found in a room filled with paintings of the simplest forms of vegetable life by the very highest as well as the humblest art powers the age can produce. We do not know, indeed, what the academicians can really accomplish—they do not know themselves—for there is no trial work, no condescending to elementary work and details, however difficult or elaborate or impossible of actual realisation. The future of art, as we think, must begin with this, to be followed by that larger decorative art visible to all. Art as it is is only for the few, fit only for dining and drawing rooms, but surely it is not too much to say that the great future must bestow it on the public and the many. But we must begin at the beginning, and that beginning must be with details and parts and simple forms. Imagination, we are told, is the soul of fine art, and serves to separate one man from another; but it would be found that two equally-gifted artists working at the same simple form, in the mere act of simple copying will differ from each other in the final result as much as if they had tried to imagine things entirely different—no two men being alike. In what way any one of our Academy artists could be induced to copy the simplest blossom and leaves the full size of life, and as seen against the pure sky, it will, of course, puzzle any conjuror to say. It may be an impossible feat, but surely it may be hoped with some confidence that the humbler rank of artists might be induced to contribute their labours to such an exhibition of art results by the artists themselves and as examples of personal artistic gifts and powers. It would help, too, to draw forth a "style"—one of the time and country, with nothing to hinder or complicate it, for the natural forms are always the same, nature never failing.

C. BRUCE ALLEN.

LINCOLN CATHEDRAL.*

NORMAN PERIOD.

FOR all speculation as to the character and extent of the first Norman cathedral erected at Lincoln by Remigius, the first Norman bishop, I must refer you to Mr. Poole's treatise. What is certain is that, with the exception of what remains of it at the west end, it has altogether disappeared. This fragment, however, is of the highest interest. It has been respected and preserved by all subsequent builders, and still forms an integral and very important portion of the west front. The outline of its simple and unadorned masonry is easily to be traced on the west elevation, and its massive proportions are as clearly visible on the plan. That we see in what is left the entire breadth of the west front of the original church of Remigius, commenced probably about 1076, there is no doubt whatever. How this design was terminated above, and on the north and south sides, is a matter of speculation. I think, however, that the solution of this problem is not so difficult a one as might at first sight be supposed. We have not time to enter upon it here to-day, but if I am correct in the supposition which I have formed, and which involves the existence originally of a single western tower, in place of the two western towers which actually exist, the opinion which Professor Willis and Mr. Poole appear to entertain that these towers were built either in restoration or in continuance of Bishop Remigius's design is incorrect. That these two towers, and other works to be noticed at the west end, were built after the second fire, which is recorded as having consumed the entire church in 1141, there is little or no doubt. They exhibit, up to the top of their third storey, in all their ornamental details, the characteristic features of this very date. They were flanked, on the north and south sides, with richly ornamented projecting gables, which still remain; and on their west side also with gables of probably similar design, which have been removed. But the weather moulding of these gables, still to be seen under the roof of the later work of the Lancet period, reveals to us the singular fact that the apex of both these gables, which corresponded with the centre of the two large circular side arches of the west front of Remigius, were not in the centres of the two towers, which latter were not, in fact, placed symmetrically with the earlier work of the west front. How these and other discrepancies of the second Norman design, which could not have been in harmony with that of the first, behind which it stood, were reconciled, we have no present means of knowing; but we may naturally conclude that they furnished the reasons which induced the gifted architect who masked these irregularities and combined the works of these different periods into one harmonious whole, to erect, towards the close of the Lancet period, the noble west front or screen, which still remains to us as it left his hands. Besides these two western towers, built at the very close of the Norman period, two other works of this date remain in the west front. The first is the circular arcade, immediately above the plain walling of Remigius' front on each side of the central arch. The second is the great western doorway of the nave, which exhibits, in the five richly ornamented orders of its circular archway, the latest features of the period to which it belongs.

TRANSITIONAL PERIOD.

Closely following the last-mentioned work, but of well-defined Transitional character, are the two other western doorways, those, namely, of the north and south aisles of the nave, that on the north side being of slightly earlier character than that of the south side; the limits of time within which all the three doorways were designed and built probably not exceeding ten years.

These two later doorways are amongst the most interesting and valuable remains of the entire structure. Although to be reckoned amongst the earliest works of the Transitional period, they contain not one of the characteristic features which distinguish the works of the Normans either in this country or their own; nor does their ornamentation resemble that of the works of any country of Europe of the same date. They prove to us, in fact, along with numerous other similar works in all parts of the kingdom, the existence in England at this time of a school of native artists, who were not only completely emancipated from those influences which had governed the designs of buildings for the previous eighty years of Norman rule in this country, but who were able to design and to carry out their works with an originality of thought, a fertility of invention, and a perfection of execution which most justly entitle them to our especial notice, as well as to separate classification.

Although they were, in reality, the earliest works of English design, properly so called, in the country, we are unable to call them "Early English" from the fact that this term has been applied to, and is generally received as indicating, the works of the subsequent or Lancet period. Neither, although belonging to that period in which the pointed arch was first used in this country, can we call them "First Pointed"—first, because that designation was also intended to apply to the works of the Lancet period; and, secondly, because in this really First Pointed period the whole of the arches of decoration are usually circular, as indeed are those of the doorways in question. Until, then, we are supplied with a better term, I shall continue to apply to them and to similar works that denominative expression which so aptly characterises the transitional nature of those intermediate works which were constructed during the prevalence of both forms of arch (used, as the latter were, simultaneously, but discriminately, in the same building), and which occupied, in point of time, the latter half of the twelfth century.

LANCET PERIOD.

We have no work in the kingdom of genuine Lancet character to which we can attribute an earlier date than the eastern transept and the choir of Lincoln Cathedral. We know, from undoubted documentary testimony, that they were commenced about the year 1190 by Bishop Hugh de Grenoble, and were on the point of completion at his death in the year 1200. The dignified simplicity of the whole of this work, and the vigorous boldness which marks the design of all its details, its simply clustered piers, the single vaulting shaft descending in their front in an unbroken line from the clerestory to the floor, their spreading capitals and projecting foliage, the bold sweep of their overhanging bands and circular bases, the deeply-moulded pier arches and vaulting ribs, and the tall single Lancet windows; above all, the largeness of treatment and the vigorous originality of conception with which the entire design has been conceived and executed, demand our highest admiration, and place this grand work clearly at the head, as well in point of time as of excellence, of the works of the Lancet period.

It is not to be wondered at that so noble an example should be rapidly followed by works designed in the same spirit. Within the next ten years several important buildings of similar character were begun; and even before the commencement of the thirteenth century this new fashion of building, the second characteristic type of English art in church architecture, had become firmly established in this country.

For those who desire to study the progress of style through the Lancet period, Lincoln Cathedral presents the amplest opportunities. We can trace the hand of the designer of Bishop Hugh's works, in continuation of that of the choir, along the east walls of the great transepts, as well in those of the east aisles as in the upper parts of the building; we can trace even the gradual slackening of the work, and its absolute cessation in the north and south walls of these transepts. Here a pause of many years must have occurred, probably whilst the crossing and central tower were rising, which, however, fell from insufficiency of some kind, *per insolentium artificia*, in the year 1239. Meanwhile Bishop Hugh, having been canonized, became the patron saint of Lincoln; the odour of sanctity attached to his memory attracted crowds of the faithful to the cathedral, and the contributions, which flowed in largely, permitted the rapid prosecution of the works, which, judging from internal evidence alone, must have been resumed about 1215, and carried out without intermission in the course of the next twenty years. These later works of the Lancet period comprise:—1. The central transept (west side). 2. Nave and aisles with north and south chapels. 3. West front, with north and south pinnacled turrets. 4. Chapter-house. 5. West porch of south transept. 6. The crossing and lower part of the central tower (rebuilt); and, 7, the two western doorways of the choir aisles. They were constructed probably in the order above given, and show, with the exception of the two last-named, but slight differences of style in their details.

With regard to the Chapter-house there exists a singular discrepancy between the internal evidence afforded by the character of its work and the external evidence of documentary history. We are told by Giraldus Cambrensis, on the authority of Wharton, that Bishop Hugh built the "Capitulum," a term which can only correctly be interpreted "chapter-house." Professor Willis, feeling convinced that the work was of later date, endeavoured to explain away the difficulty by arguing that the word "*capitulum*" meant, in this case, "*caput ecclesiæ*," the head, or east end of the church.

It is always unfortunate when, as is sometimes the case, antagonism arises between the internal evidence furnished by the building itself, and the external evidence of contemporaneous history. In the earlier days of archæological study the tendency was to discredit the former and to accept the latter; in these days the results of strict analytical investigation and comparison of the minor details of the buildings of the middle ages dispose us to place much more reliance upon this species of internal evidence than on even the most unequivocal assertions of ecclesiastical historians. The inductive reasoning based on the former appears to be safer than the possibly hearsay testimony of the latter.

Without, then, contending for, or, indeed, accepting, Professor Willis's interpretation of the word "*capitulum*," as used by Giraldus Cambrensis, I have no hesitation in asserting that the stonemasons who executed the work of the Chapter-house of Lincoln Cathedral did not live in Bishop Hugh's time, but 20 or 30 years later.*

* Lecture delivered to the Members of the Lincolnshire Diocesan Architectural Society at their Annual Meeting at Lincoln, on Wednesday, June 17, 1868. By EDMUND SHARPE, Esq., F.R.I.B.A.

* In a paper which was read at Lincoln by the Rev. J. Dymock, on "The Documentary History of Lincoln Cathedral," the day following that on which Mr. Sharpe's lecture was delivered, the difficulty above referred to was completely solved by the fact announced by Mr. Dymock, that, on reference to the original text of Giraldus Cambrensis, he had discovered that the passage in question had been erroneously transcribed and printed by Wharton, the real word in the MS. being plainly and legibly written, not "*capitulum*," but "*capitium*," which cannot otherwise be interpreted than as signifying the head or east end of the church.

The two latest of this second group of Lancet works, namely, the west porch of the south transept, or Galilee porch, as it is usually called, and the two doorways situated at the west end of the choir aisles, exhibit much greater elegance of treatment and delicacy of execution than the others. Of these two works, the former may be advantageously compared with a similar work, similarly named, at the west end of Ely Cathedral, which belongs to the earlier, as this porch does to the latest part of the Lancet period; whilst the exquisite carved work and capitals of the former correspond closely with those of the elegant work of contemporaneous date at the east end of the choir of the same cathedral, which was commenced by Bishop Northwold in 1235.

Before quitting the work of the Lancet period it may be well to notice an opinion which has prevailed, and which is due, I believe, to Professor Willis, who discovered that the name of Bishop Hugh's architect was Geoffrey de Noiers, to the effect that the design of the east transept and choir of Lincoln Cathedral is of French origin. The only feature, however, in this work which at all resembles French work of this date is the pier capital of the choir, which, with its double row of stiff foliage and four attendant shaft capitals, all attached to the same block, is not unlike those of Chartres and Goissons. But we have in the pier capitals of the presbytery of Chichester Cathedral, designed and constructed only a few years earlier, at the close of the Transitional period, the very idea in genuine English workmanship, of which these Lincoln capitals are the Lancet version, and to which, with their detached shafts, they bear a much stronger resemblance than to the capitals of any French cathedral with which I am acquainted. In all other respects in the general outline of the design, and in all its minor details of mouldings and carved work, there is no resemblance whatever between the work of Geoffrey de Noiers and that of French buildings of corresponding date.*

FASHION IN ARCHITECTURE.†

FASHION in criticism, as in art, has its day, and works its wrong. Goldsmith makes his connoisseur advise a neophyte, if he would be held in repute as a critic to praise always the works of Pietro Perrugino. A similar kind of advice, one would think, had formed a main part of the education for their pursuit of a large proportion of critics both professional and amateur, both in architecture and the sister arts. Tell one of these, while blindfold, that he stands before a church by this architect or a townhall by that, and he would dictate at once a proper critique for the publication he represents; but put the same man with his eyes open before the most meritorious work of an unknown artist and he will know equally well how to ignore all its beauties and exaggerate all its defects. This is a charming and sufficiently notorious phase of modern architectural fashion, happily not extending to the leading journals connected with architecture, but very apparent from time to time among the minor luminaries of the art press. Some years ago a periodical, devoted chiefly to ecclesiastical matters, despatched a critic, a clergyman, in fact, for the time without a cure, to descant for the benefit of its pages on the recent ecclesiastical erections in this part of the country. He visited Liverpool, enlarged on the barrenness of the town and neighbourhood in what concerned good church work, dwelt earnestly on the defects of all buildings by local architects, and revelled in admiration of the three or four which he was told were the works of some metropolitan magnates whom his editor delighted to honour.

His discrimination could scarcely have been very acute, for one of the most characteristic buildings of one of these very Titans in church design having been described to him by its sexton as the work of a local architect, he launched out freely in abuse of all that most marked it as its real author's work; he was duly informed through the press of his little mistake, but I do not remember that he acknowledged his obligation for its correction.

Let all beware how they hang their faith or their opinions in art on any information but that of their own eyes (supposing these sufficiently tutored to inform them correctly), for otherwise they will often have to retract them, and prove the rottenness of the staff on which they rested their belief.

An editor being handed a book for reviewing by a pet author, asked "had you not better, my dear sir, review it yourself?" Does this ever happen with respect to architectural works? If not, how is it that we find ourselves dropping from the sublime to the ridiculous, when sometimes induced by the glowing account given of some new building to go out of our way in expectation of gaining valuable ideas, or at least of gratifying our taste by dwelling for a time on what is described as so purely excellent.

I have been several times trapped thus, but am growing wary, as I have in most cases found that the buildings so rapturously lauded were simply examples of one or other of the prevailing "fashions" of the day, and in scarcely a single instance have I been in the least repaid for my time and trouble in making the visit.

It seems to me that a system must exist of crying up these passing fashions, well-recognised and mutually exercised by those who excel in them, since the same kind of eulogy is not, so far as I have seen, usually bestowed on any, even though much superior works, which do not step out of the recognised path of real architectural principles.

I remember to have heard it said that certain artists, anxious to place high prices on their works, made exchanges of their pictures with each other at the same nominal hundreds of guineas; and when it was related to a patron that such and such a distinguished brother brush had become possessed of the noted canvas at this high rate, he felt at once convinced that he could not be wrong in giving at least as much for its fellow.

Buildings cannot be exchanged quite in this style, but their praises may; and it would be better for our art, in respect of which, after all, I may be mistaken in imagining such a system, if authors as well as critics would abstain from excess in their descriptions of their praises, as most men of any experience and cultivation, either professionally or critically, really know pretty well the proper rank which a work is entitled to take, and know also pretty well how that rank should be stated.

Passing by this fashion of architectural criticism, a matter of no slight moment, however, to the interests of the art, I would notice a few other points in which system, and not principle, prevails to the disparagement, I think, of good art, and tending to foster what is in a great measure weak and spurious in design at least, and sometimes too in construction. One of these fashions is that of confining our study of architecture, and, as far as we can, our practice, to one style only, than which no course, I believe, has a more narrowing and damaging effect on an architect's powers of thought and design.

The custom exists, so far as I can see, much more generally among those who profess a decided preference for the Pointed styles than those whose tastes are more professedly Classical; but in either case injury is, I believe, suffered by the architect in his power of design. Preferences may and will exist, but exclusion should not; for all, as I have said, of these advanced styles of our art contain matter of immense value for the modern designer, and he who shuts his eyes to any deprives himself not only of a high source of intellectual pleasure, but of a part of that mine of pure precedent, the largest knowledge of which, as Sir Joshua Reynolds truly remarked in regard to painting, will ensure the largest powers of original design.

Do not fear the clashing of the claims of varied styles, and do not look for their combination. Many have, if we examine them to their sources, nearly a common root or stem, but all have diverged, and it is generally—may I not say always—somewhere about the middle point between their birth and culmination, if the latter has been reached, that we find them in their greatest purity of treatment and strength of individual character.

At these middle points of excellence we shall find that every style has elements of value to the designer in every other, and many an I many are the happy hints which may be derived unexpectedly and sometimes almost unconsciously from one style to enhance another. The architect cannot, if he have a general practice, afford to ignore any one of the styles recognised in the professional practice of the day, or if he do he is likely to find himself some day placed in the unpleasant and humiliating position of floundering in a design he cannot master, or obliged to find help where he should be giving instructions.

To disparage a style because not of this or that school is in a measure to bring our art into contempt, and too often marks the man who is conscious of his own incapacity in the path he decries; while, on the other hand, I feel certain that he who with natural fitness and thorough cultivation essays his powers in every pure style as occasion may require, will stand on as good a level of excellence at least as he who, by excluding all but one class from his knowledge, or at least his study, narrows in so far his perceptions, and is in danger of crippling his powers.

A fashion of rejecting local and excellent building materials for those of an exotic and perhaps not at all superior kind, is a practical affectation much to be discouraged, and it appears to be on the increase. As our population increases it will tend to exhaust the resources of certain districts, and restrict the proper measure of labour in others; while it is to be observed that it is to a great extent certain that the stone, clay, and other building materials existing in any district are those not only best suited for picturesque and artistic blending with its natural features and foliage, but often also the best adapted to withstand the local variations of climate.

The use of brick for the exterior of buildings of importance, such as churches, where good building stone, of moderate price and cost of labour, exists, and in cases where economy is not so rigidly inculcated as to make the use of brick peremptory, is, in my opinion, a mistake in art, since the higher effects of architectural design are capable of being much more fully developed with the better material; while brick, even of superior excellence, soon becomes dingy and unsightly under the influence of our damp-laden atmosphere and smoke-charged breezes.

High indeed should be the qualities in respect of fine proportion and pure form possessed by a building intended to hold its own in a garb of simple brick against all that may be raised around it with the superior advantages of good coloured and well wrought stone; and happy should the architect be who obtains a verdict of equality even for his work under the detractive effects of such material. The example of Bruges and other continental cities in which brick architecture prevails, on account of the lack of building stone, afford no sufficient precedent, in my opinion, for the adoption of this style in England. I have not yet heard of any such grand saving of cost as compensates for loss of style, and I should much regret it if this fashion, led by a few metropolitan architects, should ever become general.

The introduction of iron in constructive architecture is a feature of quite modern practice, and goes far in many cases to overcome difficulties which could scarcely otherwise be surmounted. Its visible use, suitably decorated, interiorly is evidently within the proper scope of true architectural design, and I have seen instances of its skilful adoption, and not least so in Liverpool, in external details. These latter, however, I am inclined to consider as not sound architecturally; for although by care in renewing paint and varnish the surface of such dressings may be preserved in great measure from decay or serious deterioration, the exposure of metal, in combination with stone and brickwork, to the open rays of the sun seems likely to constitute a cause of disruption in the work, since the expansion of the metal being greatly in excess of that of the stone or brick, must constantly change the dimensions of the former under varying temperatures.

I may be told that this difference is so slight as to be of no moment; but I dissent from this view, for it will be found that a wooden door hung on gudgeons and with iron bound angles will expand so much as to become completely fixed on a hot sunny day, while under ordinary temperatures it would be perfectly free—an example of large expansion which leads me to the conclusion that this fashion of introducing external ironwork in architecture has serious objections, and that it should be used only in such manner as will protect it from the direct rays of the sun, if the ill results of undue expansion are to be avoided.

As regards the decoration of our buildings at the present day, a system prevails far too commonly of leaving the carving of enrichments, capitals in both Pointed and Classic buildings, trusses, scrolls, &c., to the taste of the carver, giving, if anything at all, a mere slight sketch for his guidance. A school of clever architectural carvers has, it is true, grown up in the country, chiefly under the encouragement to their craft arising from the extended use of carved ornament in many

* To be continued

† Read before the Liverpool Architectural and Archæological Society by H. P. HORNER, architect. Continued from p. 466.

of the larger churches built or restored under our leading ecclesiastical architects. In many cases, no doubt, they have been supplied with amply sufficient details, but still they have for the greater part been taught only in one style, and that to a great extent not of our own country, but adapted from examples in France.

Much of the mediæval carving in France is no doubt very skilful, and some of it really beautiful, but I consider that its conventionalism is often carried to excess, and in so much decidedly inferior to the best stone carving to be found in our own large churches and cathedrals. At all events, much of what these skilful modern carvers produce is of this over-conventionalised kind, and also now very hackneyed, and it has become absolutely wearisome to fall again and again on the same forms and arrangements of ferns and mallows, some tolerably natural, but others quite the contrary, however well-executed; and in this respect, as well as others, I am quite at a loss to discover what advantage our late modern Gothic buildings are supposed to derive from the fashion of adopting French tracery and foliage to the exclusion of English, with many other quips and cranks of detail which render the French originals in so far inferior to contemporary English works, and tend to increase labour on our buildings without affording adequate effect. These carvers, left to themselves, will often produce in Classical buildings the most extraordinary combinations of incongruous styles of ornament—Greek anthemia, Italian scrolls, Gothic flowers and Elizabethan strap-work, mixing, but not blending, in most admired confusion.

The simplicity and consistency which meet in the best English Pointed work I do not see excelled, if indeed equalled, in that of any continental country, and I should think it much to be deplored if our native insular style were to be neglected or deserted, rich as it is in resources for endless varieties of effect, in favour of one by no means superior, and which grew up in itself complete, while foreign in many points to our own, and thus comparatively incongruous with our English tastes and habits of thought.

We have further the fashion of using Italian Gothic where surely our own in some of its varieties would be more fitting; and this, the least pure and interesting of all the forms of Pointed architecture, we find pressed into the service of secular design as a contrast to what is considered more properly the province of English and French Pointed. In neither one nor the other of the exotics do I recognise any real advantage whatever above our own, and there is a masculine, vigorous treatment in the latter, especially in the plainer and therefore most adaptable examples of its use, which I have seen nowhere in the published plates or photographs of foreign Gothic work, none of which, however, I have had any opportunity of personally inspecting.

In scale of height and in some flights of constructive power the continental cathedrals visibly exceed our own; in proportion, beauty, and completeness and elegance of composition ours, I think, as much exceed theirs, and I am not myself enamoured of those evidences of difficulty sought and met which are apt to disturb what should be the repose of artistic enjoyment by the constant thought, how dare they have ventured it? how could they have done it?

One other fashion, if it must be deemed so, demands notice, and it would be a happy day for architecture when it should die out. The debasement of any art in its practice to the level of a mere business carries with it, among other evils, the certainty that the real living distinctions between true and false art will, under such a lowering influence, be to a great extent lost sight of; and that this has, to a great extent in England, taken place, as regards architecture, during late years is undeniable. The fact, notwithstanding, remains sure, that to be really an artist a man must be naturally fitted for it by acuteness of apprehension with respect to proportion, grace, beauty, and this natural fitness must be fully cultivated to secure good results.

Nothing is much more common, however, than to find youths put into architectural training who have never evinced the least apprehension of what really belongs to art in that or any other walk, but who are brought into the profession merely perhaps because their social connections give promise of a field of practice, or that in a large family it is difficult to find varieties of calling or employment for all.

Under judicious teaching an intelligent pupil, though with little original leaning towards the pursuit, may gain much of what constitutes fitness for an architectural practice, but this is more often in the direction of construction than of design; and there can be no doubt, I think, that the cause of the great number of inartistic, vulgar, and exaggerated designs with which our land teems is to be found in the opportunities afforded by this kind of education and practice to men who are able to construct works, often of magnitude, but who have never possessed or acquired the taste needful to give grace and interest to what they or their patrons desire in an architectural shape.

Principles, not fashion, I would say, in conclusion of this hasty sketch, must be paramount with the designer and the critic, if good design and sound judgment are to prevail in our art; and fully believing that each and all of the phases of fashion I have touched upon are in greater or less degree inimical to this result, I venture to commend the matter to your consideration, while I ask you to forgive the sad insufficiency and rambling arrangement of this brief essay.

DESIGN FOR THE PROPOSED NATIONAL GALLERY.

IT will be remembered that when the competitive designs for the new National Gallery were exhibited to the public, we criticised them somewhat minutely, and concluded that neither design was worthy of the site or the purpose for which the new building was intended. After ample time for consideration the Government came to a similar conclusion, but at the same time they said the design of Mr. E. M. Barry most fully met the required conditions. And so the matter has slept, and we suppose would have slept eternally, had not the Law Courts' embroglio compelled the Government to try to please all parties. Mr. Street having been chosen architect of the new Law Courts, not exactly because his design was the best, but because he was thought to be the best architect for the purpose, the Government felt bound to do something for Mr. Barry. And it cannot be denied that Mr. Barry had a strong claim, as his plan for the Law Courts had been selected jointly with that of Mr. Street. Mr. Barry was, therefore, in obedience to the spirit of compromise, chosen as architect for the new National Gallery. We, therefore, select this week for illustration Mr. Barry's design, as submitted in competition last year. Having on a previous occasion expressed our opinion of this design, it is unnecessary for us to do so now. Under the circumstances, Mr. Barry, like Mr. Street, will no doubt feel justified in modifying his plan and his architecture, as his experience, assisted by criticism, may suggest.

MEMORIAL WINDOW AT GUILDHALL.

THIS window, presented to the Corporation of London by the operatives of the cotton manufacturing districts, was on Wednesday handed over to the corporation; in other words, it was inaugurated. The memorial indicates the gratitude felt by the Lancashire operatives for the fund subscribed in London during the cotton famine. The window, which fills the eastern end of the hall, is new only as respects the glass. The stonework is of the fifteenth century. That the glass is by Messrs. Clayton and Bell is a guarantee of its general excellence. It has the true appearance of fifteenth century work. There is plenty of light, plenty of red, enough blue, and abundance of lead, without which no window can look well; but there is not sufficient yellow and green in the composition, and the treatment of the City crest and the Lancastrian rose is unworthy of a Long Acre coach painter. Making every allowance for the gloom which for months covers the City, we are firm in our opinion that a little more colour is wanted, purple, olive, and even black. It must not be supposed that these colours do not find place in the window at present; what we would imply is, that they are insufficient in quantity. Taken as a whole, it is the best modern window of which we have any knowledge, and the difficulties surrounding design for painted glass can only be appreciated by those who have given much study to the subject. The window is divided into three sections, the central section being subdivided into five lights, and the sides into two each. The middle division is devoted to historical subjects connected with the City of London. The north side contains figures of Lancastrian worthies, and the south side men of mark of the City. The subject of the lower tier of the central portion of the window is illustrative of the rebuilding of the City by Alfred the Great, that of the upper tier being devoted to the subject of the grant of the charter to the City of London by William I. The two figures in the side division on the north side are full-length portraits of Sir Richard Whittington and Sir Thomas Gresham; those on the south side being of John of Gaunt, Duke of Lancaster, and Sir Thomas Stanley. In the tracery openings above these portraits are introduced, together with the Lancastrian rose and the City crest, the herald's bearings proper to each figure; while in the tracery openings of the main portion of the window are represented the shields of the twelve City companies. At the base of the window is an inscription illustrative of the origin and object of the window.

INTERIOR VIEW IN CHEVET CHURCH OF ST. QUENTIN.

THIS sketch, taken in the aisle of the apse, looks into one of the chapels, which were represented externally in a former illustration (see BUILDING NEWS, No. 701). The peculiarity of the arcade of three arches at the entrance to each of the chapels is likewise to be found at the church of St. Remi, at Rheims, and also cleverly managed in that of Notre Dame, Chalons-sur-Marne; in these cases the arches are not so extremely stilted as at St. Quentin, neither have they the windows over them which form a clerestory to the aisle of the apse in this example. The detail of this chevet is excellent, which we trust our illustration sufficiently shows.

WIMBORNE MINSTER, DORSET.

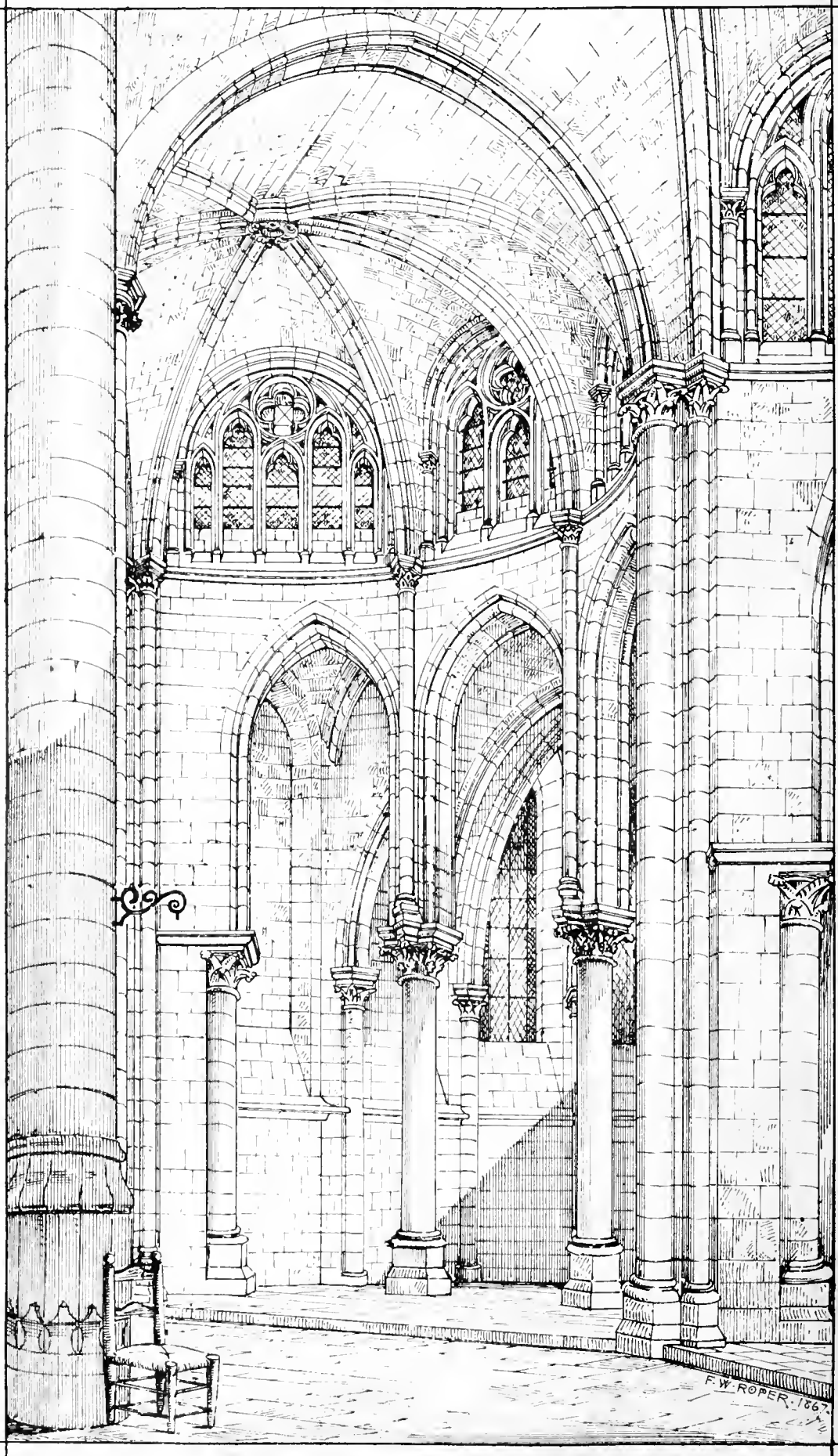
AN interesting paper on this minster was read by Mr. J. Medley Tulford, at the last quarterly meeting of the Exeter Diocesan Architectural Society. The paper was illustrated by several very clever drawings. The minster was founded, he said, A.D. 700, by Cuthberga, daughter of one and sister of another king of the west Saxons, who became the Abbess. The minster is dedicated to St. Cuthberga. A monumental brass, still existing in the church, records that Ethelred, elder brother of Alfred the Great, who was mortally wounded in a battle with the Danes, near Wimborne, was buried in the church. The nunnery was dissolved by the Danes, and Edward the Confessor afterwards converted the house into a collegiate church. The extinction of the college took place in 1547 (Edward VI.), and nearly all the manors round Wimborne, the advowson of the college church, the deanery, and all the prebends and all the chantries within it were given to Edward Duke of Somerset. Among other facts mentioned in the historical portion of the papers, it was stated that the churchwardens paid for the repairing of the copes, altars, chasubles, &c., after the Reformation, and that this was the only church in the country where the choral service of the English church had been continued with slight interruptions since the Reformation.

With reference to the statement of the burial of Ethelred, Mr. Grey said that it was generally believed, though his tomb was in the church, that he was buried in the market place. He also mentioned a curious fourteenth century painting, which formerly existed on the ceiling of the vestry, but which had now been covered with whitewash.

TECHNICAL EDUCATION.

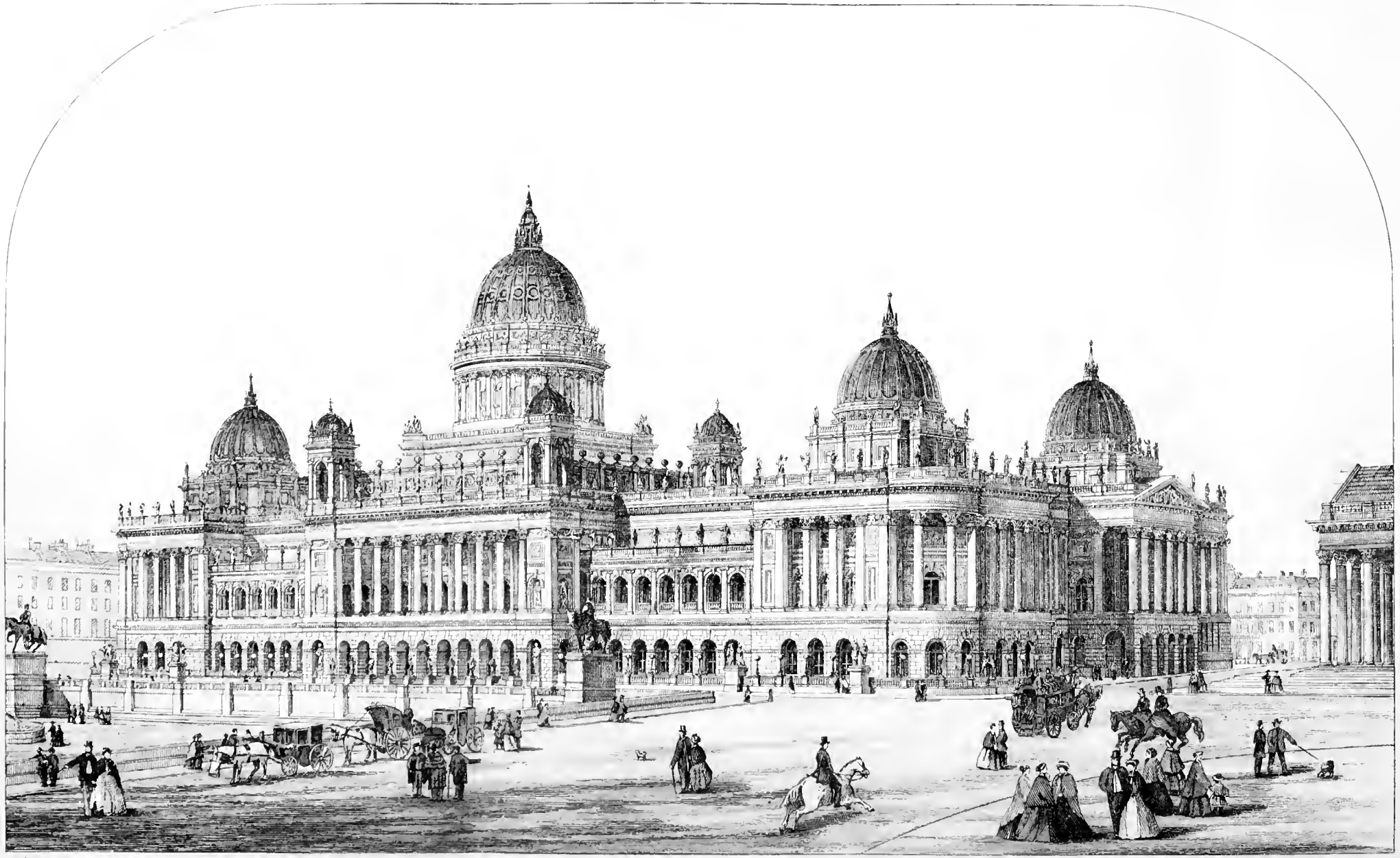
CLASSES have been formed for the purpose of giving instruction in practical geometry, and its application to building generally, in arithmetic and mensuration, in practical architecture and constructive detail, in the use of algebraic formulæ in the calculation of strength of materials, and in other matters concerning the science of carpentry and joinery. The terms are:—entrance fee 1s. and monthly payments 1s. 4d. (paid in advance,) the month being four weeks. The classes meet every Wednesday and Friday evening, at St. Gabriel's and St. Saviour's schools, Glasgow-terrace, Lupus-street, Pimlico, from 8 to 10 in the summer half year, and from 7.30 to 9.30 in the winter half year. The services of a most efficient and practical head master have been secured, and the students will from time to time be invited to engage in competitive prize essays, drawing, &c. Application for membership may be made any Wednesday or Friday evening, and any further information will be given by Robert Harvey, hon. sec., 21, Charlwood-street, Pimlico, S.W.

St QVENTIN



VIEW IN CHEVET

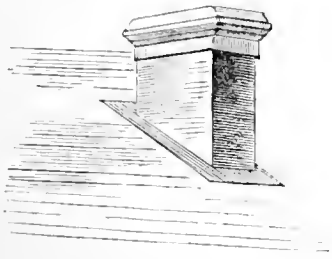
Printed by Whiteman & Bass



Design for the Proposed National Gallery, Trafalgar Square.—BY Mr E.M.BARRY, A.R.A.

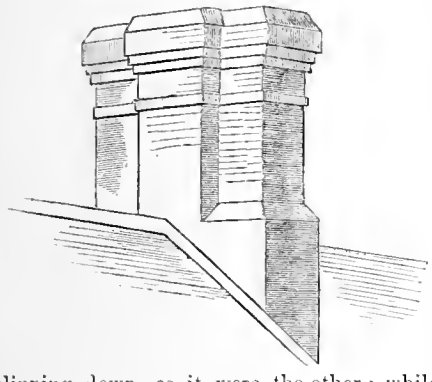
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—XVII.

THERE are few things that concern our prosaic domestic architecture so much as the external appearance and design of chimney stacks—features not long ago looked upon with a pedantic disdain as quite repellent to the spirit of literal correctness, so-called Classic taste that held supremacy, and in obedience to which chimney heads never showed themselves above our parapets and gutters. Of late a marked improvement in these useful appendages has been witnessed, and we may here profitably note the most

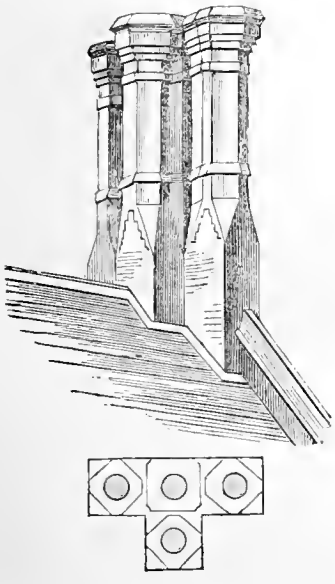


useful and effective types for our development. From the most insipid baldness they have assumed the character of most elaborate adjuncts, peering above our roof tops, and occasionally transcending in their shafted and turreted outlines the structures from which they rise.

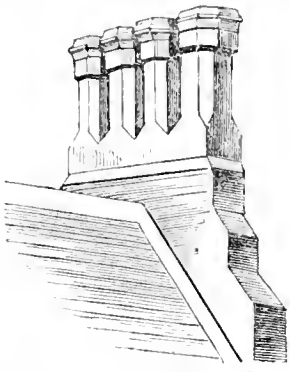
Chimney stacks may be considered under two heads—their position in regard to the building, and their design *per se*. They spring from ridges, slopes, and gutters, sometimes sitting or straddling across the one and



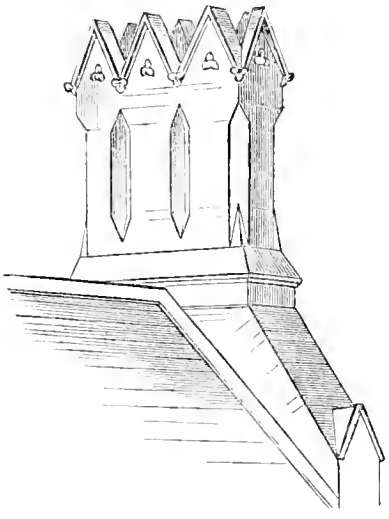
slipping down, as it were, the other; while frequently we find them perched in all conceivable positions, cutting awkwardly the lines of hips and valleys, or so unbalancing



the skyline of our buildings that they positively more detract from the general effect than help it. Of course we cannot and ought not to plan our fireplaces for our stacks, nor should we leave the latter entirely to look after themselves. Nothing, I think, is more disagreeable to the eye than the appearance of a stack on the sloping side of a roof, particularly when there is no apparent wall or base for it. It is true we are often driven to the committal of such a questionable thing, and I think there is a certain angle both in flat and high pitches that is rather more favourable than others. Above an angle of 30 deg., which may be regarded as the limit of apparent re-

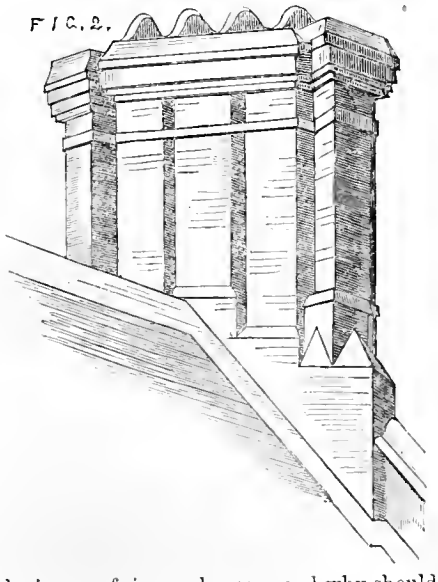


pose, a mass of work like a chimney stack has an effect of slipping, which effect increases in every steeper pitch till we arrive at a decidedly acute one—say of 60 deg.—the steepness of which renders the mental vision less uneasy by reason of the self-evi-



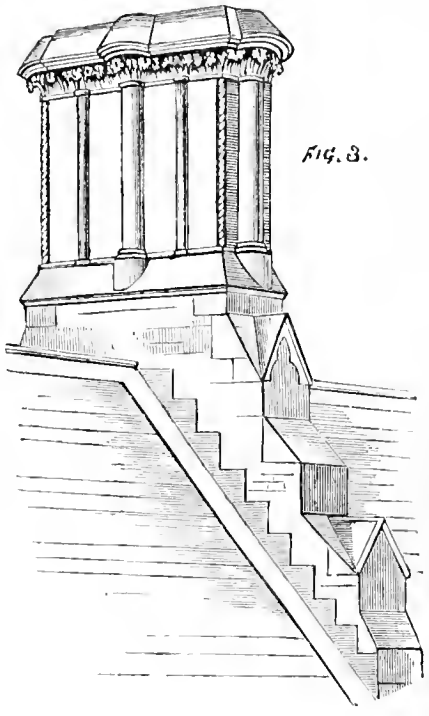
dence afforded. Our outward senses require repose or assurance in these matters; their deception often defeats the end of true art. Such a thing as a pinnacle or cupola on a

FIG. 2.



sloping roof is rarely seen, and why should smoke erections be an exception? Regularity of springing line—that is, the avoidance of an appearance of indifference or carelessness in the position of stacks as they emerge from the roof—is essential in all buildings in the regular or "Classic" styles of art; and affected irregularity in *any* style is both stupid and condemnable.

FIG. 3.



The plans or bases of chimney stacks assume a variety of form, from the simple elongated or square form to regular figures partaking more or less of polygons or crucial shapes. These complex forms may have simple square plinths, the angles being variously weathered or capped, or they may rise from the roof of similar form, though in the latter case the angles and nooks that are formed are expensive in lead aprons and flashings, and get clogged up by snow-drifts. In stacks elongated in plan, as those of party walls and the like, elevational variety may be got by recessing every other flue, or by alternating them at right angles and diagonally, or alternative forms, as round and square, may be employed with good effect. In these same kind of stacks, where they sit equally on both sides of ridge, it adds much to the appearance to see the wall from which the stack rises coped or stepped above the slating, figs. 2 and 3. With steep roofs there are rather awkward triangular spaces left under the plinth set-off of stacks. It shows how this difficulty can be met by stepping the separate shafts to the inclination of the roof slopes.

SCHOOLS OF ART.

THE awards made by the Science and Art Department to the Stoke and Fenton School of Art have been published, and are as follows:—National competition: silver medal, John Henk, modelling from nature; bronze medal, Alfred Bentley, modelling from nature; bronze medal, F. D. Bradley, porcelain painting; bronze medal, W. Boote, porcelain painting; bronze medal, R. Nabney, porcelain painting; book prize, J. Slater, design for earthenware. Free scholarships for one year, the Science and Art Department paying their fees, have been awarded to the following students for advanced works: A. Bentley, T. Emery, James Griffiths, Josiah Hassall, J. Longmore, T. Longmore, John Henk, R. Nabney, John Slater. Book prizes were awarded to the following students: W. Broad, figure drawing; Henry Corden, mechanical drawing; Thomas Spilsbury, ornamental drawing; W. Wood, architectural drawing. Francis Dutton got honourable mention. In addition to the above twenty-seven students passed in the art examination in March last, of whom seven took prizes for excellent papers.

PARLIAMENTARY NOTES.

On Friday night in the House of Lords Lord Chelmsford in bringing up the report with amendments of the Artisans' and Labourers' Dwellings' Bill, explained the various amendments which had been introduced by the select committee, and he expressed his belief that if their lordships passed this bill it would effect a great and substantial improvement in the dwellings of the labouring classes, while it religiously protected all the rights of property. Lord Portman said that the state of the bill now, as compared with its condition when it came into that house, fully justified its reference to a select committee, and he believed that it had, by their lordships' care, been made a useful and workable act. The Earl of Shaftesbury thought that the bill, as altered by the select committee, would be a useful and workable measure. The report was brought up and agreed to.

In the House of Commons, Mr. Bentinck obtained leave to bring in a bill to prevent the removal of the tower of the church of St. Mary Somerset, in the City of London, and for vesting the tower and the site thereof in the corporation of the City.

On Tuesday night in the House of Commons Mr. Gregory called attention to the present condition of the Royal Irish Academy, stating that in consequence of the mismanagement and extravagance of the Board of Works Department the Academy was inaccessible to the public, and he wanted to know what the Government intended to do in order to place the works of art more at the disposal of the public than they were at present. Mr. Disraeli said there was a commission sitting to inquire into the whole of the art institutions of Ireland, and he hoped that the result of their labours would be to terminate those abuses of which complaint was now made.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Wesleyan Chapel at Hungerford was laid on the 8th inst. It is to be erected of brick, with Bath stone dressings, in the Early Gothic style, from the design of Mr. Wilson, of Bath, the contractor being Mr. Philips, of Swindon. It is to contain 400 sittings, and will cost £1,800.

On Tuesday week the foundation stone of a new edifice erected by the Free Church congregation at Stonehaven was laid by the Earl of Kintore. The building is in the Decorated style of Gothic, simply treated in general detail. A commodious session-house is attached to the building. The cost of the building is about £1,500; and it will accommodate 500 in the area. The height to the apex of the ceiling is 33ft. The architect is Mr. James Souttar, Aberdeen.

On Monday week Bishop Trower, acting for the Bishop of Lichfield, consecrated a new cemetery at Market Drayton. It contains two stone chapels, built by Mr. C. Wright, of Nottingham, and designed by Messrs. Clarke, architects, of the same town. The cost of the cemetery, including the chapels, is about £2,200.

On the 2nd inst. the parish church of St Andrew, Dover, was reopened, after restoration, under the direction of the Ecclesiastical Commissioners. The whole of the chancel has been raised one step, and a new altar and pulpit added. The old ceiling has been removed and an open roof substituted.

On St. John Baptist's day the village church of Vaxley, Suffolk, was reopened after restoration. The chancel has been rebuilt, and the whole of the nave reseated. Mr. Blackbourne, of London, was the architect.

The foundation stone of a new Presbyterian Church, to be named "West Coates Church," was laid at Edinburgh yesterday. It will be cruciform in plan, and will be erected in the later style of Pointed Gothic. It will be built of freestone, and will seat 900 persons at an estimated cost of £7,500. Mr. Bryce is the architect, and Messrs. Oman and Mansom the contractors.

The new church of St. Paul, Glenageary, was consecrated on Wednesday week by the Archbishop of Dublin. It is in the Gothic style, and capable of seating about 600 persons. Mr. A. G. Jones was the architect, and Mr. John Nolan the builder.

The corner stone of a new Baptist Chapel at Bolton, was laid on Wednesday afternoon, by T. Barnesley, M.P. The chapel will be built in the Italian style of architecture. It will accommodate 1,000 persons, and the school 500 children. The architect is George Woodhouse, Esq., of Bolton, and the contractor Mr. J. Robinson, jun., of Hyde. The cost of the building is estimated at £5,500.

A new Roman Catholic Church is about to be built at Crosshaven, County Cork. Plans for the building were sent in by Messrs. Pugin and Ashlin, of Dublin, and accepted. The expenditure will be under £2,000, exclusive of spire, fittings, &c.

On Monday Sir John Heron Maxwell laid the foundation stone of a new United Presbyterian Church at Waterbeck, near Keithbridge, Dumfries. The church, which will accommodate 381 sitters, will be of the Early English Gothic style, and will be formed of nave and transepts. A manse is also in course of erection. The sites and the whole of the stone required for the buildings have been given free of charge, and the remaining cost is estimated at £1,868.

The works at the new Catholic Cathedral, Queenstown, have been begun to the extent of excavating for foundations and levelling the site. This portion of the work is being carried out by the architects, and when the foundations shall have been built up to surface level a contract will be entered into for the superstructure, which will be of considerable magnitude.

BUILDINGS.

On Friday last the foundation stone of the new City Police and Session Courts was laid at Manchester by the mayor. The building, which will be in the Gothic style, has been designed by Mr. T. Worthington, of that city.

On Monday the foundation stone of a new police-station was laid at Sunderland. It will comprise cells, &c., and lodging-room for officers. Mr. Younger, borough surveyor, is the architect, and Mr. Hepple, the contractor. The estimated cost is between £800 and £900.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—"Clamp."—E. P.—A. C. F. K.—C. L. E.—H. L.—S. P. C.—J. L.—I. P. S.—F. W. R.—R. H.—H. H. S.—I. I. and Sons.—C. G. D.—G. C.—I. T. B.—I. E.—I. T.—J. P. S.—W. C. F.—I. S. S.—W. N.—S. H.—G. G.—D. and T.—I. P. L.—W. R.

Re William Hey.—We shall be glad to refer to this case when "his honour's" decision is recorded.

D. C. L.—Your letter is inadmissible, though it contains many good points. We do not feel justified under the circumstances in inserting a communication which condemns with undue severity and possibly unjustly the editorial conduct of an able and responsible professional contemporary. Eagles don't like to pick out eagles' eyes.

W. H. T.—Letter and photos received. The building contains nothing sufficiently novel or good to justify a page illustration.

W. T., Truro.—Our article last week will give some of the desired information. Tall's apparatus is, we should say, as applicable for building a mansion as a cottage. Read the article again.

Correspondence.

SLOUGH CHURCH.

To the Editor of the Building News.

Sir,—Up to this date the competitors have not been apprized of the result of this competition, though you gave us their decision more than a fortnight ago. It would be highly satisfactory if you would give your numerous readers a copy of Mr. Christian's careful report in order that they might be able to see how far the final choice of the committee is in accordance with his judgment.—I am, &c.,

One of the Competitors.

July 11.

MODERN RESTORATION.

Sir,—In spite of continued remonstrances from the true lovers of Gothic art there is little sign of the decrease of the vulgar spirit of "modern restoration." True, we are not alone in the matter. Italy, who by her art traditions should scorn to countenance the practice of such imposition, goes far beyond us, and "restores" her buildings, colouring and defacing the modern parts to make them appear old. We have not yet begun that, we are at present content with the opposite anachronism of causing all old things to appear new. Of course we know architects are only partially to blame in the matter. The caprice of a client or a building committee must be humoured, or the architect's commission account will be scrupulously canvassed, and, what is of far more importance to him, his professional reputation held in very light esteem. Yet there are matters in which clients and committees seldom interfere, and for which consequently the architect must be solely held responsible. The opposite principles that guide true and false restoration have been seldom set forth more plainly than in a recent paper by Mr. James Fowler, F.S.A., on All Saints' Church, Wakefield, from which I extract them:—

1. Remove nothing save what is mean, paltry, or a sham; square pews, galleries, plaster, &c., in order to	1. Remove everything, no matter what, that is unsightly, or, if this cannot be afforded,
2. Expose freely whatever is the fruit of genuine original intellectual energy; then,	2. Hide whatever is out of fashion, peculiar, that does not match, or is of no use, and then,
3. Leave the latter as a sacred thing exactly as it is found, no matter how worn by wind and rain, or battered by ignorant persons or fanatics, merely guarding it from further dilapidation, if need be, by props and stays;	3. Without any false sentiment, whatever is broken, or bent, or bowed, or worn, or time-mark'd, chisel away, finishing afresh, so as to obtain an entirely clean and fresh surface.
4. Adding nothing save what is itself the fruit of genuine original intellectual energy.	4. Adding, according to taste and funds, conjecturally, mason's work and carpenter's work to order.

As Mr. Fowler truly says, the two columns are in themselves irreconcilable and uncompromising. True, the advocates of the second theory seldom state their views so frankly, but they are not a whit the less apparent in their works. And our worst charge against these men is that the mischief they do is irreparable. If they must prostitute art let them build their own buildings and fashion them to their hearts' content. We can some day remove them, or if not they will stand as monuments of warning to true artists. But when they attack our old buildings and obliterate the work and teaching of men to whom they are not worthy to be called successors we claim either the right of the strong to prevent or of the weak to complain. The evil by no means ends even here. The bad influence daily gains power over the minds of workmen. Architects know well enough now how difficult it is to find men able to enter into the spirit of ancient work and to deal tenderly with it. If, then, this lack of all individual art feeling be not only permitted but encouraged to assert itself, what other effect can be produced than the degradation of their minds and the exclusion from their work of all freedom and life.—I am, &c.,

E. J. K.

PRIZE COTTAGE DESIGN.

Sir,—I beg to thank you for illustrating my cottage plan in your paper. Enclosed I send you copies of four letters I have received from the Central Cottage Improvement Society, from which you can form your own opinion. I have received from them, at least, twenty other similar letters. The statements made by Mr. Fortescue are incorrect. The staircase, plans, or specification have not in any way been altered.

—I am, &c.,

J. T. Smith.

8, Windsor-terrace, The Grove,
Ealing, W., July 14.

[Copy].

Central Cottage Improvement Society, 37, Arundel-street, Strand, W.C., July 11, 1866.

PRIZE COTTAGE DESIGN.

Dear Sir,—I have the pleasure to inform you that the prize of ten guineas was yesterday awarded to you by the Council of this Society, provided that the estimate for the same is correct. (See *Award.*) Will you be so kind as to call on me to-morrow between two and four to make arrangements for carrying the plan into effect?—I am, dear sir, yours faithfully,

(Signed) H. Martin, Secretary.

Mr. J. T. Smith.

37, Arundel street, Strand, W.C., October 19, 1866.

PRIZE COTTAGE PLAN.

Dear Sir,—The Council have decided on delivering the prizes at a public meeting to be held at the Society of Arts as soon as Parliament assemble. Hoping this arrangement will meet your approval, I am, dear sir, yours faithfully,

(Signed) H. MARTIN, Secretary.

Mr. J. T. Smith.

37, Arundel-street, Strand, W.C., June 29, 1867.

Dear Sir,—I have just received yours of the 26th inst., and as Mr. Hill will now carry out the plan as desired the difficulty is over. The Council will meet here on Tuesday, at three o'clock, when you may attend and arrange about the premium.—Yours respectfully,

(Signed) H. MARTIN, Secretary.

Mr. J. T. Smith.

37, Arundel street, Strand, W.C., October 1, 1867.

Dear Sir,—We have a council meeting next Tuesday afternoon, and if you will kindly send me by that day the undermentioned paper,* I hope we shall then be able to bring the prize cottage matter to a very satisfactory conclusion.—Yours respectfully,

(Signed) H. MARTIN, Secretary.

Mr. Smith.

* [Copy.]—Should this design be chosen in competition the architect will forward a detailed estimate with the builder's prices attached.

SIR,—I notice carefully your remarks, with estimate and specification, respecting detached cottages for labourers in your impression of July 3, and beg to enclose my card. Will you permit me to say I will undertake to build any number of them at £105 each within four miles of my address.—I am, &c., T. PEARSON.

Portland House, Bancroft-road, Mile End,
London, July 9.

Intercommunication.

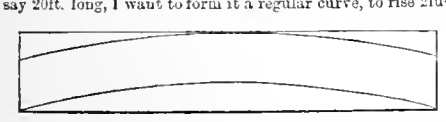
QUESTIONS.

[921.]—WORKMEN'S INTERNATIONAL EXHIBITION FOR 1869.—Some time since I saw in the papers that it was intended to hold a workmen's international exhibition in London in 1869. I have recently heard nothing about it. I should like to know whether the matter is abandoned or not, and if not, what progress has been made. No doubt some member of the council of the Working Men's Club and Institute Union, or some member of the council of the Public Museums and Free Libraries Association, could give the desired information.—W. B., Nottingham.

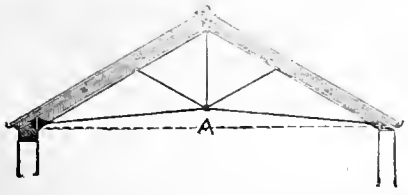
[922.]—UNINFLAMMABLE DEAL FIXTURES.—I write to ask if there is any of your intelligent readers who will be kind enough to inform me, through "Intercommunication," if there is any preparation that will render deal fixtures of a fireproof room less liable to take fire, or be less combustible? The shelves are to be filled with account books and papers.—EXONISIS.

[923.]—BRICKMAKING BY MACHINERY.—Will you or any of your contributors oblige by giving prices paid per thousand for making bricks by machinery (Porter's machine), including wheeling clay to machine a distance of 25 yards, and wheeling bricks from machine to stacks a distance of 50 yards, and backing; also prices for setting bricks into Hoffman's kiln for burning, exclusive of wheeling? The prices solicited are for labour only.—BRICKMAKER.

[924.]—ARCS OF DIFFERENT RADII.—The answer of "A. Z." to my query on July 3 not being satisfactory, I beg to put my question in another form, as I presume "A Z" did not understand my meaning. Having a beam, say 20ft. long, I want to form it a regular curve, to rise 2in. in the middle. Will "A. Z." or any of your readers inform me if there is any method by which a piece of wood ¾in. or 1in. square could be bent on surface of the beam, so as to mark the curve along the piece, as here shown?—HOWELL.

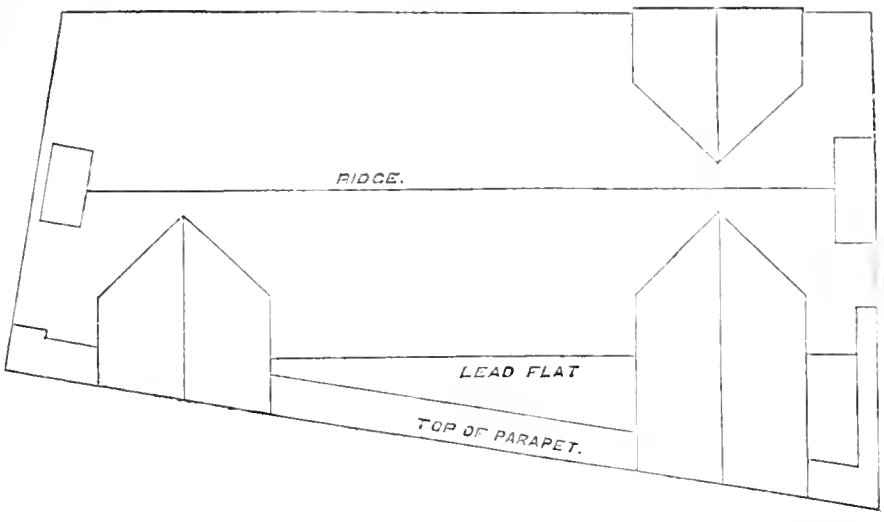


[925.]—SPAN ROOFS.—Will any of your readers kindly inform me what the effect of the undermentioned would be? I have a span roof of 29ft., but, instead of the ordinary tie beam, there is a 1in. tie rod, suspended by a 1in. ring bolt, as shown in the accompanying sketch. Now, what would be the effect on the tie rod if there was a weight (say one ton) suspended from it in the centre at A? Would it not be to bring the tie rod down until it was straight, and consequently to force out the feet of the principals? or, supposing the latter did not yield, would not the tie rod bend?—SUBSCRIBER.



[926.]—REMOVING OIL PAINT FROM STONE.—I am restoring a church, and some of the columns and all one wall are covered with thick coats of oil paint. I do not wish to resort to the detestable practice of chiselling down the surface of the stone, and so destroying all the traces of old work. Can anyone tell me how to remove this paint without injuring the stone?—E. S. B., York.

A TAPERING ROOF. (895.)



[927.]—HEARTHS.—Would you consider the specification of "slate hearthstones" correct or otherwise?—F.

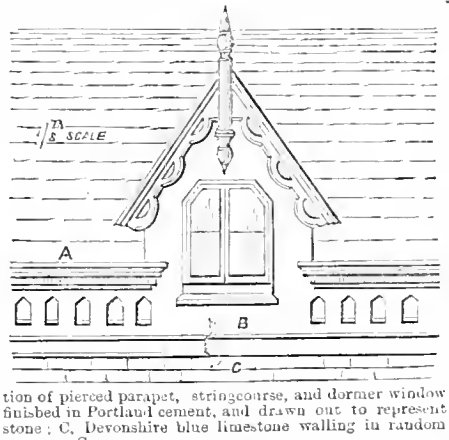
[If not strictly, literally correct, the phrase would be conventionally correct.]

[928.]—INSTITUTION OF SURVEYORS.—Will a member of the above kindly inform me, through your "Intercommunication" column, what benefit I shall derive from becoming a student in the above; also where the rooms of the institution are situate?—YOUNG SURVEYOR.

REPLIES.

[889.]—KAURI PINE.—Experience in the behaviour of this wood is limited in England. It is truly a beautiful wood, and but for its high price would undoubtedly become of general use. It is known with botanists as the *Araucaria excelsa*, or Norfolk Island Pine. It is a common wood in our Australian and New Zealand settlements, from whence it has been shipped to this country. There is no particular use to which it has been at present applied; and as it possesses neither colour nor beauty to recommend it there is a loss upon the imports. Logs of this timber are occasionally seen in London and Liverpool, and may be procured ninety feet long and a yard square. It has been used in Manchester and the cotton districts for printing rollers, in place of sycamore wood, and has been found to stand remarkably well. It is pale in colour, close in its texture, and remarkably straight in the grain; and is peculiar in having no turpentine in the heart wood, although it is abundant in the sapwood and bark. For flooring, I should consider it suitable; it would wear bright and hard, as do all our light soft woods, such as larch, sycamore, and horse chestnut. As a compact tenacious wood, the Kauri pine has few rivals; as a thin slice, if placed under a die, it will take and retain an impression in the same manner as soft metal or leather.—W. S., Nottingham.

[895.]—A TAPERING ROOF.—I have a roof of this kind in course of construction, and the annexed sketches will show the treatment I have adopted. A (in the elevation) is the parapet cornice, executed in red brickwork; B, portion of pierced parapet, stringcourse, and dormer window finished in Portland cement, and drawn out to represent stone; C, Devonshire blue limestone walling in random courses.—CLAMP.



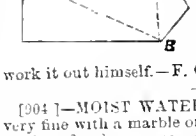
[898.]—WELL DIGGING.—For "A. B. C.'s" information, I venture to tell him that no man, to do himself or "A. B. C." justice, can give him a definite price for his work, for in neither of his questions does he say anything about the nature of the soil. This is an important consideration. It may require 14in., 9in., or 4½in. steining, or more, and these in cement; or it may do with only 4 in. dry work. The above, "A. B. C." will see, will very materially regulate the price of labour. And secondly, he does not say whether his 4ft. diameter is the diameter of earth or brickwork. "A. B. C." cannot do better, if he wants a good sound job made of his well, than to employ some respectable practical man.—W. W.

[900.]—BOLTED GIRDER.—"Peter," although so very sarcastic in his reply, has omitted the principal reason why a piece of timber cut down the centre longitudinally, and the two pieces then reversed, not only in the direction of the grain but also end for end, is considered preferable to the same piece of timber uncut. The main object of the above process being this, that should there exist a defect between the centre and one end we by it probably divide that defect between the two ends, so making the strength of the girder uniform at both ends.—F. C. H.

[900.]—"Peter" has palpably proved—to my satisfaction at least—that "prejudice and preconceived notions and ideas" *would* materially affect the strength of a girder. The argument of "having the grain of the pieces bolted running in opposite directions" as a means of securing additional strength I consider puerile. To a dead certainty, if the piece in its entirety is placed the strongest way of the grain, an argument of two to one in pieces, at least, is immediately secured; besides, the stronger half is not weakened by partially supporting the weaker; neither, again, has the whole to sustain the extra weight of bolts, or withstand the the weakening influence of holes necessary for the same. "What everyone says must be true" is an argument preeminently characteristic of aged females. The bolted girder is an erroneous and partially exploded notion, and, however readily *nobled* by "Peter," cannot certainly be so easily digested by many as by that worthy. I have re read my query carefully, and still fail to see the "sea of words" *salt Peter* is in such a "sea of troubles" about. If the *Blue Peter* is not "flying at the fore," I await a broadside.—F.

[901.]—VENTNOR HOSPITAL COMPETITION.—As the name of the successful competitor in the above did not appear in the last number of the BUILDING NEWS in answer to inquiry, it seems probable that no design was accepted by the committee. I sent in drawings, which "fell short of their requirements," and were consequently returned, together with a cheque for the amount of the first premium.—HUBERT BENSTED, Maidstone.

[903.]—CONTENTS OF CISTERN.—The answers to this query are very unsatisfactory. If "Inquirer" will give, in addition to the other measurements, the two, A B and C B, I will then furnish him with a correct solution of his question, and also the means by which it is arrived at, so that he can work it out himself.—F. C. H.



[904.]—MOIST WATER COLOURS.—Grind the colour very fine with a marble or glass slab and muller; do not use iron for the purpose, as its contact with some colours is injurious to them. Then mix to a proper consistency with a little honey.—F. C. H.

[913.]—IRON SEMICIRCULAR ROOF.—I think there cannot be any dispute as to the shape (theoretically) of these kind of roof, i.e., less deep at the crown than at the spandrel; but, in practice, I think "Calculator" is right in making the flanges parallel, as all the plates will be duplicates. But "Young Engineer" will find no satisfactory formula for these ribs. He may apply to any of our great professors, consult their works, burn the "midnight oil" to fathom the depths of their formula, and when day breaks still be in a fog. Therefore, to "Young Engineer" I would say, don't be disheartened, but do like many an "old engineer" would do under the circumstances, and copy from some existing work, such as the Great Western Railway terminus, at Paddington. Messrs. Handyside, who erected the semicircular roof at the Agricultural Hall, could no doubt give excellent advice on this subject, if "Young Engineer" were to apply. An engineering friend informs me that Phillips and Co., of the London Coal Exchange, have put up some of these kind of roofs.—NIL DESPERANDUM, Leicester.

[914.]—ETCHING GROUND.—The following is a good one:—1 part of black pitch, 1 of white wax, ½ of Burgundy pitch, 1 of asphaltum, 1 gum mastic. Melt the first three ingredients over a slow fire in a pipkin; add the other two finely powdered, stirring the whole well together; when well mixed, pour it into warm water, and make up while warm into balls. If too soft, use a little less wax. Be careful the mixture does not burn while melting.—E. J.

[915.]—DRY ROT.—The dry rot was in all probability inherent in the timber, and if so is probably not due to the formation of fungus, but to spontaneous decomposition. The remedy in this case is the use, if possible, of some substance as will, when penetrating the wood, combine with

its albumenous matter and solidify it. Corrosive sublimate, sulphate of copper, and arsenic acid have been found very efficacious. Nitric acid and sulphuric acid may be used with advantage, and especially where the growth of fungi is the cause of the rot, or where vegetation has followed decomposition, as it sometimes does.—W. R.

[915.]—Cut away the parts which are suffering, and repair with good material; at the same time look to the proper ventilation of the floors.—F. C. H.

[915.]—Wood is a light vegetable composition of a volatile nature, and if kept dry will last for a great length of time. Dry rot is a misnomer, and should be termed "wet rot," for it only exists in damp and humid places. If wood is placed against a damp wall, or used for flooring over a damp basement, it is sure to take the dry rot. Boards constantly damp will become mouldy. This mould is a fungus, and its food is the gaseous or volatile part of the wood, and will slowly consume it, leaving behind a charred powdery matter, which reminds you of the action of fire, or in other words, it leaves behind the mineral residue or ash. In some cases, where the floor joist or plinth blocks are dry, the boards take the dry rot between; in other cases, where they are damp and dry air is made to circulate under the floors, the dry rot will only seize upon that part which is fixed to the damp wood. Dry rot, as a rule, is not inherent in the wood, but is the natural result of the position in which it is placed. To cure the dry rot, you must take the moisture from the plant, and death will ensue. Ventilation (with dry air) is the only certain cure, but this is not always practical. Damp courses should be placed as much below the level of the timbers as possible, and the air in the basements or between the ground and the sleeper floors should not become stagnant; a good layer of dry rammel, or lime scraps, should be laid over the ground to prevent vegetation on the surface; such low forms of vegetation as mould engender dampness and so communicate its destructive influence to wood or other vegetable composition within its reach. Perhaps the best illustration of the "dry rot," may be given in a post fixed in the ground. That part above the ground, although wet at intervals, will remain sound, as will the lower portion, which is excluded from light and air, but the part level with the ground which is well supplied with moisture and air will rapidly decay. This portion is alive with fungi feeding upon the vitals of the wood; the sap, which is alive to all vegetable influences, is the first to be seized and then follows the heart wood. In pure and soft woods its progress is rapid; but with oak, yew, and other hard woods time must be called to aid this feeble plant in its work of destruction.—W. S., Nottingham.

[916.]—STAINING WOOD.—"X. P." can stain deal to a mahogany colour as follows:—Dilute aquafortis with an equal quantity of water, and add double the quantity of the mixture of archil. Lay it on as thin as possible, and when dry oil and polish.—K.

[916.]—To stain deal a mahogany colour, first rub the surface with dilute aquafortis; then dissolve one ounce of dragon's blood in a pint of spirit of wine by heat; and add one third of an ounce of carbonate of soda. Filter the above mixture, and lay on twice with a soft brush, of course allowing first lay on to dry previous to applying second time.—F. C. H.

[917.]—FASTENING ZINC ROOFING.—If "Inesport" will call here he can inspect the different methods of fastening of Messrs. Braby, Tyler, and Fox, and I shall be happy to explain them to him.—CURATOR, the Museum of Building Appliances, 23, Maddox-street, Hanover-square, London, W.

[917.]—In your "Intercommunication" column in last week's paper I find an inquiry as to the best mode of fastening zinc roofing. I beg to enclose a printed sheet, with illustrations at the back; but I fear the matter is too long for you to publish, so perhaps you would have no objection, in the event of not publishing the sheet, to refer the inquirer to this office, and we will forward every information to him.—JAMES S. EDMESTON, 5, Crown-court, Old Broad-street, E.C.

[920.]—RUBBING MONUMENTAL BRASSES.—The best plan is to cut away the margin, and then mount the rubbing on a clean piece of paper.—F. C. H.

WAGES MOVEMENT.

A STRIKE has taken place on the Alps. The labourers engaged in piercing the Mont Cenis tunnel struck work the other day at Bardonneche for an increase of wages. No acts of violence were committed, and it is hoped that an arrangement will be come to.

The advance of wages demanded by the Stockport bricklayers, at two days' notice, and resisted in April last, has been conceded.

The Sunderland ship joiners a fortnight ago gave notice of their intention to seek for an advance of 6d per day in order to raise their wages to the same amount as the shipwrights, 30s. per week. At a meeting held in their union room, on Friday night, 3rd inst., they determined to withdraw that notice at present, as there are many men out of employment in the trade.

STATUES, MEMORIALS, ETC.

MR. FOLEY is engaged on a statue of the late Prince Consort, for the Hyde Park Memorial, in place of that modelled by Baron Marochetti, which failed to satisfy the committee, and has been destroyed.

STAINED GLASS.

MESSRS. BEER AND SON, of Exeter, have just completed a new chancel window for Broadwood Kelby church, in that town. It is of three lights, and is in the Decorated style. The subjects are the True Shepherd, and St. Peter and St. Paul.

The Whitworth exhibition placed at the disposal of the Clifton College, has been awarded, after an open competition, to Mr. J. Bush, of Cardiff. Nine candidates competed for the exhibition.

LEGAL INTELLIGENCE.

WILFUL DAMAGE.—Last week, at the Marylebone Police Court, Edward Neal, a labourer, was charged with the following wilful damage. Samuel Wright, foreman to Thirsk and Co., builders, Chelsea, said, a few days ago the prisoner applied to him for employment on some buildings in Maryland-road, Paddington. He set him on. On Wednesday morning he disputed about his wages being only 4½d. an hour, the best labouring hands being paid 5d. The prisoner left, and said he would have it out. On return from dinner he found a quantity of brickwork thrown down, doing damage to the amount of £6. Evidence was adduced to prove the offence, and the magistrate committed him for trial.

ALLEGED SEWAGE NUISANCE.—ATTORNEY-GENERAL v. THE COLNEY HATCH LUNATIC ASYLUM.—This information was filed at the relation of the officer of the Local Board of Health at Edmonton, against the defendants for an injunction to restrain them from permitting any sewage or gas water to pass into a stream called Pymm's-brook, so as to be a nuisance injurious to public health. The plaintiff's case was that ever since the establishment of the asylum the flowing of the sewage from it had been such a nuisance as to produce remonstrances from the relators and the public, met by promises of amendment and ineffectual attempts to remedy the evil, by deodorisation, filtering beds, or otherwise, the River Lea being at the distance of several miles, and the brook flowing into it. To this it was answered that if there was a nuisance, it arose chiefly from houses and other sources, and that all that could be done by the filtering beds and use on the farm was done. The case was originally brought before Vice-Chancellor Wood and transferred to this court, and the motion for injunction turned into motion for decree. The Vice-Chancellor now recapitulated what had occurred, and under the power given to the Court by the 42nd section of the 15th and 16th of Victoria, cap. 80, directed the cause to stand over, with a reference to Captain Galton, the well-known engineer, whether it was necessary and proper, having regard to the health of the inhabitants in the district in which the asylum was situated, that any and what steps should be taken for purifying the drainage from the asylum as it now flowed into the brook; or, whether it was necessary and proper that the same should be diverted from the said stream, and if so, by what means such diversion could be made. This order could be appealed against as if it had been a final decree.

Our Office Table.

A correspondent, writing from Exeter, says that many tube wells have been sunk in the neighbourhood, in gravelsubsoil, of slight depth, and have answered admirably.

On Saturday last Vice-Chancellor Giffard dismissed the petition for winding up the Suburban Village and General Dwellings Company. The directors have now obtained an estate at Loughborough Park from the Ecclesiastical Commissioners, and operations will be commenced forthwith.

There is a statement in Constantinople that the Sultan proposes to appropriate a part of the gardens of the seraglio to the central railway station. Thus, where the Bostanji Pashi cut off heads in his fatal kiosk, the modern Pacha will be able to ticket for an excursion train, instead of taking an excursion to the other world, as his predecessors too often did.

A fine fresco has just been discovered in the church of Santa Maria del Giardino, Milan, which is now being demolished. This fresco, which is in a good state of preservation, represents St. Antonio of Padua, and is attributed to the painter Suardi.

The Metropolitan Board have accepted the tender of Mr. Strickson for the carrying out of the plan for the formation of the ornamental portion of Finsbury Park. The plan is that of Mr. M'Kenzie, with certain modifications recommended by the committee. The amount of Mr. Strickson's tender is £4,500. The other tenders were considerably higher, one being as much as £12,550.

The Exeter Freehold Land Society have quite recently laid out 30 acres of land for building over 300 houses. Every allotment has been taken up by the shareholders and others, who have already begun from 40 to 50 houses on the estate.

Lancaster has been fixed upon this year for the annual congress of the Royal Archæological Institute of Great Britain and Ireland. The inaugural meeting takes place on the 28th inst., and the congress will sit until August 4 Colonel Wilson Patten, M.P., Chancellor of the duchy of Lancaster, is the president, and the programme of the week's proceedings has been thus arranged:—On Tuesday, July 28, the inaugural meeting will be held in Lancaster Castle, and on the same day the principal objects of antiquarian interest will be visited. A reception will be held by the Mayor of Lancaster in the evening. On Wednesday morning there will be a meeting of sections, and an excursion to Heysham. Papers will be read in the evening. On Thursday the great excursion of the week will take place to Dalton Castle, Peel Castle, and Furness Abbey, where a lecture will be delivered, and the ruins described, by E. Sharpe, Esq. The Mayor of Barrow in Furness also gives a *dejeuner*. On Friday there is again a meeting of sections, and more excursions, and so again on Saturday several excursions to localities of interest in the neighbourhood are proposed. On Monday, August 3, there will be an excursion to the far-famed Bolton Abbey, Barden Tower, and Shepton Castle; and on Tuesday, the final meeting will be held, and papers will be read in the sections. Excursions are also projected to visit the Art Treasures Exhibition at Leeds in the course of the week.

Mr. B. Haughton, President of the Civil and Mechanical Engineers Society, writes us to say that besides assistant engineers and pupils for whose benefit the society was established, it is "largely patronised by men who practice engineering on their own account."

The usual quarterly meeting of the Exeter Diocesan Architectural Society was lately held. The report and treasurer's statement for 1867 were read and adopted. Since January, 1866, nine grants in aid of various buildings have been made by the society, payable when the work has been completed, according to approved plans. The financial position of the society is very fair. The report and statement were unanimously adopted.

A novel opportunity for the introduction of "arbitration and conciliation" has arisen at Ledbury, in Herefordshire. The organist of the church struck for wages on Sunday last, and positively refused to play until his demand for a rise was agreed to. In consequence of this resolution the congregation had to conduct their devotions without music.

The junction of the two Temple gardens is contemplated in connection with the improvements in progress on the Thames embankment.

The great success which has attended the adoption of the principle of arbitration upon the method of Mr. Rupert Kettle was celebrated in Wolverhampton, on Monday, after quite a jubilant fashion. Arbitration is practised in that town by the carpenters, the plasterers, and the bricklayers, but not yet by the masons and the labourers. Mr. Kettle had remembered with much pleasure the annual holidays of the operatives in the French towns, and at the last arbitration meeting he suggested that some such yearly holiday should take place in Wolverhampton, masters and men and their families cordially fraternising during the festivities. The suggestion was taken up, and yesterday "the first annual demonstration in commemoration of the adoption of the principles of arbitration as a medium for the settlement of trade disputes," as the bills term it, came off. The occasion was made a general holiday throughout the building trade there, the masters having closed their shops for the purpose. The proceedings comprised dinner, tea, and ball, music throughout the day, and the throwing open of the grounds attached to the residence of the arbitrator. At dinner the Mayor of the borough presided, and amongst the speakers were the Earl of Lichfield, Sir John Morris, Mr. Kettle, and others. Every exertion was used to make all feel at home in the somewhat novel position in which both sides found themselves, and the result was a thorough success.

The Kensington Vestry have adopted the sensible plan of watering the principal roads of the parish on Sundays.

The Westminster Board of Works have been obliged to call upon one of the dust contractors to give up his contract in consequence of his not carrying it out properly; and the contract of the whole district has been given to Mr. Cookson, who is to receive £595.

The following is the return of admissions to the National Exhibition of Works of Art, at Leeds, for the week ending the 11th day of July, 1868:—By season tickets, 5,787; by payment, 18,243. Total, 24,030.

It is expected that the Royal Academy will take possession of their new quarters at Burlington House by Christmas. It is stated that Mr. Horsley has promised that the first use of the new apartments shall be to hold an exhibition of the works of members of the Academy from the earliest times.

Trade News.

TENDERS.

BROMLEY.—For house and offices, Bromley, Kent, for J. A. Allsop, Esq.—Mr. C. H. Driver, architect, Quantities supplied by Mr. R. O. Harris:—

Gammon and Sons	£1937
Arnaud	1837
Payne and Balding	1835
Nixon	1855
Perry	1834
Taylor	1797
Nutt and Co.	1759

CARDIFF.—Cardiff Arcade, first contract for 24 shops and offices. Mr. Peter Price, architect. Quantities supplied:—

Webb	£3850
Price	3840
Stride	3765
Shepton	3550
Lock	3196
Seager	3040
Eassie and Co.	2976

EALING.—For the erection of a new Wesleyan chapel at Ealing. Messrs. J. Tarring and Charles Jones, architects. Quantities supplied:—

Brown	£6950
Myers and Son	6189
Adamson	6141
Kilby	6089
Chamberlin	6049
Dove Brothers	6009
Higgs	5862
Saunders	5840
Nye	5769
Hill	5670

HANWELL.—For the erection of a new Congregational church at Hanwell, Middlesex. Charles Jones, architect. Quantities supplied by Messrs. Richardson and Waghorn:—

Waters	£1833
Adamson	1793
Myers and Son	1789
Nye	1696
Hanson	1640
Gibson Brothers	1630

LONDON.—For alterations and repairs at 52 and 53, Margaret-street, Cavendish-square, for William S. Gard, Esq. Mr. Charles Bradley, architect:—

Longmire and Burge	£877
Haward Brothers	840
Hyde	792
Brown (accepted)	775

LONDON.—For various reparations to the parish church of Christ church, Newgate-street, E.C. Mr. H. H. Collins, architect and surveyor:—

James Pitcher	£497	10	0
George Shaw	366	0	0

NEW BARNET.—For the erection of a pair of villas, Victoria-road, New Barnet. Mr. I. Sargeant, architect. Quantities supplied:—

Bamberg	£1100	0	0
Twelvetrees	899	0	0
Binto	835	0	0
Glener	831	0	0
Hayley	827	12	6
Ginger	827	0	0

STROOD.—For new church, St. Mary's, Strood, next Rochester. A. W. Blomfield, Esq., M.A., architect:—

Browne and Robinson	£6675
Vaughan	6452
Stump	6446
Wallis	6356
Hill and Sons	6328
Wheeler	6300
Anscomb	6293
Foord and Sons (accepted)	6083
Futcher (withdrawn on account of error)	5099

COMPETITIONS.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

FINSBURY SCHOOL DISTRICT.—August 3.—Plans, sections, elevations, and estimate of costs for school at Upton, West Ham, Essex. W. W. Hayne, Vestry hall, City-road.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square, Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

CITY OF PEST.—July 31.—For excavating trenches, laying the pipes, and making them entirely watertight. H. n Moritz von Szentkirályi, Ober-Bargermeister, President, City Waterworks Company, Pest.

ROYAL ARSENAL, WOOLWICH.—August 1.—For supplying and depositing dry rubbish or dredger stuff on the foreshore. Inspector of Works, Royal Arsenal.

HERTFORD.—July 20.—For taking down and rebuilding St. Andrew's Church. Architect, Mr. J. Johnson, 35, Moorgate street, E.C.

CHESHIRE NEW COUNTY ASYLUM.—July 27.—For the erection of the above-named building. R. Griffiths, Martin-street, Stafford.

LEICESTER.—July 21.—For laying about five miles of cast-iron socket pipes. J. E. Williams, secretary, Leicester Waterworks Company.

ST. IVE'S, HUNTS.—August 6.—For supplying and lighting the streets, roads, and other places with gas, for a period of three years. Messrs. Fisher and Ginn, clerks to the Improvement Commissioners, St. Ive's.

CROYDON.—July 28.—For the construction of about four miles of brick sewer, and one mile of earthenware pipe sewer. R. J. Cheesewright, Townhall, Croydon.

MAIDSTONE.—July 28.—For 400 tons broken Guernsey granite. E. Hoar, clerk to the board, Maidstone.

INDEPENDENT GAS LIGHT AND COKE COMPANY.—July 15.—For the whole of the tar produced on their works. J. B. Coulson, 236, Kingsland-road.

BRIGHTON.—July 30.—For the construction of about 4,000 yards brick sewers, and about 22,000 yards pipe sewers. D. Black, town clerk.

BATH.—July 23.—For the supply of glazed stoneware sewage pipes for twelve months. Mr. A. Mitchell, 3, Fountain-buildings, Bath.

METROPOLITAN BOARD OF WORKS.—July 20.—For the erection of a fire brigade station in Renfrew-road, Lower Kennington-lane. J. Pollard, clerk, Spring-gardens.

GRANTHAM.—July 24.—For the purchase of the whole of the materials except bricks and rubble-stone from the old Guildhall and Prison. W. Thomson, 11, Elmer street, Grantham, and W. Eve, 10, Union Court, Old Broad-street, E.C.

WISBECH (CAMBRIDGESHIRE).—Cattle Market.—For wrought and cast iron cattle pens, fencing, &c.; and for paving, draining, &c. F. Jackson, clerk to Local Board.

TOTNES.—July 23.—For altering, enlarging, and refitting the north aisle of the parish church. Mr. G. G. Scott, architect, 21, Spring Gardens.

KINGSTON.—July 27.—For the enlargement of the workhouse in Coombe lane. Plans at Messrs. Ruckworth and Luck, Carlton Chambers, 12, Regent-street.

NELSON.—July 24.—For the supply of about six miles in length of cast iron pipes and other castings. Specifications at Messrs. Cowley and Newton, C.E., Carlton Buildings, Manchester.

BEACONSFIELD, BUCKS.—July 30.—For altering, repairing, and part rebuilding the house, &c., at Hall-place. Plans, &c., Rev. S. J. Bowles, Rectory, Beaconsfield.

HALIFAX.—August 11.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

CAVERSHAM, NEAR READING.—July 30.—For the erection of a wrought iron lattice girder bridge over the Thames. Mr. H. Woodman, borough surveyor, 3, Grey Friars-road, Reading.

FARNBOROUGH STATION.—July 27.—For works and repairs at Royal Military College. Lieutenant Colonel C. B. Ewart., Royal Engineer Office, 11, James strert, Buckingham gate.

WAR OFFICE, PALL MALL.—August 10.—For the purchase of a turret clock. T. Howell, director of contracts.

SPILSBY (LINCOLNSHIRE).—August 1.—For taking down and rebuilding the George Hotl. G. Smith, surveyor, Spilsby.

WEST HAM LOCAL BOARD OF HEALTH.—July 27.—For the construction of a wrought iron lattice girder bridge.—July 27.—For the construction of about 2,700ft. of pipe sewer. C. Wilson, Rokebo House, Stratford.

PROPERTY SALES.

JULY 7.

AT THE MART.—By Messrs. Driver and Co.—Freehold 4a. 1r. 36p. of building land fronting Hitchen-hatch lane, Sevenoaks, Kent—sold for £1,066.

Freehold 3a. 0r. 20p. of building land, situate as above—£1,460.

Freehold and leasehold property, known as Forest Lodge, in the parishes of Rogate, Bramshott, and Thelton, Sussex, comprising a residence with pleasure grounds, cottages, and land, nearly 35 acres, together with the manor of Rogate Bohnut, comprising about 531 acres—£5,700.

Freehold estate known as Bramblys, Basingstoke, Hants, comprising a residence with stabling, pleasure-grounds, offices, and 17a. 1r 9p. of land, also Brambly's Cottage, and three cottage tenements—£5,000.

By Messrs. Farebrother, Clark, and Co.—Freehold 2a. 3r. 3p. of building land, part of the Grove Meadows, Muswell Hill, Hornsey—£2,500.

Freehold property known as Colham House, Colham Green, Hillingdon, Middlesex, comprising a residence with stabling, farmery, farm yard, pleasure-grounds, and land, 4a. 2r. 12p., also the reversion to four cottages—£2,400.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold residence with garden and grounds, known as the Hermitage, Southgate, Middlesex, term 12 years unexpired at £55 per annum—£660.

By Mr. J. A. Smith.—Leasehold two cottages, Nos. 4 and 5, Wilson's road, Great Church-lane, Hammersmith, producing £42 18s. per annum, term 90 years from 1866, at £7 per annum—£205.

By Mr. Saffell.—Freehold residence, No. 4, York Villas, Albion-road, Stoke Newington, annual value £70, also builder's premises attached, let on lease at £60 per annum—£2,305.

JULY 8.

By Messrs. Norton, Trist, Watney, and Co.—Freehold plot of building land situate at Muswell hill—£70.

By Messrs Edwin Fox and Bousfield.—Freehold pleasure farm, comprising about 124 acres, with residence, pleasure garden, and buildings, in the parish of North Benfleet, Essex—£8,200.

Leasehold residence with stabling, known as Mansfield House, St John's Wood, term 77 years unexpired, at £12 per annum—£1,805.

Leasehold residence, No. 52, Ellington street, Barnsbury Park, let at £70 per annum, term 84 years unexpired, at £8 per annum—£510.

Leasehold four houses, with shops, Nos. 45 to 48, Addison-road, North, Notting hill, producing £195 per annum, term 81¼ years from Midsummer, 1868, at £9 each per annum—£2,020.

Leasehold two residences, Nos. 7 and 9, Winchester-road, Willesden lane, Kilburn, annual value £100 each, term 92 years unexpired, at £10 each per annum—£915.

JULY 9.

At the Mart.—By Mr. H. Haines.—Leasehold six houses, Nos. 112, 114, 116, 118, 120, and 134, East street, Walworth-road, producing £168 18s. per annum, term 18¼ years from Midsummer, 1867, and 28 years from Lady-day, 1814, at £11 10s. per annum—£500.

At the Guildhall Coffee-house.—By Mr. Marsh.—Absolute reversion to two third share of the house and shop, 8, Bishopsgate-street Within, expectant on the decease of a lady in her 63rd year—£600.

Leasehold residence, No. 1, Melbury-street, Harewood-square, let on lease at £80 per annum, term 83½ years from 1825, at £16 6s. per annum—£700.

By Mr. Wagstaff.—Freehold three residences, Nos. 2 to 4, Alma-road, St. Paul's-road, Canonbury, producing £152 10s. per annum—£2,350.

At Garraway's.—By Messrs. Stocker and Winstanley.—Freehold property, known as the Nevendon Hall Estate, in the parishes of Nevendon and Basildon, Essex, comprising a residence and about 72 acres of arable, meadow, and wood land—£4,050.

JULY 10.

At the Mart.—By Messrs. Norton, Trist, and Watney.—Leasehold house and shop, No. 44, Aldersgate street, let at £75 per annum, term 21 years unexpired, at £21 5s. per annum—£500.

By Messrs. Rushworth, Jarvis, and Abbott—Freehold timber yard, stable, and sheds, fronting Trinity-street, Rotherhithe, let on lease at £10 per annum—£260.

Freehold house, No. 45, Trinity-street, let on lease at £15 per annum—£200.

By Mr. Frank Lewis.—Absolute reversion to one-eighth share of the sum of £2,425 New Three per Cent. Annuities, receivable on the death of a lady aged 65 years—£100.

By Messrs. Baker and Sons.—Freehold about 5½ acres of land, situate at Harrow on the Hill, Middlesex—£1,050.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Hooker, Croydon, plumber, July 24, at 12—George M'Kerness, Forest Gate, builder, July 21, at 1—Richard Roper, New Cross, and Cubitt Town, house decorator, July 21—William Francis Shephard, Woodford, bricklayer, July 22, at 1—Charles Church, Clarkson street, Bethnal green, builder, July 29, at 11—William Robins, Reform-street, Holloway, builder, July 30, at 1.

TO SURRENDER IN THE COUNTRY.

Benjamin Bottomley, and George Spenceby, Halifax, stonemasons—Charles Davis, Castle Gresley, Derbyshire, builder, July 27, at 11—John Goodall, Stapenhill, Derbyshire, journeyman brickmaker—Thomas Guest, Gornal Wood, near Sedgley, field carpenter, July 23—Jonathan Labram, Northampton, builder, July 18, at 10—Benjamin Lewis, Trecynon, Glamorganshire, contractor, July 21—James Marshall, Hull, builder, July 22, at 12—William Cockram, Witheridge, Devon, carpenter, July 29, at 10—Robert Fearns, Ormskirk, painter, July 24, at 10—George Smith, Thurcaston, Leicestershire, carpenter, July 25, at 10—Robert Smith, Britton Ferry-road, near Neath, mining engineer, July 28.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

August 1, S. Jones, St. James's-place, St. James's-street, house decorator—August 14, T. Borras, Ransford-place, Rotherhithe brick merchant—August 28, E. Hughes, Bushwick, Worcestershire, builder—July 23, G. Griffiths and W. Evans late of Llandudno, builders—August 5, J. Lea, Balsall-heath, builder August 12, F. Woodward, Swindon, builder—August 12, T. Moorcroft, Stapenhill, Derbyshire, carpenter—July 22, W. Daw, Plymouth, carpenter—August 5, W. Munro, South Sea House, Threadneedle-street, railway contractor—July 29, H. Colton, Stratford, carpenter—August 4, D. Higginbotham, Undercliffe, Yorkshire, plumber—July 29, A. S. Butler, Smethwick, plumber.

PARTNERSHIPS DISSOLVED.

Piper and Wheeler, Bishopsgate-street, builders—Jones and Firth, Bradford, painters—South Bank Iron Company, Eston Junction—Elwon and Malcolm, Eston Junction, ironmasters—Hewitt and Co., Coventry, engineers—Wynn and Brown, Portsmouth, engineers—Lewis and Alston, Preston, consulting engineers—Poulter and Co, Waterloo-street, Camberwell-green, varnish makers—Dickinson and Robinson, Huddersfield, brass founders—Engel and Co., Gresham street, zinc merchants.

DIVIDENDS.

July 22, Sir S. M. Peto, Bart., E. L. Betts, and T. R. Crampton, Great George-street, Westminster, contractors and builders—July 22, Sir S. M. Peto, Bart., and E. L. Betts, Great George-street, Westminster, contractors and builders—July 22, Sir S. M. Peto, Bart., Great George-street, Westminster, contractor and builder—July 22, E. L. Betts, Great George street, Westminster, builder and contractor—July 22, T. R. Crampton, Great George-street, Westminster, contractor and builder—July 28, G. Gale, Sherborne, builder—July 21, C. Howell, Liverpool, slate dealer.

DECLARATION OF DIVIDENDS.

W. Hay, Rockingham-street, Newington-causeway, architect, div. 20s.

SCOTCH SEQUESTRATION.

William Kinghorn, Glasgow, joiner, July 17, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11	0	£12	0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0	12	0
,, yellow pine		2	13	4	5	Finland	7	0	8	0
St. John N.B. yellow		0	0	0	0	Memel	0	0	0	0
Quebec Oak, white		5	5	5	10	Gothenburg, yellow	8	0	9	10
,, birch		4	5	5	0	,, white	8	0	9	0
,, elm		3	15	5	10	Gefle, yellow	8	0	10	10
Dantzic oak		4	0	6	0	Soderham	9	0	10	10
,, fir		2	0	3	5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	14	0	20	0
Memel fir		3	0	4	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	3
Riga		3	0	3	3	Pumice Stone per ton	6	0	8	0
Swedish		2	5	2	8	Oils, &c.				
Masts, Quebec red pine		5	0	6	1	Seal, pale	per tun	36	0	0	0
,, yellow pine		5	0	6	0	Sperm body		95	0	0	0
Lathwood, Dantzic fm		6	15	7	10	Cod		28	10	0	0
,, St. Petersburg		8	10	9	10	Whale, Sth. Sea, pale		35	0	0	0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Olive, Gallipoli		68	0	71	0
Quebec, white spruce		13	0	20	0	Cocoanut, Cochin, ton		54	0	55	0
St. John, white spruce		13	10	15	10	Palm, fine		39	10	40	0
Yellow pine, per reduced C.						Linseed		32	0	34	0
Canada, 1st quality.		17	0	18	10	Rapeseed, Eng. pale		35	0	0	0
2nd do		11	10	12	10	Cottonseed		32	0	38	0

METALS.

IRON :—

Welsh Bars in London	per ton	6	5	0	6	5	0	3
Nail Rod	do	7	5	0	7	12	6	
Hoops	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bar, in Wales	do	5	10	0	6	0	0	3
Nailrods	do	7	5	0	7	15	0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	6	net.
Swedish Bars	do	10	0	0	10	10	0	2½

STEEL :—

Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	

COPPER :—

Sheet & Sheathing, & Bolt	per ton	85					0		
Hammered Bottoms	do	97	0	0	0	0	0		
Flat Bottoms, not Hammered	do	92	0	0	0	0	0		
Cake and Tough Ingot	do	81	0	0	83	0	0	3
Best Selected	do	84	0	0	85	0	0	
Australian	do	83	0	0	0	0	0	
Yel. Metal Sheathing & Bods	per lb	0	0	7	0	0	7½	

LEAD —

Pig, English	per ton	21	5	0	0	0	0		
,, Spanish Soft	do	18	10	0	0	0	0	2½
Shot, Patent	do	23	10	0	23	15	0	
Sheet	do	20	0	0	20	15	0	5
White	do	27	0	0	30	0	0	

REGULUS OF ANTIMONY

French	ton	43	0	0	0	0	0		

ZINC :—

English Sheet	per ton	26	0	0	26	10	0	2½
Devaux's V. M. Roofing Zinc	do	26	10	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER :—

On the Spot	per ton	20	0	0	0	0	0	nett
QUICKSILVER	per btl	6	17	0	0	0	0	

TIN :—

English Block	per ton	96	0	0	0	0	0	
do Bar	do	97	0	0	99	0	0	2½
do Refined	do	67	0	0	0	0	0	
Banca	do	94	0	0	97	0	0	net
Straits	do	91	10	0	92	0	0	

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 24, 1868.

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.

TO see clearly what one wants and why it is wanted is the first condition of lasting success everywhere. Nothing permanent can be gained by following an indefinite object in a half-hearted way. Now the singularly shallow and unreal character of much architectural progress among Nonconformists suggests the inquiry whether there is not some first cause of failure here. Have they ever fairly gone to the bottom of the subject, and decided why art is to be desired at all in connection with their worship, how far it may go, and in what direction? May it properly go as far as in a mediæval cathedral, or no farther than in a Quaker meeting-house, or where and why should it stop between the two? When, in short, utilitarian ends have been reached, is it right to spend money at all for the mere sake of dignity and beauty? These questions lie at the very basis of the matter, and influence its treatment more, perhaps, than those who pass them over are aware. The half apologetic tone with which "unnecessary" outlay is still spoken of shows that theory and practice here do not always go together. The old belief has long died out; the new one—if one has been formed—has hardly found expression yet. It is not as temples of the Deity that Nonconformist churches at any rate are built. No faith in their special sanctity gives a motive for investing them with grandeur; and thus the leading principle which governed Jews, Pagans, and Catholics alike has wholly vanished. But is excellence no longer to be desired except for what it will bring? Is it only to be coveted that it may attract a congregation and appear respectable? If so, we may as well cease to look for it; it is not to be won by those who seek it thus.

It is, of course, beyond the province of an architectural writer to show on what principles Protestantism may consistently ally itself with the arts. But that such principles urgently need to be understood, is, perhaps, of all facts, the one which most forces itself on his notice. There is no purpose, no reality, no thoroughness in the present system. A kind of latent feeling that this artistic development may be at bottom indefensible—that it needs excuses—that, after all, it is somehow at variance with the groundwork of Nonconformity—paralyzes every effort. It is not in this hesitating spirit that anything great can be done. This divided mind—swayed one way by the instinct for beauty, and the other by dogmas which seem to contradict it—leaves its own likeness on its works. The case is worth the study of the thoughtful and original of the class chiefly concerned, and to them we leave it. Two or three points, however, are clear enough. First, art is, essentially, a reservoir of *force*. Its main aim is not, and never was, to teach. It may have tried it once, but its strength did not lie in this. Ever since men have had tongues, and far more since they have had printed books, there have been readier ways of stating facts than by representing them in painting or sculpture. The highest use of these—the use of poetry and music and architecture—is to transmit energy, not knowledge; to call forth the motive power for action, to arouse the feelings and the will, and raise the soul to that glowing heat in which alone it receives durable impressions. Unless the forward impulse be too strong already; unless the present age is too enthusiastic for all worthy ends, and only needs the restraint of reason; we can hardly afford to neglect so powerful an agent. Again, those who talk of external influences as a trifle, contradict every day's experience. They *must* be felt, even in connection with our worship. The only question is, whether they shall be harmonious or discordant, elevating or debasing. People may doubtless be found so sublimely indifferent to externals, or so insensible by nature, as to borrow their hymn tunes from the music halls. Their practice does not commend itself to the general understanding, but it is precisely parallel with that which sanctions meanness and vulgarity in religious edifices. As to "unnecessary outlay," it would be hard to show why the cost of mental culture is more unnecessary than that of bodily comfort. Its object is infinitely higher, its results more widely spread and more lasting. Yet men who spare no expense for personal gratification and display cry out, "Wherefore is this waste!" over every building which makes a permanent addition to the beauty of the world.

It is assumed, then, that architectural excellence is worth having; that there are other grounds for it besides the tradesman-like one of its being attractive. But what form of excellence is possible in Nonconformist churches, and in what direction is it to be looked for? Where it is *not* to be looked for—in the imitation of buildings materially different in purpose—is sufficiently plain. The first necessity is that of honesty—thoroughness—distinct avowal of all the facts of the case, and scorn of all disguise. For a design even to become interesting, much less impressive, there must be a transparent simplicity and directness about it. The vulgar idea is just the opposite of this. To make a row of houses like a "plaster palace," and a galleried chapel like a church with nave and aisles, are what it takes to be triumphs of genius. The truth is, they are only the expedients of an unimaginative mind. The real artist would make his houses beautiful mainly by bringing out every feature peculiar to them *as* houses. In his galleried building he would emphasize above all things the galleried arrangement and whatever specially pertained to it. Far from seeking to hide away such characteristics, he would make them the salient points of his work—the problems he most delighted to study. In his hands they would be the germ of new forms of beauty; forms perhaps which no ordinary church would admit of. To him the difficulties of a feebler workman would be precious opportunities for something fresh and striking. It is only the man of no invention who is driven to mask new forms in the semblance of old ones; to copy and disguise because he cannot originate. And how wearisome is the monotony which his system produces, Belgravia and Bayswater may witness. Unfortunately, however, it is not confined to miles of stuccoed fronts in uniform patterns. Church architecture has had its full share of the curse, and Nonconformist architecture the most of all. Till it is freed from this, there is no possibility of its rising towards the perfection of which it is capable; and those who really wish well to its future will scarcely complain of any attempt to break the chains which are hindering its development.

The first principle to be applied, therefore, is one familiar enough in theory, however it may be forgotten in practice: that the leading forms of every building should naturally rise out of and express its purpose, its uses, and its structural requirements. These things in each case are among the terms of a problem which it is the architect's business to solve; his design should be the perfect solution of it. If the design does not thus solve it, but only to a careless observer seems at first sight to do so, it is not an honest or meritorious work in any sense. What, then, are the general uses, purposes, and structural requirements of a Nonconformist church? It is intended for worship, usually not liturgical—for worship of the simplest kind, almost devoid of ceremonial, and quite foreign to all ideas of sacerdotal power, and of the sanctity of places and things. To this worship, preaching is a most important adjunct. The preacher, too, must be heard distinctly from beginning to end of the service, not in the sermon merely—for the aid of a formal liturgy is wanting. The prominence given to preaching often makes it desirable to accommodate a very large audience, far larger than is usual in a parish church. When people meet chiefly for worship, and especially for worship in a prescribed and familiar form, there is nothing in that fact to make it preferable for them to occupy one large building rather than several smaller ones. But if the sermon becomes a chief feature in the service the case is entirely altered. As long as particular speakers have the power of attracting crowds to hear them so long large churches will continue to be needed by those who advocate preaching. There is, moreover, another reason for this enlargement. Amongst unendowed churches, such as those of Nonconformists generally, one large congregation works with far more ease and success than two or three of a less size. Every unit added to the congregation is an increase of strength without a corresponding increase of working expenses, and hence, if this were the only ground for it, the utmost practical accommodation would naturally be desired. For these reasons there is a certain point at which galleries become inevitable, and in practice they are commonly resorted to long before this point is reached. There is no difficulty in seating 1,500 or perhaps even 2,000 persons on one area, so as to bring them all within range of an ordinary voice. But it is so much cheaper to place a part of them in galleries, and they can thereby be grouped so much more closely round the speaker, that this extreme limit is seldom approached. Galleried buildings, then, are not likely to be altogether superseded. If they were, the great puzzle of Nonconformist architecture would be at an end. To design a one-storeyed church adapted for preaching in and artistically good is not an every-day performance, but it is easy compared with the other one. We will notice the hardest class first.

Probably the commonest of all forms of chapel, and a form so common that it seems almost typical, is that given at the head of our illustration. There are all sorts of slight variations on it, but the general principle is faithfully represented here. It is a wide, oblong building, with a pulpit or platform at one end, and a gallery at the other end and down both sides. If each side gallery contains three rows of seats, and a passage behind, it will of necessity be 12ft. or 13ft. wide. This being assumed, the width from wall to wall cannot be much less than 50ft., and would be better considerably wider. In much the most frequent arrangement, and the one to be treated of first, this span is covered by a roof unbroken on the exterior. The gallery columns may or may not be carried up to support it within. The side walls are generally low, for the sake of economy; the roof of any pitch, but frequently of a very steep one. The internal length is sure not to be great—about 80ft. will be a fair allowance for the width assumed. The general shape of building thus arrived at—which is that adopted in a very large number of cases indeed—is surely one of the most ungainly it is possible to conceive. Wide, short, and low, it is about as opposite in character to a mediæval church as anything can be. One may go further and say that it is about as destitute of beauty in form as any object can be. If economy forbids to it suitable height, and the least picturesqueness of skyline, let it have the grace to keep itself as much out of sight as possible. As an ugly piece of necessity it may, perhaps, be pardoned; till it altogether transforms itself it can never be admired. Unfortunately, however, the usual plan is to disguise some portion of it rather than to improve the whole. It is decided, perhaps, to make it Gothic—a very wise choice, for Gothic admits of the utmost freedom of adaptation, and shines in barns as well as in cathedrals. But there is a wide-spread notion among Nonconformists

that Gothic *must* be aspiring and vertical; and so, in spite of nature and facts, the aim is to make this galleried church look narrow and tall. But the main lines of a galleried building are inevitably horizontal; the roof, we are now assuming, is unbroken; and so begins the pursuit of "Gothic" under difficulties. The true course would be to remember that style should be modified by circumstances, not circumstances by style. There is no reason why a building should be made to appear specially vertical in character if its actual nature is otherwise. Make it honest and artistic first, and let it take its chance whether it suits the popular notion of Gothic afterwards. The architect's wisdom will be shown not in repressing but in developing the strongest tendencies of his subject. The custom, however, is too often to begin at the other end. To give verticality to the whole of such a building as that just described would, indeed, be an impossibility, but a lofty-looking front is easily contrived. The two elevations (figs. 3 and 4) show a common way of obtaining it. A turret is put over one of the gallery staircases, and a little bit of sham aisle over the other. In this way half the width is got rid of, and the centre gable runs up as tall and narrow as can be wished. But this arrangement can only exist for a few feet in depth. The barn-like chapel stands behind it in its native uncouthness—architecture does not extend so far back as that. A row of buttresses with windows between them may, perhaps, adorn its sides, or a few gablets may be added above, but when all this is done, two objects more totally contradictory in expression than the chapel and its front could hardly be brought together. Something more than decoration is wanted to bring two such discordant masses into harmony. The main building is heavy, wide, unbroken, and horizontal; the front is all breaks, angles, and vertical lines. The one is the extreme of utilitarianism and monotony, the other runs riot in its search for the picturesque. How can two such incongruous parts possibly make one harmonious whole? Does it really need argument to prove that a Gothic barn, with a slice from a small cathedral attached to one end of it, is not an admirable work of architecture?

It is true that a scheme for improving the form of the principal façade need not in itself be objectionable. It need not, and does not in all cases, contain so much of the element of sham as the instance just given. But the misfortune is that it so often absorbs all the care of the designer, while the real building is left alone as a subject too difficult to deal with. The same poor expedient, with trifling variations, recurs, it may safely be said, in two Nonconformist churches out of every three that are built. It seems as if they could not be contrived without it: as if this very easy device were supposed to meet all the difficulties they present. We have selected half a dozen out of an almost countless multitude of instances. They show different modes—some better and some worse—of reaching the same end, the narrowing of the front gable. This accomplished, further effort ceases. A "front" has been secured, which, from some one point of view, will appear fairly proportioned. The actual chapel is left in its native shapelessness—a "preaching-shed" with an ornamental end to it. It may be as plain as the chief elevation is elaborate, or they may both be adorned alike, but the striking discord between them is hardly more conspicuous in one case than in the other. In fig. 5 the narrowing is accomplished by bringing the centre of the building a few feet forward, and placing a tower on one side of it. In fig. 6 a lean-to roof covers the staircases at a low level. In 7 and 8 the staircases project beyond the chapel on each side, and have gabled and hipped roofs respectively. No. 9 employs a tower on one side and a turret on the other, as fit appendages to the barn behind; while No. 10 tries to keep it out of sight by two towers and an apse in the middle. Dozens of other slight variations might be found on this well-worked theme; but these are enough to illustrate the principle. Some of them, as 5 and 6, are harmless enough in themselves; others, again, might not be out of place in an elaborate and picturesque building, though verging on the ridiculous where they are. There is, of course, no reason why the staircases should not be made a distinctive feature in the building. On the contrary, it is much to be wished that they were treated more characteristically than they are. There is no special objection to putting them, in certain cases, in the angles of the front, and keeping their roofs above or below the main one. The absurdity lies in stopping here; in being satisfied with this easy expedient as the beginning and end of the external design. To take a building with the shape and proportions of a barn, and fancy that by putting a turret on each side of the front it becomes an architectural success, is almost too childish a notion to be seriously defended. Yet, as far as general design is concerned, this is all that is attempted with a great number of expensive and ornate Nonconformist churches. Is it not obvious enough that such "fronts" cannot be of a piece with the rest of the chapel: that they are out of keeping with it, and are, more or less, mere screens or disguises to it? The design is not treated as a whole, nor rendered satisfactory, as it should be, from every possible point of view. The difficulties of making a wide, low building effective are not really grappled with. They are only kept a little out of sight in the most conspicuous part, to appear, totally unconquered, everywhere else. But though this is the case, it would be quite unfair and absurd to put every instance of such a treatment on the same level. All grades may be found, from the cheap grandeur of No. 3 to the unobtrusive simplicity of No. 6. The latter is so plain throughout that want of harmony is scarcely, if at all, perceptible. In the former the contrast between back and front is almost as offensive as such a thing can be. The great want here is that of thoroughness. To carry the work through on one scale, to make it, whether more or less costly, honest and consistent in every part, is one of the most indispensable conditions of impressiveness in architecture. With buildings as with men, honour in the long run rests with those which will bear looking at all round, not with those which carry all their virtues in their face.

NATIONAL PRIZES, SOUTH KENSINGTON.

THE annual exhibition of models and drawings from the Local Schools of Art in competition for National Prizes is now on view in the competition room at the South Kensington Museum. The number of competitors is above the average, the figure of merit is rather below. The professional examiners for the year are Messrs. Maclise, Horsley, Westmacott, Redgrave, and Leighton, the official inspector being Mr. H. A. Bowler. The prize list includes ten gold medals, distributed as follows:—One medal for the best study from the antique in chalk or monochrome; one for the best study of the figure modelled from the antique; one for a group of still life from nature in colour; six for the best designs in three classes—architectural design, surface design, and plastic design; and one medal for a work of a class not included under these heads. Twenty silver medals are given to the second best works, and fifty bronze medals to meritorious works in any of the various subjects of study. Good boys also receive books. The influence of the grant annually voted by Parliament for the purposes of science and art, though not all that was expected, is greater than the exhibition of competing designs would lead many to imagine.

In many a village school the grant of one shilling for every child who gives satisfactory proof of having been taught drawing, an additional shilling for every child showing proof of proficiency, and another shilling for every child who may excel, represents much more than its money value. It is neither possible nor desirable to make artists of an entire population; but it is very important that everyone should be able to make an intelligible diagram or explanatory sketch with a piece of chalk or a bit of charcoal. If the art schools do nothing more than this they will have effected much. The space at the disposal of the authorities is not too great, and the drawings have to be hung on hinged screens; a consecutive arrangement has, therefore, not been perfected. The South Kensington authorities, for convenience, divide the branches of study into "stages," which are numbered. These we will proceed to notice, not in the succession of numbers, but in the positions they occupy on the walls or screens.

For modelling the human figure or animals, stage 19, the national gold medal has fallen to the lot of Edwin Mullins, Lambeth, carver. This is an *altorelievo*, almost equivalent to a detached statue. The gold medal has been well awarded. Edwin Mullins, carver, should, with ordinary fortune, become Edwin Mullins, sculptor, R.A. A model of the same subject, Hercules, in his Van Amburgh character, by W. Kirkman, age twenty-four, South Kensington student, obtains the silver medal. A student in the art of modelling would do well to examine these two representations of the same subject. The latter has more finish but less power, more modelling but less sculpture. Of the other statuettes little can be said. They are smooth as a worn-out cast hawked about the streets. A Venus of Milo, by Miss Caroline Nottidge, age twenty-two, South Kensington student, is the best of the unrewarded statuettes. Miss Ayres, of Bristol, student, contributes a bust of Clytie, and obtains the silver medal. Of the other specimens we can only say that they are so bad that it is to be regretted they should ever have been exhibited at all. A classical subject, by Alexander Stevens, of Lambeth, is the best. Stage 20—"Modelling fruits, flowers, foliage, and objects of natural history, from nature." Here we reach a very low degree of art. The modelling is very good, but is of no use when it is done. If a *fac simile* model of still life is wanted, there are many ways of obtaining it. Gutta percha is known to scientific men, isinglass can be bought in the market, and the plaster which is commercially known as gypsum can be procured. Why, then, all this modelling of dead ducks? A *fac simile* model of still life is an abomination. The specimens exhibited are a duck suspended by the heels, a partridge similarly placed, and a snipe. The additional water melon, pine apples, plums, grapes, and damsons are certainly round, and show modelling. In the days of our youth we were in the habit of making marbles, as they are called, of clay. These we rolled in our hands until they assumed a spherical form, when they were, by favour of the cook, allowed to bake at the kitchen fire. These products of art workmanship were never truly spherical, and for purposes of marble playing were valueless, in the same degree as these *fac simile* models of natural objects are valueless for art purposes. It will be enough to say that the national silver medal is given to a duck and game bag with a powder flask in the background. The artist is J. Henk, Stoke-upon-Trent, age twenty-one. The bronze medal falls to A. Bentley, age seventeen, Stoke-upon-Trent—the subject, a lot of vine leaves and grapes too much relieved. Any one can get a *cast* of a bunch of grapes or a few leaves. A realistic treatment of natural objects in this class is fatal to art. In fact, no artist ever so treats them. In this stage there are two panels by youths of Birmingham, aged eighteen—Messrs. Thompson and

Markland—which are well modelled. The drawings for architectural ornament are not up to the mark of last year. Mr. Paul Loocke, of Hull, aged twenty-one years, has obtained the gold medal. The stage is 12—"Painting ornament from the cast." His drawing is the best exhibited. The same subject, the "Trajan Frieze," by W. Sambrook, of Hanley, house painter, is nearly as well rendered. Mr. Sambrook obtains the national prize of books.

Prizes have also been awarded to Miss James, of Sheffield; Mr. J. Nunn, St. Thomas Charterhouse; James Brodie and Jared Reckie, of Edinburgh; and Mr. Boyes, of Bradford, for drawings of fruit and flowers suitable for architectural design. These are but copies, and show merely skill in drawing, none in design. Why not give prizes for wax models of the same? The mechanical skill is greater in the latter case, and the resemblance to nature is the closer. The bronze medal in this class falls to J. Robinson, of Edinburgh, aged seventeen. For the stage 16a, figure drawing from the cast, E. M. Bancroft, of Manchester, age twenty-one, subject the Laacöon, obtains the bronze medal—national bronze medal. Mr. J. Somers, eighteen years of age, Hull, obtains the national gold medal in stage 12a, which means a monochrome, either in oil, water colour, or tempera. In this neighbourhood may be seen about twenty examples of bad teaching gibbeted on a screen. The names of the masters of the local schools are not mentioned, but the lesson is supposed to be inculcated. A very bad lot of drawings are thus exposed. It is plain that no teaching can be worse, and the committee are right in exhibiting the results of the indifferent teaching which prevails in some of the local schools. Of these there are twenty examples, including drawings from the antique, portraits in oil, still life, and even lace patterns. Our limits will not permit, on the present occasion, a more extended notice, but next week we hope to review more fully the various objects in the national competition, more especially those which are connected with architecture and architectural decoration.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

FIFTH NOTICE.

GERMAN, FLEMISH, AND DUTCH PAINTINGS.

IN Gallery C we have a large and important collection of the works of artists who may be classed as representing the above somewhat divided, yet united, schools of art—a group having a common sentiment, yet varying much in their individual modes of expression. Commencing with the works of John Van Eyck, in the earliest years of the fifteenth century, it extends itself through a long chain of artists down to the commencement of this, the nineteenth. Embracing occasionally some who, forsaking the traditions of their fatherland, have sought to impress upon it the generally predominant feeling of Italian art, their labours have been such as only to individualise their works, for the feelings of the Teuton and the Latin races have ever been so widely divergent that it has always been impossible for the same Art language to adequately express the ideas of both.

The school of Germany, for by this generic name we shall include them all, influenced very largely the history of art in Western Europe, and from it the early schools of both France and Spain derived much of their vitality, and to it our own owes its existence. Moreover, its principal distinction, that of painting in oil, changed the entire course of Italian art itself. Of the earliest efforts of this school we have nothing here, for of all early art expressions there is, as we have before remarked, a singular absence at Leeds, nor is it until we come to the establishment of oil painting as its chiefest medium, and the name of John Van Eyck as its chief exponent, that we find here any record of art growth amongst the Tenton nations.

The humid climate of Germany soon showed that the Italian mode of painting in tempera or fresco was unfitted for the decoration of its buildings, and that some repellent, rather than absorbent, medium was a vital necessity to the existence of the art itself. With the demand, as is ever the case, came its supply, and from the painting of woodwork to preserve it, and the search of siccative admixtures to enable this to be done quickly, the painting of pictures in oil arose, and amongst the most successful applicants of this new medium were the brothers Hubert and John Van Eyck. Hubert was an artist and a chemist, and to his training and experience John owes his instruction, for Hubert was twenty years his senior, and it is more owing to his greater opportunities than to his greater merits that the fame of the younger has eclipsed that of the elder brother. Being attached to the household of Philip the Good, Duke of Burgundy, by the title of his "varlet de chambre," and being employed by him not only in artistic but in diplomatic pursuits, John's reputation and knowledge were much increased, to the spreading abroad not only of his fame but also that of the German school of art.

To him three pictures here are ascribed, and there is but little doubt but that to two of these his name is rightly given; whilst the third has, from the days of Walpole down to those of Waagen, been accepted as a genuine example of this master. This doubtful picture (501) is called "The Installation of Thomas à Becket," and purports to have been painted for the Duke of Bedford, Regent of France, at the end of the reign of our Henry V. There is much in support of this tradition, for the Duke of Bedford was son-in-law to Van Eyck's patron, the Duke of Burgundy, and the picture bears upon its back the inscription, "Johes de Eyck fecit ano MCCCCXL, 30, Octobris," an inscription which, if true, would be very important, as giving the earliest date known of this artist's signed works. Yet, in spite of all this corroborative testimony, the picture confutes it, as the architecture of the building is of much later date than Van Eyck's time; the symbol of the Holy Spirit, the label, and the mitre are all of later character than those which existed at the time the picture is supposed to have been painted, and if by Van Eyck he must have been the earliest and greatest clairvoyant known. What Van Eyck's work really was and what was the style of the architecture he introduced into his paintings is seen by referring to Mr. Hope's beautiful specimen of this master (No. 521.) Here the Blessed Virgin stands in front of a Gothic niche of elaborate detail and exquisite drawing, clad in a deep red robe, whose folds fall in the more graceful manner his earlier works exhibit rather than the stiffer and more angular one he afterwards adopted, and which, in a caricatured form, became in later times so marked a feature of the German school. The Divine Infant clasps his mother lovingly round her neck, and the work is one of great sentiment and merit. One of even finer finish, however, exists in No. 533, now belonging to the Duke of Devonshire. This is erroneously styled the Virgin appearing to St. Bruno; it should, however, be St. Bernard, and not St. Bruno, as the latter was not decreed to be a "Beato" until a hundred and fifty years after Van Eyck's death and was not raised to the full rank and title of a saint until so late as 1623; consequently, devotional pictures of this individual were not likely to have an existence in Van Eyck's day. St. Bernard, that "sweet singer of the praises of Mary," kneels under an open and arcaded loggia on a height overlooking a town, whose variegated roofs, towers, and spires are seen through its archways, and a rolling landscape of wonderful aerial quality melts away into the horizon of the far distance. St. Barbara attends the founder of the Cistercian order, and presents him to the Blessed Virgin, who holds in her arms our Infant Lord. He stretches forth a tiny right hand to give his benediction to the saint, and holds in the left a crystal orb. The amount of finish and truthfulness of execution of this small picture, the size of which is only about 5in. by 4in., is something marvellous and incredible, rendering it one of the most wonderful productions of any school we have ever seen. By Hubert Van Eyck's scholar and John Van Eyck's fellow-pupil Gerard Van der Meire there is a fair Marriage of St. Katherine (512), and to Rogier Van der Weyden is ascribed a most interesting triptych from Mr. Heath's very valuable collection. The central panel is occupied by a deposition from the cross, and the two side wings—which, however, do not belong to this centre—contain illustrations of the finding of the cross by St. Helena, and its recovery and restoration by the Emperor Heraclius after it had been stolen by the Persian King Chroses, in 614, when he sacked Jerusalem. We are hardly inclined to accept these as the veritable work of Rogier, but should attribute them to some pupil of his school.

Another very interesting early picture here is by Hugo Van der Goes, also a pupil of Hubert Van Eyck, and (517) representing the installation of, and certain scenes from, the life of St. Augustine, a subject Van der Goes would thoroughly enter into, as his unrequited love for Jacob Weyten's fair daughter drove him to seek peace and consolation under the garb of an Austin Friar. The picture, though structurally not a triptych, is pictorially arranged as one, and is particularly noteworthy for the representation of a remarkably fine folding retable, which stands upon the high altar, in front of which the ceremony of the saint's installation is taking place. The thuribles, holy water vat, asperges, and other ecclesiastical instruments are all as well worthy of study as the picture itself.

Wohlgemuth, the tutor of Albert Durer, and the supposed designer of the woodcuts which adorn the celebrated *Nuremberg Chronicl*, is represented here by a picture of most elaborate workmanship, and of ultra pre-Raphaelite character—pre-Raphaelite, that is, in the modern acceptation of the term, for which we would rather substitute the title pre-Rubensite, for the tendency of this school has always been more to the hard material objectivism of the early German rather than the subjectivism and spiritualistic aims of the early Italian school. The subject here is a compound one, representing some of the events of our Lord's Passion, and probably formed a portion of an altar triptych, which included the whole. The principal event depicted upon this is that which gives the name, "Pilate Washing his Hands," to the picture. As an example of high finish and low art it is worthy of imitation in the present day, and the seared and scarred face of the villanous executioner is sufficiently horrible and true to life in its most repulsive form to commend itself to Mr. Madox Brown and his *confrères*. As a work of the painter it is very admirable, but as a work of painting it is very painful to contemplate, and, in its close imitativeness, provokes a quotation from old Cornelius Agrippa, who, in his "Vanity of Sciences," says, "Painting is a monstrous arte, but very studious for the counterfaiting of naturall things."

By Hans Hemling we have several works, one of the most important being a remarkably fine triptych from Mr. Heath's collection (515), the central subject representing the deposition from the cross, and the side wings containing effigies of St. James and St. Christopher.

Of Mabuse we have a magnificent example in Mr. Napier's "Adoration of the Magi," of which it is quite impossible to speak too highly—the marvellous richness of the accessories, the quaintness of the architectural background, and the sparkling effect of the

whole, rendering it one of the brightest gems of this gallery. It is arranged as a triptych, and on its wings are the Blessed Virgin as the Regina Cœli, and the Descent of the Holy Spirit at the Feast of Pentecost. In this artist's works we begin to trace the first symptoms of the introduction of the Italian spirit into German art, a change we shall see more prominently developed in Bernard Van Orley, to whom six works here are attributed, the best of which will be found under the number 537. This is a remarkably good example of the union of the two styles, and represents the Holy Family seated in a garden, having on one side a Gothic fountain of pleasing design, and on the other an Italian portico. The drawing is admirable, and the tone rich and luscious. In Mr. Cholmondeley's "Adoration of the Magi" we see this struggle of the two elements rather curiously developed, even to the costume, for St. Joseph carries in his hand a straw hat of ordinary Tuscan type, whilst Balthazar, the negro king, bears upon his sable head the bright red headgear of a German baron. To Quentin Matsys is ascribed one of the innumerable "misers" or "money changers," which we so frequently encounter under his name, but which we can so rarely with truth assign to his hand. This (558) we are inclined to believe to be the work of his son John, who rather traded upon his father's reputation.

Albert Durer has been very badly used by the namegivers here, and three pictures claim to be by him, none of which, however, show anything of his spirit. One, it is true, is a copy from his woodcut of the Death of the Virgin, and comes from the Liverpool Institution, a fact which is of itself almost a proof that it is not an original, as so few rightly-named paintings exist there. Another is a very brilliant and curious work of South German character, but does not exhibit any of the peculiarities of this great artist. The artist-friend of Martin Luther and Melancthon, Lucas Cranach, is here represented by one of his nude studies, which, from some cause or another, has acquired the title of the 'Artist's Wife." A smaller replica of this exists in the Berlin Gallery, and, if we recollect rightly, is so called there also. This bears upon the rim of the fountain in front of which the lady lies the crest of the painter (for he was a noble, and entitled to bear arms) and the date, 1534, and is a work of great merit. Far otherwise is a wretched French copy here, named after him, and which, if truly so, would go a long way to prove that the birth of Protestantism was the death of religious art. The subject is "The Woman Taken in Adultery," and the lady looks as though she rather liked it. The painting is poorly and flatly trowelled on, and is almost too impudent an imposture to deceive anybody, excepting, perhaps, its owner. Perhaps Cranach's highest fame is to be derived from the fact that he was the founder of the first printing press established at Wittemburg, whence was issued Martin Luther's bible, illustrated with woodcuts by the artist proprietor, and many other works, now of the greatest rarity and value. This brings us down to the day of Holbein and the connecting point between the art history of our own country and that of Germany, whence for a time we can carry on the study of the German school on our native soil. Hans Holbein is a name dear alike to the artist, the antiquary, and the historian, and the works bearing his name are numerous at Leeds, far more numerous than his paintings, for we have some copies, some works that are like Holbein's style, by contemporary artists of lesser note, and some that we are quite at a loss to divine why the name of the Augsburg painter was given to them at all.

One of the most puzzling curiosities here in the way of nomenclature is a portrait bearing the name of "Tho. Cromwel, Æt. Ano Dni 1515." Now inasmuch as Holbein was not in England until 1526, and at the age of fourteen Thomas Cromwell, the future Earl of Essex, was only emerging from the blacksmith's boy of Putney, it is not probable he went to Basle to have his likeness taken. There are two other portraits here of him, attributed to Holbein, but both, we think, are copies of an older and engraved picture, and do not give us the character of a man who could rise from being almost the lowest to the very highest subject of so changeable and imperious a monarch as King Henry VIII. Of his uxorious majesty we have one of the ordinary flat stock portraits usually attributed to Holbein, but which were undoubtedly made in large quantities "wholesale, retail, and for exportation;" and of his son, Edward VI., we have one which must have been painted after Holbein's death. This occurred, not, as has been popularly supposed, in the plague which devastated London in 1554, but some eleven years earlier, and when the young prince could only be about five years old. A more genuine specimen of his craft will be found in No. 530, which is the portrait of Archbishop Warham, a replica of that in the Louvre, but hardly equal to it. It is the semblance of a man worn and tired with life's battle, which must have been no ordinary strife in those days. The processional cross it grieved him to see carried before the Cardinal of York is on one side, and the mitre he was soon to resign to Cranmer on the other, and the effort to keep his own head on his shoulders in those days, when they seemed so loosely attached to the body, must have been a trying one to any man of eminence. Thomas Howard, Duke of Norfolk, is here twice represented, once by Holbein, and in a copy of this same portrait, by Sir Antonio More; but one of the finest portraits here is that known as "Sir Henry Guildford," from Windsor Castle. It is a good, well-painted picture, but has suffered somewhat cruel usage at the hands of the cleaner and restorer. The green background is cleverly broken up by a spray of fig leaves, not ivy or vine, as Mr. Wornum thinks, and which throws up the figure in an admirable manner. The Duke of Devonshire sends a charming little portrait specimen, like so many others, unknown. It is a red-bearded, angular face, of great character and most admirably modelled, being one of the finest examples of the master we have seen. Many of the other paintings ascribed to Holbein here are doubtful, though some of them are excellent pictures, but of some we wonder how any could so far and so blindly deceive themselves as to hang them on their walls with such an ascription.

Lucas de Heere, who visited England in the reigns of Mary and Elizabeth, is represented by one poor specimen, and his contemporary, Sir Antonio More, by but one genuine one and some few doubtful. His portrait of his Royal master—Mary's husband—is a very fine work, and the proud, scornful face of Philip is excellently painted. Sir Antonio resided in England all through the reign of Mary, having been sent by Philip to paint her portrait before he ventured over himself, and it is stated that not only his pencil, but his pen, was largely employed on Philip's behalf during the artist's residence here. On Mary's death he returned to Spain, and soon after lost, by a practical joke, his Royal master and nearly his own life. The king, as our article on Spanish painting will have shown, was a great patron of art and artists, and amongst his most favoured was Sir Antonio. One day the king visited the painter and familiarly placed his hand upon his shoulder, when the indiscreet fellow, with a want of tact truly artistic, dabbed a large bladder of carmine on it; the courtiers shrank with horror at the irreverence, the king was wrath, and More had to make a speedy exit from Spain to save his life. The supposed copy by him of Holbein's portrait of the Duke of Norfolk we have before referred to, and there is attributed to him a poor copy of one of Bronzino's innumerable Medici portraits, and we should be inclined to ascribe to him that much repainted head called "Geronimo Deodato" (No. 563) now claimed as a Holbein. To another Flemish portrait painter who found a home in England, Paul Vansomer, we owe the very excellent portrait of Francis Bacon, philosopher, statesman, and Lord Chancellor of England, and this brings us down to the day of that prince of painters, Peter Paul Rubens, a notice of whose works we must reserve for another article, for the works of the artists of the German, Dutch, and Flemish schools are very numerous at Leeds, and it is so rarely that we have an opportunity of examining so large and good a collection that we find it impossible to include even its chiefest merits in the space we can this week devote to it.

LINCOLN CATHEDRAL.*

GEOMETRICAL PERIOD.

THE introduction of tracery in the middle of the thirteenth century caused a rapid and complete change in the appearance of buildings. It arose from the practice of perforating in various ways, the spandrels of arches and the solid stonework lying between the heads of contiguous Lancet windows. Of this practice and of its progress through the Lancet period we have excellent examples in Lincoln Cathedral. In the plain circles, trefoils, and quatrefoils, with which the solid stonework above the snb-arches of the blind-storey of the choir and east transept of Bishop Hugh is perforated, we see an early and a somewhat clumsy effort to relieve this blank space. In the nave three foiled openings more completely occupy it; and in the noble wheel window of the north transept so entirely is the large plate of stonework which fills the circle pierced that but small portions of solid stone remain between the circular voids. To call this a traceried window, however, would be a mistake. The principle of tracery, which consists in the conversion of the whole of these intervening portions of stonework into moulded bars, is wanting. This is the invention, then, which, applied in circular forms to the windows of the succeeding period, forms its chief characteristic.

1. Of the noble series of monumental works which were constructed in England during this Geometrical period one of the earliest and certainly one of the finest is the presbytery of Lincoln Cathedral. Designed, as we know it to have been, about the year 1256, at the exact moment when Gothic architecture, in its chief forms, its sculpture, its carved and moulded work had reached its highest development, it exhibits in every part a refinement and elegance, as well as a delicacy of finish in its minutest details, to which it would be difficult to find a parallel in the whole range of Gothic art. To attempt to describe to you its varied beauties in the short space of time at our disposal would be a vain effort. I can only hope to point out a few of them as we pass through the building this afternoon. I cannot, however, pass over without notice its chief and most characteristic feature, its glorious east window of eight lights, confessedly the finest of its kind in the kingdom; which, occupying, as it does, the entire east end on the inside, and worked out, as it is, with a wealth of deeply-moulded detail of surpassing excellence, may be looked upon as the crowning work of the singularly beautiful building, of which it forms the termination and chief ornament.

This building, commenced, as it is reasonable to suppose, immediately after the granting of the royal permission to remove the city wall in order to permit its construction in 1256, was so far finished in 1282 that Bishop Hugh's shrine was transferred into that year.

Among the remaining works of the Geometrical period may be noticed—

2. The stone screens of the choir on the east, north, and south sides. They were probably all commenced soon after the completion of the presbytery. One of them, on the north side, has, on its aisle front, an arcade of circular foliated tracery so exactly similar to that of the aisle arcade of the nave of York Minster, and is finished with straight canopies carrying mouldings, crockets, and finials, so identically the same, that it is

* Lecture delivered to the Members of the Lincolnshire Diocesan Architectural Society at their Annual Meeting at Lincoln, on Wednesday, June 17, 1868. By Edmund Sharpe, Esq., F.R.I.B.A. Continued from p. 483.

scarcely possible to suppose that they were not designed by the same hand.

3. An Easter sepulchre on the north side of the choir, with figures and carved work of great excellence, belongs also to this later Geometrical work.

4. It was not until the middle of the Geometrical period that the stone carvers of the middle ages began first to imitate in their works the foliage of nature. The period is thus divisible almost equally into two portions, early and late—during the earlier of which the carved work was of *conventional* design, and during the later in imitation of *natural* forms. In the Presbytery the capitals not only of the piers but of all the host of minor shafts, carry foliage of the most elegant conventional type, consisting of curled leaves of the most varied outline, but all designed in the same spirit.

In the passage leading from the north eastern transept to the cloisters, and in the cloisters themselves, we have an opportunity of contrasting this new fashion of carving, introduced about the years 1280—1290, with the old: the capitals of all the shafts of the tracery of these two later geometrical works having natural foliage only, chiefly in imitation of the oak and the vine leaf. So much as remains of this cloister is in other respects an interesting example of the works of the second half of the Geometrical period.

5. Whether the central tower, of which the two lower storeys remain, was ever carried higher, we have no record, and no present means of knowing. What is certain is, that its noble upper storey, belonging to the latter part of the Geometrical Period, must have been commenced about the year 1306. It is justly reckoned one of the finest central towers in the kingdom, and groups as grandly with the two smaller western towers as the central spire of Lichfield Cathedral does with the two subordinate western spires of that building.

CURVILINEAR PERIOD.

1. Whether or not all may be disposed to agree that the progress of art, from the point at which we have now arrived, was in a downward direction, and that the decay into which church architecture fell at the close of the Rectilinear period, dates in its earliest beginnings from the time when natural foliage was introduced into the ornamentation of buildings, and flowing tracery into their windows, it cannot be denied that, in one respect, the builders of the two latest periods surpassed their predecessors. The graceful finish of the upper walls and gables of by far the greater part of our cathedral and parish churches, of whatever date, is due to the panelled and pierced parapets and crocketed pinnacles of the Curvilinear and Rectilinear periods. Of this we have notable examples at Lincoln, the earliest of which occurs in the panelled parapet of the west front, which crowns so appropriately the earlier work below. To the same date belongs the flowing pierced parapet of the south clerestory of the nave, with its Curvilinear pinnacles marking the limits of each compartment. Following this parapet westwards we arrive at the west wall of the south transept, along which this open parapet of flowing tracery is still continued.

2. The chief work of this period, however, was the remodelling of the south front of the south transept. This work consists of a large circular window corresponding with the rose window of the north transept, and filled with flowing tracery of Flamboyant character, of a large five-light window above, and of a pierced parapet of flowing tracery to the gable.

3. It is not improbable that this work is due to the Burghersh family, one of whose members was Bishop of Lincoln from 1320 to 1340, during the time, in fact, that it must have been executed. This supposition is confirmed by the circumstance that a chantry belonging to this family was founded at the east end of the north aisle of the presbytery, one side of which was formed of the tombs of Lord Burghersh, the founder, who died in 1356, and of his brother, the bishop, who died in 1340, which are both very interesting monuments.

4. The last works of this period were the two canopied tombs at the east end of the presbytery, under the last pier-arch on the south side. They are, although late, of very elegant workmanship, and were probably erected during the lifetime of Lord Cantilupe, by whom the adjoining chantry is said to have been founded, but who did not die until 1372.

One of the most elaborate and admirable screens of any that exist, designed in this style, is to be seen in this cathedral, under the east arch of the crossing, and serves at present as the organ screen. It is stated by Wild to have been constructed in the year 1775; but it is scarcely credible that so excellent a work is due to a period when Gothic architecture was so little understood and appreciated. It is probable that it is a very careful and accurate restoration of an existing work of undoubtedly great merit, and that the greater part of what we see belongs really to the earlier part of the Curvilinear period. It deserves attentive study.

RECTILINEAR PERIOD.

1. Strongly resembling the Cantilupe tomb is the arcading of the interior of the ground-storey of the two western towers, with its elaborate vaulting; and to the same early date probably belongs the interior of the west doorway.

2. The upper part of the west towers was, no doubt, the next work executed. They are plain but well proportioned.

3. The insertion of the west windows of the nave and north and south aisles followed, and the construction of the canopied work above the west doorway, with its row of kingly statues, is of the same date.

4. The west porch of the south transept received in this period its richly panelled parapet, and the airy lightness of the sky-outline of the central tower is due to its pierced Rectilinear parapet, constructed probably about the same time.

5. The three last works remaining to be described belong all to the latter part of this period. They are the chantry chapel of Bishop Fleming, who died A.D. 1432; of Bishop Russell, who died A.D. 1480; and of Bishop Longland, who died A.D. 1521. The two last-named are excellent examples of this kind of sepulchral oratories, which were often erected by the prelates themselves during their lifetime.

In the transepts are several screens of excellent Rectilinear design, and the stall work of the choir, executed in the early part of the period, is amongst the best in the kingdom.

THE SOCIETY OF ARTS AND TECHNICAL EDUCATION.

IN February last a meeting was held at the Society of Arts, at which a number of speeches were delivered on the unsatisfactory condition of education in general and technical education in particular, in this country. The meeting ended in the formation of a sub-committee, which numbered amongst its members some of our ablest public men. This sub-committee was appointed to consider the question in its various bearings and to report thereon. The report, which has just appeared, sums up its inquiries and advice in the following resolutions:—

For the purposes of discussion, technical education should be deemed to exclude the manual instruction in arts and manufactures which is given in the workshop

That the term "technical education" is understood by the sub-committee to mean general instruction in those sciences the principles of which are applicable to various employments of life.

The technical instruction, as defined above, should not, as a rule, be given in separate professional institutions, but in institutions established for general education.

That, with a view to the development of a system of scientific education, it is desirable that schools be established having for their main object the teaching of science as a mental discipline. These science schools should prepare some youths for the higher courses of a college, and other less ambitious pupils for their professional pupilage.

That the subject of secondary instruction having been reported upon ably and deliberately by the Schools Inquiry Commission, the committee do not feel it necessary to enter into the details of this subject, while they desire emphatically to express their opinion of the necessity for the introduction of scientific teaching in all secondary schools.

That it is desirable that the higher scientific instruction should be tested by public examination, and that the proficiency of persons who pass these examinations should be certified by diploma.

That the preparation for the businesses considered by the committee is not sufficient until due scientific instruction has been followed by practical pupilage in efficient works.

The committee recommend employers of labour and others in the habit of taking pupils, apprentices, and clerks, to give the preference, as far as possible, to those adducing evidence of the possession of adequate instruction in the sciences applicable respectively to their professions or occupations.

Ample reasons are given for these recommendations.

The sub-committee are of opinion that Government should encourage systematic scientific instruction in the following way:—

1. By adopting the recommendations of the Schools Inquiry Commission, for the introduction of the teaching of natural science into all secondary schools, and for establishing new science schools of the first grade, which schools should be on all points on a footing of equality with the endowed classical schools.

2. By co-operating with universities and colleges in holding examinations which are or may be established for the purpose of conferring certificates or diplomas in connection with systematic studies, intended to educate civil engineers, mechanical engineers, officers of the mercantile marine, metallurgists, miners, naval architects, and marine engineers, architects, merchants, chemists, and agriculturists.

3. By giving some official value to those certificates or diplomas, such as allowing certain diplomas to represent a given number of marks in competitive examinations.

4. By putting at the disposal of the leading colleges which give methodical courses of scientific instruction, and diplomas of recognised value, a limited number of nominations annually.

5. By assisting old and new endowments where local subscriptions or donations prove the value set on the instruction proposed or given.

6. By instituting night classes for workmen in connection with all new scientific endowments, with access to a library.

7. By providing free libraries suitable for the use of students in night classes generally.

8. By providing suitable meeting-rooms for night classes organised among workmen, for the purpose of obtaining scientific instruction.

9. By according liberal prizes to workmen for excellence in mechanical drawing.

10. By taking steps to extend and improve primary education.

The sub-committee recommend that colleges should encourage systematic scientific instruction by the following measures:—

1. By instituting methodical courses of scientific teaching, adapted to students intending to enter a profession or business among those which have been enumerated above.

2. By the establishment of diplomas, corresponding to the several courses of study in conjunction with Government, and with the leading institutes belonging to each profession.

3. By the establishment of fellowships and scholarships in connection with those diplomas.

It is desirable that the leading civil and mechanical engineers, architects, merchants, shipowners, chemists, manufacturers, and agriculturists should encourage systematic scientific instruction by the following measures:—

1. By the creation of scholarships and fellowships in connection with those schools and colleges where methodical courses of instruction are given.

2. By co-operating in the examinations for diplomas.

3 By giving a practical value to those diplomas, such as could be evinced by a reduction of premiums to intending pupils holding such diplomas, and by attaching weight to the possession of a diploma when choosing among candidates for employment.

4. By granting distinct privileges, in connection with the professional institutes, to all holders of recognised diplomas.

At the meeting, on Tuesday, of the Technical Education Committee of the Society of Arts, the general satisfaction which was felt with the report of the sub-committee was manifest from the exceedingly thin attendance. A discussion ensued upon a suggestion of Mr. Ayrton, M.P., that science ought to be taught to children of eight years and upwards in national schools. Professor Williamson pronounced this impracticable. Dr. Storrar admitted that at so early an age only the facts of science could be conveyed, arguing strongly that the principles of science were not so easily grasped; Dr. Yeats, of the Middle and Upper Schools, Peckham, confirmed from his experience the drift of Dr. Storrar's argument; while Mr. Ellis A. Davidson and Mr. Antonio Brady spoke

of special instances showing how deeply rooted the love of scientific instruction might become in minds early familiarised with scientific phenomena. Ultimately on the motion of Mr. Ayrton, seconded by Mr. Brady, the report was adopted and ordered to be printed and circulated; and the sub-committee were requested to continue their labours until the reassembling of Parliament.

DISPUTE BETWEEN AN ARCHITECT AND A VESTRY.

AT the meeting of the Shoreditch Vestry, on Tuesday week, reports of the Vestry Hall Committee were considered. It appeared from one report that Mr. C. A. Long, the architect of the new townhall in Old-street Road, had sent in his bill of costs, amounting to £1,329 11s. 6d. He had received on account £800, and requested payment of the balance of £529 11s. 6d. The committee recommended that certain items in the account should not be allowed, but that the sum of £358 14s. 8d. be offered to Mr. Long in full of all his demands upon the Vestry. Mr. Long declined to submit to the deductions made in his bill, stating that it was framed on the most reasonable terms, and in strict accordance with the rules of the R.I.B.A. He was willing to receive the sum offered on account of his demands, and to refer the disputed charges to the arbitrament of some eminent architect, to be mutually agreed upon, or to deduct £50 from his bill, and accept £479 11s 6d. as a full settlement of his claims. The committee recommended that neither of these propositions be agreed to. After a long discussion, in which the architect was referred to in no very complimentary terms, one of the vestrymen moved that £400 be paid to Mr. Long, in full of his claims upon the vestry. An amendment was moved that £358 should be the sum paid, as recommended in the report. The amendment was carried by twenty to twelve, in spite of the warning of one of the vestrymen that they would go into a court of law with a very bad grace after refusing the architect's offer to submit the matter to arbitration.

REREDOS SKETCHES.

THE principal of the three reredos designs illustrated in this week's number is intended to be executed in stone, or alabaster and marble. The intention of the group in the chief panel is a symbolic rendering of the elements used in the sacrament of the Holy Communion; in the centre is a group of conventional foliage or scroll work, from which on the one side spring out ears of wheat, and on the other the fruit and leaves of the vine, which are being gathered by the angels, while over them the Holy Spirit is typified by the emblem of the dove. The other two designs are for reredos crosses, which may be executed in sculpture, inlay, or painting, or by a combination of all three. J. M. S.

MATERIALS FOR BLASTING.

HITHERTO the employment of nitro-glycerine for blasting and similar purposes has been attended with considerable danger. A recent invention, by Mr. Carl Dittman, civil engineer, of Berlin, has for its object not only to render the employment of nitro-glycerine safe, but to enable it to be transported and stored free from its present attendant liability to explosion. Mr. Dittman mixes the nitro-glycerine with a porous, combustible substance, such as finely-divided wood charcoal, which (by preference) has been previously saturated with a solution of saltpetre or nitrate of soda, or mixtures of the same, and also with a solution of carbonate of soda, and subsequently dried so as to expel the water employed for effecting such solution; or the nitro-glycerine may be mixed with nitro-cellulose—*i.e.*, with finely-divided wood or other solid liquorous matter which has been treated with nitric and sulphuric acid in a manner similar to that employed for the production of gun-cotton; or the nitro-glycerine may be mixed with sawdust or finely divided solid liquorous matters, previously impregnated with a solution of nitrate of potash or nitrate of soda, or mixture of the same, and with an alkali such as carbonate of soda, and subsequently dried so as to expel the water employed for effecting the solution of the salts; or, instead of employing the substances prepared as mentioned in combination with nitro-glycerine individually, mixtures of the same may be employed, and where such mixture of any two or more of the before-mentioned substances are employed with nitro-glycerine, the proportions of the same may be varied according to the desired requirement of the blasting material.

DUSTBINS.

DR. WHITMORE, the Medical Officer of Health of Marylebone, in his last monthly report, says:—"On some previous occasions I have found it necessary to advert to the intolerable nuisance which arises from dustbins in the hot months of summer, an evil which, I regret to say, lies more at the doors of the rich than the poor, and which will probably continue to exist until the owners of some few of our aristocratic mansions are summoned before the magistrate and fined for causing a nuisance injurious to the health of their neighbours. A few days since my attention was called to an abomination of this kind at a large house in my own immediate neighbourhood. The occupant of the adjoining house, by whom the complaint was made, assured me that whenever he went in or out of his own dwelling, his olfactory nerves were assailed by a most disgusting effluvia, which made him feel quite sick for a long time afterwards. The inspector, on visiting the premises, found the nuisance to proceed from the dustbin, which contained a large quantity of both animal and vegetable refuse in a decomposing state, and which, to use his own words, 'stunk most horribly.' Now this is but a slightly exaggerated description of the condition of scores of dustbins in some of our most highly rented houses, and it is really a disgrace to the owners of them that so disgusting a nuisance, which is not only injurious to the health of the servants living in the basement, but also very annoying to the next door neighbours and passers by, should be permitted to exist. Under no circumstances ought the servants to be allowed to throw either animal or vegetable refuse into the dustbin; the latter, as I have often before said, can easily be burned, unless the family be unusually large. It is simply necessary to place it, when the process of cooking for the day is over, at the back of the kitchen fire, where, in an hour or two, it becomes perfectly dried, and when it can be burned up in a few seconds without producing the slightest smell. In many families that I am acquainted with this is habitually done."

TOWN CHURCHES.

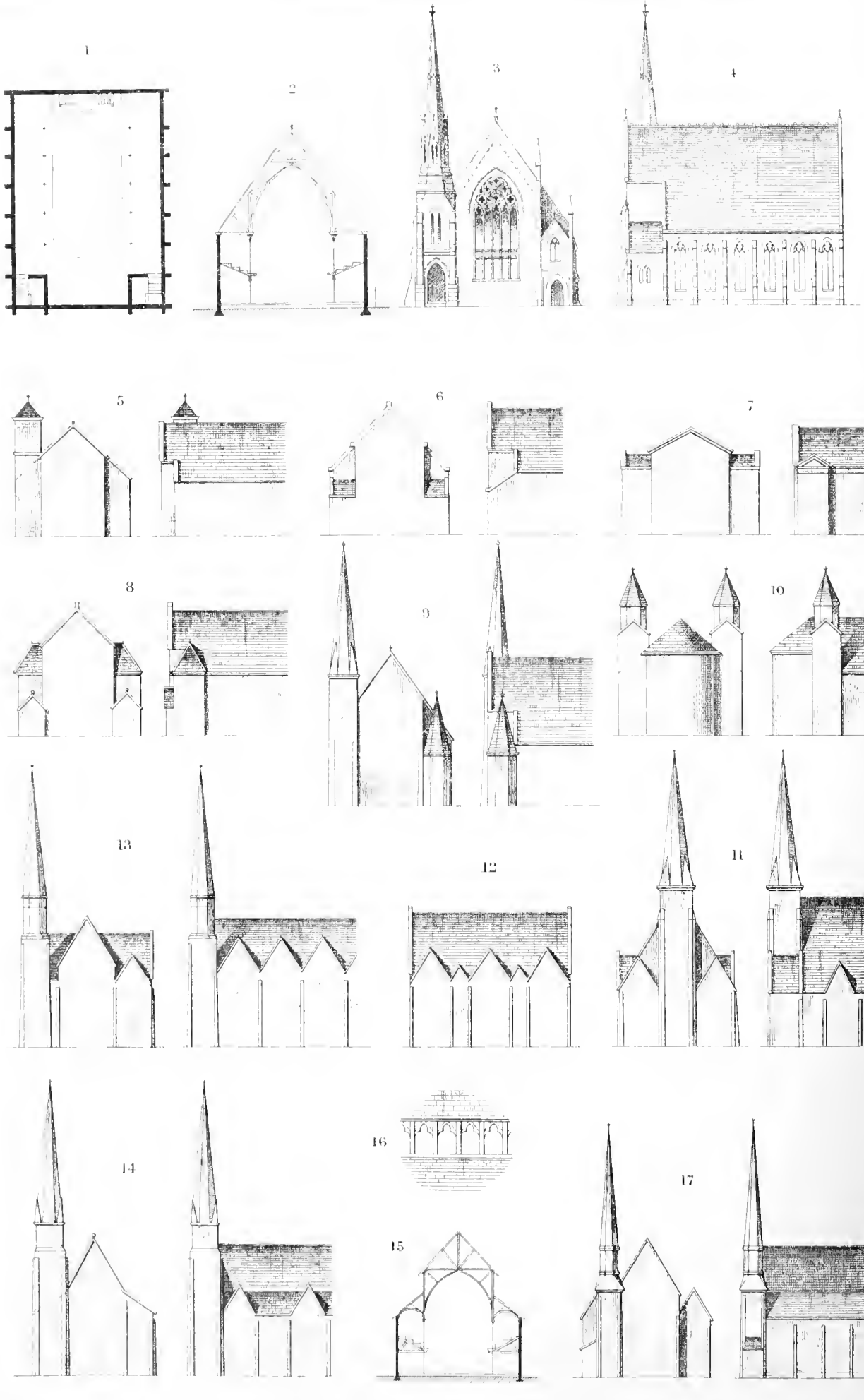
AT the last quarterly meeting of the Exeter Diocesan Architectural Society a paper was read on "Town Churches," by Mr. P. B. Hayward. The author called attention to the advantages which continental churches possess over those of this country, by being constructed so as to offer a vast unbroken space to the body of worshippers, enabling all to see and take part in the services, differing from our English churches in the absence of aisles. One form of this description of building was the polygonal or circular nave, such as in the Temple Church of London, and the churches of Cambridge and Northampton. Such a building might be roofed with a dome, like St. Paul's, or with a lantern like Ely. Even if aisles were introduced they should be used simply as passages, as in the new churches of St. Michael in this city. The cost of such churches would be great, but he argued that it was better to build one noble church than two or three inferior ones. He next called attention to the desirability, both in respect of beauty and utility, of erecting our churches higher than the surrounding buildings. There were two kinds of roofs which might be used with advantage in large rectangular churches—an open timber roof, but this was objectionable, and he preferred an iron roof. There was no limit to the capacity of that material, and he saw no reason why it should not be used in our churches. Another plan he suggested was a species of barrel roof—for the idea of which he was indebted to his father—of which he showed a sketch. Referring to the deleterious effects of town smoke on architecture, he noticed the suggestion which had been put forth for encasing the fronts of our houses and public buildings with glazed tiles. There were no doubt difficulties in the way of the adoption of this idea, but he saw no reason why terra cotta, which had been shown to be impervious to a London atmosphere, should not be more largely used, both in secular and ecclesiastical architecture. At Barking there was a new church where terra cotta entirely took the place of stone in the window tracery, columns, arches, &c. With regard to the seats in churches, he strongly advocated the use of chairs in the place of pews or benches. Not only was their cost less (about one-third), but they could be well adapted to the size of the congregation. In conclusion he strongly condemned the modern practice of elaborately and richly ornamenting the outside of our churches, and leaving the interior pinched and poverty stricken, and pointed out that it sometimes happens that a noble interior involves an unsightly and unpicturesque exterior. Let our churches, he said, depend chiefly on symmetry and dignity of outline for their external effect—and let us lavish on the interior all the wealth of art and imagination with which God has endowed us.

In the course of the conversation which followed it was stated that at Bolton-le-Moors, in Lancashire, terra cotta was used, with great effect, very largely in the construction of the church; the seats, the organ case, &c., being composed of that material. It was also used in the construction of the parsonage house. It was also mentioned that if chairs were adopted, the seating of a church would cost about 3s. 6d. per head of the congregation, but if pews the cost would be 10s. 6d.

BUCKS ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE annual meeting and excursion of this society took place on Monday week, the scenes of operation being Windsor Castle and Eton College. The party assembled in the Castle-yard, Windsor, at eleven o'clock, where they were met by Mr. Woodward, her Majesty's librarian, who accompanied them within the Castle, and gave a short address on its history, explaining the periods at which the principal portions of the building were supposed to have been erected, its original construction, and the changes that from time to time had taken place. The party subsequently (under the guidance of Mr. Parker, of Oxford) inspected the exterior of the Castle on the south side, and afterwards proceeded to Wolsey's Chapel, St. George's Chapel, and cloisters, the choir, &c. The descriptive comments by Mr. Parker on each were interesting. The visit to Eton College formed the second portion of the day's excursion. After inspecting the College buildings and chapel, especially the stained glass windows of the latter, which were commented upon by Mr. Parker, the company proceeded to the College Hall, where the general business of the society was transacted. Archdeacon Bickersteth presided. From the annual report, read by Mr. Lowndes, the secretary, it appeared that the society has now been in existence for twenty-one years. During these years much useful work has been accomplished in the accumulation of valuable information, which has been published in the "Records of Buckinghamshire;" in the establishment of a county library and museum, and the collection of antiquities, drawings, manuscripts, &c., illustrative of the history of the county. The roll of members in the first year only contained 55 names, but at the end of last year it contained 247. During the past year 14 new members have been added to the list, and 11 have been removed by death and resignation. Among those removed by death is Colonel Hanmer, one of the oldest members, and a vice-president of the society. The report was adopted, the officers for the ensuing year were re-elected, the Rev. Dr. Goodford, Provost of Eton, was elected vice-president, and fourteen new members were added to the society. The Provost of Eton then read a paper on "The Antiquities of Eton," after which the Rev. Wharton B. Marriott read a paper on "The Vestments of the Church." At the close of the proceedings the company were entertained by the Provost of Eton.

The Rector of St. John's, Southwark, is promoting a scheme to throw open the present churchyards in the parish for the recreation and use of the parishioners. The scheme seems an admirable one; these churchyards might very easily be divested of their gloomiest associations and be made pleasant promenades. The Rector appears to have something of this sort in view, as he talks of making the churchyard a place where "poor old people may smoke their pipes."

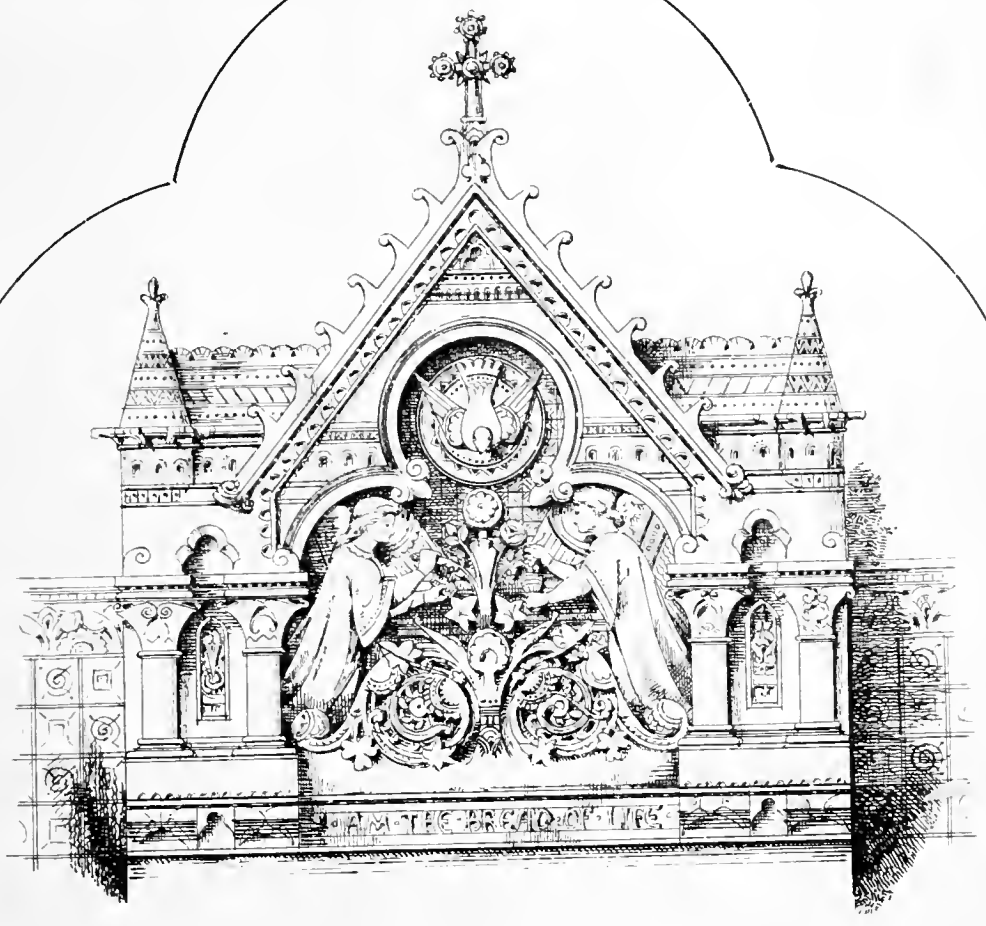


H. Ablett, Lith.

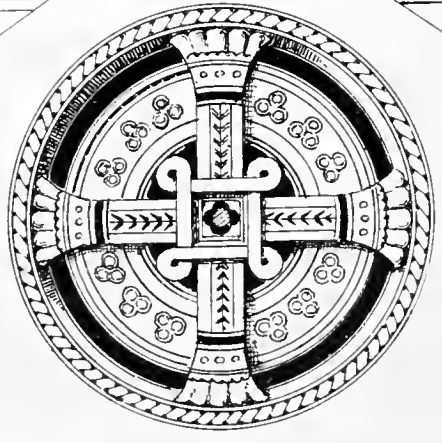
Printed by Whiteman & Bass

DEVELOPEMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.

Nº I.



· Altar · Crosses ·



· Reredos · Sketches · by · J · Moyr · Smith ·

Printed by Whitfield & Co.

THE PALMERSTON MEMORIALS.

THE two memorials erected at Romsey to Lord Palmerston were inaugurated on Tuesday. The stained window in the Abbey Church is very large, the centre light being 39ft. by 5ft. 7in., and the two side lights, 36ft. 6in. by 4ft. 2in. each. The window has been designed by Messrs. Clayton and Bell, to exemplify the idea of Government descending from heaven to earth. In the upper portion of the three windows is a representation of the highest idea of rule—the Lord Jesus Christ sitting on the throne of glory, surrounded by adoring saints and angels. Below are three subjects from the New Testament, showing acts of power and teaching; namely, our Lord feeding the Five Thousand; the Sermon on the Mount, and the Tribute Money. Below these, again, are three subjects from the Old Testament, illustrative of power and government; namely, Joseph Distributing Corn in Egypt; the Judgment of Solomon, and Daniel as Ruler. In the lower tier are figures showing, allegorically, three modes of action in which an earthly ruler may beneficially exercise his power:—1. In preserving peace and plenty; 2. In making war in defence of his country and of a right cause; 3. In breaking fetters and liberating captives; and at the bottom are the heraldic bearings of Lord Palmerston, and the following inscription:—"In memory of Viscount Palmerston: obit 1865." Beneath each of the Scripture subjects is a descriptive Latin text. In an arcading dividing the subjects horizontally are demi-figures of patriarchs, prophets, kings, apostles, and saints. The statue on the market place, which is by Mr. Noble, is of bronze, and it represents the deceased statesman in his usual attitude whilst addressing the House of Commons. The statue, including the bronze plinth, is 8ft. 10in., and the pedestal 9ft. 6in. in height. The latter is formed of Aberdeen granite, and is about 6ft. 3in. square at the base, with a polished shaft, on the front of which, in letters of gold, is inscribed "Palmerston," and at the back "Born, 1784; died, 1865."

POTTERY AND PORCELAIN.

ON the 9th inst. Mr. Chaffers, superintendent of the Museum of Ornamental Art in the Leeds Exhibition, resumed his lecture on "Pottery and Porcelain," the first part of which occupied the attention of a select audience in the Philosophical Hall, Leeds, on Tuesday week. In continuation of the thread of his Tuesday's lecture, Mr. Chaffers gave a short notice of the family and history of Wedgwood, and of his inventions. He summed up this branch of his subject by saying that Wedgwood's ordinary productions combined utility with neatness and some degree of elegance, and in his ornamental works he emulated the ancient potters of Greece, in doing which he was ably assisted by his partner. The next subject to which the lecturer addressed himself was Oriental or Chinese porcelain. The manufacture of porcelain was discovered by the Chinese 1,600 years before the western nations of the globe became acquainted with the secret as to the composition of porcelain. Kin-ti-Chin was the principal centre of this Oriental manufacture, but the rebel Taepings had totally destroyed it, and given a fatal blow to this interesting and valuable manufacture there. The porcelain tower in another locality had also been destroyed by the rebels. Mr. Chaffers next described the materials of which Chinese vases are composed; and next in order he considered the character of the decorations, and said as much as ten thousand francs had been given at a public sale for an ancient Oriental specimen. The Portuguese trade with Japan, which was interrupted in 1641 because of the attempts made to Christianise the natives, was succeeded by the Dutch getting a monopoly of the exportation of porcelain from Japan, and they had retained that privilege for more than two centuries. There was but scanty information as to the making of porcelain in Japan, but in its fabrication the porcelain of Japan was very much like that of China, though the colours were more brilliant and fine, and the birds and flowers more natural. European porcelain was next brought under notice, and those specimens which have a world-wide reputation were especially made mention of. The first attempt to imitate Chinese porcelain was made in 1580, but the ware was not so hard as that of China, and not more than thirty specimens of those products now remained. In 1706 the first operations for the manufacture of hard paste took place at the celebrated manufactory at Dresden or Meissen, and it was from 1751 to 1756 that the best productions emanated from it. The Berlin and other manufactories having been hastily referred to, the lecturer mentioned the establishment of a manufactory at St. Cloud, in France, in 1695, which might be considered the parent of all the porcelain manufactures in France. The manufacture of porcelain in England began much earlier than was generally supposed, an Englishman having, in 1671, taken out a patent "for the manufacture of transparent earthenware." The Stratford-le-Bow, the Chelsea, and the Derby manufactories, and the peculiarities of their glaze, and their other perfections were vividly described. Worcester was still a flourishing seat of the art of making porcelain which neither grew brown nor cracked, as other products of that class often did. Donaldson's classical vases, and a dessert service painted by a lady at the latter end of last century, were prominently named, and the most celebrated painters in porcelain of more modern times were honourably recalled to the minds of the audience. The lecture was brought to a close with the usual formalities.

THE DWELLINGS OF THE IRISH PEASANTRY.

THE Irish Poor Law Board, in a report just presented to Parliament, describes the present condition of the great bulk of the agricultural population of Ireland, and the rapid progress that population has made within the last eighteen years in the matters of food, clothing, and dwellings. On the latter head it is said that more than 400,000 of the worst class of cabins have been demolished since 1841. It is, however, a fact that the class next above the lowest is still the dwelling most in use. This class, although greatly inferior in lighting, cleanliness, and comfort to the English cottage, has one sanitary condition which atones for much of its apparent discomfort. The one room, serving for both day-room and dormitory, occupies the whole length, breadth, and height of the building, and is ventilated all day by a draught from the open door to a blazing turf fire under an ample chimney. Even at night, when the door is closed, there are crevices which, with the aid of the constantly burning fire, effectually and continuously ventilate the apartment. Compared with the ceiled bed-rooms of the poor denizens of large towns, the thatched cabin of the Irish peasant is comparatively free from the most active and prolific source of fever, the presence of vitiated air. The rate of mortality by fever in unions comprising large towns is more than twice that of unions with a rural population. The best evidence of the improved condition of the Irish peasantry and their dwellings is found in the fact that the country has been comparatively free from any epidemic during the past eighteen years.

SCHOOLS OF ART.

THE distribution of the prizes to the successful students in the West London School of Art took place on Saturday last in the lecture-room of the Geological Museum, Jermyn-street, under the presidency of Mr. A. J. Beresford Hope, M.P. Mr. Hope, before distributing the prizes, directed attention to the fact that though the West London was the youngest, it was, at the same time, one of the most prosperous of such institutions, for next to South Kensington it had the largest number of pupils, giving instruction to not less than 492 students. Among the students who attended the school during the year he was glad to find that there were 67 draughtsmen and designers, 45 decorators, &c.; 41 wood, stone, and ivory carvers; 9 modellers; 27 glass painters; 11 papier machè workers; 18 goldsmiths, &c.; 23 engravers and diesinkers; 16 metal workers; 21 cabinetmakers; 31 upholsterers; 9 musical instrument makers; 43 carpenters and joiners; 14 machinists; 4 masons; 18 salesmen and clerks; and 23 teachers. Mr. Ruskin also addressed the students, complimenting them with discrimination on the progress which they had made in the study of art. He had watched the progress of the school, and regretted that he had not been able to devote more time and attention to giving advice and assistance when required of him. He advised them to study carefully what he called "the three-legged stool of art," viz., form, shade, and colour. If they worked and studied earnestly they must live on bread and water during their early days, but they would in the end feed upon ambrosia. Mr. Digby Wyatt briefly referred to the satisfactory progress of the students of the school, a circumstance not less gratifying to the students themselves than to the masters, who had devoted so much time and attention to its management and control. It was a gratifying feature that the young people who had taken the prizes were all more or less connected with the technical arts of the country. It was this connection of art with technical industry that was the great want of the present day. A few years ago England was sadly behind some of the countries of Europe. Mr. Peter Graham dwelt on the importance in a commercial point of view of greater attention to the studies connected with art and industry. England had powerful competitors in every part of the world, and the only way to make that competition successful was to unite as completely as possible the study of art with technical industry. He proposed a vote of thanks to Mr. Hope for his attendance. This vote, carried unanimously, as also a vote to Mr. Macdonald Clarke, the master, and the other officers of the school, brought the proceedings to a close.

ARCHÆOLOGY.

A GENERAL meeting of the members of the Devonshire Archæological Society was held on Thursday week, at Exeter, the president, E. Smirke, Esq., in the chair. The Ven. Archdeacon Freeman was elected a member. The following objects of interest were exhibited:—An emerald signet ring, bearing an Eastern inscription, once belonging to the King of Delhi, but now the property of Mrs. Palmer, and an antique cornelian ring, belonging to Mrs. Thompson—both shown by Lieut.-Col. Harding, F.G.S; a Samian patera, found in Exeter, and a portion of a smaller one, shown by W. R. Crabbe, Esq., F.S.A.; and two Palstaves found at Chagford, by G. W. Ormerod, Esq. A paper on the "Ancient Stone Bridges of Dartmoor" was read by Lieut.-Col. Hardinge, and another, on "Archæology," by W. R. Crabbe, F.S.A.

WATER SUPPLY AND SANITARY MATTERS.

A SYSTEM of sewerage has just been undertaken at Wolverhampton, at an estimated cost of £40,000. The sewage is to be utilised, and land has been bought for the necessary works of filtration and irrigation.

The attention of the Chief Commissioner of Woods and Forests has been drawn to the present offensive state of the pond near the northern end of the Broad-walk, Regent's Park. The Sanitary Committee of the St. Pancras Vestry advise that it be thoroughly cleansed and supplied with fresh water.

Building Intelligence.

CHURCHES AND CHAPELS.

A new font has just been placed in Christ Church, Albany-street, or rather the old font of white marble has been cased with other various marbles. The church some time ago was thoroughly redecorated, and there was only wanting a font of a superior nature to complete it. This has now been fixed, and shown for the first time last Sunday week, in time for a festival held there on Monday week, the thirty-first anniversary of the dedication of the church. Mr. Butterfield was the architect for the restoration. The design of the chancel is very tasteful. The reredos is composed of various marbles and alabaster. Derbyshire fossil, white marble, Languedoc red marble, Irish green marble, dove, and alabaster, have been used for the chancel work. The steps to the altar are marble, risers of red and dove marble to white treads. The floors in the nave and aisles are of encaustic tiles, self-coloured mixed with Portland stone. Open wainscot oak seats have taken the place of close pews.

The new Catholic Church at Burton Park, Sussex, is rapidly approaching completion, and will be opened some time this month. The details are of the most elaborate character. Mr. Gilbert R. Blount is the architect, Mr. Edward Jones the clerk of works, and Mr. J. Ellis, of Chichester, the builder.

The lately restored parish church of Elmesthorpe, Leicestershire, was reopened on the 14th inst. The building originally consisted of nave and chancel, and was built by the Earl of Leicester in the reign of Edward II., and part of the army of Richard III. slept within its walls on the night before the battle of Bosworth field.

St. Philip's Church, Kelsall, was consecrated on the 9th inst. by the Bishop of Chester. The style of the building is early Gothic of the thirteenth century, and it comprises nave, chancel, sacristy, and organ chamber. It is rather small, only affording sitting room for 180 adults and 80 children. Mr. Thomas Bower, jun., of Nantwich, was the architect.

On Wednesday week the foundation stone of a new Wesleyan Chapel was laid at South Shields. The chapel will be 68ft. by 40ft. in breadth, the vestry and porch will be 24ft. by 10ft., and the schoolroom 50ft. by 24ft. Accommodation will be provided for 400 sittings in the chapel, and 300 children in the schools. Mr. T. A. Page is architect, and Mr. Joseph Robson contractor. The cost will not much exceed £1,000.

On Thursday week the Bishop of Chester consecrated the new church of St. Paul, Bootle, Lancashire. The style of architecture is the Geometric Pointed, of a simple character, the west front having a central recessed porch and a large window over. On the north of the doorway there is a bell turret, 110ft. high. The front and side porches are built in Yorkshire shoddy stone and Stourton stone dressings, the remainder of picked bricks and stone dressings. There is accommodation for 850 persons in the shape of open benches on the ground floor, two galleries, and a small organ gallery at the west end. Messrs. Culshaw and Summers, of Rumford-court, are the architects, and Mr. George Rome the builder.

On Monday afternoon the foundation stone of a new Wesleyan Chapel was laid at Burscough, near Liverpool. The plan of the building is cruciform. The building will be in the Early Pointed style. The architect is Mr. Thomas Bridge, jun.

A new reading-desk, lectern, and pulpit have been placed during the past week in St. Nicholas Church, Tooting-Graveney, S.W. The reading-desk and lectern are of wainscot oak, with shafts of polished ebony, the capitals of the former being moulded, and those of the latter carved. The pulpit is of Caen stone, supported on eight columns of Irish green and red Devonshire marble alternately. The centre shaft, of yellow Mansfield stone, is octagonal in plan. Five sides of the pulpit are incised with the following figures under canopies:—1. Our Lord. 2. St. Peter. 3. St Paul. 4. Moses. 5. Elijah. The whole is surmounted with a foliated cornice. The lectern is a memorial offering. The rector has replaced those pews which are his property with open seats of a simple and effective design. The architect is Mr. E. Swinfen Harris, and the work has been executed by Messrs. Bell, Redfern, and Almond.

A letter from Jernsalem states that the grand cupola of the church of St. Sepulchre (which had fallen in) is now entirely covered with lead and surmounted with an elegant cross of gilt bronze. In the interior the mural paintings are being rapidly restored, and about the end of October the whole of the repairs will be finished and the scaffolding removed from the edifice.

The foundation stone of a new Congregational Church at Stoney Stanton, Leicestershire, was laid on Tuesday, the 30th ult.

On the 1st inst. the foundation stone of a new Baptist Chapel was laid on the site of the old chapel, Greek-street, Stockport. The estimated cost is £3,000.

On Wednesday week the foundation stone of the church of St. David, Westbourne-road, Arundel-square, was laid by the Earl of Shaftesbury. The cost, including site, will be upwards of £4,000, and seats will be provided for 1,000 persons.

On the 10th inst. the corner stone of the nave of Prior's Hardwick Church, which is being restored, was laid. The architects are Messrs. Slater and Carpenter, and the builder is Mr. Watson, of Napton.

The church of St. Mary, Sheet, Petersfield, Hants, is about to be completed by the addition of the remaining portion of the tower and a spire, in accordance with the original design, the Bishop of the diocese bearing the expense.

On Monday week the Bishop of Oxford consecrated the new church at Bledlow Ridge, Bucks, the foundation stone of which was laid in August last. The building is small and neat, and consists of nave and chancel, with a south porch, and bell turret at the western end. It is simple in detail, and is built of flint, with stone windows and coping.

On Tuesday last the Bishop of Hexham laid the foundation of a new (Roman) Catholic Church at the Brooms, Leadgate, near Newcastle. The style of architecture adopted in the new structure will be Gothic. Mr. E. Welby Pugin, of London and Ramsgate, is the architect; and Mr. Jasper Thornton, of Durham, the contractor for the masonry, plastering, and slating.

On Tuesday the foundation stone of a new Wesleyan Chapel was laid at Bill Quay, Newcastle. The style of the building is Gothic. It will seat 450 persons, at a cost of £950. Mr. Edward Titles, of Heworth-lane, is the architect, and Mr. Minto, of Hebburn, the contractor.

BUILDINGS.

Morecambe is about to be improved by the construction of a new pier. It will be 950ft. long, and generally 20ft. wide. The pier is the property of a company, and will cost about £10,000.

From Australia we hear that a new Mechanics' Institute has been completed at Geelong, at a cost of £5,600. The style of the building is a combination of Italian and Greek. It covers an area of 130ft. by 54ft., and comprises hall, lecture room, reading room, library, class rooms, offices, and private apartments.

A new cemetery has been completed at Clayhills, near Tunstall, and the Anglican portion was consecrated last week by the Bishop of Gibraltar. The cemetery was designed by Mr. R. Dain, architect, of Burslem, at a cost of about £4,000, and covers over seven acres. Chapels will shortly be erected.

Mr. Charles Brook, of Enderby Hall, has offered to build and endow a convalescent hospital in connection with the Huddersfield Infirmary, at a cost of £30,000.

On the 24th ult. the foundation stone of a new Masonic hall was laid at Belfast. Mr. John Lanyon is the architect.

New public baths, built by the Corporation, were opened at Blackburn on Saturday week.

A new post office is to be built in the High-street of Weston-super-Mare, and the foundation stone was laid last week. The building is to be erected by Mr. Harford, contractor, from designs furnished by Mr. Hans Price, architect.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—I. I. R.—B. N.—W. I. T.—I. F.—I. C. I., with MS.—E. G. R.—G. and Co I. F.—R. L.—T. B.—E. W. P.—I. A. H.—O. W. D.—I. B.—I. T. D.—C. R. and Co.—H. S.—I. H.—I. R. B.—P. and B.—I. G. P.—E. W.—K. and W.—I. W.—H. B.—I. B.—H. L. L. A.—I. S.—A. G. H.—A. C.—I. K.

I. T. When stones are worked in regular beds and joints and are dressed for facing work they are called ashlar.

"Peter's" communication throws no additional light on "bolted girders."

I. T.—Under the Nuisances Removal Act, 18 and 19 Vict., c. 121, sec. 26, the sanitary inspector appointed under that act is empowered to seize unwholesome meat &c., exposed for sale, and a justice of the peace may order it to be destroyed, and the owner is liable to a penalty of £10 for each carcase, &c.

Correspondence.

EXHIBITION OF STUDENTS' WORKS. KENSINGTON MUSEUM.

To the Editor of the BUILDING NEWS.

SIR,—The works forwarded by the students of the Kensington School of Art and its branches for national competition are now exhibited in one of the galleries of the above building, and are well worthy of a visit, although there is little or no improvement whatever on the last year's exhibition, which reflects very little credit on the masters, though the cause of the apparent failing to a great extent lies in the mistake that no student shall compete again in the stage in which he has once been successful, thereby giving no encouragement to the student who would wish to attain perfection, for no juvenile cares about working for twelve months at a drawing or design if there is no chance of a reward, and if to receive a prize is his ambition, his mind must be directed to another stage entirely out of his sphere, and for want of sufficient study he naturally fails. Can a person who has for a few years been studying from the antique models and oil paintings be expected to compete in architecture with advanced pupils from architects' offices? No; therefore the principle upon which the national art schools are working is wrong, and excuse must be made for many of the unawarded designs now exhibited. However, to return to the works, I select the architectural stage first. The principal drawing is that by W. E. F. Clarke, age twenty-four—a design for a church, or, to use his own expression, an attempt to apply the dome to Gothic architecture. The plan, of course, is cruciform with a dome at the intersection of the transept, with nave. Throughout the whole design truth is preferred to economy, which is a very sensible preferment in the present instance, and in one point especially does Mr. Clarke deserve great praise, that is, his protesting against the old sham principle of an inner roof of stone and an outer of wood and slate. In this case the groining and the roof are one, but here look very ugly; another ten feet to the clerestory and an addition of gablets into the roof would be an improvement, and also the removal of the bell tower. However, I hope the idea of a dome to Gothic churches will be followed not only by students but by architects in practice, who seldom, if ever, attempt to apply a dome to that style of architecture, but with one exception, viz., the National Gallery and Law Courts competition, which undoubtedly were Mr. Clarke's models, judging from the similarity between them; however, Mr. Clarke was awarded the gold medal, and considering the age, I should expect something better. The silver medal was awarded to Mr. T. Patchett, for a design for a townhall, represented by the most carefully-prepared drawings, with the exception of perspective, which is very tame indeed, and spoilt by a badly-proportioned, ill-designed dome. Mr. Patchett, nevertheless, is well worthy of his reward, and his drawing of close inspection. The bronze medal it has been thought fit to award to Mr. Edwards (age twenty-two), for a measured drawing of two or three bays of Lincoln Cathedral, carefully drawn—nothing more. A design for a villa in brick, with a quantity of timber, by Mr. H. Price (age seventeen), is really very good, and tastefully got up, and, in my opinion, deserves a bronze medal, but, to my great astonishment, receives nothing. It must either have been overlooked or sent in too late, for surely Mr. Redgrave could not let such drawings go unrewarded. Mr. Chapham received the national prize books for design for a villa of very insignificant design, though the draughtsmanship is very good. Prize books have also been awarded to Mr. Woodsend for a design for a villa; such a design! and also to Mr. Willmott (age seventeen) for a measured sketch of an altar, pulpit, Litany desk, &c., designed by G. Street; and prize books also to Mr. Jones (no age mentioned) for a design for the upper part of a tower. Judging from the subject and detail, he must be quite a junior. Mr. A. Foster exhibits a measured sketch, also of Lincoln Cathedral. I believe that gentleman got the national bronze medal last year for a measured sketch of the Chapter-house of the same building, much better executed than the present drawing. I advise him to measure some other cathedral or edifice, or we shall get sick of it. Poor Mr. Dunster (age twenty-five), who sends a sketch design for a museum and art school, though an architect's assistant, seems quite in the rear.

A gold medal has been awarded to Mr. T. Cox (age twenty-one) for a set of church furniture, but as it consists of an altar, reredos, pulpit, &c., it is as much architecture as furniture. It has many nice bits, but which recommended the gold medal

I cannot for my life conceive. However, believing I have described all that is exhibited in the architectural section—I am, &c.,

H. A. G.

THE ART OF BUILDING IN CONCRETE.

SIR,—Will you permit me to make a few remarks upon your impartial article on my patent concrete building apparatus, which in one or two points is the same as several of my correspondents, who have, with the purest motives, suggested many improvements in theory, but when met with the practical experience have acknowledged themselves in error.

From my previous correspondence with you I am satisfied you will be just in at once acknowledging the impracticability of your suggestion which you apply in the following words:—"We cannot, however, but consider that a large portion of the timber in it might be advantageously replaced by iron." This suggestion I have carried out, which has proved a total failure, and I will give you the result. Firstly, a timber rail 15ft. long, 3¾in. by 2in. red deal, weighs 1½lbs. per foot, and an angle iron rail 1¼in. by ⅛in. weighs 2½lb. per foot, so that a wood panel of two rails 15ft., 3¾in. by 2in., and the middle rail 2in. by 1¼in. would weigh 55¾lb., but if in angle iron it would weigh 103¼lb. From this you will see the advantage of the wood panels over the iron where portability is so essential. And, secondly, you must be well aware that in attaching the zinc lining to an iron frame it must be soldered, and in the buckling of the zinc plates no soldering would keep it in its position to a bar of 1¼in. by ⅛in. angle iron; and again, on the 15ft. panel being taken from the concrete work and laid on the scaffold until the corner pieces and separating pieces are being removed, the labourer is likely to lay one end of the panel on a block or other material and then step upon it, which in iron 15ft. long would bend, and hence involve time and labour to strengthen it again, when if the panel is wood it would spring to its proper position.—I am, &c., J. TALL.

TECHNICAL EDUCATION.

SIR,—A meeting convened by the Pimlico Amalgamated Society of Carpenters and Joiners was held in the schoolroom of St. Gabriel and St. Saviour, Pimlico, on Friday evening, July 17, the Rev. B. Belcher, M.A., presiding, at which Earl Granville and other gentlemen were present, to inaugurate the establishment of a school for technical education amongst carpenters and joiners by the above society. Earl Granville highly approved of the object, and hoped it would receive the encouragement it deserved. Mr. R. Trollope, of the eminent firm of Trollope and Son, spoke of the value of a scientific education to working men as tending to increase their skill and consequently their wages. Captain Oldershaw and other gentlemen followed, and it now only requires a little support in the shape of books, drawings, &c., to give the school a fair prospect of success.—I am, &c.,

GEO. GINN.

13, Lincoln-street, Chelsea, July 21.

THE NEW NATIONAL GALLERY.

SIR,—If, as is supposed, the new National Gallery was given to Mr. Barry as compensation for the loss of the Law Courts, the arrangement, however satisfactory from a red tape point of view, was scarcely a correct way of determining an art question. The choice of the design published in last week's BUILDING NEWS I consider most deplorable. Though not a great admirer of any of the designs submitted in the National Gallery competition, yet for convenience, economy, and art merit Mr. Murray's design for the conversion of the existing building appeared to me vastly superior. Mr. Barry's new design appears like a *rechauffage* of old city structures—St. Paul's, Bank of England, and Mansion House, and not the slightest hint is given of its intended purpose as a picture gallery. From the necessity of top lights one would expect a picture gallery to have its uses plainly marked on its exterior, but in this design the attempt appears to be to nullify any such idea; the five domes, with their wide-spreading podium, appear to cover the greater part of the roof, and the enormous area beneath them must be lost to all purposes of picture exhibition. The wonder is where the pictures are to go. As a common sense question I should like to know what domes have to do with a picture gallery. A moderate-sized one over the entrance hall or staircase would be reasonable enough, but what excuse can be made for five? They are worse than useless, for, costing a vast sum of money, they are utterly at variance with the intended uses of the building. Better far the present much-abused but unpretending work of poor Wilkins than Mr. Barry's costly, piled up agony of pretentious inconsistency—a design only improving by those gross, exaggerated features for the which there is no reason or shadow of excuse.—I am, Sir, &c., M.

BUILDING SOCIETIES AND STAMP DUTIES.

SIR,—Permit me to call attention to the bill now before Parliament to amend the law relating to Inland Revenue, sec. 10, wherein it is proposed to take away the exemption from stamp duties hitherto enjoyed by building societies on all mortgages under £200.

As solicitor to upwards of twenty building societies of different principles, the members of which comprise all classes, but the majority of them being poor, and to whom every shilling is of consequence, I think every person ought to use his influence in opposing or causing the bill to be opposed in its present form.

The present Government ought not to wish to pass a bill affecting the interests of so many poor people without giving them an opportunity of being heard.

If the present bill is passed it would, in my opinion, materially retard the beneficial results of building societies, which are one of the great improving features of the present age.—I am, &c.,

T. F. PEACOCK.

111, Gower-street, Bedford-square, July 21.

SLOUGH CHURCH.

SIR,—I hope the letter of "One of the Competitors" in this matter will bring the referee's report before the public, so that we, as competitors, may be satisfied that justice has been done to all parties. Our designs ought to have been returned long ago if not accepted.—I am, &c.,

July 22. ANOTHER COMPETITOR.

KITCHEN SINKS.

SIR,—I have found it a good plan (to prevent unpleasant smells arising during the night from interior sinks) to cover up the traps with flannel kept down by a weight and filling the trough with water. You noticing this in your next issue may add some little comfort to your subscribers this hot weather.—I am, &c., J. G. BROWN.

Intercommunication.

QUESTIONS.

[929.]—MATHEMATICAL QUERIES.—Will any of your correspondents kindly inform me of the shortest, and at the same time exact, known method of finding the square of any whole number contained between ten and one hundred. Also, a method by which accurately, and with the fewest figures, it is possible to find the length of the side of an octagon from the diameter or radius of the inscribing circle.—A. P. B.

[930.]—QUANTITIES.—I am an architect's assistant, and am often much pressed by builders to take up the quantities of different building jobs for them. Will any of the readers of the BUILDING NEWS, who are conversant with the law on these points, kindly tell me to what extent I may render myself liable (not being a professional surveyor) in the event of any mistake existing in the bill of quantities?—S. M.

[931.]—RECTILINEAL METAL BEAMS.—Would you allow me to request to be informed of some simple formula for calculating the strength of rectilineal cast metal beams when the proportions of top and bottom flanges are as 1 to 6, and the weight equally distributed over the beam. Also, what proportion should the maximum load bear to the breaking weight. In the event of a beam of the above description being calculated to bear a given load as above, what would be the section of a built wrought iron beam to bear a similar load, and a simple formula for calculating it, and what proportion would the load bear to the breaking weight.—AN INTERESTED ONE.

[932.]—MASTIC CEMENT.—Would you allow me, through "Intercommunication," to request information as to the nature and properties of mastic cement? First, what is it composed of? I believe it is generally used with boiled linseed oil, but sometimes with water. Second, if it sets with either, why is oil used? If the oil is better, what is the chemical action? Third, what is the meaning or origin of the term "mastic"? We hear of gum mastic, mastic varnish, &c., but why is the cement called so.—AN INTERESTED ONE.

[933.]—WASHING PLASTER OF PARIS CASTINGS.—Would any of your readers kindly inform me, through your "Intercommunication," what is best to wash a casting of the Last Supper, made of plaster of Paris, so as not to fill up the niches? I want it white.—X. Y. Z.

[934.]—TECHNICAL EDUCATION COMMITTEES.—Can any of your readers tell me what has become of the Technical Literature Committee and the Workmen's Technical Education Committee, connected with the Working Men's Clubs? Reports of several meetings of the former appeared in the BUILDING NEWS in November and December last year; and the latter was represented to have been appointed to give expression to the working men's pleas, with the view of assisting the deliberations of the Government; but I have heard nothing of its mission since it was appointed. There was another committee also formed, I think, by the same society, on the subject of Play Grounds for the Children of the London Poor; and still another, on the Adulteration of Food. These committees would strengthen the claims of the Club and Institute Union to public support, and prevent much misapprehension in the future, if the public could hear aught of their inquiries and operations.—J.

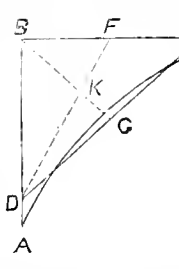
[935.]—REMOVING OLD STAIN AND VARNISH FROM FRAMEWORK.—I should feel obliged if any of your correspondents would give me the best recipe for removing old stain and varnish from framework, so as not to injure the wood.—A SUBSCRIBER.

[936.]—THE WEATHER AND COAL.—Does coal suffer deterioration from exposure to the weather? If so, in what way and to what extent?—PHOSO.

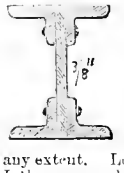
REPLIES.

[902.]—STRENGTH OF CYLINDERS.—Your correspondent "P. S." means probably "by hollow iron cylinders of a circular form" hollow globes or spheres, and the question resolves itself into one of determining the resistance of it to an internal pressure. If P be the pressure for unit of surface, R the radius of the sphere, S the coefficient of resistance, and T the thickness of the metal, the total pressure P^1 equals $P \times \pi \times R^2$. In order to ensure equilibrium, the total pressure must equal the resistance, which is equal to $\pi \times T \times S\,(2R + T)$, and consequently we have $P \times \pi \times R^2 = \pi \times R \times S\,(2R + T)$. Solving for T, we obtain $T = \sqrt{\left(\frac{PR^2}{S\,(2R+1)} + \frac{1}{4}\right)} - \frac{1}{2}$. For practical purposes, as a safe working load for wrought iron, S may be taken equal to 4,000, and for cast iron S = 3,000.—ENGINEER.

[909.]—THE CENTRE OF GRAVITY.—A geometrical method for finding the point K sufficiently accurate for all practical purposes may be thus worked out:—Let A B C represent the semi arch of which it is required to find the centre of gravity K. In the first place, by equalization (a common problem in plane geometry), make the area of the semi arch equal to the area of the triangle D B E by drawing the equalizing line D E. Then bisect the line B E in F, and draw D F. We know, mathematically, that the centre of gravity of the triangle D B E will be somewhere in the line D F. Again, bisect the line D E in G, and draw E C. Since the centre of gravity of the triangle will also be somewhere within this line, it will manifestly be found at K, the point of intersection of the lines D F and B G.—Q. E. F.



[913.]—IRON SEMICIRCULAR ROOF.—In answer to an "Engineer's Pupil," his section of rib should be that of an ordinary plate girder, as per sketch. To find, first, the strains, and then the quantity of metal required in the flange, it will be necessary to make an approximate estimate of the roof itself, which is easily done. The actual weight of the girder itself may be omitted in this calculation, as it will be very trifling, and will not affect the result to any extent. Let W equal the total load upon the arch; L the span, and R the rise; then the strain S in tons at the centre is $S = \frac{W \times L}{8 \times R}$; and the value of S divided by 5 will give the number of square inches of metal required in the flanges at the centre, or the number of square inches in the two upper angle irons and two lower, respectively, in the cut. The strain at any other point, and consequently the number of square inches of metal, may be found from the formula I gave in my last answer. It will be sufficient to find the strain at one other point near the springing, and if the sectional area be increased the depth of the girder may be constant throughout; or, instead of altering the size of the angle irons, the depth may be slightly increased towards the springing. For the girder in question, a depth of 18in. at the crown and 24in. at the springing would be sufficient; but this depends in some measure upon what the covering is made of, as it might be very heavy or very light. I recommend a plate girder, as it is stiffer, although not necessarily stronger, than a lattice one.—CALCULATOR.



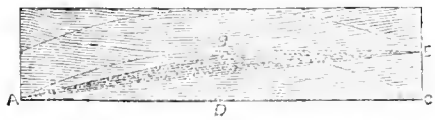
[918.]—FLUSHING HOUSE DRAINS.—In this very dry weather the waste water from the sinks is not sufficient to completely cleanse the drains from all solid matter, and hence the unpleasant smell complained of by "Tim." Mr. Allen, an authority upon these points, gives a very simple remedy for the evil. He says that the cleansing of the house drains may be effected at a very trifling expense by shortening about a couple of inches the waste pipe of the cistern, for as the water comes in from the main faster than it runs off by the waste pipe, the cistern would continue to fill till the rate of its coming in becomes exactly equal to the quantity running off, and this flowing and continual cleansing would last until the water was cut off at the main. Accordingly as the quantity of water that is required is much or little, so must the length of the waste pipe be adjusted.—S. S.

[921.]—WORKMEN'S INTERNATIONAL EXHIBITION FOR 1869.—The scheme of this exhibition is not abandoned. Some months since a salaried assistant secretary, altogether new to such work, was appointed and in the course of a few weeks a number of vice presidents and a guarantee fund of about £1,500 were obtained. Two months ago application for the use of buildings at South Kensington was made to the Science and Art Department, and the interval has been filled up in waiting for the answer from the Government.—A MEMBER OF THE COUNCIL.

[924.]—ARCS OF DIFFERENT RADII.—For the information of "Howell" I beg to hand you a method. To describe a segment, A B C, of a circle, by means of an angle, let A C, fig. 1, be the length or chord, and B D the

FIG. 1.

FIG. 2.



versed sine; join B A and B C; produce B A to E, and B C to F, making B E and B F of any length, not less than the chord A C. Prepare two straight edges, B E, B F, and fasten them together at the angle B so that their outer edges may form the angle A B C, and to keep them to the extent fix another slip, C H, to each straight edge at C and H. Bring the angular point B to A; then move the angle thus formed by the straight edges, so that the edge B E may always move upon the point A, and the edge B F upon the point C. A pencil being held to the angular point B, the segment of a circle will be described. Fig. 2, if you think proper to insert it, will explain itself.—PICK.

[926.]—REMOVING OIL PAINT FROM STONE.—I have practised with satisfaction a method lately made known by Mr James Fowler, F.S.A., which I think will satisfy "E. S. B." Dissolve in as little water as possible some coarse American pearlash, and apply with a tow mop. In twelve hours the surface will have partially dissolved into a thin paste, which may readily be removed with a whitewasher's brush and some water. Should any of the paint still remain re-apply the mixture. To prevent any injury to the stone from the alkali, add a little sulphuric acid to the last rinsing water. This method will not injure any stone, and the only difficulty in its application is where Roman cement wash, harder than stone, sticks so fast that the mixture is not able to reach the object of its attack. —K.

LAND AND BUILDING SOCIETIES.

THE fourth annual meeting of the City of Rochester and General Land and Building Society was held at Rochester on Monday week. The directors have the pleasure to state that the profits realised during the first year enabled them to apportion a sum equivalent to 6½ per cent. per annum compound interest, a portion of the profits being, at the same time, placed to the reserve fund of the society. The balance sheet, read by Mr. T. S. Warne, the secretary, showed that the total income of the society for the past year had been £7,442, including £3,519 received in subscriptions from borrowing and investing members, £1,683 on redemption of property in mortgage to the society, and £1,950 received on loan. On the other side of the account the sum of £4,725 had been advanced to members on freehold or leasehold securities, £455 to members on withdrawal, and £1,309 on repayment of loans. The report and balance-sheet were unanimously adopted.

WAGES MOVEMENT.

MESSRS. BUNNETT AND CO., the well known shutter manufacturers, have received a threatening circular, which for the sake of the trades' unions, we trust may turn out to be a hoax. The following is a copy:—"Messrs. Bunnett and Co. (Limited) Gentlemen We have to inform you that a resolution has been passed condemning the system of piecework as most obnoxious to trades' unions; and after the ensuing month, should you attempt to deviate from the tenor of this intimation, you must bear the consequences.—Yours respectfully, From the General Secret Committee, July 15"

Mr. Rupert Kettle, judge of the County Courts of Worcestershire, who has organised a system of Courts of Arbitration at Wolverhampton and Coventry, attended last week at Leeds as arbitrator in a dispute which has arisen between the master carpenters and joiners and their workmen respecting the rates of wages and the hours of labour. The views of both parties were placed before the arbitrator, and the result was that the men are to receive an advance of ½d. per hour in their wages, but that the demand for the reduction of the hours of labour was abandoned. It was agreed to appoint a court of arbitration to settle disputes that may arise during the next two years, and Mr. Jowitt was selected as the gentleman who is to be invited as umpire, should any dispute arise rendering his advice necessary.

The journeyman plasterers of Glasgow have hitherto been paid at the rate of 6d. per hour, or 2s 6d. per week At a meeting of the employers, on Thursday afternoon, the 9th inst., it was resolved to make an advance to 6½d. per hour, or of 2s. 6d. per week, to take effect at once, and continue for six months, after which the wages should be raised to 7d. per hour, thus conceding the whole demand of 5s. per week.

The master builders of Lymm, in Lancashire, have received a notice from their workmen expiring in eleven days, to the effect that an increase of 2s. and a reduction of 3½ hours a week is required. A strike is threatened if the demand is not complied with.

STAINED GLASS.

A NEW stained glass window by Messrs. Hardman and Son has been inserted in the parish church of Gosberton The window consists of three lights. Besides the tracery running through the three lower compartments, there is a representation of the Lord's Supper; above this the Crucifixion, the cross being a vine, with full-sized figures on each side of the mother of our Lord and St. John. In the tracery are figures of the patron saints of the church, St Peter and St Paul, and above all a striking figure of Christ in glory.

A stained glass window has been placed in St. Benedict's Church, Cambridge, by Mr. W H Constable, of Warwick. The window filled is the west, and consists of three lights, the centre one being the Ascension under a rich canopy, and at the base an angel bearing the inscription "I go to prepare a place for you."

A sixth memorial window has been presented to the parish church of Willesden. It consists of three lights, each containing a scene from the life of Joseph, and surmounted by emblems of his dreams and of Pharaoh's vision It is from the manufactory of Mr. Hughes, of Frith-street, Soho.

A memorial stained glass window has just been placed in St. Margaret's Church, Durham. The window is of three lights, and its pictures represent the leading scenes connected with the parable of the Good Samaritan. The glass was supplied by Messrs. Clayton and Bell, of London. The stonework of the window was executed by Mr Joseph Taylor, builder, Durham, from the designs of Mr. C. H. Fowler, architect, of the same place.

STATUES, MEMORIALS, ETC.

THE Thames Embankment is regarded as an excellent site for statues and drinking fountains. Noble's statue of Sir James Outram is, it is said, to be located on the embankment near the Houses of Parliament. A statue of Sir James Brooke will, when sculptured, be placed near it; and numerous statues now standing in inappropriate or obscure places will, it is expected, find final resting places on the Thames Embankment, thus becoming conspicuous national ornaments to the grand river esplanade. Let us hope all not yet executed may approach a little nearer to artistic excellence, and not, like the majority of existing London statues, disfigure the site they are meant to adorn.

A statue is about to be erected at Southampton to the memory of Lord Palmerston The site, which is in the Old Fairfield, fronting Marland place, has been marked out.

LEGAL INTELLIGENCE.

BREACH OF THE METROPOLITAN BUILDING ACT.—Mr. Frederick James Gribble, builder, of 27, Marquess-road, Camden-square, was summoned before Mr. Barker by Mr. Henry Baker, district surveyor of St. Pancras, for infringing the 20th and 26th sections of the Metropolitan Building Act, 1855. Mr. Baker said that the defendant had erected three houses on the west side of York-road, Camden-road, the eaves and cornices of the overhanging roofs, both in front and rear, being of woodwork, instead of brick or other fire-proof material. This practice was very much on the increase by builders in the suburbs, and the Metropolitan Board of Works had issued an order directing that proceedings should be taken in every case in which the board had not given permission for their erection. The defendant had failed to remove the timber and woodwork now in contiguity with the brickwork of the several flues and chimneys, up to Wednesday. The defendant said that if time was given him he would communicate with the Metropolitan Board of Works, who would give him leave to keep them as they were. Mr. Barker made an order for the work to be done in accordance with the terms of the notice. The defendant was then summoned by Mr. Baker for commencing three houses without having given due notice in writing, stating the situation, area, height, and intended use of such buildings, whereby he had incurred penalties amounting to the sum of £60. Mr. Barker made an order for the defendant to pay £2 2s. costs and £2 penalty. The defendant said he thought it was very hard, and asked for time to pay the money.

Mr. George Bransbury, a plumber and glazier at Littlehampton, Sussex, was summoned before the county magistrates at Arundel on Tuesday week for commencing the erection of a building without giving due notice of such erection to the Littlehampton Local Board. A fine of 10s. and costs was inflicted.

Our Office Table.

At the meeting of the Social Science Association at Birmingham in October next, one of the subjects selected for special discussion in the health section is:—What is the relation of the water supply in large towns to the health of the inhabitants?

The University of Durham have awarded the Whitworth Exhibition of £25 placed at their disposal by Mr. Whitworth, to Mr. John A. Bennion, of Manchester.

The seventh of the series of lectures promoted by the committee of the Leeds Philosophical and Literary Society, in illustration of the Fine Art Exhibition, was delivered yesterday week by Mr. J. C. Robinson, F.S.A., the lecture being on "The Old Masters, considered from Modern Points of View," and containing valuable suggestions respecting the formation of a Gallery of Art in Leeds

The *Medical Times* states that house vermin may be destroyed by introducing into the holes or cracks a few drops of petroleum.

Builders and joiners should be careful of their shavings this hot weather. Last week at Yarrow, N.B., a joiner's shop was set on fire by the sun. It appears that in passing through a pane of glass the rays of the sun were concentrated into a focus over some shavings. These being very dry eventually took fire; but the occurrence being soon discovered the flames were extinguished before any serious damage was done.

The municipal government of Paris caused a careful examination to be made last year of the remains of the Old Louvre, the fortified castle of Philip Augustus, which lie beneath the enclosed court or square of what is now called the Old Louvre, and it was found that the ideas respecting this ancient edifice were very erroneous. The base of the Donjon-tower, which figures conspicuously in history, was found intact, and only a few feet beneath the present surface of the ground. An admirable method has been adopted of recording the form of the ancient fortress; the entire ground-plan has been laid in black and white asphalte, except where the old building lies beneath the pavement of the present court, in which case granite has been used to represent the foundation of the old building.

The quarries of Carrara produce, besides the statuary marble for which the district is famous, another description of white marble, and a blueish marble, called bardiglio. Mr. Harries reports that in the course of three years, 1863-5, there were exported from Carrara 126,928 tons of marble, the average annual value of which was upwards of 1,000,000f. The export and other duties levied by the State amounted to about 80,000f. per annum. 2,238 persons, or about one-seventh of the whole population of the district, were employed in working the marble. There is a greater variety of marble in the adjoining district of Massa, but the elevated position of the quarries and the want of transport prevent them from being completely worked. Oriental alabaster is found in the Siena country. In the neighbourhood of Volterra there are 29 quarries, which yield annually 580,000 kilogrammes of alabaster of different colours and qualities. The alabaster statuettes, vases, and ornaments of all sorts that are sent from Italy to all parts of the world are made principally at Volterra.

The Streets Cleansing Committee of the Corporation of London have just reported their own experience of performing their own dusting, cleansing, and watering. The cost for the past nine months has been £16,559 3s. 2d., and the cost for the whole year is estimated at £22,078 17s. 6d. The amount paid under the contract system for the year ending Michaelmas, 1867, was £22,845 19s. 3d.; so that a gain of nearly £800 is expected in the first year. The committee is now seeking power to purchase its own horses, carts, and plant, as a great saving will thereby be effected.

A serious fire broke out the other day in the tower of Boyn Hill Church, Maidenhead. The heat was so great that two bells were melted, and two others fell on to the lower arch of the tower. The fire was fortunately extinguished in time, or all the bells, eight in number, must have been destroyed. The damage is estimated at from £500 to £600.

At the last meeting of the Marylebone Vestry a long debate ensued as to the advisability of extending Thayer-street, Manchester-square, to Oxford-street. The promoters of the scheme estimate the cost at something under £20,000.

Mr. William Hey, architect, of New Kent-road, has applied to the Court of Bankruptcy to annul his bankruptcy, he having paid in full every claim against him. The Commissioner made an order in accordance with the application.

The Metropolitan Board of Works is endeavouring to secure London Fields, Hackney, for purposes of public recreation.

The largest and most varied display of the works of the sculptor ever exhibited at the Royal Hibernian Academy is that of the present year. During former years very few objects met the visitor's eye on entering the sculpture room, but at this exhibition we find no fewer than 260 statues, busts, medallions, groups of figures, and other products of the sculptor's chisel, executed in marble, clay, and plaster. The largest contributor to this department is Mr Joseph Watkins, of Dublin. Mr. Watkins received the great national medal for the best specimen of modelling offered at the competitive trials at the South Kensington Museum, besides other honours awarded by the Royal Dublin Society and various art institutions. Among his contributions to the present exhibition are busts of the Archbishop of Dublin, Sir George Hodson, Bart., and Lady Hodson, the late Dr. Robert Sullivan, &c. The remaining works are from a large number of artists—Mr. Joseph Kirke, Mr. John Farrell, Mr. Thomas Farrell, Mr. Harwood, Mr. Stevenson, Mrs. Hill, Mr. Millard, Miss White, and Mr. Woodhouse.

The section of the Metropolitan Extension Railway which is to be constructed on the Thames embankment from Westminster Bridge to Blackfriars will be commenced immediately. The contractors for the works are Messrs. Lucas, Waring, and Co., who have constructed the line from Kensington to Pimlico, and beneath Victoria-street to Westminster, a great portion of which is finished. The *souterraine* through which the line will pass is to be constructed in the following manner, on account of the newly-made ground:—Deep excavations will be made, the side walls being of thick, massive brickwork, upon which the roof of ironwork will be fixed; shafts for the purposes of ventilation will be constructed at certain distances from each other, and the intermediate stations will in all respects be similar to those on the Metropolitan trunk line. Until the extension of the Thames Embankment is completed to Blackfriars, the railway works cannot be carried further than the Temple-gardens.

23,279 people, including season ticket-holders and those admitted by payment, visited the Works of Art Exhibition, at Leeds, last week.

The footway of the Northern Thames Embankment will be formally thrown open to the public on the 30th inst. by the Board of Works.

An artisans' conversazione at the South Kensington Museum is on the *tapis*.

Professor D. T. Ansted, M.A., F.R.S., Professor Robert Kerr, of King's College, and Dr. Edwin Lankester, F.R.S., have been added to the list of vice-presidents of the Public Museums and Free Libraries Association.

In the House of Lords on Tuesday evening, the Commons' amendments to the Artisans' and Labourers' Dwelling's Bill were agreed to.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3428 R. PORTER. IMPROVEMENTS IN THE CONSTRUCTION OF METALLIC AND OTHER BUILDINGS. Dated December 2, 1867.

This invention has reference, principally, to buildings constructed mainly of metal, and consists, first, of the following method of constructing the walls of the said buildings. The patentee makes the said walls of corrugated sheeting, either of iron or zinc, the corrugations being situated vertically, and he supports and strengthens the said wall by means of standards made of metal, rolled or otherwise formed into a trough-like figure. The said standards are fixed against the corrugated walls in such a position that the edges of the said trough like standards fall into and lit against the bottoms of the corrugations in the walls. The standards may be made of a width proper to include two, three, or more corrugations. Along the interior of the walls, and nearly midway between the floor and roof, he fixes horizontal rails which may be made of wood, iron, or of both combined. The said horizontal rails are supported in brackets connected with the standards, the connection between the said standards and brackets being effected through holes in the corrugated walls. Horizontal rails of the kind described may also be fixed in a similar manner at any required height inside the building. The standards may be fixed inside the building, and the horizontal rails outside where required. The walls may be lined internally with a cheap description of paper board, such as mill boards, straw boards, and the like. He attaches the said lining by making it in sheets or panels, which are inserted in rebates or grooves of wood or metal fixed to the walls, or to the horizontal rails. The invention consists, second, of the following method of attaching the ridge caps on the roofs of metallic buildings, and other buildings having corrugated metallic roofs. On the summit of each side of the roof he fixes a strip of hoop iron, which has been corrugated with corrugations similar to those of the roof plates. The said strips of corrugated hoop iron are so fixed on the summit of the sides of the roof that the concavities in the said strips are opposed to the concavities in the roof plates, and there is thus formed a series of nearly circular spaces or openings. The ridge caps are fixed upon the said corrugated strips of hoop iron. There is thus left a series of nearly circular openings along the whole length of the ridge of the roof, by means of which the ventilation of the building is effected.—Patent completed.

Trade News.

TENDERS.

BLETCHINGLEY.—For the erection of a villa residence at Bletchingley, Surrey, exclusive of local stone, for Mr. W. D. Howard. Joseph S. Moye, architect:—

Ball	£2050
Fish	1903
Walton	1735
Barnes	1725
Taylor and Clear	1690
Grover (accepted)	1556

BROMLEY.—For the erection of a new chapel in Devonshire-lane, Bromley, for the United Free Methodists. Quantities supplied:—

	Tenders.	Credit for old chapel.	Credit for old chapel if materials, so far as are sound, fit, and approved, to be re-used.
Aldous	£2877 0 0	£ 50	—
Stevens	2758 0 0	30	£ 60
Wardle	2700 0 0	60	45
Cobelblick	2650 0 0	150	175
Spurman	2640 0 0	30	65
Girling	2581 18 5	50	80
Heath	2560 0 0	100	200
Gregar	2559 0 0	40	70
Winship	2540 0 0	50	120
Watts	2520 0 0	—	100
Stains and Son	2498 0 0	28	38
Manly and Rogers	2490 0 0	50	130
Atherton and Latter	2475 0 0	50	60
Hedges	2463 0 0	40	50
Harrison	2459 0 0	30	90
Brittan	2455 0 0	50	105
Holford	2434 0 0	50	70
Nightingale	2425 0 0	30	75
Wigmore	2400 0 0	—	40
Abraham	2396 0 0	30	50
Shetfield	2389 0 0	50	90
Scrivener and White	2297 0 0	20	45
Turner	2247 0 0	80	100
Mundy	2100 0 0	40	50
Foale	2050 0 0	34	20
Pearce	1999 0 0	—	137

CAMBERWELL.—For the erection of a soda water manufactory, with stabling, at Camberwell, for Mr. T. A. Taylor. Joseph S. Moye, architect:—

Walton	£4990
Stoner	4850
Sapwell	4849
Fish	4730
Blott	4500
Enstace	4484
Higgs	4431
Grover	4388
Foster	4051

CHESTERFIELD (Derbyshire).—For the erection of a house, &c., in connection with the Roman Catholic Church, for the Rev. H. Birch. Mr. S. Rollinson, architect:—

Heathcote and Son (accepted)	£800

HIGHGATE RISE.—For additions to La Sainte Union Boarding house, Highgate-rise. Messrs. Goldie and Child, architects. Quantities supplied by Mr. Jas Schofield:—

	Building.	Fittings.	Less if Cement instead of Stone.
Simpson	£4732	£462	£228
T'Anson	4374	360	150
Jackson and Shaw	4273	420	225
Roberts	4275	347	160
King and Son	4190	390	200
Longmire and Burge	4163	380	235
Hill, Keddell, and Waldrum	4070	375	200
Conder	4048	376	176

HIGH WYCOMBE.—For the erection of a new storehouse at Frogmore Brewery, High Wycombe. Mr. Charles Carter, architect:—

Spicer	£1312 14 0
Corby	1295 0 0
Reavell	1257 0 0
Woodbridge (accepted)	1228 0 0

KIDDERMINSTER.—For a new carpet manufactory for Mr. W. Green. J. B Baker, Esq., architect:—

Abell, Worcester	£6863 13 10
Lovatt, Wolverhampton	6140 0 0
Trow and Sons, Wednesbury	6188 0 0
Reid and Bourne, Oldbury	6105 0 0
Hilton	6034 0 0
Horton, Brierley Hill	5737 0 0
Aukrett (accepted) Kidderminster	5718 0 0

LONDON.—For parsonage house of St. Andrew's, Bethnal-green, for Rev. Charles Kirton. Mr. Benjamin White, architect. Quantities supplied by Mr. Longmore:—

Browne and Robinson	£1663
Perry and Co.	1600
Rivett	1553
Hedges	1509
Hill, Keddell, and Waldrum	1485
Kilby	1469
Ashby and Horner	1460
Hearle	1335

LONDON.—For Baptist Chapel, Charles-street, Goswell-road. Messrs. Finch, Hill, and Paraire, architects. Quantities furnished by Mr. Barnett:—

Garrod	£4987
Carter and Sons	4870
Keeble	4834
Higgs	4522
Hill, Keddell, and Waldrum	3980
Browne and Robinson	3974
Hart	3962
Dove Brothers	3920
Hill and Sons	3850

LONDON.—For Willson's Wharf, Tooley-street. Messrs Smoke and Stock, architects. Quantities supplied by Mr. Marsland:—

Hart	£26,950
Wills	26,900
Thompson	25,880
Coleman	25,750
Hill, Keddell, and Waldrum	25,488
Holland and Co.	25,400
Munday	25,390
Browne and Robinson	25,260
Brass	25,137
Adamson	24,644
Webb and Son	24,586
Conder	24,528
Kider and Son	23,180

PLYMOUTH.—For alterations to premises 257, High-street, Exeter, for Mr. R. J. Watts, Plymouth. Mr. J. Harvey, Plymouth, architect. Quantities supplied:—

Stafford	£97 0 0
Force	80 0 0
Harvey	65 0 0
Brag (accepted)	53 10 0

RICHMOND.—For building four houses at Richmond, Surrey, for H. Hill, Esq. J. Blore, Esq., architect. The whole of the brickwork to be built with best hard burnt Middlesex stock bricks, picked stock facings, with white and red brick bands, quoins, arches, and reveals, and devices in front. The mortar to be composed of the best Dorking lime and Thames sand. Stone coping, &c., to the gables. Dry areas, &c.:—

Hayhoe	£1390
Sims (accepted)	1400
Foster (the builder of the house at East Sheen, under A. W. Blomfield, Esq.) for erecting the same with Tall's apparatus and concrete construction, omitting dry areas	1515

STAVELEY (Derbyshire).—For the erection of a girls' school, for His Grace the Duke of Devonshire. Mr. S. Rollinson, architect:—

Marriott and Waterhouse (accepted)	£618

STRATFORD.—For bridge and roads at Stratford, for the Carpenters' Company. Messrs. Pocock, Corfe, and Parker, surveyors. Quantities not supplied:—

	Bridge.	Roads.
Moreland and Son	£1575	—
Rivett	1493	£287
Hill, Keddell, and Waldrum	1480	267
F. and F. J. Wood	1463	259
Hedges	1292	290

SUTTON.—For erecting a residence for Mr. J. Cann, at Sutton, Surrey. Mr. Thomas, architect. Quantities supplied:

Best	£1694
Cowland	1399
Nightingale	1343
Thompson	1340
King	1195

TULSE HILL.—For villa residence at Tulse Hill. Mr. J. D. Hayton, architect. Quantities supplied by Mr. C. H. Gough:—

Myers	£2555
Dove Brothers	2455
Henshaw	2388
Geo. Smith	2374
Coleman	2285
Gammon	2257
Hill, Keddell, and Waldrum	2253
Colls and Son	2200
Downs	2196
Higgs	2163
Piper and Wheeler	2150

WINSTER (Derbyshire).—For the erection of a Parsonage House for the Rev. H. Milnes. Mr. S. Rollinson, architect. Quantities supplied:—

Gregory and Fryer (accepted)	£1209

COMPETITIONS.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

FINSBURY SCHOOL DISTRICT.—August 3.—Plans, sections, elevations, and estimate of costs for school at Upton, West Ham, Essex. W. W Hayne, Vestry hall, City-road.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square, Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

CITY OF PEST.—July 31.—For excavating trenches, laying the pipes, and making them entirely watertight. Hon Moritz von Szentkirályi, Ober-Burgermeister, President, City Waterworks Company, Pest.

ROYAL ARSENAL, WOOLWICH.—August 1.—For supplying and depositing dry rubbish or dredger stuff on the foreshore. Inspector of Works, Royal Arsenal.

ST. IVE'S, HUNTS.—August 6.—For supplying and lighting the streets, roads, and other places with gas, for a period of three years. Messrs. Fisher and Ginn, clerks to the Improvement Commissioners, St. Ive's.

CROYDON.—July 28.—For the construction of about four miles of brick sewer, and one mile of earthenware pipe sewer. R. J. Cheesewright, Townhall, Croydon.

MAIDSTONE.—July 28.—For 400 tons broken Guernsey granite. E. Hoar, clerk to the board, Maidstone.

BRIGHTON.—July 30.—For the construction of about 4,000 yards brick sewers, and about 22,000 yards pipe sewers. D. Black, town clerk.

WISBECH (CAMBRIDGESHIRE).—Cattle Market.—For wrought and cast iron cattle pens, fencing, &c.; and for paving, draining, &c. F. Jackson, clerk to Local Board

BEACONSFIELD, BUCKS.—July 30.—For altering, repairing, and part rebuilding the house, &c., at Hall-place. Plans, &c., Rev. S. J. Bowles, Rectory, Beaconsfield.

HALIFAX.—August 11.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

CAVERSHAM, NEAR READING.—July 30.—For the erection of a wrought iron lattice girder bridge over the Thames. Mr. H. Woodman, borough surveyor, 3, Grey Friars-road, Reading.

WAR OFFICE, PALL MALL.—August 10.—For the purchase of a turret clock. T. Howell, director of contracts.

SPILSBY (LINCOLNSHIRE).—August 1.—For taking down and rebuilding the George Hotel. G. Smith, surveyor, Spilsby.

LEAVESDEN, WOODSIDE, NEAR WATFORD, HERTS.—August 12.—For the erection of an asylum.—W. F. Jebb, 37, Norfolk street, Strand.

ASHBY-DE-LA-ZOUCHE, LEICESTERSHIRE.—For about 1,000 yards of brickwork. Messrs. Spagg and Joyce, architects, Stafford.

STOKE UPON-TRENT.—August 13.—For the erection of a new manufactory. C. Lynam, architect, Stoke upon-Trent.

OLD KENT ROAD.—For the erection of twenty houses on the Trafalgar estate. Mr. W. Smith, 12, Copthall-court, city.

PORTSMOUTH.—August 10.—For the erection of the New Baring fever hospital. Mr. St. Aubyn, architect, Lamb's-buildings, Temple.

For dredging and removing the mud from about 16 acres of ornamental water. F. M. Eden, 11, Eaton place, West, S.W.

NORTH LONDON RAILWAY, BOW, MIDDLESEX.—August 4.—Construction of passenger station, &c. R. S. Mansell, secretary, Euston Station.

CHRISTCHURCH, MARYLEBONE.—July 30.—For painting, colouring, &c. W. Greenwell, Vestry Clerk.

ZEALAND, DENMARK.—August 8.—For execution of works of Zealand railway. To the directors, &c., Copenhagen.

KIDDERMINSTER.—Extension of time till July 25.—For the erection of new Wesleyan Schools. Mr Bland, architect, Union-buildings, Temple-street, Birmingham.

WOOLWICH.—August 8.—For erecting a block of troop stables, &c., for the Military Train. Lieut. W. D. Gossett, Royal Engineer Office, Woolwich.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Ford, Newman-street, Oxford-street, carpenter, July 31, at 12—John Moore, Euston-road, ironmonger, August 7, at 11—Frederick Alfred Stevenson, and Henry Theodore Knibbs, Joseph-street, Commercial road, East, ironfounders, July 29, at 11—George Froud, Acton, builder, August 7, at 11—Thomas Spearing, Hungerford road, Holloway, builder, July 31, at 12—Edwin Taylor, East Dulwich, builder, August 6, at 11—Charles Turner, Camden-grove, Peckham, builder, August 7, at 1.

TO SURRENDER IN THE COUNTRY.

Wilson Brown, Barmby-on-the-Marsh, Yorkshire, joiner, July 30, at 12—George Allen Duns, Liverpool, builder, July 31, at 11—Evan Evans, Llandudno, joiner, July 31, at 10—Thomas Hinks, Loughborough journeyman painter, July 28, at 11—James Milburn, Middlesborough, journeyman bricklayer, July 29—Robert Combs, Worcester, plumber, August 5, at 11—William Murray, Carlisle, builder, August 3, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

August 1, R. Hart, Hammersmith, plasterer—August 14, C. Goodman, Bow, builder—August 14, W. Hutchinson, Lyme Regis, and Wardrobe-place, Doctors Commons, cement manufacturers—October 2, S. R. Bridges, Cotton-street, Mile-end, pavior—August 3, W. J. Baker, Lissongrove, carpenter—August 4, G. Hull, Waterloo, near Liverpool, builder—August 4, J. Hughes, Llandudno, builder—August 4, T. Smitton, Seaforth, near Liverpool, stone mason—July 30, John Crellin, Ireleth Marsh, near Barrow-in-Furness, builder—August 18, J. Hobson, Calverley, stonemason—July 30, W. Matthews, Cardiff, mason—August 13, W. Winterflood, Brighton, painter—August 13, S. B. Palmer, Brighton, ironmonger—August 11, E. Sharp, Child Okeford, carpenter—October 7, C. Clarke, Kilburn, plastering builder October 13, W. Charlton, Brunswick-street, Barnsbury, plumber—July 30, W. Carver, Norwich, engineer—August 11, H. Petty, Southampton, carpenter.

PARTNERSHIPS DISSOLVED.

Carr and Milner, Kilham and Pocklington, brickmakers—Leber and Sanderson, Compton-street, Clerkenwell, engineers—Morgan and Co., Pontardawe, brass and iron-founders—Mendham and Huke, Lowestoft, painters—Symons and Bradford, Barnstaple, timber merchants.

DECLARATION OF DIVIDENDS.

E. and J. C. Jones, Rathbone-place, Oxford-street, smiths, div. 1s. 2 1-16d.—J. T. Ward, Queen-street, Pimlico, glass merchant, div 3½d.—J. Rouse, Sunning-hill, contractor, div. 2s. 6 3-8d.

BANKRUPTCY ANNULLED.

William Hey, Rockingham-street, Newington-causeway, July 16.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£11	10	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12 0
,, yellow pine..	2	13	4	5	Finland	7	0	8 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0 0
Quebec Oak, white..	5	5	5	10	Gothenburg, yellow	8	0	9 10
,, birch.....	4	5	5	0	,, white	8	0	9 0
,, elm	3	15	5	10	Gefle, yellow.....	9	0	10 10
Dantzic oak	4	0	6	0	Soderham	9	0	10 10
,, fir	2	0	3	5	Christiania, per C.,			
Memel fir	3	0	4	5	12 ft. by 3 by 9 in.			
Riga.....	3	0	3	3	yellow	14	0	20 0
Swedish	2	5	2	8	Deck Plank, Dantzic,			
Masts, Quebec red pine	5	0	6	10	per 40 ft. 3 in.	0	15	1 3
,, yellow pine..	5	0	6	0	Pumice Stone per ton	6	0	8 0
Lathwood, Dantzic, fm	6	10	7	10	Oils, &c.			
,, St. Petersburg	8	10	9	10	Seal, pale....per tun	36	0	0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	95	0	0 0
					Cod	38	0	0 0
Quebec, white spruce	13	0	20	0	Whale, Sth. Sea, pale	35	0	0 0
St. John, white spruce	13	10	15	10	Olive, Gallipoli.....	68	0	73 0
Yellow pine, per reduced C.					Cocoanut, Cochin, ton	53	0	55 0
					Palm, fine	40	0	40 0
Canada, 1st quality.	17	0	18	10	Linseed	31	10	34 0
2nd do.....	11	10	12	10	Rapeseed, Eng. pale..	34	0	0 0
					Cottonseed	32	0	38 0

METALS.

IRON:—

Welsh Bars in London ....per ton	6	5	0	6	5	0	3
Nail Rod ..... do	7	10	0	7	12	6	} 2½
Hoops. ..... do	8	5	0	9	0	0	
Hoops, Single ..... do	8	0	0	9	0	0	
Staffordshire Bars..... ..... do	7	5	0	7	15	0	} 2½
Bar, in Wales .... do	5	10	0	6	0	0	3
Nailrods .... do	7	10	0	7	15	0	2½
Foundry Pigs, at Olasg, No 1 .. do	2	13	3	2	17	6	net.
Swedish Bars ..... do	9	17	6	10	10	0	2½

STEEL:—

Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2½
Swedish Faggot ..... do	0	0	0	0	0	0	

COPPER:—

Sheet & Sheathing, & Bolt ....per ton	79	0	0	82		0	} 3
Hammered Bottoms ..... do	97	0	0	0	0	0	
Flat Bottoms, not Hammered .. do	83	0	0	0	0	0	
Cake and Tongh Ingot ..... do	81	0	0	83	0	0	
Best Selected ..... do	77	0	0	85	0	0	
Australian ..... do	77	10	0	0	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	6¾	0	0	7¾	

LEAD —

Pig, English .....per ton	21	5	0	0	0	0	} 2½
,, Spanish Soft ..... do	18	10	0	0	0	0	
Shot, Patent ..... do	22	10	0	22	15	0	
Sheet ..... do	20	0	0	20	15	0	} 5
White ..... do	27	0	0	30	0	0	

REGULUS OF ANTIMONY

French ..... ton	43	0	0	0	0	0	

ZINC:—

English Sheet .....per ton	25	10	0	26	10	0	2½
Devaux's V. M. Roofing Zinc .... do	25	0	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot .....per ton	20	0	0	0	0	0	nett
QUICKSILVER .....per btl	6	17	0	0	0	0	

TIN:—

English Block .....per ton	95	0	0	0	0	0	} 2½
do Bar ..... do	98	0	0	99	0	0	
do Refined ..... do	97	0	0	0	0	0	
Banca ,, ... do	85	10	0	97	0	0	} nett
Straits ..... do	92	10	0	93	0	0	

PERPETUAL INVESTMENT and BUILDING SOCIETY.

The seventeenth annual general meeting of the members of this society was held at Radley's Hotel, Bridge-street, Blackfriars, D. Pratt, Esq., in the chair.

The notice convening the meeting having been read,

The SECRETARY (Mr J. E. Tresidder) read the report of the Directors and the annual statement of accounts. The report stated that the business of the last year had exceeded that of the preceding, and yielded a much larger amount of divisible profit than in any previous year. One thousand nine hundred and nine new shares had been issued, and a sum of £236,936 had been received for the purchase of realised shares bearing interest after the rate of £4 per cent. per annum, payable half-yearly. A sum of £18,505 8s. 1d., including interest, had been repaid upon shares withdrawn, and the amount invested in this department, inclusive of capitalised interest to the 30th April last, was £102,407 17s. 6d. A sum of £31,546 8s. 4d. had been received upon subscription shares, while £25,053 5s. 4d. had been repaid to shareholders, including interest upon shares matured and withdrawn. All subscription shares have been credited with the amount of interest due thereon, and the balance now remaining invested upon such shares, with the accumulation of interest and bonuses, was £148,339 6s. 2d. A sum of £5,313 13s. 1d., equivalent to a bonus of £6 per cent. upon all subscription shares entitled to participate, had been apportioned and credited to the several shares accounts. The bonus now declared, while equal to that of the four preceding years, was in the aggregate largely in excess of any previous year; but in consequence of the very large increase in the number of participants in the bonus, the per centage remained the same. A sum of £3,213 18s. 1d. had been received on deposit at £3 per cent., and the balance now remaining on deposit with the Society was £18,689 1s. 4d.; the total advances of the year were £74,3-8 19s. 6d. A sum of £15,871 1s. 11d had been received for interest upon loans during the year, and the balance now remaining due to the Society upon loans was £224,678 12s. 7d. The total amount advanced by the Society from its commencement was £670,305 8s 2d. The Directors had devoted considerable attention to the investment of the estates purchased at East Dulwich and Benhill, and they had also secured estates at Beddington, Epsom, and Muswell-hill. Upon the estate at East Dulwich a portion of the land had been let for the building of ninety houses, nearly the whole of which are completed. To facilitate the sale of houses to persons desirous of occupying them, the Directors had agreed to advance a large proportion of the purchase money at a reduced rate of interest, thus enabling the investors of the Society to become their own landlords upon advantageous terms. Upon the estate at Benhill thirty-two houses were in the course of erection. Plots of land upon either of the estates could be secured upon application at the offices. It had been decided that portions of each estate should from time to time be offered for sale, the purchasers having the option of paying the purchase money by quarterly or half yearly instalments; and the Directors had full confidence that the gradual development of this department of the Society's business would tend greatly to promote the general interests of the shareholders.

The CHAIRMAN in moving the adoption of the report, expressed the regret which he felt at the absence from the chair of Mr. Gover, who had hitherto filled that position, and who was known to the members of the Society for the energy and ability with which he worked for their interests during the last seventeen years. Referring to the progress of the Society he said he was entitled to congratulate the members upon the satisfactory character of the report submitted by the Directors, and it required very few observations from him to commend it to their approval. It was, indeed, so favourable in every respect, that he had no doubt it would be adopted with acclamation. A Society which had advanced during the year, upon the best security, no less a sum than £72,000 was certainly a very large and flourishing institution, and the members might well be gratified at the prosperity which had been attained. It was satisfactory, too, to find that the Society was not one that had ceased to attract public attention, for during the past year one thousand nine hundred and nine new shares had been issued, and the other business transacted was of an equally extensive character. The total amount now out upon loan was £224,000, and this Society had advanced, altogether, since its commencement nearly a million of money. It might, therefore, be fairly said to have achieved a great success, and to those who were Directors of the Society, as he had been from its foundation, it was a source of much pride and gratification to find that it had realised all that it had promised at its outset. The first thing necessary to the success of a Society like theirs was a sufficient amount of capital to carry on their business. He was glad to say that, in this respect, they were well supplied. Indeed, the difficulty which they had was to know how to employ the money which they received so as to make it reproductive. Next to an ample capital they wanted trustworthy management in order to make the institution flourish: and speaking for himself and the other members of the Board, as well as for the secretary and staff of the Society, he maintained that no society could be conducted with more prudence and economy and sound judgment. It was content to divide only what had been well earned; and by that means, and by adapting itself to the wants of borrowers, and charging them a moderate rate of interest, it secured the confidence of the public; and many who availed themselves of the accommodation which it afforded were so gratified that they came to the office to thank the Secretary for the benefits they had received through the agency of the Society. With regard to investors, he did not hesitate to say that the security offered by the Society was equal to that of the Bank of England. All its loans were made upon freehold or leasehold property, which was carefully valued before being taken as security; and though it might sometimes make a loss of a trifling character, the Board always saw that the amount was written off the moment it was ascertained, so that the value of the securities was not affected. It should be remembered that all the Directors were investors themselves in the Society, and their interests were therefore identified with it, and nothing which they could do would be wanting to promote its prosperity. Another feature in the Society which materially helped to promote its success was its established reputation, and with such distinguished characteristics as an ample capital, trustworthy and economical management, adaptation to the wants of all classes of borrowers, perfect security to investors, large bonuses to members, and an established reputation, he had no doubt that the Society would go on extending its business and increasing in prosperity. A dividend of 10½ per cent, at a time the Bank rate was only 2 per cent, was something to congratulate themselves upon, and he therefore asked them with great confidence to adopt the report.

Mr. HUDSON, jun., said he had no objection to adopting the report, but thought the remuneration of the directors was too large, and hoped a reduction would be effected. It appeared to him that the amount was out of proportion to the total expenditure.

Mr. GOVER said the question to be considered was not whether the amount was out of proportion to the general expenditure, but whether it was too much or too little. He was of opinion that if Mr. Hudson was acquainted with the machinery for working the society and the amount of work performed by the directors, he would not think of objecting to their remuneration.

Mr. HUDSON, sen., said the remuneration of the directors was more than was given in many other companies of a much higher character. He also referred to the way in which the Sutton Estate had been allotted, and said that the best plots had been given to the directors.

The SECRETARY explained that the estate had been allotted by ballot, and no plots had been given to the directors except those which they had drawn. There was no favouritism whatever displayed.

After some further conversation the report was unanimously adopted.

The retiring directors, Messrs. Thompson, Silvester, and Freeman, were then re-elected, as was also Mr. W. H. Millar, the retiring auditor.

A resolution was then submitted by Mr. HUDSON in favour of a reduction of the remuneration of the directors, but on a division only seven hands were held up in its favour, and it was consequently rejected.

A vote of thanks was then passed to the directors for their services during the past year, and Mr. GOVER acknowledged the compliment.

Mr. BURTON moved a vote of thanks to the secretary and staff, and Mr. BURGESS seconded the motion, which was agreed to.

Mr. TRESIDDER, in reply, thanked the meeting for the cordial way in which the vote of thanks had been received, and made remarks upon the gradual growth of the society to its present position, which he said was due to the great care and attention bestowed on its management by the directors.

A vote of thanks was next passed to the solicitors and acknowledged by Mr. WATSON, and a similar compliment was passed to the chairman, and the meeting then terminated.

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 31, 1868.

ENGLISH WOODS AT THE ROYAL AGRICULTURAL SHOW.

AMIDST the mass of material exhibited by those interested in the science of cultivation at the Royal Agricultural Society's show in Leicester, we noticed a splendid collection of English-grown woods. From their uniform character, classification, and high finish, they monopolised a large share of attention. Perhaps with the exception of the refreshment booths, which absorbed the first attentions of the visitors during those remarkably hot days, there was no other spot so well attended. This might be attributed to the owner of the collection, who was no less a personage than his grace the Duke of Rutland. The woods exhibited were not arranged to show the splendid quality of the Belvoir grown timbers, nor to illustrate eccentricities or failings of growth in their youth or age, but to make public their adaptability for manufacturing purposes, and their beauty in grain and figure when adorned with the lustre imparted by the modern race of polishers in wood. Our English-grown woods have been much neglected; those of a useful character are too limited in quantity to maintain their importance in the face of the mass of foreign-grown timber which is daily landed on our shores, and those of an ornamental character have long since fallen into disuse. The fashion for using foreign woods of bright and transient colours, aided by the charm of french polishing, has supplanted our native-grown woods, with their unassuming lustre under the old wax or oil polish. In the short space of half a century we have forgotten all that our grandfathers knew upon this subject, and we are astonished to find samples of English-grown woods possessing beauty of figure and brilliancy of colour. As yet we have heard of no other collection of a similar character, and from its novelty and useful bearings we are led to give it a welcome notice.

The woods under notice have been collected and arranged under the immediate supervision of Mr. James Parker, chief forester to the Duke of Rutland, and they form the major portion of that gentleman's museum of arboriculture at Knipton, in the Vale of Belvoir. As lord of the forest the oak claims our first notice. Along the walls we are presented with polished specimens, showing its clearness of growth and adaptability for manufacturing purposes. They are all specimens of the *Quercus pedunculata*, or hard variety of English oak, which grow to such noble size on the fertile slopes of the Belvoir hills. We have, also, specimens of the brown oaks—some rich in medullary figure; others, known as the pollard variety, remind us of the best specimens of Italian walnut. For furniture and dining-room fittings brown and pollard oaks are becoming extremely popular. In every case, when naturally coloured, they are the produce of old ancestral trees. They are scarcely ever felled on our English estates; but time and the fierce blasts of winter topple them over, and so they fall into the hands of our cabinet makers and ecclesiastical wood workers, by whom they are highly prized. Other specimens showed peculiarities in growth, attributable to the nature of the ground upon which they were grown, and are known as the "Croxton Park Oaks." Here the oak timber is worthless, as every tree growing upon that high table land, which is composed of oolitic iron-stone, is shaked from the root to the topmost branches. This wood is unnaturally hard, and the effects of swelling and shrinkage, in conjunction with the severity of the frost in that elevated district, split the wood in every direction. The ring and heart strakes admit stagnant air to the interior, dry rot ensues, and the trees, if not cut down, naturally fall before they have become thoroughly matured. Mr. Parker assured us that a sound oak tree had never been felled upon that portion of the duke's estate. We noticed fine specimens of the ever green and Turkey oaks. The ash (as with the other useful woods) was exhibited in planks both plain and polished. Its size and clearness were remarkable. Selected specimens of "ram-horned" and "figured ash" were shown which were highly beautiful. Since the introduction of "Polish ash" for ornamental furniture ash has become a great favourite. We were astonished to find specimens of of English-grown ash in the collection as clear and beautiful in figure as the celebrated "Polish ash." The specimens of mountain ash showed a marked distinction from the common ash. The elm also played an important part; its size was exhibited in plank specimens, and its beauty in panels and cabinet specimens. The English and Scotch varieties were defined by the former being lighter and closer in its grain than the Scotch or broad-leaved elm, but all the pollard specimens, which were so beautiful in grain and depth of colour, were the produce of the latter variety; indeed, it is highly questionable whether the English elm is ever pollard.

Amongst the woods remarkable for their grain and figure, we noticed the following:—Walnut, both the common kind and black American (which does well on our English soil), Portuguese laurel, pear tree, plum tree, yew, buckthorn, and common crab, all of which partake of red and its nearest compounds. Yellow, in like manner, was represented by the alder, acacia, Spanish chesnut, and cherry (both wild and cultivated). Amongst the lighter coloured woods we noticed the holly, horse chesnut, and sycamore, the latter being a beautiful specimen, clearly white, and polished without the introduction of stain or colour. This specimen was very suggestive, from its silky lustre, for light furniture as for panel work.

The pine family, which produces our most useful timber, was well represented. The Scotch fir was somewhat open grown compared with the foreign-grown timber of commerce. With the spruce, its resemblance to the Norway and Riga white woods was close indeed. The Weymouth or Quebec pine, which grows well on this estate, was somewhat open in its growth, being more defined in its grain, and more highly charged with resinous matter, than is common with that of Canadian growth. The specimens of silver fir and larch were remarkably fine. The latter, from its soft red colour, was greatly admired. In Gothic furniture it would be highly suitable for pierced or diagonal boarded panels, as it is forcibly marked in its grain, It would not be suitable for large plain surfaces where repose was needed.

The specimens of "Cedar of Lebanon" were much admired. Those who inspected them from sheer curiosity associated the wood with "Solomon in all his glory." "So that is cedar of Lebanon!" exclaimed one. Another would remark, "I thought it was red, like the cedar of our pencils." But they all admired its beauty of growth, or its soft brown colour, and regretted that it was so rare as an English-grown wood. These trees attain a remarkable size in the Vale of Belvoir. A section was exhibited close upon 3ft. in diameter. This section, along with a horse chesnut bur, were splendid pieces of workmanship. It is well known that sections of trees cannot be preserved in a sound condition. To obviate this evil they were cut off as veneers, and afterwards mounted and polished. The question naturally presents itself, Why are not our national and scientific collections so prepared, and why do we so rigidly adhere to using our ornamental woods longitudinal in their figure? As a curiosity we noticed a plank of "Arbor Vitæ." It strongly resembled our common red or yellow pine. As the "Arbor Vitæ" rarely grows larger than a shrub, a plank from such a tree may truly be termed a curiosity. The ordinary woods embrace the alder, apple, acacia, beech, birch, crab, elder, juniper, hawthorn, hornbeam, laburnum, lime, common and Portuguese laurels, maple, mulberry, plum, black Italian (male and female) poplar, Lombardy or upright poplar, plane, and pear tree. In all we noticed fifty-one kinds of woods; and some idea of the collection may be formed when we note they were exhibited in both plain and polished planks, and a great many of them were also shown in transverse sections. A high meed of praise is due to Mr. J. Parker for his energy and scientific attainments in perfecting such a collection, and praise is also due to the Duke of Rutland for affording facilities for the advancement of science and technical knowledge in connection with "English-grown timber."

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.—II.

LEAVING, then, for the present, the very large class of chapels in which the external design is more or less concentrated on a showy front, we will notice those in which some thought is bestowed on the work as a whole. It is of course understood that the form of plan still under consideration is, as before, a nearly unbroken parallelogram, wide enough to admit of side galleries. The first difficulty which here strikes anyone who aims at real mastery of the subject is what to make of the roof. An unbroken roof of fifty or sixty feet span on a low and short building is nothing less than an extinguisher to all artistic merit. It dwarfs and crushes everything beneath it, and refuses to combine with anything but the heaviest and severest detail. Before any sort of decoration can be attempted, the first necessity is, plainly, to remove the shapelessness of this crowning feature; to give the whole design, in short, some beauty of general form—some play of light and shade. The first idea that suggests itself seems to be that of putting gablets along the sides. This system has two advantages: it enables the top windows to be greatly enlarged, and it breaks up, in some measure, the vast and dreary expanse of slating. Hence it is not surprising that it should have come into very common use. But, like the device last noticed, the misfortune is that it is in danger of being made a substitute for thought. It is a "dodge" that very soon tires by repetition, and it has already been repeated quite enough, unless it can be advanced upon and developed. Fig. 11* shows a familiar instance of its application. There is a gablet over every bay, or sometimes over every alternate bay, of the side elevation. In the present example this redundance of gablets is further increased by making each front staircase into a piece of sham aisle. A row of small gables, however, unless bound together and subdued by some strong governing feature, is generally fatal to anything like breadth and vigour. It does away with the main horizontal lines of the building—those in the eaves' cornice or parapet—the contrast of which with the vertical members is almost as essential in Gothic as in Italian. And the more gablets there are the less telling they become. Three in a series are far more striking than five or six, for intensity of effect is not increased by multiplying salient points. In fig. 11, too, and in the class it represents, the huge roof still stands behind this fringe of gablets. It is not changed, it is only hidden in part. It rarely harmonises with them, and they as rarely harmonise with the unbroken walls. Something more is needed to conquer this first difficulty of a galleried

* See lithographic illustration last week.

building. In certain cases, however, another step has been taken by reducing the main roof. Instead of the overwhelming mass seen in the front of No. 11, it has been brought down to the proportions of the centre gable in No. 13. This is effected by starting it, not from the side walls, but from the gallery columns, and by continuing the roofs of the side gablets to meet it.* Variations on this arrangement may easily be invented. In fig. 13, for example, the side roofs are all equal in span; in fig. 12 a wide and narrow one are used alternately. But this principle, which has probably been adopted more often in Episcopal than in Nonconformist churches, seems capable of further expansion. Of its results in internal planning we may speak hereafter. Externally it brings the main roof to a manageable span, though it does not give height like a clerestory, and though the broken eaves' cornice and serrated gables are adverse to simplicity and repose. This last seems to be its most serious fault. If want of height in the roof were all, it might and ought to be made up for by additional height in the walls. One of the commonest faults in town churches of all kinds is that their walls are too low. They are looked down upon by the very dwelling-houses that adjoin them. Instead of holding their proper position by superior size and dignity of form, they seem as if they were built by a smaller race of men than shops and warehouses are. They are too often dwarfed in elevation and frittered in detail. No wonder that a strong prejudice against Gothic still exists among the non-professional public, for the Gothic they are most familiar with seems identical with all that is weak, tame, and puerile. This is bad enough in a village, where nothing but cottages surround it: it is ten times worse in a city crowded in by lofty buildings on every side. For the sake of dignity and impressiveness—for the sake of breathing room for the congregation—galleried churches, above all others, ought to be built a great deal higher than they usually are.

Another expedient often resorted to in contending against the crushing heaviness of a wide span roof is that in sketch No. 14. The rafters start from the walls at a low pitch, and some distance up the rake suddenly turn to a much steeper one. There is, in short, an internal angle on each side of the gable. This plan is sometimes adopted alone, and sometimes combined with the dormer system. At first sight it may seem promising, but there is a painful look of weakness about it as generally applied. In able hands, perhaps, it might be turned to good account. There are few forms so hopelessly bad that a man of original powers would be unable to deal with them, for form as well as colour is in some degree relative. Very much depends on the surroundings, on slight modifications and judicious contrasts. But in the present case, as in those before noticed, the effort to harmonise discordant features is too often wanting. The first idea is used and re-used in all its primitive crudeness. It is taken, not as a good basis for further thought and invention, but as a fixed recipe, to be mechanically carried out. Now rested on so, neither the present nor any other device will do away with the difficulties of chapel design. The faults of this one seem to be that its outline is concave and suggestive of sagging in the rafters; that it does not, after all, give a marked and effective break to the great surface of tame, textureless slating; that it leaves an awkwardly shaped gable in the front, and is too light, not to say fantastic, to agree well with a building of unbroken oblong form. These objections are not stated as reasons for its entire disuse, but for a more careful study of the compositions in which it is introduced. In certain examples, indeed, a very narrow strip of walling, carried by the columns below, divides the steeper from the flatter parts of the slope. This helps to remove the boneless, unmuscular look that a large roof is apt to have, but within the building it leads to all the faults of a clerestory without its advantages.

The next example (No. 15) shows the usual extent, in Nonconformist churches, of attempts at wooden or other light clerestories. The forms adopted—fig. 16, for instance—have generally been mere reminiscences of stone tracery. Scarcely any of them can therefore be found which are successful artistically. Yet the great advantage of a range of windows in this position for light and ventilation might well warrant its further trial. If the gallery columns go up, as they so often do, to support the roof, it makes no difference to the question of sight and hearing whether they carry some modification of a clerestory or not. A good upper light is so valuable that it is a pity to lose it when it can be readily obtained; and windows high above the audience can be freely opened in hot weather without being angrily shut again, as lower ones generally are, by some fancied invalid near them. Where stone clerestories are placed on iron columns there is usually, indeed, a compromise far from satisfactory. The stonework is much too thin for strength, and the columns so thick as to be much in the way. By studying each case separately this might, perhaps, be in some degree avoided. The unpleasant fact would, however, still remain, that cast iron, once heated to redness, cannot even bear its own weight, and a very small outbreak of fire near a main column might thus bring down all the arches of the building. The possibility may be remote enough to be worth risking; but in the case supposed, a framed superstructure would probably suffer far less by the failure than a stone arcade. In trying, however, to develope the principle now under notice, the first thing is to break loose from previous practices and prejudices, to work the system out on rational principles towards its actual aim and purpose. The advantages to be sought are light and air within—height and dignity of proportion outside. The problem is to gain these without inconveniencing the congregation, and without falling into weak or temporary construction. A deep clerestory with an open roof above is, as many modern churches prove, a very bad arrangement for sound. The voice seems to be lost in the central space over the windows; but a very narrow band of lights placed near together under a boarded ceiling of any appropriate form, would be entirely free from this objection. A number of small apertures here, carefully guarded from producing down-draughts, would be a great advantage in hot weather. Ventilation, it is often forgotten, must be carried on in different ways during different temperatures. In the winter time a few small holes may carry off the foul air of a heated room effectually. On a hot summer's day the direct admission of the wind is the only practicable means. For this reason it is always desirable to have a number of windows capable of being thrown wide open. The small hoppers and sliding squares in which "Chapel Gothic" delights are next to useless when they are needed most. A range of openings in the nature of a clerestory would be a most welcome addition. Next to theatres, Nonconformist churches are almost the worst ventilated class of public buildings. Any plan for giving them a little fresh air deserves consideration. In some temporary structures of large size a system resembling that suggested has been found to work well; but it needs to be refined and translated into more permanent construction. Anything like a copy from the clerestory of a mediæval church would be absurd and inappropriate. The feature suggested would have to be *designed* for the purpose—an insurmountable bar to its adoption in certain schools of chapel architecture. If stone or brick can conveniently be used, so much the better; where these are inapplicable it may be worth trying if no lighter material will serve the purpose.

The triple roof—a variety of which is shown in fig. 17—has now and then found a place in wide chapels. There is a well-known practical objection to it on account of the long gutters which it involves, which, when choked with snow or leaves, are liable to overflow into the interior. Extra width of lead outside, and a boarded ceiling within, would, of course, lessen this failing, which a little contrivance might altogether remove. The arrangement might then receive more attention than it has hitherto done. It has the merit of giving a manageable form of end elevation, admitting great variety of proportion. It is free from the crushing expression of a wide single-span roof, though it has some tendency towards that small prettiness which is the weak point of much English Gothic.

We have thus examined some of the principal ways in which the roofing of a wide galleried church has been hitherto managed; the plan being supposed to be similar on the whole to that of No. 1 in our last illustration. This plan, however, is far enough from perfection. It happens to be one which Nonconformists have received from their ancestors, and which they have in many cases perpetuated almost unaltered. Their efforts have been spent very much on decorating it outside and in, and very little in revising or improving it. Externally it presents a very unpromising subject to work on, while within it needs radical changes. In continuing these papers it is intended to notice some plans which have been or might be used in lieu of it, and to say something more of internal design generally.

* By a slight error in the shading of the lithograph, these gablets look in the side elevations of figs. 12 and 13 like mere dormers springing from the base of the main roof. They are, however, in reality short transverse roofs, with gutters between them, joining the main roof some 12ft. or 15ft. within the walls.

NATIONAL PRIZES, SOUTH KENSINGTON.

LAST week we gave some account of the objects in competition for these prizes, and published a letter from "H. A. G.," calling attention to the architectural drawings. In stage 23b, architectural design, E. F. Clarke, of St. Martin's, obtains the gold medal. The subject is "An attempt to apply the dome to pointed architecture." In this work there is nothing new, and neither the design nor the execution entitles it to so high a prize. J. Woodsend, carpenter, Nottingham, age eighteen, receives "books" for a very creditable drawing of a bad design. Eugene Clepham, builder, and a South Kensington student, also receives books. This drawing has many faults; the shading is softened off till it resembles the old-fashioned Poonah painting. The effect of the pen is mixed with that of the brush, and is not carried through. The plan is not positively bad, but the elevations are. No prize should have been given in this instance. A design for a private residence, by H. Pryce, aged seventeen, South Kensington student, is very creditable, and should have been rewarded. Thomas Cox, age twenty-one, Birmingham, is another gold medallist. The work is neat, but shows no signs of *drawing*—no touch, no effect, in some of the shadows great carelessness, and in all more or less dirt. A nicely bound book, with pictures inside, would have been a more appropriate reward than a national gold medal. W. Edwards, age twenty, Lincoln, gets a bronze medal for a very careful drawing. He has evidently studied Sharpe's Parallels. H. J. Wilworth, age seventeen, Warminster, receives books. He will certainly make an excellent draughtsman. The architectural drawings are, as a whole, very indifferent. In stage 23a, mechanical drawing, R. B. Mowbray, Chester, is awarded a bronze medal for a drawing of a locomotive, as is also R. G. Morton, Dundee, for a depiction of some machinery. This drawing shows a great waste of time in representing the grain of the wood and similar trifles. E. C. Hocking, black-

smith, Truro, age twenty, exhibits a very neatly shaded drawing in Indian ink. He receives a prize. T. L. Phipps, Birmingham, is successful with a drawing of a rifling machine. He shows a thorough knowledge of the true projection of shadows, but there is no life in the drawing; and, as he might have made the machine in probably less time than it took him to make the drawing, we cannot see that he has been spending his time profitably. All the machine drawings are examples of misapplied industry on the part of the pupils and bad teaching on that of the masters. In stage 11, "Painting ornament from the flat or copies," Joseph Turner, age twenty-seven, Gloucester, receives a bronze medal. He will never set the Severn on fire. Stage 22a, "Studies treating natural objects ornamentally," is very interesting. Given spaces are to be filled with an ornamental arrangement of natural objects. This is *design*, and if the art schools do not succeed in producing designers, they will have failed in great measure in realising the hopes that have been formed of them. Books are awarded to Sarah M'Gregor, Bloomsbury, and to E. Perry, Birmingham, age nineteen—occupation, teacher. We have no wish to be hard on the latter, but a teacher, even if only nineteen, should produce something better than a boarding-school plaything to be taken home at the holidays. W. Stanley, Birmingham, decorator, obtains a bronze medal; his design is clever, but the design of R. Young, Nottingham, age twenty, solicitor's clerk, rewarded with books, is better. W. Watson, age sixteen, also gets books, and he deserves them. In stage 23c, "Applied designs, technical or miscellaneous studies," under the head "surface designs," Alfred Honey, age eighteen, Glasgow, sends a good design for a scarf, but he is unrewarded. The silver medal is taken by W. G. Murray, Dublin. Bronze medals fall to R. Gates, Lambeth; F. Hall, Macclesfield, age sixteen, card cutter; S. R. Stevenson, Nottingham, age seventeen; Joseph Harris, South Kensington, design for a lace lappet; and A. Harrison Goodall. We cannot pass unnoticed a design for poplin by Miss Isabella Bevin, Dublin, and a design for wall decoration, by Miss Booth, also of Dublin. A silver medal falls to Miss Ruth Nicholson, Dublin, for a design for muslin, which is highly creditable, and evidently designed *con amore*. Glasgow shows a design for a tile floor, which is better fitted for wall decoration. T. Mountford, age fourteen, has a promising design for a Kidderminster carpet. The gold medal is taken by G. Clanson, age sixteen, design for tapestry, hearth rug, carpets, &c. A bronze medal, for muslins, is given to W. H. Arnold. Edinburgh sends three "surface designs." A. H. R. Bartram, age thirteen, Cirencester, has a clever design for encaustic tiles, plates, &c. The national gold medal is worthily awarded to Miss Frances Brett, age twenty, Dublin, for wall decoration. Dublin comes out well in this class. Miss Maria Brooks, South Kensington, carries off another gold medal; and N. G. Broadhead, Nottingham, lace design, receives the third. This last is neither very elegant nor very new. Vases, filled with flowers, are not suitable for lace design, and we cannot conceive on what grounds this award has been made. W. Johnson, Glasgow, age nineteen, bronze medal for wall decoration—a very good design. Two bronze medals have fallen to Kidderminster. A. W. Poole, age sixteen, receives books, as does Francis Spring, Dublin, age nineteen, for design for furniture poplin. Marcella Irwin, Dublin, takes a silver medal for a design for a carpet or table cloth, and Charles Smith, Kidderminster, one for a design for a rug. The arrangement of this stage, 23c, is no arrangement at all. Designs for tiles, carpets, lace, wall decoration, and watch cases from Coventry are mixed together in an extraordinary manner. For watch-case design W. Scott takes a silver medal; T. N. Storer, a bronze medal, for designs for card backs; and F. Jones, Worcester, for plates. Birmingham sends next to nothing. A few indifferent designs for buckles, and a very bad one for a vase, are about all. This vase is emblematical of "Sport," Cupid on one handle, Psyche on the other, with "the Herald of Sport in the midst. On the body of the vase Ariel nymphs are enjoying their juvenile festivities. At the base are seated figures, representing boating, fun, and the battledoor!" (*sic.*) We will not give the name of the author. He is most probably a wag, but his master ought to have seen the joke. Sheffield sends little, and had better not have sent even that. Manchester is in this class represented by *one* design, a couple of fancy daggers. E. Slocomb, age seventeen, South Kensington, receives the bronze medal for a very good design for locks and hinges. This brings us to the end of the "applied art." In stage 14, painting direct from nature, Manchester actually gets two silver medals. Miss Manley, pupil teacher, previously medalled in this class, exhibits the best example. This class does not present any features of especial interest. It shows that drawing and colouring are taught, but when the drawings are done they are of no use. In stage 15, groups as compositions of colour, E. M. Bancroft, Manchester, takes the gold medal; Miss Malcolm the silver medal. Miss Jane Ogden, Manchester, exhibits a duck and curlew. Manchester seems to study those things which are of least consequence, while in applied art and design she gives little evidence of possessing local schools of art. The bronze medals have been distributed in such a way as to satisfy national pride. Dublin, Edinburgh, and Gloucester each get one. In drawings of the human figure, stage 8, the gold medal is given to C. O. Murray, Edinburgh; the silver medals to W. W. Oliver, South Kensington, age seventeen; to H. W. Foster, Nottingham; and the bronze medal to Miss R. M. Bowser, South Kensington.

A visit to this collection will furnish food for reflection. The question which naturally arises is this, why do those towns of whom most would be expected contribute the fewest and perhaps the worst examples? Birmingham, Manchester, Sheffield, Leeds, Edinburgh, and Glasgow are literally nowhere. Dublin takes, in our opinion, the first place. For this there must be some good reason, and the report of the Science and Art Department in the forthcoming Bluebook will doubtless give it. On the whole, the national prizes seem to us to be distributed with a too lavish hand, and the assurance of some of the masters in advising the exhibition of many drawings on the walls of the competition-room exposes them to private exhortation, if not public rebuke. There are limits which even emulation should not overstep.

THE TRANSACTIONS OF THE ROYAL INSTITUTE OF ARCHITECTS.

THE "peculiarities of domestic architecture in America" in comparison with those of England are stated in the paper by Mr. Gervase Wheeler to result from the fact that American life is "social on a much larger scale" and "far more comprehensive in its domestic machinery than English; the consequence, practically, being that the houses are all very much larger, the rooms of great size, and the appliances and arrangements to save labour to servants are most important features in the plan." It is, however, to the "local influences of climate"—which are added by him as the last and least on this list—that we think the principal differences observable are due; and we believe it will be found that the architectural lessons we can learn from the practice of our transatlantic cousins will prove far from numerous. What Mr. Wheeler describes as the most marked features of an American town residence, viz., the large cornices containing the gutters in place of parapets, would be neither necessary nor admissible here, and the width of frontage to houses usual in their cities would be precluded by the greater value of our land, as also would be their extreme depth; as, in a climate like ours, it would be impossible to content ourselves (as they seem to do) with borrowed light to the rooms in the centre of the blocks. The greater prominence of their entrance doorways it might be desirable to adopt, but this could be done at first hand—as it has often occurred to us it should—from those of Paris and other continental cities. Then as regards the country houses, their special features seem to be exclusively due to the requirements of the climate, and their "ample provision of verandahs, colonnades, and other shade-affording external features" would be quite *de trop* in England. Nevertheless, the fully-illustrated paper by Mr. Wheeler will be found to contain much information of value and interest, particularly with regard to practical details, as, for instance, the method of warming their houses, to which the Americans have devoted a great amount of attention. The notes on "The Exploration of Jerusalem and the Holy Land," by Mr. Grove, the honorary secretary to the Palestine Exploration Fund, though unfortunately rather barren of result—as is the composition of the heaps of *debris* through which Lieutenant Warren is, with the most commendable patience, driving his dusty way—are a record of British perseverance for the sake of "an idea" not less remarkable than the expedition to free the captives in Abyssinia. The most interesting discovery yet made, as remarked by Mr. Fergusson in the discussion which ensued, is the wonderful development of the terrace walls of the Temple, which are found to be no less than about 190ft. high, of wrought masonry, one half of which is now hidden by accumulations of rubbish. The paper by Mr. T. Roger Smith, on "Buildings for European occupation in Tropical Climates, especially India," is an able summary of the difficulties to be apprehended and requirements to be fulfilled by architects in such works, founded upon the experience of the author. Light and heat (which here we court) are the enemies to be encountered. Native prejudices have to be consulted, and destructive agencies, with which we are unacquainted, have to be guarded against. Then the appliances for the erection of buildings and the methods of carrying out works are so essentially different from our own that the information here recorded will prove valuable for reference to such members of the profession who may have to design buildings for tropical climates. Mr. M. Digby Wyatt contributes a valuable historical paper on "The Foreign Artists employed in England during the sixteenth century, and their influence on British Art." He has treated the subject, according to his wont, in a learned and exhaustive manner, and illustrated it with seven lithographs drawn on the stone by himself. It is impossible for us to take the interest which Mr. Wyatt does in this art of the era of the Renaissance. It is, however, fortunate that its attractions to some are so great as to induce them to give that research to its history which every past phase of art deserves,—and a phase which can boast among its masters of names like those of Torrigiano and Holbein must ever command respect. Whether or not these artists were in any degree answerable for the setting aside the purer, truly English, and far better Gothic art, or whether, as Mr. Wyatt urges, they merely replaced it after it had perished from inherent decay, it is impossible to be blinded to its comparative defects in all the higher qualities and aims of art by any technical superiority. Exquisitely as the recumbent figure of Dr. John Young in the Rolls Chapel may be sculptured, nothing can be more ridiculous than the design of the monument; and the Cupids on the tomb of Henry the Seventh are as absurd in their attitudes as Nonsuch Palace (of which an illustration is given) is in its architecture. The series

of papers is closed with a practical one by Mr. Charles Barry, in which he explains the use of terra cotta on a large scale as a building material, founded upon his own experience at the College of God's Gift, at Dulwich. By the energy of Mr. Blashfield and other makers the difficulty arising from shrinkage during burning seems to have been to a great extent overcome, and its colour being now under command, the imperishable nature of the material and its moderate cost must, we imagine, bring it rapidly into general use. Two very well executed lithographs of the details of this building, by Mr. Kell, accompany this description of Dulwich College; we could wish that the design, as a whole, gave us equal pleasure.

In the report of the Council to the annual meeting a table is given which shows the increase in the number of the members to be in greater proportion every year. Its funds improving sufficiently, the Institute is now able to afford the additional cost which was entailed by the recent appointment of Mr. C. Eastlake as assistant secretary, with a librarian as well. Through the liberal contribution of £500 by the President towards the purchase of books, and under the management of Mr. Kershaw, the library of the Institute may now be considered as taking its proper rank as the best collection of architectural works, and as such will no doubt prove an inestimable boon to the profession.

An alteration of the bye-laws during the session has increased the general term of office of the members of the Council to three instead of only two years; the latter period having been found practically too short, since it naturally takes some time for members to become well acquainted with their duties.

The committee for the "Conservation of Ancient Monuments and Remains" and the Professional Practice Committee provide a valuable machinery for watching over the interests of the profession—the former, by interfering when necessary to prevent the demolition or injudicious restoration of those ancient precedents which it values so highly, while the latter takes notice of the relation of architects among themselves and with the public, and has already done good service by establishing fixed rates of professional charges, and may yet do more by defining some of the other questions which daily arise, not only between architects and their employers, but also with those who are employed under them to carry out their designs, a subject, we believe, now under their consideration.

WOODS USED IN CABINET-MAKING.

WE have noticed in another part of to-day's impression the little volume "Modern Industries," published by the Paris Excursion Committee. The following is taken from the report on "Cabinet-making and the Woods Employed in it," by C. F. Hooper. After noticing the cabinet work of the Exhibition, the author says:—I shall notice the kinds of wood which from experience I consider to be, in appearance and wear, most suitable. For furniture for the hall, dining-room, library, and bedrooms, my first preference would be most decidedly for mahogany. Of this wood several kinds are in use. The best—close, fine grained, rich in colour, and of good figure—is the St. Domingo; Cuban, being straight-grained and clean, is used for mouldings; plain Honduras is used for inside work, carcases, drawers, &c., and for veneering on, but a rich figured veneer, called "feathers" and "curls," seen in cheap, strong furniture, is often produced from it. The best furniture should be made of Spanish mahogany, of which the richest kinds are cut into veneers. A good piece of work in cabinet-making, when well-seasoned wood has been given to the workman and the veneer is properly laid, is equal to solid work. The richest wood is much fitter for use in veneering than in the solid, but it should always be laid on a good dry and sound foundation of Honduras; if used in the solid it will not stand in wear like the plain, which is straight in grain, but will twist and crack; while in veneers, laid on mild straight-grained wood (such as Honduras) it will, the longer it remains in use, if kept in good condition, increase in beauty and richness. Dining-room and library furniture is often made of solid oak. This is a bad wood for the purpose. It gets dark and dirty-looking in wear. It never has the rich beauty of mahogany; it is, when not well seasoned, nearly certain to twist, crack, and fly, and even when it is well seasoned, no dependence can be placed on it. In my opinion, good pine, stained, grained, and polished to resemble oak, is as good for use as the genuine article. Let oak be kept for building purposes and for fittings in churches, chapels, and large halls, where strength rather than beauty is desired, and where it is fixed, not portable. For bedroom and boudoir furniture mahogany veneered with satin or walnut, or inlaid with coloured or stained wood, is the best. Walnut is rich in figure, but it will not stand well in wear; the grain cracks, shrinks, and opens after it has been some time in use. It is very porous. I have known furniture in this wood to be beautifully finished, the grain so close and fine, the polish so perfectly smooth—in appearance like glass, so that a spot or defect of any kind could not be discovered—but after three months' wear it has become full of cracks, small holes appeared all over the surface, and there has been that continual sweating (inherent in the wood) which causes so much complaint between customer, employer, and workman. Satin-wood is being introduced in preference to walnut. It will certainly wear better, but it runs very narrow when cut into veneer, there is great waste (on account of the sap) in the manipulation, and it requires good jointing and matching of the grain so as to deceive the eye. Of late years great improvement has been made in staining, graining, and polishing pine for cabinet work. For bedroom furniture more particularly it is capable of being used with advantage; it is at once portable, inexpensive, and when good dry material is well stained and polished, equally as serviceable as more costly woods. But it requires to be used with care; on account of its softness it will show every mark, scratch, or bruise, and it needs to be kept well dusted and perfectly clean. There is an advantage in its use, which does not apply to the old style of painted deal—that it must be sound or the faults will soon expose themselves, whereas in the case of painted furniture "shakes" can be filled in and stopped, and covered with size and paint. In drawing-rooms walnut has been in the fashion, but will be superseded, I think, by ebony and gold—a mode of decoration than which nothing can look richer. Here, marqueterie, with light, elegant turning and rich carvings can always be introduced at pleasure. Good carved work overlaid with gold shows to great advantage, and can at any time be restored and made equal in appearance to new work. Ottomans, couches, chairs, &c., covered in blue, crimson, amber, or green, invariably look richer when the woodwork is wholly or partially gilt over. In gilding, the use of solid ebony, which is brittle and expensive, can be avoided, and a close grained wood of another kind, stained in resemblance of ebony, when the grain is well filled in and properly polished, may be substituted so as to stand well in wear. Drawing room cabinets, if of ebony alone and richly carved as in France, display gold decoration in effective contrast. Loo, card, and occasional tables should be of marqueterie, as also the smaller fancy tables, which can be varied in design. Tripods for plants and flowers look rich in ebony and gold, and stands for supporting vases should be either of ebony or gilt. These contrast well with silk, tapestry, and lace, and with the white marble which is so necessary in drawing room decoration. I have not here noticed other woods, as maple, birch, and ash, which are used sometimes in cabinet work. I might here notice rosewood as being a good material, but it has given place in actual use to walnut; it is rich in appearance and wear, but very heavy; it is at present little in use, and scarce, although I believe that it is preferable to either walnut or oak.

Having given my opinion from experience of the woods most suitable for cabinet work, and shown where they can be employed to the best advantage both for appearance and for wear, I may now turn to what especially concerns the workman and his labour. The workman is often obliged to use wood that is unseasoned, shaky, and faulty, owing in some cases to the ignorance or the wilfulness of a foreman or employer who pretends to practical experience: in some cases to the desire for cheapness, the idea being that the workman can make the best of his materials or at all events bear the blame if he does not. A workman shall exert his utmost skill in preparing and finishing an article in cabinet work—he shall put and fix everything thoroughly well, with close, fine joints, dovetails, and tenons, made as though the completed work had grown; and yet, after a few months' wear, loud reports from the furniture are heard—reports that might originally have suggested the invention of "spirit-rapping"—caused by the shrinking and splitting of the wood, the sundering of the joints, and the general description of the work. Alas! for the workman, upon whom inevitably falls the blame. Customers quarrel with employers, and employers in their turn quarrel with the journeymen, who must quietly submit to the injustice or go about their business; or if work has been done "by the piece" the man must put it all right again at his own cost in labour if not in material. There is, I am sorry to say, a system prevalent in London among many who call themselves "house furnishers" of making furniture, especially if it be for the country, of bad, unsound material and labour so indifferently paid, that a large profit can be realised. London being the great centre of trade and commerce, country people foolishly go to the trouble and expense of sending to the metropolis for goods of this sort, vainly imagining they can be better supplied there than by manufacturers in their own towns, where at least they know with whom they deal. This, I think, will be found to be not the practice in France. There, as is well known, men may be found who —such is their love for art—work for glory alone, and whose aspirations soar higher than the mere acquisition of wealth. The workman, too, is encouraged by honours and rewards from the Government to exert his labour and skill in the production of works that shall promote the advancement of the nation. In no country in the world, I am bold to say, is there less respect paid to labour alone than in my own; and what progress have we made since 1851 as compared with our neighbours across the Channel? In the cabinet trade, as a whole, there is no improvement, no design, no carved work, which may be put in comparison with the display of the manufacturers and workmen of France; nor shall we ever progress so long as it is felt to be a degradation to own one's self a mechanic.

The process of polishing should have some notice in a report upon wood. The niceness of the grain, displayed to so much advantage in screens, where "feathers" and "curls" of every design are produced, would not exhibit half its beauty were it not for the labour and skill of the polisher. But here there is too often the fault of hurry, and what we call "scamping" the work. Polishing, to stand in wear, should never be hurried. Without entering into the secrets of the trade, I may add that it ought to be repeated at certain intervals, so that the grain may be well filled in before it be finished off, or it will soon expose its deficiency in wear. A piece of good work well polished will always show to the best advantage, and will increase in beauty and richness by use if properly attended to. Where there is carving, and the fingers of the polisher cannot apply the rubber, a thin coat of varnish can be applied with a brush, so as to put a gloss on it, as it protects the work from dirt and dust which would otherwise so eat into the fine and delicate parts that it could not be removed. Much must in this case depend on the knowledge and skill of the polisher.

KEIGHLEY, YORKSHIRE.

MECHANICS' INSTITUTE AND SCHOOL OF ART.

THE erection of a large building, for the joint accommodation of the Mechanics' Institute and School of Art, has just been commenced at Keighley.

On the ground or principal floor the Institute will have its more important rooms, consisting of reading-room (at the south-west angle of the building), 38ft. by 20ft.; conversation-room, 28ft. by 18ft.; library, 33ft. by 18ft.; also patents-room, pence bank, and secretary's office. The lecture-hall, a large and handsome apartment, 87ft. by 44ft., and with a waggon-headed and panelled and boarded ceiling, will be common both to the Institute and School of Art, and will seat about 700 people.

On the upper floor the School of Art will be located, and will have an exhibition-room, 46ft. by 22ft.; mechanical-room, 28ft. by 18ft.; painting-room, 30ft. by 18ft.; modelling-room, 33ft. by 20ft.;

casting-room, master's room, and retiring-rooms and lavatories for each sex. The lighting of the painting-room will be to the north, and of the exhibition-room from the top. From the landing of the principal staircase leading up to the flat or story, a gallery opens out into the lecture-hall before mentioned, giving accommodation for about 100 persons.

The whole of the basement story, which, from the nature of the site will be clear of the ground on all sides, is occupied by a range of class-rooms, ten in number, some of them of very large size, also by a tea-room, 50ft. by 18ft., and a residence for the hall-keeper. Separate entrances to this story are provided in the plan.

The building is so arranged that the Mechanics' Institute, the School of Art, and the lecture-hall may be in operation at the same time, and yet not interfere with each other. All the rooms are lofty and well ventilated, and will be warmed by open fires or by hot water apparatus.

Externally the building will form a handsome Gothic structure, built entirely of stone, and with ashlar quoins and dressings. It is situated at the angle formed by Cavendish street and the Skipton-road, and will be a conspicuous addition to the public buildings of the town. The principal entrance will be under a lofty tower (rising to the height of nearly 100ft.), and serving to unite and yet to distinguish the double block of the buildings. The contracts for the erection have been chiefly taken by Keighley contractors, and the estimated cost, with the land, is about £12,000. The architects are Messrs. Lockwood and Mawson, of Bradford and London.

BATHS AND WASHHOUSES, KEIGHLEY.

The erection of baths and washhouses for the township of Keighley has just been commenced by the Board of Health. The accommodation provided will consist of a central office, with separate entrances and waiting-rooms on either side of the baths; two men's tepid swimming baths (first and second class), each 60ft. by 30ft., with open framed timber roofs and top lights; four first and nine second class men's slipper baths. On the upper floor, and approached from either entrance (so as to be used by either sex on different days), will be a suite of Turkish baths, with a first and second class tepidarium and frigidarium and calidarium complete to each.

The washhouse will consist of thirty double washtubs, each supplied with steam and hot and cold water, and with drying closet, and all requisite appliances to correspond, on the most approved principle. An engine and chimney (the latter 90ft. high), and a suitable residence for the attendant in charge, will complete the arrangements.

The building is Gothic in design, and the large inside baths will be treated to correspond. The contractors are wholly Keighley men, and the designs are by Messrs. Lockwood and Mawson, architects, of London and Bradford. The cost, exclusive of the ground, will be about £7,000.

A NEW BLASTING POWDER.

SOME curious experiments have been made at the Merstham Grey Lime Stone-works, near Redhill, with dynamite, a new blasting powder, the inventor of which is Mr. A. Nobel, a Swedish gentleman. Dynamite, which resembles coarse dark-brown sand, is a solid granular explosive, for which is claimed force of a remarkable degree, and a harmlessness under ordinary circumstances that cannot fail, if fully confirmed, to make it one of the most popular and desirable of explosive agents. The causes which render gunpowder and nitro-glycerine so dangerous to handle, or convey by the common modes of transit, have no effect upon it. Nitro-glycerine explodes at 240 deg. Fah., gun-cotton at 400 deg., gunpowder at 600 deg., a common fire at 1,200 deg.; but a much higher temperature than this is required to ignite dynamite, which must be placed somewhere between 1,400 deg. and 3,280 deg. A thin deal box containing 10lb. of the compound was placed over a raging fire; the box was consumed, but there was no explosion, and the dynamite mingled harmlessly with the ashes. It was in other ways placed in immediate contact with fire, with the same results. Gunpowder was exploded near it without effect. The superiority of the material over the dangerous explosives as to which concussion would be certain destruction was acknowledged by several practical persons present connected with the carrying trades. Ten pounds of dynamite were enclosed in a second deal box, and hurled from the top of a cliff. It fell 60ft. upon the rocks below, with no more signs of explosion than would be caused by the fall of a brickbat. Equally striking were the illustrations given of its deadly strength. A cartridge filled with dynamite was placed upon a 2-inch oak plank. A fuse with a strong percussion cap was attached to it and fired, and the plank was split in several places, and had a hole knocked through it. The percussion cap is the explosive agent, and it is claimed that nothing else, so far as is known, will do the work. In this instance the work was done most effectually, although the cartridge, which was about the size of a man's finger, was laid loosely on the plank. A large block of granite, about a yard cube, was shivered by like treatment. A block of wrought iron with an inch bore hole, but without either plug or tamping, shared the same fate, as did a wrought-iron cylinder with a charge laid loose on the top. The rocks were bored 15ft. deep, and fired, with an effect that startled the quarrymen present, not because of the loudness of the report so much as because of the immediate and extensive character of the blasting. Other experiments demonstrated the great velocity imparted to fragments of shells charged with dynamite, and its adaptability to distress signals. At the close, Sir Charles Fox, and several gentlemen connected with mining, railway, and other kindred interests expressed their surprise at and admiration of what they had seen, one speaker saying that if the material were in use much saving of life would be the result, and another expressing his belief that railway companies might carry it without any risk. Sir Charles Fox thought it would act admirably in borings under water. Entire confidence was expressed as to the future of the invention, and Mr. Nobel experienced a reception that amounted to an ovation when he briefly thanked the spectators for the disinterested kindness they had shown him. The merits of dynamite are already engaging the attention of foreign governments.

THE ORIGIN OF THE POINTED ARCH.

A CORRESPONDENT of the *Athenæum* says:—In Mr. Garbett's "Treatise on the Principles of Design in Architecture" is the following passage:—"Vaulting being the all pervading motive, the final cause of Gothic architecture, that to which all its members subserve." And, in a note,—"This was first shown, we believe, by Ware, in his admirable 'Tract on Vaults.'" This view was in reality first suggested by Barry, the painter. We quote the following passage from Vol. I. of his works, p. 130 (1809):—"The absolute origin and cause why the Pointed arch came to be introduced was the confounding the circular and square forms together, and the ill-understanding of some few examples of the ancients, when the necessity of things constrained them to use those forms together. Besides the examples cited from the Amphitheatre of Titus there is to be seen in Adrian's Villa, at Tivoli, a number of chambers which are square, and as there was a necessity for covering them with a vaulted roof, the four sides met in a common point in the centre of the ceiling, by which means each side of the ceiling gives exactly the same form of the Gothic arch, although they are, in reality, made up of half circles crossing one another.' Barry's letter to Edmund Burke, in which this passage occurs, was written about 1768, and Ware's "Tract on Vaults" was published in 1822.

FIREPROOF FLOORING.

EXPERIMENTS have lately been made in New York to test the merit of floors supported by wooden beams, and prepared with the intention of rendering them impervious to fire. A floor was constructed in the following manner:—Strips of pine, half an inch wide by half an inch thick, were nailed along the centre of the upright floor beams throughout their length. Thin sheets of iron were then nailed upon them the strips keeping the sheet-iron a distance of half an inch from the beams. Plaster of Paris, to the depth of 1¼in., was poured on the sheet-iron, and the sides and top of the beam smeared with it, and when conveniently plastic rounded to some 2in. up the sides. After the plaster had become set the floorboards were fixed. Provision was made against fire from the upper as well as the lower side by fastening thin sheets of iron on the tops of the beams, and spreading a layer of plaster of Paris ¼in. thick over the sheet-iron before laying the wooden flooring. It is said that a fire beneath the flooring, which was raised about 3ft. from the ground, was lighted and kept up for three hours, at the end of which time the flooring was comparatively uninjured. The only portion which the fire affected was the sheets of iron where they were joined. These were found to be slightly sprung. A hot fire was then lighted on the top of the platform, and allowed to burn three hours. This test was also perfectly satisfactory. The cost of this fireproof floor per 100ft. by 25ft., less walls, would be 675 dollars.

LUXURY AND SQUALOR IN A PALACE.

"THIS but one step from the sublime to the ridiculous;" and, according to the *Lancet* Sanitary Commission, there is hardly so great a distance intervening between that luxuriously-appointed though seldom used, home of royalty, Buckingham Palace, and the wretched and squalid, though constantly used, quarters in which the Queen's body-guard and a company of Grenadiers are located. The soldiers quarters are at the southern extremity of the Palace. Here three huge columns support a massive plinth, and behind these are two doors, more like entrances to a Grecian temple than to the two wretched apartments in which the troops are located. In the guard-room the men sleep and take their meals, the cooking being done in a kitchen 11ft. by 12ft., of which space the stove occupies a large proportion. The guard-room is lighted by two large windows on the western side, and thorough ventilation is secured. The guard-room is, however, a palace compared with the barrack-room above, which is 70ft. long, without windows at the sides or ends. The low, flat ceiling is broken by two small cupolas, with a lantern opening on the top of each. In this apartment are beds for 37 men. In one corner of the small yard are dirty-looking latrines and lavatories out of repair; while hard by is a stinking dustbin, foul with refuse, stale vegetables, and spoilt food. The Commission has met with no accommodation so infamous as this. "The comforts of the men have been altogether sacrificed to outside architectural effect. Windows are not consistent with Classic columns and stately temples; the soldiers must, therefore, be made to go without."

ART EDUCATION.

LAST week we called attention to the report of the committee which had been appointed in February last to inquire into and to suggest the best methods for promoting technical education in this country, and we give the results contained in resolutions which the committee adopted. The committee, however, reserved for separate consideration the education of those who are producers of works of fine or decorative art, or directors of art manufactures. It is necessary to bear in mind, says the report, that for the production of works of an æsthetic character, scientific principles occupy a subordinate position, while a knowledge of the details of execution is desirable for those who design or guide the work of others. Moreover, it must be borne in mind that the taste of those to whom works of beauty appeal is far more fluctuating than the demand for productions in which utility is alone considered.

The committee are of opinion that one of the first conditions of progress is, the cultivation of artistic knowledge and taste in all classes of society. With this object in view, no less than with a view to the technical education of the art-workman, provision should be made for the teaching of drawing in all schools, primary and secondary, as a branch of general education, in order to train the eye and hand, and in order to cultivate habits of observation. It is essential that drawing should be part of the regular school course and not an extra lesson; and, further, that it should be taught intelligently, not from mere copies, but from real objects. The art-workman needs, in addition to a power of free-hand drawing, an acquaintance with geometrical drawing, in order that he may be able to execute work correctly, in accordance with the designs of the artist who directs him.

The committee are of opinion that the Universities may render great service to the technical education of those engaged in artistic pursuits by the recognition of art as an element in general education, and by professorial lectures. Some steps in this direction have been taken, by the

regulations attaching importance to drawing in the local examinations; but the committee would gladly see the practice carried further, and applied to the higher stages of academical education. They do not doubt that the study of works of ancient and modern art would have a tendency, in connection with literature, to diffuse culture throughout the nation, and to raise the standard of technical education.

CHURCH OF THE ENGLISH MARTYRS, PRESTON.

THE accompanying illustration represents the south-east view of the above-named church. The building is about 140ft. long by 70ft. in width, and the same in height. It is externally entirely built of Longridge stone, and, independently of the tower, which is not yet commenced, has been erected at the remarkably small cost of £4,000, exclusive of altars and fittings. The church has been built for the Rev. J. Taylor, of Moor Park, from the designs of Mr. Welby Pugin, of 1, Oxford-street, Liverpool.

A COURSE OF STUDY FOR ARCHITECTS.

THE committee appointed by a meeting called together at the Society of Arts to consider the best method of promoting technical education selected Mr. John Scott Russell to draw up a course of study for mechanical engineers and architects. We will not dispute Mr. Russell's ability to map out a programme of study for mechanical engineers, but we altogether question his ability to do a similar thing for architects. The following is the three years' course, as recommended by Mr. Russell :—

FIRST YEAR.—Mathematics, physics, chemistry, descriptive geometry, strength of material, statical construction, principles of style and design, surveying and measurement.

SECOND YEAR.—Physics, natural history, physiology of health, psychology, constructive geography, principles of carpentry, metal, stone work, mechanism of buildings, principles of beauty in buildings, history of architecture.

THIRD YEAR.—Mathematics of curve lines and surfaces, light and shade, perspective, history of building materials, health of buildings, domestic economy of buildings, principles of proportion and decoration, practical design.

The names of Mr. J. P. Seddon and Mr. R. Phené Spiers having been added to the committee after the special course above suggested was drawn up, these gentlemen recommended that the following should form a part of the course of education for architects :—The study and delineation of ancient monuments, the visiting and examining buildings in progress, the study of ornament and of the human figure, modelling, perspective, decorative colouring, landscape painting.

CARVED STONE PANEL.

AS long as carving is entered into bills of quantities, jumped at by builders, and sub-contracted for at a grinding price, it must remain poor and spiritless. How can we expect it to advance in quality as long as we value it together with bricks and mortar? Happily there are some few professional men who retain their own sculptors, whom they have educated to make manifest their ideas without having to supply them with elaborate drawings, which are a very important item to the architect. It is very common and very aggravating to have to pay a fancy price for the poor work of inferior artists; this is no less the case with many architectural carvers.

An experienced hand can mentally see his work done before his chisel touches the stone—of course where a considerable subject has to be treated a pilot model is indispensable; he will boast out his light and shade crisply and with confidence, making the foreseen effect at an early stage of his proceedings, and finally giving here and there a suggestion of the details, and no more, he will not forget the architectural duty of the subject in hand, and will leave proper material witness of its character. Let us look at our less fortunate friend for a moment; he does not know what it will look like when finished, but he has a vague notion of *fat* carving, so he manages to lump his work up, expecting the effect to come at every stroke; perhaps he will leave it in this state to show that there is a dash about him, or, if he is a painstaking person, he will finish it off with a nicely furrowed or granulated surface, with a bit of roughing or stamping at the back, much in the same manner as cheap, shoppy metal castings are got up just now.

Our continental neighbours are most enthusiastic in their publication of architectural details, and it is really wonderful how they make it pay, considering the elaborate manner in which the plates are executed. Such works are comparatively rare with us. General views and sketches are not uncommon, and for this reason, that architects have no objection to publish from their portfolios and sketches that which advertises them. But measured-up detail is quite another thing: this, along with bits of carving and quaint conceits, he trots out occasionally in his designs, and stands sponsor to. None know better than the profession that the publication of old examples, particularly of ornamental details, prevents their being used; the thing becomes patent, and it is not without good results—it obliges architects to design for themselves, or draw from an unpublished source. From accounts we have of the secrecy of their craft and the appearance of their works, there seems little doubt but that the "old fellows" did much the same thing; but with this difference, that they returned from their pilgrimages possessed of that which students nowadays do not bring home with them, viz., inspiration. After what I have said, I shall offer no apology for mingling old work with new, it being so usual in actual practice, and, if judiciously done, of more or less advantage to both. The three figures in the illustration are from old authorities; there is a very pleasing freshness about them, being unlike any one thing in nature, without being unnatural. They do not go in for the stark stare which mediæval animals are prone to, but rather for the expression of thought. In the latter part of the "Seven Lamps of Architecture" the author has illustrated and beautifully described this species of grotesque.

The panel, as illustrated in the lithographic drawing, is intended to be placed on a level with or a few feet above the eye, either by itself or in company with a series of similar panels and heraldic emblems or monograms to form a band or frieze, or the bottom portion may be removed and the remainder made a square panel. The whole of the subject is dished out of the flat, the foliage kept quiet, the leaves being depressed at their origin and rounded softly at their extremities, the flowers gently cupped, avoiding littlenesses. The figures must retain portions of the original flat surface, particularly on their shoulders, back, and sides, and be kept subordinate to the central composition.

I might add that the foliage is not from any particular plant or flower, for experience teaches one that conventionalising any leaf or flower not only cramps the imagination and makes designing arduous, but it courts the criticism of the fastidious; and further I have reason to believe that the names of carved or otherwise idealised plants are given to them after their execution on account of some accidental resemblance they may possess. —O. W. D.

THE NEW CHELSEA BARRACKS.

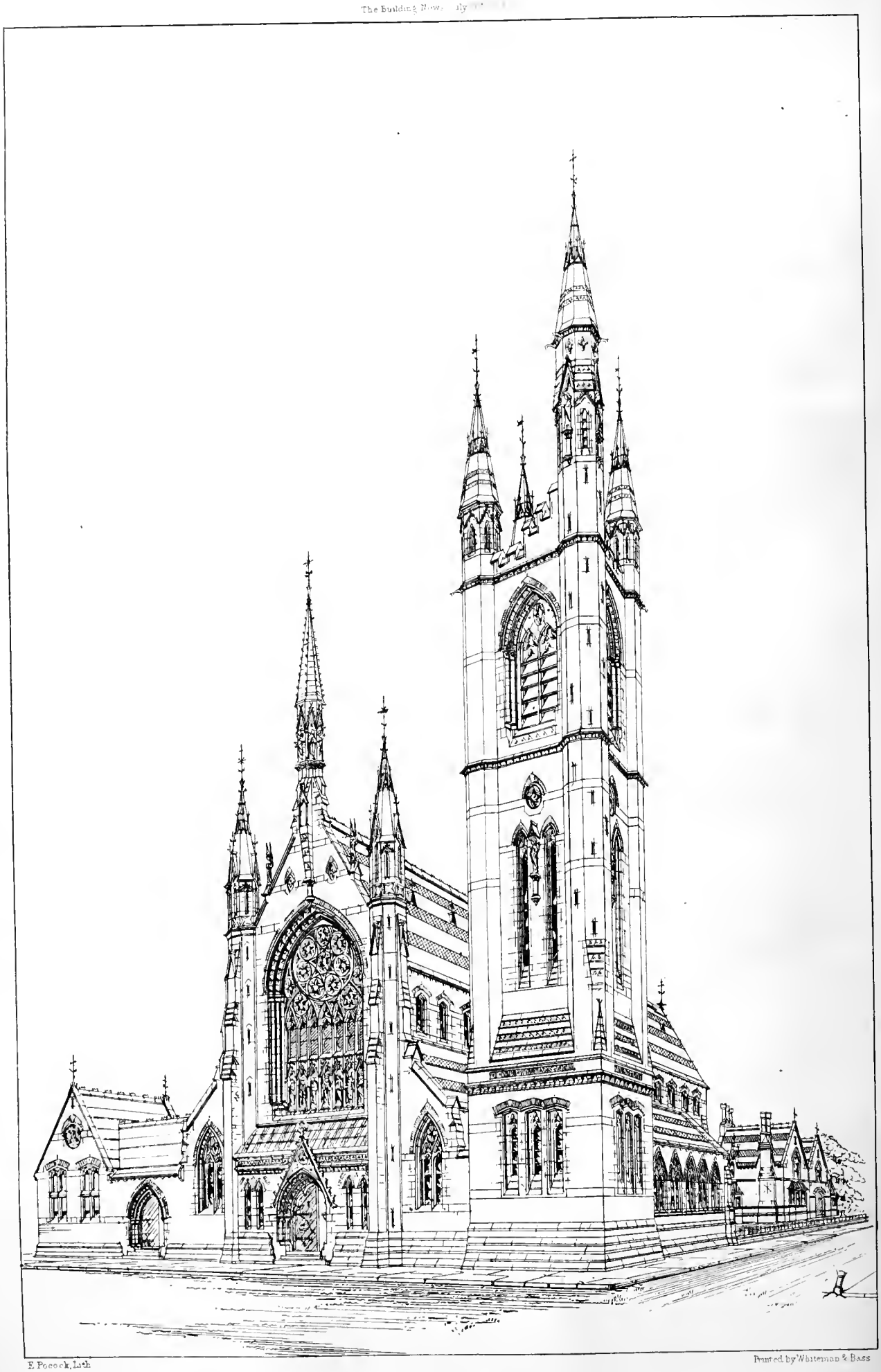
THE *Lancet* Sanitary Commission on the state of the barracks of the household troops has paid a visit to the newly erected barracks at Chelsea, which are constructed on the very latest model. The site is good, and the drainage excellent. The buildings cover thirteen acres, and are so distributed as to secure free passages for air between them. The main building is upwards of a quarter of a mile in length, and is devoted to the ordinary barrack-rooms. The basement is open from end to end, and was intended for a shooting gallery, but the architect, evidently no rifleman, did not allow sufficient height for the trajectory, thus rendering it impossible to shoot from one end of the gallery to the other. An attempt was made to remedy the evil by placing the men in a pit; but rifle practice has now been discontinued. Each block of six barrack rooms is approached by a common staircase; each room accommodates twenty-five men. In size and construction there is nothing to desire. Cold and excessive ventilation were complained of in the winter, but an extra blanket supplied to the men obviated the inconvenience. The lavatories and night urinals are placed in small apartments on each landing. These are dark and imperfectly ventilated; there is no intermediate corridor, and the foul air enters the passages and barrack-rooms. The windows are narrow, and do not reach the ceiling. In every instance the floor was wet, generally from leakage. The urinals, if not locked up in the day time, would be perpetually out of order. Out of the 27 used by the Fusiliers 13 required repairing at the last quarterly inspection. If a urinal on the ground floor be out of order it becomes necessary to shut up all those above it. No latrines or sinks are provided for the wives and families of the pay sergeants, who have, therefore, to cross the parade ground (in some instances probably not less than a third of a mile). The commissioners recommend that these people should be provided with earth-closets. The baths are good, clean, and abundantly supplied with *cold* water. They are, consequently, never used in winter. Throughout the barracks the surface is artificial, and there is a general settlement of superficial paving which destroys the incline of watercourses, &c. This needs to be once for all revised. The prison is altogether badly ventilated. There is an excellent cupola roof, which, if capable of opening at the top, would effect everything required. The air of the cells is excessively offensive, and the windows do not open. The shoemakers' shop belonging to the Fusiliers is overcrowded and badly ventilated. The wash-house and laundry are well fitted, although the number of coppers is insufficient. The married quarters are the best the commissioners have seen. There is a sink and water-tap on each staircase. The rooms are all of the same size, and a few of them were hot and overcrowded. The gymnasium, fives court, chapel, libraries, kitchens, and dining halls are beyond praise. The supply of water is 57·7 gallons per head per day, much of which large quantity probably runs to waste. There is no hospital accommodation. The commissioners, in concluding their report, state that they were forcibly impressed with the substantial construction of the building, and what appeared to them an unnecessary waste of brickwork. Fourteen-inch walls are made to carry stone staircases, the number of which is incredible. There are huge hollow shafts of brickwork closed both at top and bottom, and acres of heavy white-washed passage walls in all the married quarters. These add nothing whatever to the efficiency of the building, whilst they have enormously increased its cost.

ARCHÆOLOGY.

THE British Archæological Association has chosen Cirencester as the place for holding its annual meeting. The session will commence on Monday, August 10, and last the entire week.

On Tuesday the annual general meeting of the members and friends of the Essex Archæological society was held at Brentwood. After the transaction of the ordinary business a paper was read by Colonel Joseph Samuel Chester on "Essex Families and Nomenclature in New England." This was followed by a paper by Mr. H. W. King, on "An Inedited Letter written in the Tower by Miles Corbet, on the night before his execution, and long preserved by his descendants at Shenfield," the adjacent parish to Brentwood; and also a paper on "Inventories and Assignments at South Weald and Brentwood in the time of Edward VI." After some conversation on topics arising out of these papers, the meeting proceeded to visit Herdern (specially interesting for its chantries and sepulchral monuments of the Tyrells of Heron), Little Warley, and other places of antiquarian interest, where papers were read. The meeting then returned to Brentwood, where a dinner at the "White Hart Inn" brought the day's proceedings to a close.

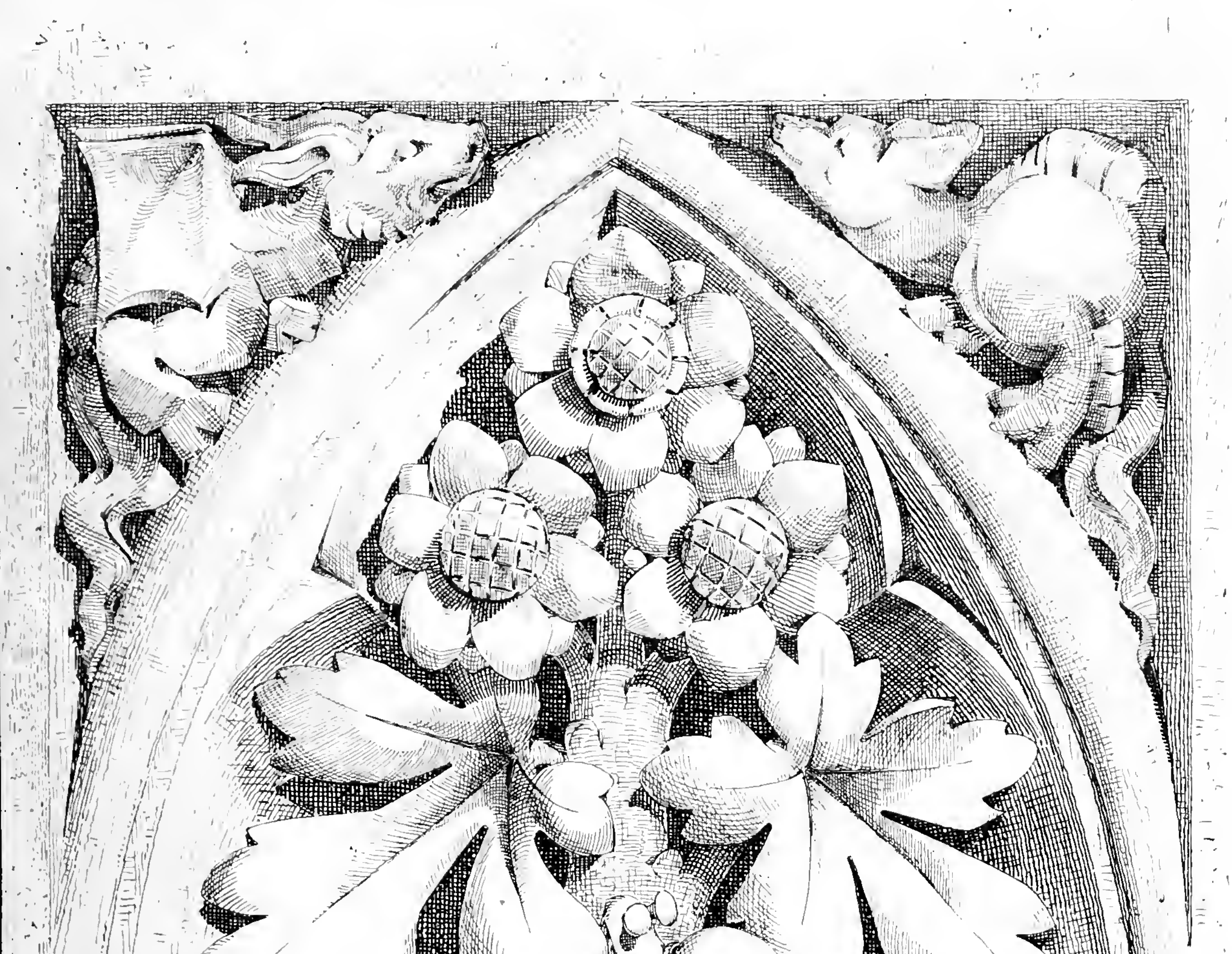
The annual excursion of the Surrey Archæological Society took place on Thursday week, when about one hundred and fifty ladies and gentlemen proceeded from Dorking in carriages and breaks. The first point made was Milton Court, a seventeenth century Surrey mansion. Wotton Church, said to be a specimen of Saxon work, was then visited, and its principal features were explained by the rector. Anstiebury Camp, by some said to be a memento of the Roman occupation, and by others affirmed to be a relic of the Druids, was next visited. Returning to Dorking, the visitors viewed the recently restored chancel of St. Martin's Church, and thence proceeded to inspect a collection of antique and modern furniture at Pipbrook House. Fifteen gentlemen were afterwards elected members of the society.



E. Pocock, Lith.

Printed by Whiteman & Bass

CHURCH OF THE ENGLISH MARTYRS PRESTON. E. WELBY PUGIN ARCHT



CARVED STONE PANEL.

Owen W Davis del et lith

Printed by Whiteman & Bass

WATER SUPPLY AND SANITARY MATTERS.

BAD drainage and scanty water supply, aided by the hot weather, are again doing their work at Sydenham. Fever of an aggravated character has attacked the town, proving fatal in a large number of cases. Many of the older houses have no water supply at all, and trust to foul-conditioned wells and pumps. Great alarm is felt in the neighbourhood, and prompt public action is desirable.

The defective water arrangements at Saltburn-by-the-Sea are about to be remedied by drawing the supply from the Leckwoode and Swindale springs, 6½ miles distant. A company, with some £10,000 capital has been formed for the purpose, and tenders for the same have been let.

New waterworks are forthwith to be commenced at Rhyl.

Owing to the drought, the Stubden reservoir, near Denholme (from which the inhabitants of Bradford and the vicinity are supplied with water) has been exhausted.

On Monday the commission for inquiring into the pollution of rivers visited Stockport in the prosecution of their inquiries respecting the Mersey and its tributaries. They were accompanied in their inspection by the Mayor and other members of the Corporation. Samples of the water were taken at various points for the purpose of testing.

Out of 5,068 houses in Hackney visited by sanitary officers during 1867, no less than 1,000 had the top window sashes so fastened that they could not be opened for purposes of ventilation.

New drainage works have just been completed at Hastings. The old drains, which used to empty themselves at different points in front of the esplanade, to the great annoyance of bathers and of the inhabitants generally, have been intercepted by a main sewer, which, with a fall of 5ft. 6in. per mile, takes all discharge eastward to a tank capable of holding 1,500,000 gallons. In this tank the sewage is stored until low water, and then discharged through about half a mile of 4ft. iron culvert, with a fall of 10ft. per mile, into the sea. Over the tank are air gratings, fitted with charcoal boxes for neutralising the escaping gases. The entire cost is upwards of £30,000. The works have been carried out by Mr. Howell, contractor, from the plans of Mr. Andrews, the local surveyor. Similar works have been carried out at St. Leonards, under the direction of Mr. Bazalgette.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Wesleyan Chapel was laid at Normanton, near Wakefield, on Monday fortnight. The building will be of red bricks, with white brick arches and string-courses, with stone dressings. The inside dimensions of the chapel are 42ft. long by 33ft. wide, and it is capable of seating 200 persons. Mr. William Watson, of Wakefield, is the architect, and the contract has been taken for the whole of the works by Mr. Henry Gibson, of Normanton, builder.

The ancient little church at Frinton, Essex, the smallest, it is said, in England, which stands upon the cliffs only about 300 yards from the sea, was reopened on the 7th inst., having undergone considerable restoration and improvement. The south wall has been entirely rebuilt, a small window being added to it. The roof has been retiled, and the high unsightly pews and old benches have been replaced by a number of neat varnished benches, space being economised thereby, accommodation for from twenty to thirty additional persons being now provided. The total cost has been about £150, and Mr. Joseph Grimes, builder, of Colchester, has performed the work.

The church of St. Peter's, Hunslet Moor, was consecrated on Thursday fortnight. This is the second church built by the Leeds Church Extension Society, and has cost £5,400. On the same day the Bishop of Ripon laid the first stone of another church, built under the society's auspices, which is situated in Goodman-street, Hunslet-road. The society has also nearly completed a church at St. Clement's, Sheepscar.

A new church at Kelsall, near Chester, dedicated to St. Philip, was consecrated on Thursday, the 9th inst. The church, which has been built chiefly at the expense and through the exertions of Colonel Tomkinson and members of his family, is a small but very neat structure, fitted with open benches, accommodating 180 adults and 80 children, with chancel stalls. It consists of nave, 60ft. by 25ft., and chancel 28ft. by 18ft. There is an organ recess and sacristy on the north side of the chancel, and a bell gable constructed over the chancel arch. It is built entirely of local stone; roofs open and boarded. The building has cost about £1,800. The architect is Mr. Thomas Bower, jun., of Nantwich, and the work has been principally executed by local workmen.

A new church at Ivegill, Cumberland, was consecrated on Wednesday week. The style is Geometric, and the structure is built of stone from the Ivegill quarries, faced with Shawk stone. The church comprises nave and chancel, south porch, vestry at the north-east, and a bell spirelet surmounts the apex of the west end gable, pierced for three louvres. The east window depicts the Last Supper, and this window, together with those in the nave and at the west end (which are all of stained glass) was executed by Messrs. O'Connor, of Berners street.

The people of Banbury have just declined a munificent offer of £1,000 from the vicar's father, and £500 from a brewer of the town, towards rebuilding the chancel and improving the organ of the parish church.

The whole of the sum (£12,000) required for the building of the Cathedral of St. Finn Barr, Cork, has now been subscribed.

On Thursday week the foundation stone of a new Wesleyan Chapel was laid at Whickham, near Newcastle. The style is Gothic, and it will be built of local stone. The plans have been designed by Mr. J. E. S. Vardy, architect, of Newcastle.

On Monday week the foundation stone was laid of a new Wesleyan Chapel at Southwick, near Sunderland.

The church of St. Margaret, Whitnash, near Leamington, was reopened on Thursday week, after restoration. The whole of the south aisle has been rebuilt, giving nearly 100 additional sittings. A new porch has also been added. Mr. George Gilbert Scott was the architect, and Messrs. Ballard and Price, of Leamington, the builders.

Truro Cathedral has just been presented with fittings and stalls for the entire choir. The donors of these costly and elaborate carvings are the Misses Cooper, of Markree Castle, and they were brought from abroad by Mr. Cooper.

Broomfield Church, Chelmsford, is to be restored, at a cost of £2,000. Mr. Chancellor is the architect.

The church of St. Mary, Stottesdon, Shropshire, was re-opened on Tuesday week after undergoing restoration at the hands of Mr. Blashill, of Jewry Chambers, London, at a cost of upwards of £2,000.

A new Congregational Chapel is about to be erected at Bognor.

The foundation stone of a new church at Brighouse, Yorkshire, was laid on Saturday last. The cost will be between £4,000 and £5,000.

The Earl of Bradford, on Saturday week, laid the corner stone of the new church of St. Mark, Bolton. The building is to accommodate 900 persons, and will cost £5,000.

Hampnett Church, Gloucestershire, was lately reopened, after restoration by Mr. Street.

The foundation stone of St. Mary's Church, Strood, was laid on Wednesday week. The contractors are Messrs. Foord and Sons, and the edifice is to be completed in a twelvemonth.

The foundation stone of a new Wesleyan Chapel, at Goldenhill, near Runcorn, was laid on Tuesday week. The building will be erected from the designs of Mr. Roberts, of Trentham, the contractor being Mr. John Grosvener, of Bradley Green. The cost is expected to be about £2,200, including the price of the land.

The parish church of Broadwood-kelly, Devon, has been restored at a cost of £700. The tower has been partially rebuilt in strict accordance with the ancient character of the building. Messrs. Gould and Son, of Barnstaple, were the architects, and Messrs. Pulsford, of the same place, the builders.

The old church of St. Michael, Spurriergate, York, was re-opened on Sunday last, after restoration. The north wall has been rebuilt, and several stained glass windows inserted. The church has also been re-floored and re-pewed throughout. Messrs. J. B. and W. Atkinson, of York, were the architects.

A new Congregational Chapel was opened at Ross, Herefordshire, on Tuesday week. It is built of native stone, in the Middle Decorated style. It is 60ft. long, 37ft. 6in. wide, and 21ft. in height. Mr. B. Lawrence, of Newport, was the architect, and Mr. Durke, of Cinderford, the builder.

The foundation stone of a new chapel, at Lancing College, Sussex, was laid on Tuesday by the Bishop of Chichester.

On Wednesday week the foundation stone of Chipstable Church, Devon, was laid. The tower of the old edifice has been restored, and the portion which is now being rebuilt will comprise south aisle, chancel, and porch. Mr. Ferrey is the architect, and Mr. J. Davis, of Taunton, is the builder.

The new church at Llanfair is rapidly approaching completion. The edifice has been rebuilt, as far as possible, upon the old foundations, and consists of nave and chancel, north aisle, vestry, and south porch; and when the tower (the base of which alone is standing), is carried up and thrown up on to the church, accommodation will be provided, by open seats, for 427 persons. The rich transitional south doorway has been retained. The old font will be restored and provided with a cover, and the recumbent figure of St. Elidon will be replaced in the chancel. The chancel will be marked internally by a low stone screen, and will be provided with prayer-desk and stalls. The pulpit (of stone, inlaid with coloured marbles) stands on the south side. The space within the altar rail is paved with Maw's encaustic tiles, and the slab at the back of the altar table will be inlaid with majolica and other tiles. The windows (with the exception of that next the pulpit on the south side, which is filled with grisaille glass, by Heaton and Co., London), are glazed with thick green cathedral glass (the east window being in geometrical patterns), by Messrs. Done and Davis, of Shrewsbury. Local bluestone is used for the walling, with red Shelvoke for the dressings to windows, &c. The roofs are slated. The work has been carried out by Mr. R. Lloyd, builder, Welshpool, under the direction of the architect, Mr. E. Hycock, jun., of Shrewsbury, at a cost of £2,000, including warming apparatus.

The foundation stone of a new church was laid on Saturday at Brighouse, Yorkshire. The style will be Decorated Gothic, and it will be built at a cost of between £4,600 and £5,000, from designs prepared by Messrs. Mallinson and Barbe, of Halifax.

A new Wesleyan Chapel is about to be built at Ran Moor, Sheffield, from designs by Mr. John D. Webster, architect, Sheffield, which were selected in a limited competition. Accommodation is provided for upwards of 300 adults, in addition to a gallery for children.

BUILDINGS.

Mr. Honeyman, architect, Glasgow, has submitted to the Helensburgh town council plans for the re-erection of the town buildings.

The governors of Middlesex Hospital are about to erect a building in which to train nurses for the sick. The cost is calculated at £6,000.

The works in connection with the enlargement of the Leeds County Court premises, rendered necessary by the great increase of business, were commenced last week. The extension will be carried out from the designs of Mr. T. C. Sorby, architect, London. With respect to the court where the trials take place there will be no alteration. There will, however, be a new large public office, measuring 42ft. by 32ft. 6in. The front will be ornamented with both circular-headed and pedimented windows and bold moulded cornices.

A new bridge is being built over the Dee, at Penylan, by Mr. Hardcastle, and the first stone of the column on the Shropshire side was recently laid.

New grammar and infant schools at Abingdon were commenced last week. The buildings will be of brick, with bands of coloured brick and stone introduced, and will be erected by Mr. Charles Claridge, of Banbury, at a cost of £4,610, from the designs of Mr. E. Dolby, architect, of Abingdon.

The Poor Law Board has sanctioned the plans for the new St. Pancras Infirmary, at Highgate, which will cost £40,000.

New schools, in connection with the London-road Congregational Church, Chelmsford, were opened on Wednesday week. The buildings are of white brick, relieved with yellow bands and arches, the style being Romanesque. Mr. C. Pertwee, of Chelmsford, is the architect, and Mr. Henry Gozzett, of Woodham Walter, was the contractor. The cost is £2,500.

The plans for a new convalescent hospital, which is to be built at a cost of half a million, have been prepared by Mr Dale, New Inn. The architect has planned out six separate dining-halls, library, reading, billiards, and smoking rooms, gymnasium, and baths; and hygienic principles will be observed in regard to ventilation, water supply, drainage, &c. It is intended to accommodate a thousand persons at one time.

The new London University buildings are so far advanced, interiorly, that an examination of candidates for degrees in science is being conducted in two rooms at the back of the building, which is much more forward than the front portion.

A new lunatic asylum for the county of Berkshire has been commenced at Wallingford, near Moulsford station. The first contract, for the sum of £46,000, has been taken by Messrs. Mansfield and Price, of London.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—E. S.—R. L.—G. E. S.—G. R. T.—I. C—G. R. and Co.—W. O. C.—G. F.—A. B. T., with photos. O. W. D.—C. S., with article on ventilation of drains.—C. R. and Co.—P. and B.—I. T. G. E. S.—I. S. D., with designs for stencilling, which will probably be inserted.

F. L., Jersey.—A short account of the action and construction of Norton's tube wells will be found in an article on "Artesian Wells," in the Building News of Dec. 27, 1867.

Correspondence.

THE PROPOSED DESIGN FOR A NEW NATIONAL GALLERY.

To the Editor of the Building News.

Sir,—Allow me, I beg, to say a few words respecting the view you lately published of the new National Gallery. The simple public probably believe in the bonâ fide nature of the representation, and expect the building to look in execution as there portrayed. That it can and will do so is simply impossible. The original drawing which was submitted in competition was a very beautiful one, no doubt, much advancing Mr. Barry's interests and doing his artist infinite credit. But to allow perspective views at all in a competition without fixing the position of the supposed spectator and the height of the horizontal line is a great mistake. Competition perspectives are, as a rule, purely hypothetical, imaginary representations under the happiest conditions, poetically pretty, but flagrantly false, and of this kind is the view under consideration. It is an impossible one. The spectator must be supposed to be in the Strand with one side of Trafalgar-square (Morley's Hotel, &c.) swept away, and the said spectator to be elevated 20ft. in the air to get such a view! The figures, too, and the distant buildings are much too small, so giving undue size and importance to Mr. Barry's design. The view is, in fact, false and mischievous, a delusion and a snare, and something more truthful should at once be produced. There ought to be views made as the building would show within the limits of Trafalgar-square, both from the upper and lower parts, the horizontal line kept at correct height and no fudging. Considering the amount of discussion and wrangling, the decisions and changes of purpose, and general anxiety there have been during the last five and-twenty years on the subject of a new National Gallery worthy of the finest site, if not in Europe certainly in London, it ought to be faithfully shown and clearly understood, before a brick or stone is laid, what we may expect. A correct view from the lower part of the square would show the domes considerably lower than in present view, the lines of cornices &c., more rapidly declining, the breaks of front much more prominent, the east side not seen, and the whole building much less regular and imposing. On the north side of square the differences would be still greater. From thence the domes, even the centre monster, would be, I expect, invisible.—I am, &c.,

P. E. M.

EXHIBITION OF STUDENTS' WORKS. KENSINGTON MUSEUM.

Sir,—Having last week forwarded you an account of the architectural works exhibited in the above exhibition, I now pass a few remarks on the designs submitted for articles of manufacture, viz., such as carpets, muslins, surface decorations, pottery, &c., and it is a question requiring much consideration as to how to criticise most of the drawings, for, although they all, more or less, possess many faults, one scarcely has the courage to point them out when he reflects upon the age of the students by whom such works were produced; in fact, it is simply surprising how some could have designed and executed them at all, and particularly in two or three instances. It is incredible how such designs as those of Messrs. G. Clanson and A. Poole could be the result of students only sixteen years of age, but I have every reason to believe they are, and consequently the art schools are not such a failure as a great many are too often led to imagine.

Now let none of these young gentlemen feel annoyed or disheartened in whose drawing I may point out a few errors; but let them pause over them and try to avoid them in future, for all who have had any experience whatever in art are aware of the follies and eccentricities of the beginner, who, after having designed, as he believes, something original, no matter how absurd or ridiculous it may be, is reluctant to remove it at the advice of his more experienced masters. I am sorry to say that this obstinacy is possessed by not a few of the more advanced students, and who, like idle schoolboys, discover their error when it is too late to amend it.

The following is a list of the successful competitors in the branches named at the commencement of this article, the gold medal having been awarded to the four following pupils:—Mr. G. Clanson, designs for a piece of tapestry and carpets, most successful both in form and harmony of colour, in two cases especially; Mr. G. Broadhead, for a lace curtain, possessing many good points well worthy of study; Mr. F. Brett, for designs for wall paper—though the form is not so happy, the colour is superb, principally composed of green grays, relieved here and there by a large red flower, unknown, I am sure, to any botanist, but in its right position here; and to Miss Brooks, also for wall paper of very insignificant design. The following pupils have had the pleasure of receiving the silver medal:—Mr. A. Braker, for designs of subjects suitable for stained glass, most beautifully drawn and indicative of great power; Mr. Smith, design for a rug, possessing good colour throughout; Mr. M'Irwin, design for a carpet, very straggling design, colour passable—in my estimate not worthy the silver medal; Mr. N. Nicholson, design for muslins, a little too wiry; Mr. W. Murray, surface decoration—very poor, both in design and colour, from a student whose age is eight-and-twenty; and to Mr. W. Scott, watch covers,—sorry to see such beautiful designs crammed into so small a surface. Bronze medals have been awarded to E. Slocombe for some spirited designing in metal work; J. Trego, watch covers; T. Stone, for card backs, the whole well worthy of inspection; F. Jones, age fifteen, for an attempt at designing plates; Mr. W. Scott, for ribbons; J. Frost also, for ribbons of very good design; Mr. W. Johnson, for two slips 3in. wide, surface decoration, good in colour and design—why make leaves of slight lines connected by acute angles? in nature not even the ivy is such; Mr. H. Clarke, a carpet, colour good, as long as it remains at that scale; Mr. W. Arnold, Mr. P. Kirkby, and Mr. R. Gates, for designs for muslins; Mr. F. Hall, ribbons—nice colour; Mr. S. Stevenson, wall paper, very good indeed; Mr. J. Harris, lace, the masses being most beautifully disposed; Mr. H. Goodhall, wall decoration; Miss Freeman, lace curtains; W. Stanly, surface decoration—why fill up hexagons, cinquefoils, &c., with a design when there is no use for it when executed? and also to Mr. J. Turner, for specimens of illuminating. Are they supposed to be designed or copied, as I cannot waste my time in finding out what stage A, B, or C means? Prize books have been awarded to Mr. F. Reading, J. Slater, R. Young, J. Watson, J. Turner (age thirty-five), J. Weir, W. Burnett, Miss S. Gibbons, J. Thatch, E. Buckler, F. Spring, J. Guthrie, A. Webster, J. Johnson, D. Dudson, J. Wright, A. Poole (for a magnificent design for a carpet), and to Miss S. M'Gregor, (for anatomizing flowers suitable for ornament). Among the unawarded drawings, the following are those to which I would call the visitor's attention:—A design for a carpet, by Mr. E. Poole; a silver bridal cup, by Mr. H. Mason; and iron railing, by Mr. W. Morgan; book covers, by Mr. T. Ritche; wall papers, by Mr. C. Jockel; a design for a tile floor, by Mr. Guthrie—good as a surface design, but for tile flooring most absurd; and ribbons, by Mr. Thomas; and, for curiosity, to a design for a carpet—a most extraordinary production, the colour being composed of scarlet, French blue, chrome yellow, and emerald green, but it nevertheless is very good for a child not more than fourteen years of age.

Now, after examining the whole of these designs, one clearly discovers the feeling of the age, and how the natural curve that was so much admired by the ancient masters, and Hogarth's line of beauty and grace (that we were told was the foundation of ornament), are now falling to decay, and their position occupied by the more geometric style of the compass and square. Now the fault of the curvilinear design, if overdone, is that it impresses motion with confusion, but the latter, nevertheless, is exposed to the same danger, for a straight line here terminating with a conventional ivy, and another with a flower, composed of so many dots, is suggestive of anything but tranquillity. We ought, therefore, to draw a line between these two extremes, for there is little doubt but that the beauty of ornament lies in its simplicity and repose both in form and colour. But the aim of the present generation is change and novelty, not only in the works of the architect and ornamental designer, but even artists will have to give us wonderful productions yet, such as drawing without shadow, lose sight of perspective, revive the gilded backgrounds, talk up Purigino, Fra Angelico, and the mediæval illuminators; run down Rubens, Rembrandt, and Turner. All these things must be done, though its career be cut short before the thirst for change be satisfied.—I am, &c.,

H. A. G.

COMPETITION PLANS FOR WALWORTH COMMON ESTATE.

Sir,—As an unsuccessful competitor I feel at some disadvantage in making any remarks on the decision lately arrived at by the Poor Law Guardians, but in justice to myself and a great number of my fellow competitors, I must protest against the utter inconsistency and absurdity of that decision, and the injustice that is done to a body of gentlemen who have devoted much time and labour to the preparation of the plans, which the result shows might just as well have been spared. The facts are, that the three prizes offered by the Guardians for the best plans have all been awarded to competitors who are connected with the parish.

To this I would make no objection if the plans were in accordance with the instructions of the Guardians themselves, as printed and circulated amongst the competitors, or that they possessed superior merit to those plans which have adhered to the instructions.

On reference to the selected plans (especially the first and second prizes), it will be seen that they are entirely at variance with the instructions in several important particulars; whilst I, and many others of my professional brethren who sent in plans, imagining that the instructions were given bona fide, and that the points I allude to were of importance, have taken especial pains to adapt our designs to the supposed requirements of the Guardians. It was distinctly stated that "the Guardians require two good roads, from 55ft. to 60ft. in width, to intersect the estate from west to east." Two of the selected plans do not strictly comply with that part of the instructions.

The one receiving first prize has the principal roads on one of his plans only 50ft. wide, and on the other only 42ft., 45ft., and 50ft. wide.

The one receiving second prize has the principal road only 45ft. wide, in other parts 50ft. wide (although marked on his plan 55ft.)

And the one receiving third prize has interfered with the workhouse grounds; but his general design is good, and is really the only one of the three entitled to a prize.

All the plans selected interfere with the stoneyard. The plan receiving second prize shuts up Boundary-lane, which has been a public road for twenty or thirty years.

I can give you other instances, particularly with regard to the arrangement of the other roads and building sites. The plans receiving first prize show the largest number of sites, but their frontages are only 15ft. to 16ft., and many of them are fronting the main roads, and many are only 13ft. wide (although stated by the authors in their report that none are intended to be less than 16ft.). Likewise they also contain sites which are only 35ft., 40ft., and 45ft. deep, and are arranged quite regardless of uniformity, ventilation, and sanitary arrangements, as required by the instructions.

The plan receiving second prize has six courts from 15ft..

to 20ft. wide, with sites 42ft. and 45ft. deep, also sites for houses fronting the main road not 40ft. deep; a lane, 500ft. long, 20ft. wide, with fifty-six houses introduced, which have no fore courts; and many measuring only 30ft. and 40ft. deep. So much for sanitary arrangements. Plans A, C, and D, all interfere with the workhouse buildings, whilst several of the rejected plans have strictly complied with the instructions and contain nearly as many sites, and with frontages of 18ft. to 20ft., and depths not less than 55ft. and 66ft.

I think I have said enough to show the folly of a professional man, a stranger to the members of the board, attempting bona fide to compete under such circumstances, and to devote time and labour only to find himself stultified in such a decision as the one arrived at. If the plans had all been sent in under mottoes and had been examined and decided on with the assistance of a professional man, as suggested both in the *Builder* and to the Guardians themselves, there would have been a very different result; at any rate, the unsuccessful competitors would, I am sure, have been better satisfied than they are likely to be.

It just comes to this, that the Guardians have issued instructions which they have not abided by in their decision, or that they have so far altered their views as to put a number of gentlemen (whose time might have been better employed) into an extremely false position.

As the plans are to be open for inspection at the Walworth Vestry this week, I fearlessly refer the ratepayers of the parish, or any professional gentlemen, to the plans selected, and beg that they will compare them with the rejected ones, and the facts stated in this letter.

If the Guardians have decided in error of the measurements here referred to, let them, in justice to the other competitors and for the sake of future competition, re-examine and re consider all the plans with professional aid, and a "true verdict give" according to merit.—I am, &c.,

FREDERICK A. KLEIN.
Civil Engineer and Architect, 110, Cannon-street, E.C.
Author of the plans marked X.Y.Z.

Intercommunication.

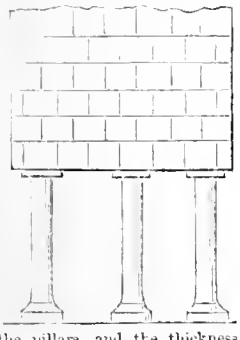
QUESTIONS.

[937.]—GAUGED ARCHES.—Would any of your contributors to "Intercommunication" let me know of the best way of setting gauged arches. Should they be set only with putty, or ought cement to be used for the bed joints and putty for the outside, or pointing, as it might be termed?—BRICKLAYER.

[938.]—PLASTERING.—I should take it as a favour if any practical plasterer would tell me what is the difference between the material used in the first and second coat, that is, between laying and floating? I have always understood that the stuff for floating should be rather thinner, and more hair put in it than for laying.—M. N.

[939.]—ORNAMENTAL WATER.—I am getting out some ground for a circular piece of water in a park, and I wish to know how much it will hold when full. The outside diameter is 23ft. 6in; the depth, 4ft.; and the slopes 2 to 1, which will make the diameter from bottom of opposite slopes a good deal less than the outside one.—HYDRAULIC.

[940.]—CAST-IRON PILLARS.—In the sketch, there is a mass of brickwork, weighing 14 tons, to be carried upon three cast-iron pillars, 9ft. 6in. high. What should be the



diameter of the pillars, and the thickness of metal in them? They are to be placed at equal distances apart, so that between them they will carry the whole load of 14 tons.—L. C. P.

[941.]—TUDOR ARCHITECTURE.—Will any of your numerous readers give me a geometrical rule for determining the exact shape of what is called a Tudor arch? Is it considered a strong form of arch, or only one suited for ornamental purposes?—STUDENT.

[942.]—COLOURING A BLACK BOARD.—Would you or any of your readers kindly inform me of the best manner of colouring a black board, so that the chalk marks may not be visible when cleaned? By so doing you would greatly oblige.—ALBERT.

[943.]—CISTERNS.—Will any of your readers kindly inform me whether lead is preferable to zinc for lining cisterns; and if so, why; and whether either or both metals are poisonous to the water contained in them?—ENQUIRER.

[944.]—WATER COLOUR.—Will anyone kindly inform me of a work on water colour suitable for an amateur architectural draughtsman?—STUDENT.

[945.]—PAPERHANGERS' WORK.—Can anyone inform me, through "Intercommunication," of the proper method for measuring paperhangers' work, and of the difference in measurement between French and English papers?—A SMALL BUILDER.

[946.]—BALTIC TIMBER.—Which are the most useful, the strongest, the best, and the toughest descriptions of Baltic timber? TYRO.

[947.]—CLAY WALLS.—Will some one inform me whether any kind of clay may be made into a clay wall, and what kind of clay is the most enduring; and what materials may be used with different kinds of clays to bind together? C. F. H.

[948.]—MAKING BLUE BRICKS.—Can you or any of your correspondents inform me of the best method of making bricks and tiles a blue colour?—ALFRED MILLS, Spotland-road, Rochdale.

[949.]—BRICK-MAKING BY MACHINERY.—I am proprietor of a small brick yard in this town, and I make some 12,000 per week, all by hand. I find that by the introduction of patent machines in the neighbourhood they can make a better class of brick than mine, sell them at the same or less price, and make them at 10s. or 12s. per thousand, whereas mine cost me about 15s. per thousand; therefore, I wish you would give me your opinion as to which is the best machine to adopt, and the one you can recommend. I want to make from 15,000 to 30,000 weekly. I want the machine that makes the best common brick, and the one that costs the least per thousand for making, least cost for machine, and the one that you can recommend for economy and utility. I have seen several patent machines that turn out 100,000 per week; but I don't want anything of such magnitude as that, as the machine cost over £4,000 putting down; then again I could not find sale for the bricks. I see, from different articles in the BUILDING NEWS, there are a great variety of patent brick-making machines mentioned (I think some 300); therefore I thought it very likely, out of such a vast number, you may find or know of one that will answer my purpose. The best and cheapest one I have seen myself is the one I have mentioned turning out 100,000 weekly, at the very small cost of 6s. 4½d. per thousand, which includes all making and burning complete. I think all is done by machinery—grinding, moulding, pressing, and all complete. There is a great difference between the price I pay and their 6s. 4½d.—Y. Z., Batley.

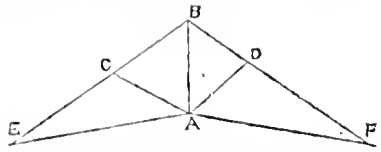
[950.]—ART STUDENTS AT SOUTH KENSINGTON.—In your last week's issue there appeared a letter of criticism from "H. A. G." on the Exhibition of Students' Work, South Kensington Museum. Perhaps "H. A. G.," or some other correspondent, will kindly inform me through your columns the terms of this competition, viz., the qualified ages of intending competitors, the subjects given, the place and time of examination, whether I must be a member of a class connected with the museum in any provincial town, or taking a course of instruction at the museum, or any other information he may imagine I should wish to know, if intending to compete?—A. F. G.

REPLIES.

[900.]—BOLTED GIRDERS.—It appears to me that the gentlemen who have undertaken to reply to "F.'s" query have, in their efforts after facetiousness, rather overlooked the real subject under consideration. The question raised is undoubtedly an important one. "F." states the fact that it has become, through long-established custom, the practice to halve timber when used in large balks for breast-summers and such like purposes. His question, as I read it, is very plain. Is this treatment of the material (the reason for which has been in the lapse of time forgotten) founded on any formerly known law that the strength of the timber is thereby increased? In the absence, as far as I am aware, of actual experiments, the only way to investigate the subject is to consider the advantages and disadvantages of the practice from a common sense point of view. The earliest examples of halved beams date, I believe, long before the use of iron in the form of bolts, when pins or trenails of hard wood were employed to fasten all woodwork. The iron screw bolts of the modern carpenter are doubtless greatly superior to the trenails of the originators of halving. May not the practice have arisen from a desire to discover whether the beam was sound throughout? In the days before Tredgold's tables little was known about the strength of timber, and with few precedents and no rules the early builders were forced to trust to the soundness and excellence of the materials they employed. If my suggestion is correct we can readily understand that in the event of any part of the beam showing signs of weakness they would either reject it altogether, or, as "F.C.H." suggests, reverse the halves end for end (why, by-the-bye, also in the direction of the grain, which surely is synonymous?). Then knowing the heart of the timber to be less liable to be attacked by insects and more durable than the exterior, they would turn these sides outwards. Here we have a simple and rational explanation of the practice. It only remains for us to consider what effect halving is likely to produce upon the sustaining power of the beam. However well joined with the trenails or even bolts, the two halves would lack the cohesion of the undivided balk, and would not, in the case of a weight bearing on one side of the beam, such as a row of floor-joists, act together in resisting that weight. If one-half failed, or the trenails drew a little, the beam would be demolished half by half, which, in the case of the solid balk could never happen. The wrought iron flitch is a modern invention, and does not come under "F.'s" question. I will not, therefore, notice it. To conclude, the chance of making a strong part sustain a weaker, the exposure of the heart wood to the weather, and the power of ascertaining the perfect soundness of the beam, do not, I think, counterbalance the danger of the destruction of each half separately by an unequally distributed load. I, therefore, maintain that the solid beam is to be preferred to the halved one.—GILBERT R. REDGRAVE.

[922.]—UNINFLAMMABLE DEAL FIXTURES.—A solution of asbestos is frequently employed for the purpose of rendering woollen and cotton fabrics uninflammable, and it is very probable that the same method would prove effectual in the case referred to by your correspondent.—CALORIC.

[925.]—SPAN ROOFS.—"Subscriber" evidently does not understand the nature of the action of strains, and, with your permission, I will explain to him what would be the result of his placing a weight in the centre of the tie used. Let a weight be suspended at A in figure; it will, in the first place, be directly supported by the ring rod A B; this rod will, in its turn, pull upon the apex at B, causing a thrust upon the rafters in the direction of their length. This thrust will be resisted at E and F, where it will tend



to thrust out the feet of the rafters, which will be held together by the two inclined ties, E A, F A. It is quite an error to suppose that the immediate effect of the weight would cause the tie rod to bend, or that it would bend if the feet of the rafters were fixed down to the piers. In the latter case, the whole of the thrust would be taken by the fixed points at the feet of the rafters, and there would be no strain at all upon the inclined tie rods. The strains upon a trussed roof require a very careful analysis to investigate them correctly.—CALCULATOR.

[929.]—MATHEMATICAL QUERIES.—There are only two methods of finding the square of a number. One is to multiply the number by itself, which is called involution; and the other is by logarithms. Thus, to find the square of 36 by involution, we have $36 \times 36 = 1296$. By logarithms, putting N for the answer, we have 2 log. 36 = log. N; or $2 \times 1.55630 = \log. N = 3.11260$. On looking for this logarithm in the table we find it to be the logarithm of 1296. With respect to the second part of the question, it may be solved as follows:—Let R equal radius of circumscribing circle about the octagon, and D the length of the required side. Now the side of the octagon is exactly one half of that of a square, but if D be put for the side of the square, we have in terms of the radius $D^2 = 2 \times R^2$; and consequently, since $d = \frac{D}{2}$ we have for the length of the side of the octagon $d = \frac{R\sqrt{2}}{2} = 0.74\,R$.—Q. E. D.

[929.]—"A. P. B.'s" first question—the shortest way to find the square of any whole number—is so simple that I would say let him square it. His second query—as to the best way of finding the side of an octagon, given the radius of the inscribed circle—I think the following rule is about the shortest method of doing it:—Find the diagonal of the square whose side is the radius of the circle; subtract the side from the diagonal, and thrice the difference will be the side of the octagon.—Q. E. D.

[936.]—THE WEATHER AND COAL.—It is of the utmost importance to keep coal as dry and as sheltered as possible from the time it leaves the mine to the time it reaches the stove or furnace. It should be protected from the showers and sun of summer, and from the storms and alternate frosts and thaws of winter, as all coals are affected by such exposure. Anthracite, from its hard, compact structure and glassy substance, suffers least; cannel ranks next; and bituminous coals are most affected. The effect of exposure on the latter class of coal has formed the subject of experiments in Germany, by Herr Grundmann and Herr Varrentrapp. These experiments showed that bituminous coal exposed to the weather in heaps, lost, during a period of nine months, 50 per cent. of its value as fuel. During exposure, the coal undergoes a process of slow combustion, taking up oxygen and giving off the volatile products of oxidation. In this decomposition air and moisture play the principal part, and warmth is the condition promoting it. Coal should never be piled in heaps when wet, and never in great quantities even when dry.—IGNEOUS.

WAGES MOVEMENT.

THE United States statistics of manufactures show a clear increase of 60 per cent. in wages in 1866, as compared with the wages paid in 1860.

At the meeting of the Social Science Association, which will commence at Birmingham on September 30 next, in section IV. (Economy and Trade), the second question for discussion is:—"In what manner can arbitration and conciliation be best applied in the settlement of disputes between employers and employed?"

On Friday last a large number of the operative masons of Halifax struck work for an advance of 2s. a week wages. A six months notice of the intention of the men had been given to the masters, who tried to compromise the matter by offering 7d. per hour wages. The hours of labour for the week are 50½, which, at the rate of 7d. per hour, would raise the wages to £1 9s. 3½d., the present amount being £1 8s. The men object to work under the hour system.

Messrs. Colls and Son, builders, of Camberwell, and of 28, Moorgate-street, received the following notice on Tuesday morning:—"To Messrs. Benjamin Colls and Sons.—Gentlemen,—We have to inform you that a resolution has been passed condemning the system of piecework, which many employers are endeavouring to enforce, and which they well know is most obnoxious to trade unions, and hereby intimate that after the usual period has elapsed such employers deviating from the tenor of the foregoing must bear the consequences.—Yours respectfully, from the General Secret Committee."

STAINED GLASS.

A NEW stained glass window in memory of the late Chancellor Bird has this week been put in Lincoln Cathedral, at the east end on the south side. The medallions represent 'God's Revelation under Three Dispensations: Life in Christ, out of Sin and Death, through Substitution and Sacrifice.' The cinquefoils contain pictures of SS. Peter and Paul, and the three large lights three medallions each, viz., "The expulsion from Paradise, the Sacrifice of Abel, the translation of Enoch, the tower of Babel, the sacrifice of Abraham, the translation of Elijah, the Adoration, Gethsemane, and the supper at Emmaus."

A three-light memorial window has lately been set up at Downham Church, Norfolk. The centre light contains

a figure of our Saviour in the character of "The Good Shepherd," under a canopy, and the side lights each consist of a border with bosses, medallions rosettes, and diagonal texts of Scripture, set on a ground of flowered quarry work. Messrs. Wailes, of Newcastle, executed the window.

STATUES, MEMORIALS, ETC.

AT a meeting of the Court of Common Council on Thursday week, a report from the City Lands Committee, recommending that a bust of the late Lord Brougham be placed in the Guildhall, at a cost not exceeding £200, was agreed to.

LAND AND BUILDING SOCIETIES.

THE report of the Birkbeck Permanent Benefit Building Society announces that the total gross receipts during the past twelve months have been upwards of £400,000 in excess of those in the previous year. Since the last annual statement there has been an increase of £400,080 11s in the gross receipts, of £154,092 17s. 7d. in the deposit branch, of £4,791 2s. 7d in the profit, of 3,063 in the number of shares, and of 2,319 in the number of depositors. The undivided accumulated profits, after providing for all exigencies, amount to £30 281 18s. 8d, which entails a bonus of nearly 56 per cent. upon the total due to the shareholders The receipts for the past year under every branch have amounted to £1 062,585 10s. 7d.

A meeting has been held at Bristol for the purpose of forming a working men's co-operative building society. A resolution pledging the meeting to support the society was unanimously carried.

LEGAL INTELLIGENCE.

AT the Lancaster Assizes, on Saturday last, before Mr. Justice Hannen, the cause of Gibson *v.* the Mayor and Corporation of Preston was heard. The action was brought to recover compensation for injuries sustained in January last, owing to the dangerous state of a public footpath at Preston. The defendants were sued as the local board of health of Preston. Under the 68th section of the Public Health Act it was their duty to keep in repair all the public streets (which include footpaths) within the borough. The plaintiff was proceeding from the railway station in the direction of Walton Parade Bridge, when he stepped into a large hole, and his right leg was broken in two places. A verdict, by consent, was taken for plaintiff—damages £400 subject to leave to move upon certain points of law.

At the Antrim County Assizes, on Thursday week, before Baron Fitzgerald, Mr. F. J. Robinson sued Mr. Archibald M'Crea, a builder, for breach of contract. The defendant had contracted to build sixteen houses for the plaintiff, and to pay a penalty of £1 a day for every day the houses remained unfinished after a certain date. They were not ready for 75 days after the date agreed upon, and the plaintiff, therefore, claimed £75, which sum was awarded to him by the jury.

CLERKENWELL POLICE COURT.—On Friday, the 24th inst., Mr. Albert N. Bryett, builder, of 116, St. James-road, Holloway, attended at this court to answer a complaint preferred against him by Mr John Turner, district surveyor of the eastern division of Islington, for erecting a building at the rear of No 36, Grove road, without first having given two days' notice to him, as required by the 38th section of the Metropolitan Buildings Act. This case had been adjourned on two previous occasions to enable the defendant to receive a reply from the Metropolitan Board of Works to a complaint he had made in reference to the proceedings taken by the district surveyor in respect to the said building.—Mr Joseph E. Turner of 36, Gresham-street, E.C., appeared for the district surveyor; and Mr. Ricketts, of 19, Frederick-street, Gray's Inn road, for the defendant.—The facts of the case, as stated by Mr. Turner, solicitor, and borne out by the evidence, were as follows:—That on March 23, 1867, notice was given by Mr. Bryett of his intention to erect six houses, shops, and additions in the Grove-road—the size of each of the proposed buildings given in the notice was equivalent to an area of 549 superficial feet. In November last the roof of the house No. 36, Grove road, was covered in, and the building, as then carried up, was found to contain an area of 956 superficial feet. In the month of January last the district surveyor had occasion to visit the premises, when the house was occupied and an oven had been erected by another builder, and that on April 21, 1868, he discovered the building in question began at the rear of the house, and for which he required notice, which had not been given. The sections relied upon by the solicitor for the district surveyor were the 9th, 27th, 28th, 40th, 41st, &c On the part of the defendant it was contended that works were going on from time to time on this and the other houses mentioned in the original notice, and that even at the present time all the houses were not thoroughly finished, and that the building in question was simply a coal cellar, of about 7ft. high, and was included in the description of "additions" contained in the original notice of the houses; he also contended that, although this house was "covered in" at the time stated, yet, as the remaining houses, for which notice had been given, were not in such a forward state, this house could not be considered to be completely finished, and that, according to one of the interpretation clauses of the act, the term "area of a building" was not to include "attached buildings, the height of which did not exceed the height of the ground story."—The magistrate (Mr. Barker) decided that, as the house was proved to have been covered in at the time stated, and taking into consideration that the area given in the notice for the houses was considerably exceeded, although the other houses might not have been completed at the same time as No. 36, Grove-road, yet to all intents and purposes each house, although included in one notice, must be considered as a separate building, the rules of the act applied to each individually; and the work complained of having been commenced after the roof of the house, No. 36, Grove-road, had been covered in, notice should have been given to the district surveyor; he should, therefore, impose a nominal penalty of 5s., and award two guineas costs.—Mr Ricketts stated he was instructed to ask for a case which was granted.—Mr. Turner, the district surveyor's solicitor, informed the magistrate the decision of the Metropolitan Board of Works to the complaint made by Mr Bryett was in accordance with his (the magistrate's) decision.

NOTICES OF BOOKS.

Modern Industries: a Series of Reports on Industry and Manufactures, as presented in the Paris Exposition in 1867. By Twelve British Workmen visiting Paris under the auspices of the Paris Excursion Committee. London: Macmillan and Co.

THIS volume is similar in plan to that issued some time since by the Society of Arts, the principal difference being that the former volume was composed of reports written by workmen specially chosen by the Society of Arts, and the work before us contains the picked results of a prize fund raised by the Paris Excursion Committee for the purpose of rewarding the authors of the best reports on the various subjects. Appearing as it does before the public after the publication of the work issued by the Society of Arts, it is likely to evoke less public interest than it deserves, or would otherwise have done. It comprises twelve separate reports on pottery and porcelain, gold and silver work, maps and educational appliances, preparation of leather, watchmaking, iron, china and ceramic ware, cabinet-work, cabinet-making and the woods employed in it, tools and machinery for the manufacture of steel and iron, and brickwork and concrete building Some of them contain a large amount of really good information; and in another column will be found a lengthy extract from Mr Hooper's report on the woods employed in cabinet-making Every paper is characterised by an earnest desire on the part of its author for a larger share of the advantages derived by their continental brethren from their more frequent opportunities of visiting the national museums and the acquirement of art-education. One or two of them, indeed, cry out in a somewhat un-English manner for the more direct interference of the ruling powers in the industry and recreations of the people. The work has been edited by Mr. J. T. Dexter, the corresponding secretary to the committee; but no alterations have been made except such slight changes in the punctuation and the form of expression as were absolutely necessary to render the sense clear.

St. Davids: Its Early History and Present State. By an Ecclesiologist. Bemrose and Sons.

PARTAKING somewhat of the nature of a popular guide book, this little work affords a good idea of the ecclesiastical buildings of St. Davids, one of the most interesting places in the Principality. Situate in the Hundred of Dewisland, a peninsula of Pembrokeshire, it is comparatively unknown to English tourists, yet few localities abound with greater interest to the antiquarian and the architect. The cathedral, built in the twelfth century, and the Bishop's Palace and College which adjoin it, are all in a very sad state, the condition of the two latter being positively ruinous. The cathedral itself, as our readers will remember, has been partially restored by Mr. G. Scott, but the eastern portion yet remains untouched. Detailed descriptions of all the buildings are given, and the principal of them are illustrated by lithographs. St. Davids was a place of considerable importance during the occupation of the Romans. They had a station there called Menevia, from which a Roman road ran through Pembrokeshire, and, passing through several counties, terminated at Bishop Wearmouth. At the present day the general aspect of the place is very poor; the houses are meanly built, covered with thatch, and smeared with white or yellow wash Architectural tourists would find the time spent in a short visit to St. Davids by no means wasted. There are ample materials for their sketchbooks, and they may acquire at the same time renewed health and fresh knowledge.

Catalogued Examples of Medieval Art Metal Work. Joseph Ratcliff and Sons, Birmingham.

THIS catalogue illustrates the metal work in the mediæval style which the Messrs. Ratcliff are prepared to supply. It contains twenty-two designs for door hinges, twenty handles and closing rings, upwards of forty finials and vanes, and as many patterns of railings and gates. For baptistery, chancel, and other screens and gates, four good designs are furnished, besides a large number for altar rails, standards, brackets, lamps, &c. The style is, for the most part, that of the twelfth century, and the designs are, with few exceptions, remarkably good, the most successful being those for door furniture. The railings, at all times difficult of treatment, admit of considerable improvement, especially those designed for streets or boundaries, where delicate parts are exposed to injury from wantonness or carelessness. The designs for gas branches are good, and so are some for lamps. Those for coronæ and chandeliers we do not particularly admire. Messrs. Ratcliff call attention to the brilliancy of their burnished brass work, and state that "the great value and apparent beauty of wrought surface decoration have induced us to apply a process hitherto patent only to the French art metal works in the mediæval revival—viz., the calling into use the services of the sculptor and chaser to assist in producing works of that characteristic and vigorous detail peculiar to the twelfth century, and hitherto eliminated from the modern English middle age metal work revival" They also intend to publish at an early date designs in the Italian, Flemish, and pseudo-Classic styles. They have been established for more than half a century.

Our Office Table.

The *employees* of Messrs. Morant, Boyd, and Morant, of 91, New Bond-street, had their first annual dinner at the Crown Hotel, Broxbourne, on Saturday. The principals were all present, and entered most cordially into the entertainments of the day. Various amusements were provided, and a very pleasant day was spent by all.

The death of Mr. George Cattermole, R.A., the water-colour artist, took place in the sixty-eighth year of his age, at Clapham, on Friday last. Mr. Cattermole was chiefly remarkable for his vigorous painting of scenes of feudal life. Several of his works are in the water-colour department of the Leeds Exhibition. He was elected R.A. in 1848.

The domes of the Metropolitan Meat and Poultry Market are covered with stamped ornamental shell pattern copper, with ornamental copper dormers. The work, which has been executed by Tyler and Company, of Abingdon-street, presents a fine and picturesque appearance, and is well worthy the attention of architects.

At a meeting of the shareholders of the Whittington Assurance Company, on the 16th inst., the thirteenth annual report was presented by the directors. The business of the company has prospered to a very satisfactory extent, the premium income for 1868 being £25,884, as compared with £15,001 during 1866 and £20,446 during 1867. The directors remind the shareholders that the next triennial bonus will be declared at the end of the present financial year and look forward to that event with the expectation of its affording substantial proof of the satisfactory character of the company's past proceedings.

On Thursday week a meeting on the subject of Museums of Trade and Industry was held in the assembly-room of the Metropolitan Club, Piccadilly, under the auspices of the Public Museums and Free Libraries Association. Mr. John Holms, D.L., F.R.G.S., presided. Mr. W. H. Ablett, formerly of Coventry and Macclesfield, read a paper, which was further illustrated by means of collections of textile fabrics placed for close inspection by the audience. Resolutions were passed, unanimously recognising the importance of Mr. Ablett's scheme, and urging their consideration by the Government and the public, in the interests of our industrial and commercial enterprise; and at the close thanks were voted to Mr. Ablett for his paper, to the committee of the Metropolitan Club, and to the chairman.

A few days ago, Mr. William Dashwood, of Whippingham, Isle of Wight, on examining a piece of fir timber about 30ft. long lying by the roadside, found, on the side exposed to the sun, a number of nicely drilled holes, about 3in. deep, the circumference being large enough to admit a large wasp. On a closer examination of the timber Mr. Dashwood saw marks of other holes being bored from within, and found that each contained a fly working its way out. Two of these flies were secured. One is of somewhat greater circumference than a large wasp, and is 1¼in. long; the other is a trifle less in circumference and 1¼in. long. Their wings are like those of the dragon fly. It is supposed that they were bred in the timber, which was perfectly sound when laid down a few months ago.

The current and final exhibition of national portraits, South Kensington, will close on the 22nd of August. On and after Monday next the gallery will be open free on Mondays, Tuesdays, and Saturdays; on Wednesdays and Thursdays the charge for admission will be sixpence.

The German traveller Rohlfs has arrived at Bremen from Abyssinia. At Lallibala, the holy city of the country, he found nine Christian churches of the Primitive Byzantine style of architecture, all monoliths—that is to say, each hollowed out of one enormous block of stone, and richly ornamented. In passing by Axum he found that the last of the obelisks standing is in a state of almost complete ruin.

M. Blasius, director of the Brunswick Museum, has just made a discovery which causes a considerable sensation in that city. He has discovered that former conservators have carried off by degrees a large number of valuable objects of art. Thus at present ninety pictures are sought for in vain, five of them by Albert Durer, and several others by masters such as Paul Veronese, Murillo, Van Dyck, &c. The whole of the etchings by Rembrandt have disappeared, except eight, and the same with a collection of Chinese objects in steatite. The value of the Roman coins, &c., which have been taken away alone amounts to £1,400.

New York papers make mention of a simple but ingenious machine which has lately been constructed there, by which it is intended to light the gas lamps in the city. It is an adaptation of electricity, and by its means the entire city can be instantaneously lighted. The cost for the apparatus for the whole of New York is estimated at 38,000 dollars, which, it is alleged, will be more than saved in labour and gas in one year.

Her Majesty has been pleased to confer upon the Birmingham Society of Artists (one of the oldest, if not the oldest and most flourishing societies in the provinces), the title of "Royal," and in future it will therefore be styled "The Royal Birmingham Society of Artists."

The north-eastern portion of the burial-ground adjacent to St. Paul's Cathedral has not hitherto shared in the improvement of the remainder. It belongs to the parish of SS. Augustine and Faith, being, in fact, the burial ground of that church. The churchwardens have laudably resolved to put it in order, and have appealed to the public for help.

The Ipswich Fine Arts and Industrial Exhibition, in connection with the Ipswich Working Men's College, was opened yesterday (Thursday).

The report of the Select Committee on the House of Commons Kitchen and Refreshment Rooms was published on Saturday last. The committee dissent from the recommendations of the Select Committee on House of Commons arrangements so far as the removal of dining rooms and kitchens is concerned, and are of opinion that the proposition for converting the conference and committee rooms into dining rooms, with new kitchens and offices, is the best that has been devised for the accommodation of both houses. Such a plan, we believe, would not be incompatible with carrying out in other respects the recommendations of the "arrangements" committee should it be thought desirable to adopt any portion of them.

At a meeting, on Wednesday week, of the special committee of the Dublin Municipal Council, letters were read from Mr. James Synan, C.E., of Ballinasloe, suggesting the excavation of the bed of the River Liffey to the depth of 18in., which would bring it to a level uniform plane, and that the stuff should be towed out to sea in boats, which plan would remove the bad odours at present emitted from the river. The City Engineer was directed to report on the plan, and the engineer to the Dublin Port and Docks Board has been requested to do likewise.

Mr. T. Baker, late second assistant clerk in the City Architect's office, has been elected to the new post of "surveyor of the City and Bridge House Property." There were two other candidates, viz., Mr. J. W. Forge, surveyor, and Mr. J. Liddiard, surveyor.

Minto-street, Bermondsey, it is said, "has not been swept since the heavy fall of snow last March twelve-month, and only watered twice in that time."

Maiden-lane, King's Cross, is to be widened on the west side, near the railway bridge, the North London Railway Company having ceded to the St. Pancras Vestry a large piece of land for that purpose.

The French Government has just informed the Chambers of Commerce in the chief maritime towns that large sales of timbers in the Crown forests of Corsica will take place this year.

The Highways Committee of the Paddington Vestry have now under consideration a proposal to widen the Harrow-road between Edgware-road and Paddington Green.

The canal basin, Paddington, is in a dreadful condition, the recent cleansing having had but a partial effect. The authorities of St. Mary's Hospital have remonstrated with the vestry, stating that the effluvium arising from the water is extremely prejudicial to the health of the inmates. The Metropolitan Board of Works is said to share much of the blame, they requiring too extended a notice before a remedy can be applied.

In a street abutting on Regent-street, twenty-six houses have been measured for the purpose of introducing the Lodging House Act; and allowing 500 cubic feet for each person they should have contained 198 people. It was found, however, that no less than 549 human beings were sheltered in these houses, giving an excess of population in twenty-six houses of 351 persons. Dr. Lankester is of opinion that 500 houses in the district of St. James's, Westminster, are thus overcrowded. At the lowest calculation this district contains 7,000 more inhabitants than law permits, and as there is no probability of extending the building accommodation it is only by sending the excess of population out of the parish that the provisions of the act can be carried out.

Mr. G. A. Jermyn, a surveyor and draughtsman well known to older members, died on the 17th July, at the age of sixty-two. Among his drawings was a measured drawing of Waterloo Bridge for the Messrs. Rennie. He designed a Moorish arch for the Great Globe in Leicester-square, which perished with that structure. Mr. Jermyn had been long connected with the Institution of Civil Engineers.

The "knockers," as the boys call them, are being put up in succession on the Thames Embankment. The Temple has lions' heads on its river front, though they might have been varied here by the lamb and the pegasus. It has been suggested, as a means of making the knockers useful and giving help to persons falling into the river, that chains should be put in festoons from lion's head to lion's head, but a better way would be to let a chain hang from each ring, which could be made ornamental. It is, however, stated by the lightermen that the water thieves would carry off the chain as they have stolen other objects to the damage of the stairs on the river. Perhaps the patrol of the police on the embankment would save the chains.

Water companies are perfectly justified in prosecuting unscrupulous individuals who appropriate water by unlawful means and then evade any payment for it, but their zeal may be carried a little too far. At the Sheffield Police-court, on Friday last, a respectable inhabitant of Crosspool, a village within the boundaries of the borough of Sheffield, was summoned by the Sheffield Water Company for unlawfully taking water from a conduit, which runs past the village for the supply of the town. Crosspool is not supplied with water by the company, and in consequence of the long-continued dry season, the ordinary sources open to the inhabitants of obtaining water had failed. The water was taken by the defendant for the use of a brother who was dying, his medical man having prescribed cold water as part of his treatment. At the time he took it he gave his card to a watchman in the service of the company, and offered to pay the value of the water. As a matter of law the defendant was convicted in a penalty of 2s. 6d. and costs, but the two magistrates who heard the case expressed themselves pretty strongly upon the necessity of a better supply of water being procured for the town, and upon the desirability of the supply being in the hands of the governing body of the town. A project for the purchase of the company's works is at present under the consideration of the Town Council.

Trade News.

TENDERS.

CHESTERFIELD (Derbyshire).—For the erection of a villa residence for S. Naish, Esq. Mr. S. Rawlinson, architect. Quantities supplied:—

Mason, &c.—Austin	(accepted)	£488	0	0
Joiner, &c Ellis	,,	277	0	0
Slater.—Marjerrison	,,	37	7	6
Plumber, &c Gothard	,,	110	0	0
Plasterer.—Roper Brothers	,,	63	0	0
Smith, &c.—Oliver and Co.	,,	24	0	0
Painter, &c.—Slack	,,	19	10	0
		£1018	17	6

DORKING.—For aisle to St. Paul's Church:—

Putney	£2148
Inkpen	1900
Collings	1888
Hamblin	1760
Clear	1752
Dove	1653
Shearburn (accepted)	1294
Goddard	1215

HADDENHAM.—For Gasworks. Mr. David Oldfield, engineer to the Company:—

Contract No 1.

Chandler and Son	£512	0	0
Porter and Co.	439	0	0
Feast (accepted)	380	0	0

Contract No. 2.

Edmundson	£630	0	0
Penny	544	0	0
Chandler and Son	514	0	0
Newton and Chambers	500	0	0
Hastings	497	15	0
Monk	495	0	0
Cutler	495	0	0
Ault	457	10	0
Porter and Co.	439	0	0
Holmes	400	0	0
Marriott	390	3	0
Laidlaw and Son (accepted)	314	0	0

LLANERCHYMEDD.—For the erection of a workhouse and outbuildings, &c., at Llanerchymedd for the Guardians of the Anglesey Union. R. G. Thomas, Menai Bridge, architect:—

T. M. Griffiths, Brynsiencyn	£2246	10	0
T. Chester, Prestalyn (accepted)	1925	0	0

LONDON.—For a warehouse in Cloth Fair, Smithfield. Messrs. Haywood and Blashill, architects. Quantities by Mr. D Cubitt Nichols:—

Clemence	£1437
Enmor	1369
Beeton	1297
Scrivener and White	1239
Tully	1235
Newman and Mann	1236
Hill, Keddell, and Waldram	1225
King and Sons	1160

LONDON.—For alterations and additions to 122, Pall Mall. H. H. Collins, Esq., architect:—

Messrs. Shaw	£845
Sale	842
Ball and Russell	595

LONDON.—For alterations and repairs to three houses Nos. 136, 137, and 138, Sloane street, Chelsea, and building three stables at rear for Messrs. Roope. Messrs. H. Jarvis and Son, architects:—

Hart	£4687
Higgs	4520
Macey	4302
Henshaw	4196
Turrell Brothers	4121
Tarrant	4000
Thompson	3920
Richardson	3663

LONDON.—For new infirmary and casual wards, &c., for Wandsworth and Clapham Union. Messrs. Beeston, Son, and Brereton, architects, 27, Grosvenor Mansions, Victoria-street, S.W. Quantities supplied by Mr. James Barnett:—

Patman and Fotheringham	£43,295
Mansfield, Price, and Co.	42,551
Perry and Co.	42,279
Higgs	40,718
Ashby and Sons	40,670
Macey	40,593
Browne, and Robinson	40,500
Kirk and Parry	40,500
Downs	40,190
Piper and Wheeler	39,940
Rider and Sons	34,790
Avis and Sons	34,497
Easton Brothers	39 200
Nicholson	34,168
Adamson and Son	38 897
Myers and Sons	38,867

LONDON.—For the erection of four houses in the Ladbroke road, Notting-hill, for T. H. Scarborough, Esq. E. Habershon, Brock, and Webb, architects:—

Manley and Rogers	£4200
Temple and Foster	3900
Ruskin	3800
Macers	3614
Mildwater	3315
Johnson	32.0

STAFFORD.—For bridge and roads, for the Carpenters' Company. Messrs. Pocock, Corfe, and Parker, architects. Quantities not supplied:—

	Bridge.	Roads.
Moreland and Son	£1575	—
Rivett	14 3	£287
Hill, Keddell, & Waldram	1480	267
F. and F. J. Wood	1462	259
Hedges	1292	240

SWINDON.—For new shop front for Mr. Hill, Wood-street, Swindon. Mr. Thomas S. Lansdown, architect, Swindon:—

Lovatt	£252	10	4
Barrett (accepted)	245	8	5

COMPETITIONS.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P., 9, Queen-square Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ST. IVE'S, HUNTS.—August 6.—For supplying and lighting the streets, roads, and other places with gas, for a period of three years. Messrs Fisher and Ginn, clerks to the Improvement Commissioners, St. Ive's.

HALIFAX.—August 11.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

WAR OFFICE, PALL MALL.—August 10.—For the purchase of a turret clock. T. Howell, director of contracts.

LEAVESDEN, WOODSIDE, NEAR WATFORD, HERTS.—August 12.—For the erection of an asylum.—W. F. Jebb, 37, Norfolk street, Strand.

ASHBY-DE-LA-ZOUCHE, LEICESTERSHIRE.—For about 1,600 yards of brickwork. Messrs. Spagg and Joyce, architects, Stafford.

STOKE UPON-TRENT.—August 13.—For the erection of a new manufactory. C. Lynam, architect, Stoke upon-Trent.

PORTSMOUTH.—August 10.—For the erection of the New Baring fever hospital. Mr. St. Aubyn, architect, Lamb's-buildings, Temple.

For dredging and removing the mud from about 16 acres of ornamental water. F. M. Eden, 11, Eaton place, West, S.W.

NORTH LONDON RAILWAY, BOW, MIDDLESEX.—August 4.—Construction of passenger station, &c. R. S. Mansell, secretary, Euston Station.

ZEALAND, DENMARK.—August 8.—For execution of works of Zealand railway. To the directors, &c., Copenhagen.

WOOLWICH.—August 8.—For erecting a block of troop stables, &c., for the Military Train. Lieut. W. D. Gossett, Royal Engineer Office, Woolwich.

NOTTINGHAM.—August 18.—For the erection of a new bridge over the river Trent. W. Enfield, public offices, Nottingham.

STRATFORD-ON-AVON.—August 7.—For the erection of a new workhouse, infirmary, &c. R. H. Hobbes, 1, Bree-street, Stratford on Avon.

WEST HAM LOCAL BOARD OF HEALTH.—August 10.—For the erection of a wrought-iron lattice girder bridge. C. Wilson, Rokeby House, Stratford.

ASCOT HEATH.—August 8.—For the erection of a new race stand and weighing offices. Messrs. Clarke and Holland, architects, Newmarket.

GRANTHAM LOCAL BOARD.—August 11.—For the construction of sewers, &c. H. Beaumont, clerk, Grantham.

TUNBRIDGE WELLS.—August 10.—For erecting a new wing, and alterations to the infirmary. Messrs. Hooker and Ladds, architects, 4, Chapel-street, Bedford-row, W.C.

BLACKHEATH.—August 6.—For the completion of four houses in Kidbrooke Park road. J. Whichcord, architect, 16, Walbrook.

ABINGDON (Berks.)—For the erection of a boys' and girls' school. E. Dolby, architect, East St. Helen's, Abingdon.

LONDON, BRIGHTON, AND SOUTH COAST RAILWAY.—August 11.—For the construction of a locomotive running shed &c., at Battersea. August 4.—For the necessary works for completing the New Cross Junction railways. August 4.—For the erection of a passenger station, &c., at Kemp Town, Brighton. A. Sarle, London Bridge Station.

PORTSMOUTH.—August 22.—For laying down, constructing, and finishing various brick, pipe, and cast-iron sewers. S. J. Elliott, clerk to the Local Board.

CONTRACT DEPARTMENT, ADMIRALTY.—August 18.—For the supply of steel and files.—August 11.—For the purchase of English oak trenails. A. Brady, registrar.

August 10.—For painting, &c., at the Orford High and Low Light establishments. R. Allen, secretary, Trinity House, London.

MORPETH.—August 5.—For erecting new matron's quarters and new cells in the female side at the county prison at Morpeth. Surveyor's office, Moot Hall, Newcastle.

BETHNAL GREEN.—August 6.—For the purchase of the dust and refuse of St. Matthew's parish, also for watering the streets and roads of the same parish. R. Voss, Vestry Clerk, Church-row, Bethnal Green-road.

PROPERTY SALES.

JULY 17.

AT THE MART.—By Messrs. Farebrother, Lye, and Wheeler.—Freehold post windmill and 1a. 3r. 28p. of meadow land in the village of Stone, Bucks—sold for £600.

Freehold 2r. 7p. of land, with barn, situate as above—£100.

Freehold 3r. 8p. of pasture land, situate as above—£130.

Freehold 3a. 1r. 37p. of pasture land, situate as above £140.

By Messrs. Cobb.—Freehold 19a. 0r. 32p. of pasture land in the parish of Wye, Kent—£1,930.

Freehold property known as the Withersdane Estate, Wye, Kent, comprising mansion, gardens, stabling, buildings, and 144a. 3r. 36p. of land £15,000.

Freehold farm-house and 36a. 3r. 15p. of land, situate as above—£2,400.

Freehold 17a. 0r. 32p. of pasture and arable land, in the parishes of Wye and Brook, Kent—£910

Freehold 22a. 1r. 27p. of arable and pasture land, situate as above—£1,160.

Freehold 5a. 0r. 6p. of pasture land, in the parish of Wye £360.

Freehold 5a. 2r. 27p. of arable land, in the parish of Wye—£500.

Freehold 5a. 3r. 27p. of pasture land, in the parish of Wye—£510.

Freehold 31a. 3r. 5p. of meadow and woodland in the parish of Wye—£3,600.

Freehold 2r. 14p. of garden ground, in the parish of Wye—£400.

JULY 20.

At the Mart.—By Messrs. Blake, Son, and Haddock.—Freehold mansion, with pleasure grounds, also a cottage residence, with stabling, farmyard, cottage buildings, and 12a. 2r. 30p. of land, situate at West Wickham, Kent—£8,250.

Freehold 12a. 0r. 30p., of meadow land situate as above, with lodge entrance—£3,200.

Freehold 25a. 2r. 2p. of meadow land, with cottage and buildings, situate as above—£5,500.

Freehold 16a. 0r. 1p. of land, with two cottages, situate as above—£2,650.

By Mr. R. W. Fuller.—Freehold estate, known as Tilburstow Hall, Tilburstow-hill, Godstone, Surrey, comprising mansion, with stabling, buildings, pleasure grounds, orchard, and meadow land, containing 8¾ acres—£8,980.

Freehold plot of land fronting Sutton grove, Sutton—£150.

JULY 21.

At the Mart.—By Messrs. Driver and Co.—Freehold estate, known as Bradstone Brook, Shalford, near Guildford, Surrey, comprising a residence, with stabling, buildings, cottages, and park containing 40a. 1r. 33p.—£9,000.

Freehold cottage and meadow 1a. 0r. 16p. situate as above—£300.

Freehold house, stabling, buildings, and land 8a. 1a. 36p. situate as above—£1,000.

Freehold 14a. 0r. 38p. of arable and grass land, situate as above—£1,400.

Freehold 4a. 1r. 27p. of arable land, situate as above—£300.

By Messrs. Farebrother, Clark, and Co.—Freehold cottage and garden, situate in the parish of Hemel Hempstead, Herts, let at £14 per annum—£300.

Freehold 8a. 3r. 16p. of arable land, situate as above—£500.

Freehold 7a. 0r. 21p. of arable land, situate as above—£405.

By Messrs. Debenham, Tewson, and Farmer.—Freehold residence, with pleasure garden and paddock, comprising 2a. 0r. 22p. in the parish of East Bagshott, Suffolk—£760.

Freehold house and shop, No. 21, Holywell-lane, Shoreditch, annual value £50—£405.

Freehold estate, known as Upper Grove, Dedham, Essex, comprising residence, stabling, buildings, and 230a. 0r. 37¾p. of land—£7,100.

Freehold 18a. 1r. 25p. of meadow land, known as Great and Little Rays, Dedham—£1,545.

Freehold 18a. 1r. 9p of land, known as Post Piece and Waterlane Piece, Martlesham, Suffolk—£780.

Freehold 15a. 0r. 16p. of land, known as the Abbey Meadows, Walton, Suffolk—£920.

The rectorial or impropriate tithe rent charges commuted at £60 4s. 2d., arising from 36a. 1r. of land, situate in the parishes of Walton, Felixtowe, and Trimley, St. Mary, Suffolk—£980.

JULY 22.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Copyhold property, situate in the Lower road, Richmond, comprising a residence, known as St. Mary's College, with stabling, buildings, and grounds, containing 1a. 0r. 31p.—£1,300.

Freehold 12a. 1r. 31p. of meadow land, situate in the parish of Nuttfield, Surrey—£760

Freehold plot of building land, situate at Carshalton, Surrey—£85.

Freehold plot of building land, situate at Carshalton, Surrey—£100.

Freehold plot of building land, situate at Carshalton, Surrey—£120.

Freehold plot of building land, situate at Carshalton, Surrey—£140.

Freehold 1a. 0r. 36p. of building land, situate at Leatherhead, Surrey—£230.

Freehold 3a. 2r. 35p. of building land, situate at Leatherhead, Surrey—£449.

Freehold 3a 0r. 16p of building land, situate at Leatherhead, Surrey—£330.

Freehold 3a. 0r. 14p. of building land, situate at Leatherhead, Surrey—£310.

Freehold 5a. 3r. 25p. of building land, situate at Leatherhead, Surrey—£640.

By Messrs. Edwin Fox and Bousfield.—Leasehold ten tenements, Nos. 1 to 10, Andover street, Hornsey-road, producing £260 per annum, term 99 years from 1853, at £40 per annum—£1,435.

By Messrs. Temple and Moore.—Leasehold residence, No. 1, Rose-villas, Choumert road, Rye lane, Peckham, value £40 per annum, term 74 years unexpired, at £6 per annum—£280.

Leasehold residence, No. 2, Rose-villas, let at £36 per annum, term and ground rent similar to above—£250.

Leasehold two houses, shops, and outbuildings, Nos. 1 and 2, Lavender-cottages, Choumert-road, producing £36 per annum, term 74 years unexpired, at £6 per annum—£235.

Leasehold house, No 3, Lavender-cottages, let at £23 per annum, term 74 years unexpired, at £3 per annum—£165.

Leasehold house, No. 4, Lavender-cottages, let at £24 per annum, term 21 years unexpired, at £19 12s. per annum—£5.

Leasehold two residences, Nos. 1 and 2, Lansdowne-villas, Albert-road, Peckham-rye, producing £58 per annum, term 82 years from 1867, at £7 per annum—£480.

Leasehold six houses, two with shops, Nos. 1 to 6, Francis-place, in rear of above, producing £121 16s. per annum, term 82 years from 1867, at £9 per annum—£820.

Leasehold plot of building land, situate at the corner of Albert-road, Peckham-rye, term similar to above, at a peppercorn rent—£135.

By Messrs. Edwin Smith and Co.—Freehold residence, with stabling, gardens, and land, nearly an acre, situate No. 16, Highbury-grove, Highbury—£3,200.

By Mr. J. Cayley.—Leasehold four houses, Nos 1, 2, 4, and 5, Faston's-terrace, Paradise road, Stockwell; also an improved leasehold ground rent of £4 per annum, secured on No. 3, Easton's terrace, the whole producing £108 per annum, term 87½ years from 1849, at £10 per annum—£1,080.

Leasehold two houses, Nos. 7 and 8, Cambridge-circus, East, Cambridge road, Bethnal-green, producing £36 14s per annum, term 14 yrs. unexpired, at £5 per annum—£50

BATH STONE OF BEST QUALITY.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

James Boxall, jun., Boston-place, Dorset-square, carpenter, August 5, at 11—William Hatten, Croydon, builder, August 7, at 1—Henry Parker, Coombe and Malden, builder, August 6, at 1—Matthew Shield, Wynell-road, Forest-hill, contractor, August 7, at 2.

TO SURRENDER IN THE COUNTRY.

Samuel Robson, Durham, builder, August 4, at 11—Frederick Thomas Tutt, Hastings, boat builder, August 3, at 11—Isaac Broad, Wantage, sawyer, August 19, at 12—Thomas Hoe, Bottesford, Leicestershire, brickmaker, August 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 2, J. Tapper, Upper Dorset street, Vauxhall Bridge-road, builder—October 2, J. Evans, West Ham, builder—October 5, J. Watling, Everett street, Brunswick-square, house decorator—October 3, T. G. A. Palmer, Sackville street, Piccadilly and Cambridge, iron founder—October 3, E. Meadows, Plaistow, builder—August 13, D. Davies, Tufnell Park road, builder—August 10, R. Marrable, Forest hill, builder—A. Powley, Warren street, Tottenham Court road, painter and glazier—August 13, T. W. Graveley, Woolwich, general house decorator—August 13, J. and H. Coyle, Great Marylebone street, builders—August 19, G. Bloomfield, Reading, carpenter—August 11, T. Thomas, Aberaman, Glamorganshire, mason—August 11, B. Lewis, Aberdare, contractor—October 13, W. F. Shephard, Woodford, bricklayer—October 14, G. Hare, Sheerness, plumber—August 10, J. Plumb, Sandiacre and Long Eaton, stonemason—August 12, J. H. Doctou, Padstow, builder.

PARTNERSHIPS DISSOLVED.

Hey and Dransfield, Dewsbury, engineers—Edleston and Son, Accrington, brickmakers—White and Brothers, Milbank-street, Westminster, and Swanscombe, cement manufacturers—Garsden and Byrom, Blackburn, brick manufacturers—Birrell and Rotheroe, Gracechurch-street, engineers—The Mediæval Ironwork Company, Windhill, near Shipley—King and Booth, Lower Norwood, builders.

DECLARATION OF DIVIDENDS.

E. and L. Powell, Hereford, builders, div. 1¾d.

SCOTCH SEQUESTRATION.

William Kerr, Glasgow, painter, August 4, at 11.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11	0 £12 0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0 12 0
,, yellow pine		2	13	4	5	Finland	7	0 8 0
St. John N.B. yellow		0	0	0	0	Memel	0	0 0 0
Quebec Oak, white		5	5	5	10	Gothenburg, yellow	8	0 9 10
,, birch		4	5	5	0	,, white	9	0 9 0
,, elm		3	15	5	10	Gefle, yellow	9	0 10 10
Dantzic oak		4	0	6	0	Soderham	9	0 10 10
,, fir		2	0	3	5	Christiania, per C., 12 ft. by 3 by 8 in., yellow	14	0 20 0
Memel fir		3	0	4	5	Geck Plank, Dantzic, per 40 ft. 3 in.	0	15 1 5
Riga		3	0	3	3	Pumice Stone pr ton	6	0 8 0
Swedish		2	5	2	8			
Masts, Quebec red pine		5	0	6	10			
,, yellow pine		5	0	6	0			
Lathwood, Dantzic, fm		6	15	7	10			
,, St. Petersburg		8	10	9	10			
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.								
Quebec, white spruce		13	0	20	0			
St. John, white spruce		13	10	15	10			
Yellow pine, per reduced C.								
Canada, 1st quality.		17	0	13	10			
2nd do		11	10	12	10			

Seal, pale	per tun	36	0	0	0			
Sperm body		95	0	0	0			
Cod		38	0	0	0			
Whale, 8th, Sea, pale		35	0	0	0			
Olive, Gallipoli		68	0	73	0			
Cocoanut, Cochin, ton		53	0	55	0			
Palm, fine		40	0	40	0			
Linseed		31	10	34	0			
Rapeseed, Eng. pale		34	0	0	0			
Cottonseed		32	0	33	0			

METALS.

IRON:—

Welsh Bars in London	per ton	6	5	0	8	5	0	2½
Nail Rod	do	7	10	0	7	12	6	
Hoops	do	8	5	0	9	0	0	
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bar, in Wales	do	5	10	0	6	0	0	3
Railrods	do	7	10	0	7	15	0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	6	net.
Swedish Bars	do	9	17	6	10	10	0	2½

STEEL:—

Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	

COPPER:—

Sheet & Sheathing, & Bolt	per ton	79	0	0	82	0	0	3
Hammered Bottoms	do	97	0	0	0	0	0	
Flat Bottoms, not Hammered	do	83	0	0	0	0	0	
Cake and Tough Ingot	do	81	0	0	83	0	0	
Best Selected	do	77	0	0	85	0	0	
Australian	do	77	10	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7½	

LEAD —

Pig, English	per ton	21	5	0	0	0	0	2½
,, Spanish Soft	do	18	10	0	0	0	0	
Shot, Patent	do	22	10	0	22	15	0	
Sheet	do	20	0	0	20	15	0	5
White	do	27	0	0	30	0	0	

REGULUS OF ANTIMONY

French	ton	43	0	0	0	0	0	

ZINC:—

English Sheet	per ton	25	12	0	25	10	0	2½
Devaux's V. M. Roofing Zinc	do	25	0	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20	0	0	0	0	0	nett
QUICKSILVER	per btl	6	17	0	0	0	0	

TIN:—

English Block	per ton	95	0	0	0	0	0	2½
do Bar	do	96	0	0	99	0	0	
do Refined	do	97	0	0	0	0	0	
Banca	do	95	10	0	97	0	0	nett
Straits	do	92	10	0	92	0	0	

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 7, 1868.

THE PROPOSED NEW PUBLIC OFFICES.

THE few beautiful moonlit evenings which have occurred since the promenade along the new Embankment was opened to the public from Westminster to beyond Waterloo Bridge, have revealed in it a potent and enduring source of delight, such as the inhabitants of London could previously have had only a faint conception they would ever have had placed at their command. It may safely be said that no city in the world possesses anything comparable to the magnificent reaches of the Thames, which both to the right and left now greet the eye of the spectator as he paces the crescent curve formed by this noble causeway of granite. It would be hypercritical, where there is so much to admire, to seek out for faults, and our present purpose is not to criticise details, but to consider the opportunity recently afforded by this embankment for the architectural embellishment of the metropolis, more particularly in connection with the contemplated scheme for building the various Government offices said to be needed by the nation, as well as with regard to the proposed new Law Courts. The partial completion of one block of these offices (the Foreign Office) has to a certain degree decided the mode of their general arrangement, and renders it quite unnecessary to consider the idea, once propounded, of concentrating them all into a vast parallelogram of architecture. This was prominently put forward in an able pamphlet by Mr. Hope* during the time of the exhibition in Westminster Hall of the competition designs for the Foreign and War Offices. We do not greatly regret the impossibility of carrying out such an idea, as we are unable to endorse the opinion he so strongly expressed therein that it would be desirable, even if it were practicable, again to isolate Westminster and its palaces from eastern London, as was the case in the Middle Ages. We think it essential to preserve their present union with the great City of London by the means of a continuous street—*let it be a street of palaces*—extending from Trafalgar-square to the Abbey precincts. At the same time we quite agree with Mr. Hope that the splendid cordon of parks, which forms so unique a feature in our capital, should—nay, must—be carried down to the river side, with spaces sufficient to afford good vistas left between the separate blocks of buildings which would form this street. These buildings might, perhaps, be themselves united by means of screens somewhat of the character of that by Mr. Decimus Burton at the entrance to Hyde Park, or by arcades which might support galleries of communication, and thus a semi-rural, semi-urban character be preserved, and quiet secured to the occupants of the offices.

Since the conditions for that competition for the block plans and the approaches to the new Palace at Westminster were laid down, a considerable portion of the ground necessary to be obtained has been purchased, and the embankment, then hardly more than contemplated, has been erected. A wider view of the subject is, consequently, more possible now than it was then, and it is probable that the next Parliament will take such a view; it becomes, therefore, important to consider and ventilate the subject well in the interim.

In a letter from W. H. Gregory, Esq., which appeared in the *Times* of July 30, attention is called to the three plans for the concentration of the public offices which are embodied in "the report of the commission appointed by Treasury minute of November 23, 1866, to enquire into the question of the accommodation of public departments." These plans are entitled respectively, "the First Commissioner's plan," "Sir Charles Trevelyan's," and "Lieut.-Colonel A. Clarke's plan of 1865-6." Each of these plans Mr. Gregory considers to deserve attention, although he dismisses Colonel Clarke's somewhat too summarily, it appears to us, on the ground partly of want of the necessary concentration, and partly on the score of expense. He then refers to that which goes under the name of the Chief Commissioner of Works, the main features of which, he says, "are to extend the Admiralty into Spring Gardens, and to place the War Office by the side of the Horse Guards, on the ground now occupied by the Treasury, Board of India, and Privy Council. These offices are to be removed and to form part of a large block of buildings which are to extend from the present India and Foreign Office into Great George-street, Westminster."

This plan he criticises from the practical point of view, as not providing for the Horse Guards under the same roof as the War Office, as was strongly recommended by the Reorganisation of the Army Committee of 1859, and as not in a strategical point of view providing equal security to the Houses of Parliament and protection to the Royal palaces as that by Sir Charles Trevelyan, through want of direct communication with the Thames and the Embankment for the police and soldiery in cases of disturbance. But the main objection which he urges against it is that it ignores altogether the immense æsthetic advantages offered for the display of the architecture of these several buildings by the frontage to the river.

Then Mr. Gregory powerfully argues for the superiority of the plan which goes by the name of Sir Charles Trevelyan, but which he says in reality is due to Lord Llanover, being "the result of an enquiry in 1856 by a committee of more than ordinary strength."

This plan Mr. Gregory thus describes:—

> Its main features are as follows:—To take in the ground between Bridge-street and Montagu-house, having the Thames as the boundary on one side and Parliament-street on the other, and on that magnificent site, now occupied almost exclusively by squalid, miserable houses, to build the future Admiralty and War Office in conjunction with each other, and with the Horse Guards under the same roof as the War Office. All the other offices he proposes to include in two great blocks on the other side of Parliament-street, the Colonial and Home Offices, in the block of which the India and Foreign Offices form a part, and the last in a block bounded on the south by George-street. Next to the Home Office he proposes to erect a building to take the place of the Scotland-yard depot of police, and, judging from the performances of last year, this proximity will not be misplaced. Between this and the Horse Guards will be another building to hold a detachment of troops in conformity with the views of high military authorities, who consider this to be a necessary provision for the protection of the Royal palaces and the Houses of Parliament in case of any sudden tumult. Exactly opposite to the Horse Guards Sir Charles proposes to open a fine street by the Banqueting-hall to the Thames Embankment, which, as the leases of the houses to be taken have mostly fallen in and the land is Crown property, would combine profit, convenience for traffic, and be no small embellishment, as by some alterations at the Horse Guards, a full and beautiful view from St. James's Park to the Thames would be afforded, and at some future period the original plan of Inigo Jones might be partially carried out in the spirit, if not in the actual letter, of his design. Sir Charles further proposes to extend the road at the rear of Carlton-terrace into Cockspur-street, so that carriages, instead of meandering by St. James's Palace and down Pall Mall, may drive at once from Belgravia into Trafalgar-square. The whole cost of this plan would apparently exceed that of the Treasury plan by about £200,000; but in reality, if we examine closely into the gains and losses on both sides, there would be very little difference of expense.

It is to this æsthetic question that we will principally address ourselves, and, looking broadly at the several plans, it appears to us that each offers some advantages which have been overlooked in the others, that each is worthy of attention, but that the plan to be ultimately adopted should be different from either, for as unquestionably each presents defects and demerits which can and might be avoided.

However, we can and do cordially concur with Mr. Gregory and Mr. Cochrane, who, in his letter to the *Times* of July 31, supported the former in his appeal to obtain a fair hearing for the artistic element in the scheme. "Here," says Mr. Cochrane, "is an opportunity for embellishing the metropolis which once lost can never be regained." He goes on to show that economically there are sets-off against the additional cost of following the most artistic arrangement, but into these we do not propose to follow him. Whether £200,000, more or less, would or would not be incurred by placing one of the buildings, of an equal frontage to that of the Houses of Parliament with its façade toward the river, as Sir C. Trevelyan would propose, cannot affect the decision. Nor, were Colonel Clarke's idea the best to be followed, should an additional million be allowed to stand in its way! "Whatever may be the expense of erecting the new public offices (we are quoting from the report of the Commissioners) the work is intended for the convenience and the ornament of all future generations." This ought to be sufficient reason to discard from the consideration the national habit of cheeseparing, and yet each and all the plans have been spoilt by it. To take a broad view of their several characteristics. Sir Charles Trevelyan's evidently provides the greatest degree of concentration, together with the finest architectural opportunity, by reason of so large a portion of the buildings being on the site facing the embankment; but it errs, together with the others, in sticking the offices, for economical reasons, cheek by jowl, without proper separation. Such a length of façade as that of the India Office and the one to be connected with it should not face a narrow alley such as all three of the plans propose in the place of Charles-street. If a building be worth seeing at all it needs greater width in the street than that given by either of them, and though no one is likely to break his neck with anxiety to examine the small and trivial details of the structure which already forms the greater part of the one side of it, we live in hopes that now that the trammels imposed by Lord Palmerston are removed, no other mass of equal want of interest will be suffered to be erected hereafter.

Then, looking at Sir Charles Trevelyan's plan, we would ask, might not the chief offices of police more modestly retire behind and still be in connection with his "War Department for Guards, &c.," and leave another vista from the park down to the river? To gain so desired an end we must, it is to be feared, lose the present picturesque building of the Horse Guards, although architecturally it is of ten times the value of its recent pretentious neighbour.

Colonel Clarke's plan, in our opinion, is the best of the three, as regards the treatment of Charles-street, though it is far from being liberal enough, and he leaves a fine opening from the park, with Whitehall Chapel as a central feature opposite, his vistas to the Thames being left on either side of it. The Commissioner's plan eastward of the Foreign Office has the considerable merit of hiding the worst part of that building, and of retaining the present Horse Guards; but though the positions of the War Office on the one flank of that structure and the Admiralty on the other may be as convenient as may be desired, the manner in which they are all jumbled together must prove architecturally detrimental both to the present and proposed buildings, and leads us seriously to warn the authorities against such an attempt at patchwork as a certain failure.

We think no one can carefully examine the

* "Public Offices and Metropolitan Improvements." By ALEX. JAMES B. BERESFORD HOPE, Esq., M.P. Ridgway. 1857.

rival schemes without coming to the same conclusion that we have done, that the subject deserves and needs fuller consideration, and that, though each plan has great merits, each has some defects, and that the interim between this and next session will be well occupied in its further and more careful consideration.

The Report of the Commission concludes, we regret to say, with the following unfortunate recommendation, the confident tone of which we are at a loss to understand, seeing that the assistance of Mr. Scott in the preparation of the report is so prominently acknowledged. We allude to the removal of St. Margaret's Church. The Commissioners say they think it right to draw attention to it as a *public improvement* long contemplated, and as naturally following the adoption of the recommendation they have made. They say—"When a magnificent street, 150ft. wide, has been opened from Whitehall to Westminster Abbey and the New Palace, it will become more than ever necessary to remove what will be the only obstacle to the Abbey forming the termination of a vista which will be probably unsurpassed in any European capital." Never was there such a *non sequitur*. We unhesitatingly declare that the removal of this church would be most unfortunate in its effect both to the Abbey, the Palace, and to the new buildings themselves, if they are in any degree better than those of the new Foreign Office. The present contrast of the three buildings in juxtaposition is eminently to the advantage of the larger ones, and they form all together an exquisite group, which would be as irretrievably ruined by the destruction of the smallest as of either of the others. But where are Mr. Scott's "no faltering accents" as regards this point? In Mr. Hope's pamphlet, before referred to, he says—"The English advocate for the retention of St. Margaret's is Mr. Scott, and the French, M. Viollet le Duc," and contends that in saying so he has "urged enough to suspend that unthinking fashion of reprobation with which that church is too commonly visited."

Has the official tyranny of Lord Palmerston quelled his noble spirit? Does the shade of the deceased Premier haunt him still, and prevent the expression of his true opinion? At any rate, Canon Conway and Dean Stanley have spoken out on the subject with no faltering accents, and we trust that their remonstrances will have the desired end. But further, we boldly state that we trust that another point in the Government decision will be reconsidered, that, namely, of which Mr. Gregory reminds us:—"Mr. Scott is to have the erection of the Government buildings." It seems to us preposterous that all the works referred to should be placed in the hands of one architect. Of course, we know that the enunciation of such an opinion exposes us to the imputation of professional jealousy, and that it is thought that all the claimants for Government patronage have been disposed of by the appointments of Mr. Street to the Law Courts, Mr. Waterhouse to the buildings at South Kensington, and Mr. E. Barry to the National Gallery. There were, however, other competitors both for the Government Offices and the Law Courts, and there are other architects; and there will be, before half these offices are finished, other rising and risen men who might fairly ask for a share, or a chance of a share, in this great opportunity, which is one of an age. These, however, are but the claims of the profession. The public may be asked whether they desire or would be satisfied with many more acres of buildings such as the Foreign Office. We have left ourselves no space here to speak of the site of the Law Courts, and can only echo the hope expressed by Mr. Gregory and Mr. Cochrane, that the obvious gain to the architectural embellishment of London by placing such a building upon the Embankment instead of upon the wretched site proposed, will be taken well into consideration before it is too late—a hope in which we are sure the able architect engaged for the work cannot but join.

ARCHITECTURE AND ENGLISH ARCHITECTS IN INDIA.

We are about to refer to an architectural document of some interest to the profession—the statement exhibiting the moral and material progress and condition of India during the year 1866-7, prepared pursuant to act of Parliament, and just printed. This is of course a blue book, and we may be told blue books have nothing to do with architects, and India still less, and that many of our readers care about neither, which we readily believe. We shall nevertheless proceed to pick out from the undigested mass of the report such material as we can find relating to public buildings, and this will be of a very fragmentary character.

There is a heading for public works, and that we shall take first, although it does not contain all the information. The water supply of Fort William, at Calcutta, has been brought into active operation, but it only supplies 4,000 people. The Cartridge and Percussion Cap Factory at Dum Dum has been completed, and good progress made in remodelling the Gunpowder Factory at Ishapore. The Sailors' Home, for unemployed seamen, has been completed. A scheme has been approved for the construction of a small pox hospital in the suburbs of Calcutta. A new arrangement has been made for the pauper and police hospitals, by which the sick poor will be accommodated in the building originally intended for the Sealdah market, and the Amherst-street hospital will be made available for the sick police, while the building at Entelly is to be occupied by cases of cholera and infectious diseases. Slaughter-houses were in progress.

Plans and estimates for the central gaols in Bengal are still under consideration, but it is feared the climate will not admit of their being constructed of such cheap materials as those in the north-west provinces. The central penitentiary for European convicts at Hazareebaugh was nearly completed, and other gaols were in contemplation.

In the north-west provinces they had large military works in hand, the completion of the new barracks at Agra and Morar for artillery, and also some new barracks in the fortress of Gwalior. The construction of the building for the new infantry lines in the cantonment at Nowgong had been begun. New central gaols were in course of construction at Benares, Allahabad, Futtehgurh, Bareilly, and Agra. The public offices at Allahabad had been delayed for want of some ironwork from England. The progress of the Cawnpore Memorial Church had been stopped.

In the central provinces there had been a heavy expenditure on military buildings—at Jubbulpore, Saugor, Kamptee, and Nagpore. In the fort at Sectabuldee permanent accommodation had been ordered for the European garrison, and the works begun. Very satisfactory progress had been made in the advancement of the four central gaols at Nagpore, Jubbulpore, Hoshungabad, and Raipore. The construction of permanent police buildings had been in abeyance, awaiting a revision of the plans. A "handsome" post-office, near the railway station at Nagpore, was near completion, as also a new telegraph-office at Jubbulpore. Of miscellaneous and municipal works in hand, there were water supplies for Nagpore and Hinghunghat, townhall at Jubbulpore, clock tower at Hurdah, market places at Toomsur, Seonee, and Baitool. It is reported there is hardly a town of any importance but has its drinking fountain, well, schoolhouse, dispensary, or some public building, erected by private munificence.

Of the Punjaub there is no detailed report. In the Hyderabad districts, lately assigned, about £45,000 was spent in civil buildings and local works, including two court houses, a gaol for 500 prisoners, several police stations; and at Oomrawuttee several large municipal schemes were on hand. Of English Burmah little detail is given, but it is stated that the new municipality of Rangoon was about spending at the rate of nearly £40,000 a year for improvements.

The chief thing we can make out as to Bombay—for there is no detailed report—is that a new cantonment has been sanctioned at Kolaba for the whole of the garrison of Bombay, including the native regiments. Gas has been introduced into the present barracks. At Poona and Kirkee this has not been found so feasible. A new European general hospital is proposed at Bombay, and alterations have been made in the existing hospital, and gas and water laid on. A new hospital has been erected at Karwar for the police, and a new civil hospital is to be built at Kaira. Considerable progress has been made in lighting Bombay with gas, and eight native gentlemen presented the municipality with large ornamental lamps for central positions. Two additional churches have been built at Poona and Egnthoora.

The Madras report speaks of a very large outlay for public works, but, like many others, gives no particulars, only that the new central gaol at Rajahmundry was completed, as also another at Coimbatore. It appears the Government has authorised the construction of a new passenger terminus at Madras, near the "People's Park." New gaols were in progress at Vizagapatam, Vellore, and Madura. The municipality of Madras has received enlarged powers.

Of miscellaneous matters it may be mentioned that new churches had been erected at Chindwarra and Khundwa in Nimar; that at Hoshungabad was near completion. Funds had been raised for a church at Chanda, and for one at Nursingpore. A new church had been completed at Chudderghat in Secunderabad, and one nearly completed at Berhampero. One was under construction at Tellicherry. All these are in the diocese of Calcutta. Two churches have been completed at Purneah and Aya, and those at Cachar, Arrah, and Motecharree are advanced. The memorial church at Ferozepore has received a tower and spire, and the church at Attock has been nearly completed. At Meean Meer the Roman Catholic Chapel has been enlarged.

Under the head of public works, exclusive of railway and irrigation companies, the outlay was as follows:—

Bengal	£964,742
North West	852,805
Central	442,642
Punjaub.....	871,775
Hyderabad	110,705
Burmah	250,066
Madras	704,609
Bombay, no return ...	—

There are no reports for Oude, Mysore, and Ooorg. The total above reported is £4,200,000, and this constantly increasing expenditure now amounts to about £5,000,000 per annum.

Now come a few questions, first from insensible readers—Who cares about Meean Meer and Moteharree? and one from reflecting readers—Who expends the £5,000,000, and are they architects? This is the real professional question: What share have English architects in the expenditure of about £5,000,000 a year, chiefly for constructive purposes? So far as we know, architects are not employed at all. A very significant illustration of the system is given at page 43, where it is stated "no progress worth noting has been effected in the completion of the memorial church at Cawnpore, in consequence of the want of a qualified assistant as superintendent of the work, the executive engineer's time having been fully employed in another channel." Let us paraphrase this. "The progress of the Public Offices in Downing-street, or Palace of Law, is delayed in consequence of the want of an Engineer to

superintend the decorations, and of the time of the executive Engineer, who has charge of the designs, being fully employed in another channel." "The restoration of St. Mary's, Redcliffe, is going on during the period Corporal Smith can spare from the pot-house in this hot weather, under the casual supervision of Lieutenant Bumblebee, R.E., who is also superintending a fort at Plymouth and a gaol at Gloucester." "York Minster is being touched up by Sergeant Johnson, of the Sappers and Miners, when not disabled by *delirium tremens;* Captain Mudlam, R.E., the officer in charge, being laid up with fever." "The new bridge over the Brent, erected only last spring, has come to grief. The plans of Second Lieutenant Smithers, R.E., were in accordance with book and rule, and approved by Lieutenant-Colonel Robinson, R.E.; but it is supposed the bridge reached its untimely end through Sergeant Browning, the acting official, placing too much confidence in the brother of his native mistress, to whom he gave the contract, and who forgot to put any mortar between the bricks, as specified by the department. Sergeant Browning, a most deserving officer, who built the new church of St. Barnabas, has been severely reprimanded, and sentenced to lose five days' pay."

We do not grudge the proper employment of military engineers or of civil engineers, but let the military engineers be kept to the military works, so far as they do not involve civil economy, and let the civil engineers attend to their departments, in which they have more than enough to do. We contend that the taste of this country is not to be exhibited in the monuments of our rule in India by entrusting their superintendence to military engineers, or to civil engineer assistants who have passed a casual examination in architecture. The whole system must be reformed, and the architect put in his right place, and not, as now, ignored or put in a position of subordination. Public interests and professional interests equally require this change, and we hope the subject may at length receive attention. The civil engineers have done much to relieve themselves from the illicit competition of military engineers, and if architects had the same spirit they would have equal success. About a quarter of a century ago the military engineers had succeeded in invading much of the civil domain in England, but were resisted by the civil engineering press and profession. The result was the military engineers were driven back, and at length their monopoly in India has been assailed, and a civil engineering department has been constituted in India employing a large body of civil engineers, to the great advantage of India, the civilisation and progress of which are much promoted. Of these results the report now before us furnishes frequent evidence.

It will not unnaturally be said by some who think little about the subject—"This does not matter to us, we care nothing about our profession, we are not going to India and do not want to go, we shall stick here and carry on surveying, building, and the copying of other people's designs." Yet the sons of such people might get employment, and bring employment to the paternal shop. At all events, that great body who honour their profession and seek advancement, when once aroused will feel the grievance, which equally affects the older and younger members of the profession. If the older members pursue their practice here they ought to enjoy many advantages in consultation, in supervising designs, and in making visits of inspection to India. Mr. Rendel, C.E., has just returned from such a tour, but which of our architects has been called upon to exercise such a mission? It is well known the consulting business for India affords a lucrative income to many leading engineers.

The time is favourable for the agitation. The Indian public appreciate the advantage of having the services of men of genius and education. The Government is in want of competent assistants, and it only needs a movement to be made. The employment of Mr. Burges to design a school of art for Bombay shows the temper of the Indian public, and the way in which he has been treated illustrates departmental injustice. The Institute and the Association can do no better than in each session to devote special attention to professional interests in India, beginning with next session.

THE VENTILATION OF THE DRAINS AND SEWERS IN TOWNS.

THE death of Mr. Henry Austin, the superintending engineer of the late General Board of Health, was a great loss to municipal authorities. His investigations, had they been continued, would probably have placed the subject of the ventilation of town drainage upon a more satisfactory basis both in the metropolis and other towns than it now rests upon, if, indeed, it can be said to have reached a state of rest at all. His successor, Mr. Rawlinson, has, indeed, contributed in many ways to the interests of municipal authorities in the matter of town drainage, and has fully recognised the value of the proposal of Dr. John Stenhouse to employ charcoal to disinfect the gases that escape from the main sewers, and has frequently warned us not to employ indiscriminately the rain-water pipes of houses for the ventilation of drains; but the numerous occupations of Mr. Rawlinson under the several Royal Commissions that have of late years been appointed to inquire into the disposal of sewage, the remedy for the prevalent pollution of rivers, the employment of the cotton operatives during the American war, &c., have probably diverted his attention from the subject of the ventilation of town drainage to a great extent. Had his predecessor, however, lived as his coadjutor we might by this time have seen more successful results in this matter than we have attained. Twenty years ago, nearly, Mr. Henry Austin arrived at some conclusions on this subject which remain good to this day, and with one exception, viz., that of the use of charcoal, have not been excelled.

His conclusions at that time were that a system of ventilation of the sewers could not be dispensed with; that experience had shown that unless simultaneous provision to effect this object be made, the increased trapping of gullies would render the sewers unbearable and dangerous, and would tend seriously to increase the evils intended to be remedied (the evils, viz., of trapping sewers and drains without simultaneous attention to their ventilation in other places); that the system of ventilation by shafts and grates discharging in the centres of the streets (this, by the bye, was before the use of charcoal had been suggested) was objectionable and ought to be discontinued as soon as better means could be adopted; that any general system of ventilation by connection with furnaces and chimney shafts at considerable distances would be attended with great difficulties and much manual labour and current outlay, without promise of satisfactory results; that the experience obtained as to the draught of air through tubes carried to the tops of houses gave indication that, under proper management, a good system of self-acting ventilation might by these means be established, and warranted the recommendation that a more extensive and efficient trial should be made of it. So far Mr. Henry Austin. Seventeen years afterwards, viz., in the year 1866, Mr. J. W. Bazalgette, the chief engineer of the Metropolitan Board of Works, finds the following four modes of preventing the escape of noxious effluvia from sewers to be those most deserving attention, viz., the use of charcoal ventilating grates; ventilation through chimney shafts and furnaces; ventilation through pipes carried to the tops of buildings; dilution of the sewage with water. Of the first method he reports to the Board generally in favour of it, but recommends further experiments to be made. These he afterwards makes in conjunction with Dr. W. A. Miller towards the close of the year, with results tolerably successful. Of the second method Mr. Bazalgette finds that it can be of but very limited application anywhere, and in some districts could not be applied at all. Of the third method he reports more favourably, having made the trial in eighteen localities on the south side of the river, care having been taken that the tops of the pipes were above, and at a distance from, the attic or upper windows of the buildings, and in none of the instances has any complaint been made by the residents of smell or inconvenience arising from them. Great difficulty was, however, experienced in getting the consent of the occupiers of the houses to such an arrangement, arising from the fear that the foul gases, under certain conditions of the atmosphere, would descend the chimneys or enter the upper windows.

Mr. Bazalgette adds that this fear would, in his opinion, render a universal adoption of the plan impracticable, "otherwise the cost of maintenance would be trifling." Let us hope that a plan that appeared to Mr. Austin to be "a good system of self-acting ventilation," and to Mr. Bazalgette to present as its chief difficulty the fear of occupiers of houses that "the foul gases would descend the chimneys"—that a plan with these merits, and with those we will name presently, may claim the further attention of municipal authorities, and of all those who are engaged in building and draining houses.

It is remarkable that Mr. Bazalgette does not hint at any belief on his part that such a result would take place as that which the occupiers fear; and this might have been anticipated, for when we consider the action of the foul air in the sewers and drains in ventilation we shall see that it is very improbable.

Before going further into the subject we must remark that in speaking of the ventilation of sewers and drains, we mean essentially the ventilation of drains and sewers, for we conceive that to ventilate the latter only is to fall far short of the object to be attained—viz., the purification of the atmosphere both in the streets and in and about the houses. And we will say at once that it appears to us that if the effectual ventilation of the house drains be accomplished, that of the sewers will necessarily follow—certainly, to a great extent, if not entirely. But this can only be the case where flap traps are not used at the junctions of the house drains with the sewers. In any case where flap traps are necessary the system of ventilation by means of the house drains cannot effect the ventilation of the sewers, though it will be equally effectual for the house drains themselves. But, probably, it is a very small minority of house drains in towns generally that are so trapped, and, therefore, let our remarks be understood to apply to the general state of things.

House drains seldom, if ever, run full, and their upper spaces afford a ready outlet for the air in the sewers when there is a free means of escape at their upper ends, nor is their length often sufficient to cause any serious drag to the air in its passage through them. What is wanted, then, is an escape pipe at the upper end of every house drain, or at the upper end of as many of them as suitable positions can be found for, according to the construction of the houses; the essential requisite being that the pipes be carried above the roof and not in proximity to bedroom windows. The action of such ventilating pipes we take to be this. So long as the rain-water pipes from the roof are connected immediately with the drains they flush them with water on the occurrence of every rainfall, and a large body of air is at those times displaced in the drain. If there be an opening in the drain, through which this air may expand, as in a pipe carried up from the head of the drain to the top of the house,

above the roof, it will follow the course made for it, whenever any force is exerted within the drain, as when a rainfall occurs or when the expansion of the sewer gases takes place by reason of their lesser specific gravity. And the fear that this gas will descend again after its dissipation in the atmosphere above the houses seems to be chimerical. Much obloquy has been cast upon this method of ventilation by the indiscriminate attachment of the rain-water pipes to the drains for the purpose of ventilation, for in most cases these rain-water pipes lead up to, or near to, the upper windows of the houses, and any gas escaping from them has a tendency to be blown into the houses; but the case is wholly different when ventilating pipes are specially constructed for the purpose and terminated above the roof. In closely-built towns the wind has often but little action at the street level, but if we ascend to the attics we usually find the air in motion; and the foul air of the drains and sewers is, in fact, blown away above our heads, and so much mixed and diluted with atmospheric air as to be rendered innocuous. If we usually dwelt above our roofs we should hesitate to adopt this plan of ventilation, but seeing that we inhabit usually but a stratum of air of some few feet in height above the ground there need be no fear of the effects of the foul air when dissipated in this way.

The facilities which house drains present to builders to get rid of the rain water from the roofs, when it is not required to be stored for use, have induced a common practice of connecting them directly with each other; but seeing that in most cases the down pipes have their upper ends near the bedroom windows it seems wrong to run the risk of carrying up the foul air of the drains in these places. To obviate this a syphon trap is often inserted in the drain at the foot of the down pipe, to prevent the foul air ascending there, but the lodgment of matter that is brought down from the roofs causes frequent stoppages and outbursts of water on the occurrence of rains. Therefore this cannot be said to be an effectual remedy of the evil it is intended to prevent. On the other hand, these traps are omitted often with the intention of ventilating the drains by means of these downpipes. It is good to have the intention to ventilate the drains in any way, but if we consider the action of the rain water passing through these pipes we shall see the impropriety of attempting to ventilate the drains by them. They are not usually so large but that they are choked by even a moderate rainfall; a 2½in. or 3in., or even a 4in. down pipe with a considerable roof area draining into it, cannot carry down the water and allow at the same time room for the ascension of air, except under exceptional circumstances of violence, and the natural result therefore is that the air of the drains is driven forward and must find its readiest outlet, which is in too many instances the opening of the kitchen sink or of a defective trap elsewhere.

As to an ordinary water trap, with but two or three inches head of water upon it, preventing the eruption of air from the drains, it needs but a little consideration to see the futility of the supposition. It occurs, then, to us that not these rain-water pipes should be made use of for ventilating the drains, but pipes specially erected for the purpose, in situations where the escape of the air may be above the roof and out of the way of doing mischief.

The ventilation of town drainage seems to be a subject that can only be approached tentatively, and for this reason it is incumbent on every engineer, architect, and builder to say publicly what he has found to be most available in this case. The experiments made by Mr. Bazalgette, and reported by him to the Metropolitan Board of Works, have already been mentioned as agreeing in the main with the conclusions the late Mr. Henry Austin had come to, and they consist essentially of experiments in two methods of ventilation, viz., of charcoal intervened between the sewers and the outer atmosphere, and of free ventilation by pipes carried up to a considerable height above the ground—the charcoal purifiers being placed shortly beneath the surface. These charcoal boxes obstruct the ventilation of the sewers to some extent, and where they are employed the experiments seem to show that it is necessary to increase the number of openings so as to compensate for this obstruction. It is a dangerous thing to confine the air in a sewer where men are at work, for by preventing a free contact with the atmosphere the air in the sewer loses its oxygen to such an extent as to make it unfit to live in; and the increase of carbonic acid gas under the same circumstances increases the danger, but with a greater number of ventilating shafts the difficulty is overcome.

THE PERMANENT WAY OF DIFFERENT COUNTRIES.

To every nation belong its own distinguishing characteristics and its own particular method of carrying into execution the principles of theory and science. Each country regards the adoption of any established system from a point of view most in consonance with its own peculiar ideas and national traits; and although science is universal and principles are absolute, yet between the abstract conception and the practical operation there is abundance of scope for the display of each nation's individuality. It might be supposed that if the different systems of the practical application of a principle could be all referred to one source or origin, they would, instead of exhibiting marked discrepancies, be almost identical. This assumption is completely erroneous. The whole of the railway system, the principles of its construction, even to the minutest details, emanated from our own country. There is a certain similarity or amount of identity possessed in common by all railways, but each is more or less strongly marked by the characteristics of the people to whom it belongs. In some degree these differences are due, not to any distinct efforts of national skill, but to the natural features of the district through which the line passes. The Mont Cenis railway is an example of our meaning, where, owing to the local difficulties to be surmounted, special contrivances were resorted to for the purpose of overcoming them. Manifestly a flat country, similar to Russia, does not demand those appliances and mechanical arrangements necessary in a land like Switzerland, nor does a straight and level piece of line require the aid of the mid-rail to obtain a sufficient amount of haulage power.

During the last ten years the permanent way of railroads has received numerous modifications and alterations, and many principles have been tested with a view to arrive at the best form of rail, the best description of joint, and, in fact, the most eligible arrangement of the *tout ensemble*. The very steep inclines, which it has been impossible to avoid in making lines in mountainous districts, have had a great influence in altering the rail from its original size and weight. The effect of a severe gradient is to tax the two special qualities of a rail to the utmost. It calls forth its capabilities with respect to strength and durability with extreme severity. In ascending steep slopes a certain amount of weight is necessary to obtain adhesion, and in descending them the action of powerful brakes is required to bring the train to rest. Anyone may be convinced of the tremendous wear and tear induced upon the head of the rail by the continued use of the brake by observing how the metals at a station are worn, in comparison with those at some distance from them along the line. About three years of ordinarily heavy traffic will place a rail *hors de combat*, but there are abundance of instances where half this period will suffice, on very heavily worked portions of line, to render them unserviceable. In order to obtain an increased hardness of surface in the rail, combined with greater strength and rigidity, the use of Bessemer steel rails is rapidly spreading, both amongst ourselves and on the continent. Their tenacity is 65 per cent. above that of ordinary iron, and their rigidity and elasticity are commensurately superior, and so soon as the quality can be unmistakably guaranteed, the only objection to their universal employment will be removed. It is the difficulty of ensuring this uniformity in their manufacture that has caused them hitherto to be so high in price. The double requisition of strength and hardness that is to be bestowed upon a rail before it can be considered fit for its duty led engineers to attempt to accomplish the purpose by steeling or case-hardening the upper surface, and also by actually substituting that material for iron in the head of the rail. It is more than two years since this plan was adopted in Austria upon the Sommering line. The contractor's or Vignoles's rail is used there, and the head is of steel, while the flange is of iron. So much success has attended this experiment that the same description of rails has been laid down upon the Brenner line, recently opened for traffic. At the same time, the application of this method of soldering steel and iron must receive a trial upon a more extended scale before it would be prudent to pronounce decisively upon its adoption. Three different kinds of steel may be used for rails, including puddled, cast, and Bessemer steel, each of which is imagined by its special advocates to possess advantages surpassing those of the others.

In Germany the contractor's rail is preferred in general to all others, and is the chief rival of the double-headed form elsewhere. It is true that it is inferior with respect to the rigidity of its attachment to the sleepers, but, taken as a whole, a permanent way consisting of the Vignoles rail laid upon cross sleepers possesses a greater amount of simplicity and fewer individual parts than any other system of road. Both the Great Northern and the Orleans lines in France give the preference to it. As is well known, the Midland and Western Companies adhere, as a rule, to the double-headed rail, which is also much used in England. The bridge rail is used principally upon the Southern railways in Ireland, and also to some small extent in this country. Other systems, embracing the adoption of the Barlow, the single T, together with stones and iron for the supports, have either failed to give satisfaction or been employed upon a scale too limited to entitle them to the appellation of recognised permanent ways. So soon as the weight of a rail becomes augmented, it is equally necessary to increase the number and size of the sleepers, the former desideratum being accomplished by simply placing them nearer together, so as to diminish the span or unsupported bearing of the rail. If we assume, as the average, cross sleepers to be 9ft. in length and 9in. in breadth, and spaced about 2ft. 8in. from centre to centre, the proportion of bearing surface actually obtained per yard run of road will be nearly eight square feet. According to experiments and accurate records kept in Germany, sleepers of uncreosoted or natural oak last, upon the average, fifteen years. By creosoting or impregnating them with other preserving substances they endure for upwards of twenty-two years. From the same authority we learn that creosoted fir sleepers have a duration of about thirteen years, while pine and beech will not last longer than nine. The lighter description of traffic prevailing over the German lines, which have furnished the above results, is the real cause of the sleepers lasting so long. It is needless to remark that upon our heavily worked railways they do not enjoy so long a life, but succumb, in the majority of instances, to wear and tear in about half the time, and in many instances much sooner.

All the varieties of iron permanent way

may be reduced to one of the three following classes:—Firstly, roads carried upon isolated supports; secondly, those supported by transverse bearers; and thirdly, those carried upon continuous or longitudinal supports. Greave's pot sleepers, and Livesey and Edwards' principle, are examples of the first class. They have been attended with a good deal of success in some localities, for which they are specially adapted, and are ultimately destined, applying the remark to iron permanent ways in general, to a wider range of utility. In Egypt, India, Brazil, and other distant countries, pot sleepers have answered well. Continental engineers have not been behind us in turning their attention to the eventual substitution of iron for timber cross sleepers. A Belgian principle, the Mareinelle Couillet, consists of a strong horizontal transverse sleeper of the double tee form, carrying two wooden blocks to serve as supports for the ordinary rail, of whatever shape it may be. Three principal lines in France have afforded a fair trial to iron roads, and selected the Fraisans system, which gives a total weight per yard run, including rails and all fastenings, of a little over two hundredweight. The principle of Leerimer, which in many respects greatly resembles that just quoted, has been laid down for eight years on some of the Portuguese lines, and is still doing good service. In Prussia the Hartwich longitudinal road is employed to some extent. It consists of a pair of heavy contractor's rails, tied by iron transversals, which carry them and rest upon the ground, the flange of the rail having a breadth equal to half that of the height. The same principle has been adopted upon portions of the Lyons railway, only the height of the rail is made equal to that of its base, which in this instance rests upon the ballast similarly to a Barlow rail. The system of Barlow is, in fact, identical with that of an engineer, Bergeron, and so is the iron longitudinal plan that is soon to be practically tried in Austria. At present it is certain that these iron permanent ways, which are based upon the transverse principle, have enjoyed more favour and likewise more success than those modelled after the longitudinal method. The desideratum to be ensured in all rigid roads similar to iron ones is the imparting of some slight degree of elasticity, not as absolutely necessary for the safety of the road, but to diminish the enormous wear and tear that would be otherwise brought both upon the rails themselves, as well as the whole of the rolling stock.

THE ARCHÆOLOGICAL INSTITUTE OF GREAT BRITAIN.

ON Tuesday week the annual meeting of the Royal Archæological Society of Great Britain and Ireland commenced at Lancaster. The principal business of the day consisted in the resignation of the presidency of the society by Lord Talbot de Malahide in favour of Colonel Wilson Patten, M.P. During the afternoon the castle and church were visited, and in the evening a soiree was held at the residence of the mayor.

On Wednesday, at ten o'clock, there was a meeting of the historical section of the institute in the Music Hall, under the presidency of Mr. Beresford Hope, M.P. Lord Talbot de Malahide and other leading members were present. Two papers were read—one on "The Roman Roads of Lancashire and North Cheshire," and the other on "The Recent Excavations at Rome." The paper on Roman roads was by Dr. Robson, of Warriegton, and in the author's absence it was read by Dr. Moore. The Roman roads in Lancashire and the bordering county to the south are not very numerous nor very important—with one exception, that in Chester. Manchester, the writer observed, was probably an early border fortress, and Lancaster seemed to have been something like Manchester, a walled fortress. About the middle of the last century, it appears, an investigation was entered into respecting the Roman roads by several gentlemen—Percival, of Royton; Watson, of Stockport; and Whittaker, of Manchester—but the results were not very satisfactory, and their account of the structure and character of the roads is very imperfect Whittaker asserts that all the roads from Manchester issued from the same gate, some, however, branching off from the original. "The materials of it may be plainly distinguished from the natural gravel of the ground by the bricks and broken millstones which were found incorporated with them. It appeared to be constructed of strong gravel, mingled with large boulders and fragments of rock, and the whole was about 11 yards in width and 1½ yards in depth.

Mr. Barber then read his paper on "The Recent Excavations in Rome." He described the nature of the investigations which have now been proceeding for some time under his directions, the various discoveries which he had made, and also the results of the excavations on the banks of the Tiber, made by the direction of the Pontifical Government. The excavations had disclosed works of historic interest of the first century, which were almost as perfect as though they had only been built ten years. He accounted for the perfect state of their preservation on the supposition that they had been buried immediately after they were built, by a a sudden inundation of the Tiber.

In the afternoon, there was an excursion by rail and carriage to Cartmel Church, an interesting piece of ecclesiastical architecture belonging to the "transitionary period," which is said to be without a rival of its kind in the kingdom. The party were afterwards entertained at luncheon at Holker Hall.

On Thursday a most interesting visit was paid to Furness Abbey, which was described by Mr. E. Sharpe, M.A. By the aid of some admirable drawings and diagrams, Mr. Sharpe explained, first, the general principles in the study of architecture and its division into periods, and the examples of those different periods which were afforded by the ruin before them. Besides the four periods of Gothic architecture—lancet, geometrical, curvilinear, and rectilinear—there was the intermediate period of forty-five years, in which the circular arch and the pointed arch were used indiscriminately, or rather they were used together with discrimination. He believed that the round arch, being found weak for constructional purposes, was abandoned for the pointed arch where strength was required, and used only for decorative purposes. By the aid of other diagrams he showed the different examples of arches, and their dates, thus:—Norman, 1145; Transitional, from 1145 to 1190; Lancet, from 1190 to 1245; Geometrical, from 1245 to 1315; Curvilinear, from 1315 to 1360; and Rectilinear, from 1360 to 1550. Of these six periods they had in Furness Abbey examples of four, which he pointed out as follows:—Of the Transitional period, the entrance gateway, the entire church, with the exception of the choir, tower, and some inserted windows, and the hospitium, all of the date of about 1160; of the Lancet period, the chapter house, the fratery, and the eleemosynary, dated about 1230; of the Geometrical period, the abbot's lodge and chapel and abbot's hall (1300), and the gateway chapel (1306); and of the Rectilinear period, the choir, sacristy, windows of transept and choir (1400), and the west tower (1420). Mr. Sharpe went on to observe that this was one of the earliest abbeys of the Cistercian order, which was founded at the latter end of the eleventh century by the secession of three monks of the Benedictine order, who protested against the worship of saints, the servile prostration of the body, the use of images, and of gaudy colours, gold ornaments, pictures, &c. That secession was, in fact, the beginning of a great reformation, and might be looked back to as the precursor of the Reformation which followed later. He explained the rules of the Cistercian order, and showed how they had been strictly carried out in the erection of Furness Abbey. It was the strict adherence to these regulations that had led him to draw an imaginary plan of the foundations of these ruins, which subsequent excavations, made through the liberality of the Duke of Devonshire, had verified.

On Saturday an excursion was made to Borwick Hall, Levens Hall, Sisergh Hall, and Kendal. Leaving Lancaster by train the party proceeded to Borwick Hall, a fine old building in the Elizabethan style, about ten miles from Lancaster. Mr. E. Sharpe stated that it was supposed to have been built in 1561, and within three-quarters of a mile from it there are the remains of a Roman dock, from which it is inferred that the sea, although now many miles from it, flowed within a mile of the hall during the occupation of this country by the Romans. It is now the property of the Martin family, of Capernwray, and is only partially occupied. It contains, in addition to a fine wainscoted hall and a guard-room, an oratory and a "confessional," of which the railings are still in existence. The principal bedroom is that in which Charles II. slept, in August, 1651, when on his way with his army to Worcester.

Leaving Borwick, the excursionists, who numbered about 150, proceeded to Milnthorpe by train, and from thence by carriage to Levens Hall, the seat of the Hon. Lady Howard. This interesting old building, with its gabled roofs and square headed mullioned windows, is a picturesque mansion of Elizabeth's time, and in the fine hall there are some decided features characteristic of that period The Rev. G. F. Weston, in describing it, said there was abundant evidence that this hall once formed one of the grim peal towers with which the border country was so thickly studded, but that it had since been converted into an Elizabethan mansion. Somewhere about 1500 the building was purchased by one Allan Billington, in whose family it remained till 1699, after which the illustrious name of Howard became connected with the place.

After a short visit to Sisergh Hall, the residence of Miss Agnes Strickland, the well-known authoress, they reached Kendal, where they were conducted over the church by the Rev. Archdeacon Cooper, who read a paper by Mr. Crowther, describing the church. The church is now, and has been for the last twenty years, under restoration.

Mr. Crowther in his paper, after mentioning that the church was dedicated to the Holy Trinity, observed that it possessed the peculiarity of having four aisles co-extensive with the nave and chancel. The entire length east and west was 140ft., and the width 103ft., including an area exceeded by few parish churches in the kingdom. In the course of a discussion which took place a few years ago about the relative size of parish churches, Mr. Beckett Denison made Kendal to be the eighth in area of purely parish churches. It was built in the fifteenth century, ranging from about 1440 to the close of the century. The foundation of an earlier structure on the same site has been found. This church appeared to have been of the Early English period. As far as the details could be ascertained, they had been copied in the restorations which commenced in 1850. There were some Early English fragments in the belfry roof of the tower. The ancient Early English church must have been a structure of great beauty, far exceeding the present church; and so it continued for many years, until the rage for erecting sanctuary chapels set in and led to extensive enlargements and reconstructions of portions of the fabric. The outer walls of the church were first attached, a clerestory built, and the sanctuary chapels attached. These sanctuary chapels were now part of the church, and hence the double aisles. In the eastern column of the south arcade of the chancel was an arched recess, which had been supposed to be a piscina, but research had been made, and no outlet for water could be discovered, and no drain beneath. Mr. Crowther, therefore, came to the conclusion that it was not a piscina, but a credence table. It had been carefully restored. There was no piscina or aumbrey discovered in the east wall of the church. The windows in the clerestory had no reference to the windows or bays below.

The party, after taking refreshment at the townhall at Kendal, returned to Lancaster by train at half past eight o'clock.

The concluding meeting took place in the Shire Hall on Tuesday last. An excursion was afterwards made to Cockersand Abbey, and in the evening a *conversazione* was held.

THE PRINCIPLES AND LIMITATIONS OF GLASS PAINTING.

MR. GAMBIER PARRY, in his report on the Glass Painting in the French International Exhibition of last year, has some excellent remarks on the general principles of the art. The following are the concluding paragraphs of the report:—

"The questions naturally suggested by this Exhibition are—what are the especial principles of glass-painting, and what are its limitations? The art, as it is here presented, ranges over every

possible phase, and, as a whole, it is an abnegation of any principle, and a protest against any limitation. Ought it so to be? Is it so with any other art? All productions of art are properly subject to two restrictions—the nature of their materials and the nature of the human eye. We have now to do with an art which is especially connected with those of architecture and of picture—with the former as an adjunct and ornament, with the latter as a sister art of colour and design. The nature of glass itself differs from anything else that those arts have to do with. Both these arts are based on definite principles and bound by definite limitations. Let a picture be black as night or fresh as morning, severe or sketchy, it will be good only if it have not transgressed the laws of chiaroscuro, of transparent and opaque colours, of colour in relation to light and shade, and of texture in relation to proximity or distance, and of linear and atmospheric perspective. These involve principles that are inviolable, and beyond those limitations no good work ever was or ever can be produced. They are the natural laws of the materials in relation to the eye. The other art, architecture, whether Classic, Gothic, modern, or aught else, has equally its laws and limits. It cannot without ruin transgress the powers of its own materials, nor can it, without offence, violate that science of numbers (the very soul of art, including that of music) which we call proportion. Is, then, glass-painting to be free of all control—the only art let loose in the vanity of unmitigated fancy? A complaint commonly made by glass-painters is that, if their art be tied by old restrictions, they have no opportunity of raising it. They demand freedom for 'high art.' But, on a closer questioning, it is found that few of such complainants have studied general art principles at all extensively; and that, in the detail, knowledge, and drawing of the figure, upon the perfect acquaintance with which 'high art' entirely depends, both their education and practice are still more at fault. The complaint, therefore, resolves itself into little else than impatience of the conditions of the art they profess. Precisely such impatience has led to the chaotic condition of modern architecture. If only they would recognise the dignity of their own beautiful art, and work within the sphere of 'glass' without wandering into that of canvas, and exert their powers in perfect truth of form and in that use of colour which distinguishes a window painter's glass from a picture painter's palette, we should then happily arrive at an art as 'high' as the artist can produce, and one made perfect by being perfectly consistent with itself.

"Pictorial effect is a quality common to sculpture, picture, and glass, though different in each. In the two first it is always regulated by the space it occupies. No figure-painter, no sculptor of alto or basso relievo, would so treat a subject, extending over a series of distinct spaces, as to ignore the forms of the architectural construction which bounded them. Each group would be complete; their connection would be made by the interest of their story. The metopes of the Parthenon, to a certain degree, illustrate this. It is much to be regretted that glass-painters are impatient of this law, which binds all other arts. They also violate the very nature of their own materials in the attempted pictorial effects of atmospheric perspective. These are properly attained only by modulation of colour and loss of outline. Neither of these are properly producible, for modulation is impossible where every piece of glass is of a different tint, and loss of outline is impossible where every piece is held in its place by a black frame of lead. It is answered that these effects are possible, and easily produced by painting in coloured enamels. Let the answer hold good; but we come then to the question of other limits—limits of the right and wrong of human labour, and limits of the duty to human sight. Excessive 'finish' is not a necessary quality of high art; the highest art is that in which the greatest conception is the best expressed. The too high-wrought picture in glass condemns itself by the prodigality of human labour on a material so fragile that the least injury would mar it; and, if the artist were dead or distant, it would be irreparable. It condemns itself also by offering such work as no eye can rest upon to analyse without pain and fatigue. The fault of ambition lies in the pretension of an unjustifiable independence. If the glass-painter be impatient of all limits, whether of architecture or of the special qualities of his own materials, limits, too, of the pleasure, power, or endurance of human sight and the use or abuse of his own labour, let him throw up his art and take to canvas. Then he may labour without stint and satiate the eye without fatigue; but if he is to be a glass-painter, let him honour his own art, and neither borrow the specialities nor wander into the province of another.

"Nature may be prodigal of her ephemeral loveliness, because she can produce the same again to-morrow; but art cannot. If, therefore, there be any right or justice in the principles laid down here and throughout this report, glass-painting must be, as are all other arts, subject to principles and limitations. However high an artist's attainments may be, it will give him room for them. It is an insult to art that all its forms and phases should be forced in one groove or ground to one level. A perfect work of art must be thought out in its own language. A picture-painter rarely designs well for glass, because he cannot think in glass, and he is often a bad judge of works in glass for the like reason—that he is always thinking in his own art-language, and mistakes for good what another art has borrowed and mimicked from his own. Hence it comes to pass that this beautiful art of glass-painting is often misconceived both by artists and by the public. The art, with all its limitations, is large enough to open a field for ever to great genius and study. A man cannot draw too well for it, nor think too poetically; only let him remember into what he has to translate his thoughts—glass, lead and light."

THE BUILDING STONES AND SLATES OF LEICESTERSHIRE.

At the recent show of the Royal Horticultural Society at Leicester a fine collection of specimens of stones, slates, and other building materials found in Leicestershire was exhibited. The collection also served very clearly to illustrate the geological formation of the country. Amongst the specimens of materials exhibited, says the *Gardeners' Chronicle*, was the celebrated Mountsorrel granite, which belongs to the quaternary family, *i.e.*, consisting of quartz, felspar, hornblende, and mica. The large irregular blocks are extensively employed for building churches, chapels, and other public edifices, the small chippings for the macadamisation of roads, and the sifted portion for gravel walks and footpaths, while the fine powder (from the quantity of soda and potash it contains) is admirably adapted as a top dressing for heavy clay soils. The same observations will apply to the sienites of Markfield, the porphyritic green stone of Bardon Hill, and the green stones of Enderby, Huncote, and Croft. The gneiss from Brazil Wood, on Lord Lanesborough's estate, near Swithland, was chiefly interesting from being the only example of this primitive rock found in England, as it does not make its appearance until we reach the Highlands of Scotland. The slates from Swithland and Groby were excellent samples of the hardness and durability of this class of rocks. It is now understood that the whole of the Charnwood rocks belong to the Laurentian system, and, therefore, are among the oldest rocks in the globe. The slates from the Groby pits are said to have been selected by Mr. Gilbert Scott for the basement steps of the Prince Albert Memorial. The beautiful colour of the slate is one of its greatest recommendations, independently of its hardness, which renders it practically imperishable. In the second column are grouped the mountain limestones from Gracedieu and Breedon Hill. These limestones contain a portion of magnesia; the light yellow colour, so different in appearance from the great mountain limestones of Derbyshire, is due to the heating or dolomitization of the material. Succeeding these were the fireclays, coal, and clay ironstone, which form important geological features of the north-west of the county, and furnish employment to vast numbers of the population. Mr. W. Whetstone exhibited excellent specimens of the clay-ironstones and fireclays. These valuable clays are now extensively used for a great number of terra-cotta ornamental purposes, and in the manufacture of coloured tiles for pavements, which, for beauty of design and excellence of manufacture, will bear comparison with any of a similar kind made in Great Britain. Here also were samples of the great new red sandstone formation, which occupies nearly half the surface of the county. Fine samples were exhibited of the "water stones," or Lower Keuper sandstone, lying at the base of this formation. These sandstones are rather soft in character, but are extensively used for building purposes where a cheap stone is required. Of gypsum, of which the county possesses the most extensive deposit found in Great Britain, fine blocks were exhibited. The gypsum is quarried extensively in various parts of the county, and formerly was close to the town of Leicester itself; in fact, it is the gypsum axis that holds up the Spinney Hills, the race-course, and the high ridge of ground extending to the cemetery. Examples were shown of the interesting thin sandstone beds, first discovered in Gloucestershire by Murchison, called the Upper Keuper sandstone. These occur at the Dane Hills, near Leicester, and are chiefly interesting because they were quarried by the Romans for building the ancient town. The important formation of the lias and oolite extending over the remaining half of the county was also illustrated. Messrs. Ellis and Sons showed fine samples of the valuable limestone from Barrow-on-Soar, the special quality of which is its power of setting under water. In these beds the gigantic saurians and other reptilæ exhibited in the Leicester Museum were found. Next came specimens from the middle lias or marl stone, which is extensively used for church building in the eastern part of the county, and is distinguishable by its quantity of fossil shells. Fine samples of this are exhibited by the Duke of Rutland from Waltham and Croxton Park. Of the lower oolite, oolitic ironstone, and great oolite, the lower oolite is principally used for building walls and houses, and for repairing roads. The valuable ironstone band found in this formation and worked so extensively in the adjoining county of Northamptonshire runs down towards Melton, Waltham, and Denton, near Belvoir Castle. All that is required for working this invaluable bed would be a line of railway through the district. The great oolite furnishes a valuable building stone for carved and decorative architecture, and is extensively quarried near Waltham and Ketton.

WHITE LIAS LIMESTONE, WORCESTERSHIRE.

It is always satisfactory to call public attention to an enduring building stone, and such we are informed, on excellent authority, is obtained from the white lias limestone quarries, in Armscott Fields, Tredington, Worcestershire. Professor D. T. Ansted, in his report on this stone, says:—"The white lias of Worcestershire is a variety of argillaceous limestone at the bottom of the lias deposit, well known and easily distinguished from the oolitic limestones, and equally unlike the carboniferous limestone. It has a singularly fine texture and close grain, and is greatly valued for various purposes. It makes admirable ornamental pavements, being tough and polishing easily, with a good face. It is also well fitted for the ornamental parts of houses and public buildings. It is easily cut with the saw or chisel, has few or no hard veins, resists atmospheric action in a remarkable degree, takes a very good polish, and, being very uniform in tint, may be selected with advantage for large works. It possesses the grain and texture of Solenhofen lithographic stone, and might perhaps be available for similar purposes. Its colour is cream, or white. The best quality of white lias limestone is not often found in slabs so large or so thick as in the top bed at Tredington. As a building material it is perhaps unrivalled for the pertinacity with which it resists weather action, and also for its permanent softness. Tombstones made of it are now in Tredington Churchyard more than two hundred years old, which show the lettering as sharp and clear as if it had been done yesterday, and though placed in the most unfavourable position, frost seems to have had no effect in splitting them. It is desirable that the special properties of the Tredington stone should be made known, as they give a real value for many important uses. The toughness and extreme durability, combined with softness and even texture, are due, no doubt, to the large proportion of argillaceous matter the stone contains. This amounts to nearly one-third of its weight."

The above stone was used for the sculpture and ornamental work of the mansion built for E. P. Shirley, Eatington Park, Warwickshire, from the designs of Messrs. Prichard and Seddon, about ten years since, and it is said that the work is as clean and free from weather action now as when produced.

We have seen a specimen of the stone at Mr. Seddon's, and we have no hesitation in saying that it possesses, to all appearance, all the qualities attributed to it by Professor Ansted.

MARC ANTONIO.

IF there is one thing more than another to which we owe the advance that, with all our shortcomings, has undoubtedly been made in most of our manufactures to which fine art is applicable, it is the recurrence from time to time of loan collections of the masterpieces of the art of bygone times. We would call especial attention to the now annual exhibitions of the Burlington Club, which are most valuable. Last year we had a fine display of the works of Rembrandt; this year Marc Antonio is well represented. There are also a few engravings of his scholars and followers, among whom Agostino Veneziano shines out as the principal. The chief contributor is Mr. R. Fisher, to whom also we owe a capital monograph of all that is known respecting the life and works of the great artist from whose engravings we know a good deal of some of those designs of Raphael which have perished. Mr. Fisher is well supported by Mr. Alfred Morrison, the Duc d'Aumale, Lord Foley, Mr. Holford, Mr. Reiss, Mr. Vaughan, and others. The particulars of Marc Antonio Ramondi's life are few and uncertain. 1487 or '88 is given as the date of his birth. This date, as pointed out by Mr. Fisher, is borne out by a probable reading of ÆT. 18 on the copy of Albert Durer's woodcut of "The Adoration of the Magi." He learnt his art first in the School Francia, at Bologna. His first known production was "Pyramus and Thisbe," which is very inferior to his later works, after he had had the advantage of studying Albert Durer, and of having the great Raphael for his master. Of his disagreement with the former artist there is some difference of opinion. All that is certain is that Albert Durer made a complaint to the Venetian Senate that Marc Antonio had plagiarised from his woodcuts. What order the Senate gave with respect to the matter it is almost impossible to determine, though we incline to the opinion that the exact converse of the usual story—viz., that he was ordered not to affix A. Durer's monogram to his copies—is the true state of the case. It is always stated that he did the "Life of our Blessed Lord" first, and that then he was ordered not to affix the monogram. But the fact is that he had not affixed it to the "Life and Passion of Christ," but did to the "Life of the Virgin," so that, if we are right in the priority of the former, it follows probably that the real order was that Marc Antonio, having pirated Albert Durer's designs without acknowledgment, was ordered for the future to affix the  and so not rob the author of the credit due to his compositions. This is rendered more likely by the date upon one of the prints, viz., 1506. Now none of the woodcuts have a previous date to 1509, so that it could not have been copied from any of them, though it might have been subsequently added, not impossibly by Albert Durer's order, to fix the date of his making the drawings. It is more reasonable to suppose that the designs were the point for which protection was granted by the Venetian Senate than the actual woodcuts, firstly, because the copies being on copper could really deceive no one who had seen the originals; and, secondly, because, as is now generally allowed, the woodcuts were not executed by Durer himself. It is true that this is a little hard to believe when we consider the wonderful feeling and freshness of most of the cuts. He probably carefully supervised the work of the celebrated woodcutters Hans Burgmaern, Lucas Cranach, and others, who are believed to have been employed by him, if he did not actually work upon the blocks himself. The effect of Albert Durer's influence over Marc Antonio's style is variously estimated by the two sections who idolise each to the disparagement of the other. Thus, on one side we are told that he owed everything to his study of Albert Durer's designs and mode of engraving, while others would lead us to suppose that the principal influence was that it caused him to forsake the tender delicacy of his first style. There is, however, little doubt as to the enormous advantages he gained from the study and imitation of his great rival. As a copyer we doubt if he ever came up to the originals. The "Virgin with a Butterfly" is doubtless a very fine thing, but it lacks the sharp clearness and spirit of the master's work. The landscape is quite heavy and coarse compared with the beautiful print from which it is copied. There are many more beautifully finished backgrounds than this, which he copied or imitated from Lucas Van Leyden, Albert Durer, and other German artists. Pre-eminent for delicacy of touch throughout are the lovely impressions of the "Adam and Eve." In technical skill Marc Antonio never surpassed and seldom came up to Albert Durer—though he surpassed him in grace and taste generally. His drawing of the human figure was far more beautiful than that of any of the German artists. But in judging of the comparative powers of each we must not forget the vast difference of the opportunities which the one possessed. It was a very different thing to draw from the lovely women of Italy as models and the coarser and seldom handsome women of Germany. Then, again, the Italian had the antique to copy from and chasten his taste by the lovely discipline of the Greek teacher. One of the greatest proofs of the eminence of Marc Antonio is that, though he copied and appropriated right and left, he never lost his own individuality: the vigorous Bolognese feeling is apparent in all his work. But for all that, a comparison between him and Albert Durer, to the disparagement of the latter, is unwise. The two men stand upon quite different ground; with the latter engraving was merely a παρεργον, one among a multitude of excellences. He was equally celebrated as a man of science, a painter, and architect. He also occasionally executed sculpture with his own hands, and in as masterly a manner as he performed all his work. Marc Antonio, on the contrary, was only an engraver, and an engraver to a considerable extent in the sense in which we now understand the word. He engraved always, as far as we know, from the designs of other people; nay, not unusually he copied almost line for line the detail of other engravers, as we have shown above. However much, then, he excelled his great contemporary in elegance, choice of subject, gracefulness of outline, and breadth of expression, and poetical taste and feeling generally, he does not occupy the same exalted position as one of the greatest masters in the world, who, against every possible disadvantage in selection of models, the fashion of his country, the rudeness and coarseness of the life around him, still, single-handed as it were, brought well nigh to perfection an art which was before him quite in its infancy, and which, except in the hands of such a giant, would have required "the progressive concurrence of the exertions of succeeding ability." But really there is no necessity for such invidious comparison; strictly speaking, no fair comparison can be made. The one made the best of his vast natural talents, and the other of his talents and extraordinary opportunities. The earliest engraving of Marc Antonio with a date is the "Pyramus and Thisbe," 1505, the character of which shows that the artist was only a beginner. There is a wonderfully fine print of the "Guitar Player," said to have been a portrait of Achillini, the poet, which has been ascribed to as early a date as 1504, when the artist was only sixteen years of age; but if this print is really the portrait, it is most likely that the date usually given is too early; for though some of the early engravers, especially Lucas Van Leyden, did wonders at an early age, the "Pyramus and Thisbe" shows that Marc Antonio could not have previously executed such a print as the "Guitar Player," although the background is probably copied from some German or Low Country print. The true date, as Mr. Fisher points out, need not be much before 1512, in which year the book "Il Vividario" was published. As soon as he became acquainted with Albert Durer's work, his progress was wonderfully rapid. In 1506 he did the marvellously delicate print of "Apollo and Hyacinthus." In 1509 he did the print called "L'Homme et la femme aux boules," a copy of which, in the finest possible state, is exhibited by the Duc d'Aumale. This print, and the Mars, Venus, and Cupid, of which there were two prints, the second being entirely re-worked, some considerable additions of ornamental detail being added, are among the best proofs of the great influence the great German at this time exercised over his admirer, though without at all destroying his Italian feeling. About this time was executed the beautiful Venus called "Accroupie," and soon after he probably went to Rome, for in 1510 we have the group of figures, "Les Grimpeurs," from Michael Angelo's cartoon of Pisa. The background to this was copied almost line for line from Lucas Van Leyden's print of the "Mouk Sergius killed by Mahomet," but without his neatness. This also applies to the background of Dido—also copied from Lucas Van Leyden—a print which was engraved when the artist was only fourteen years of age. After his residence at Rome and connection with Raphael, Marc Antonio showed his full powers. Among the most beautiful prints of the earlier part of his stay there are Lucretia, from a design by Raphael, and the "Philosophy," from the ceiling of the Signatura Chamber. All these copies from Raphael are most valuable, especially as they were doubtless taken from the drawings, so that we have in them the artist's first ideas, which were often altered in the finished pictures. Some show immense power. The "Madonna lamenting over the Dead Body of Our Saviour" —*La vierge au bras convert*—of which a fine copy belonging to the Duc d'Aumale is exhibited, is a remarkably fine instance. Mr. Holford's impression of the "Plague" (B. 417) is a very beautiful print. One of the most interesting of the Roman pictures is the "Last Supper," from a design by Raphael, of which there is a drawing in the Royal collection at Windsor. This is one of the most impressive representations of the subject that has ever been made. We cannot help regretting that so grand and reverential a description of the sublime scene was not carried out in painting. One of the very finest engravings after the designs of Raphael is "The Murder of the Innocents." Of this, there are two plates, both, apparently, by Marc Antonio, though the one with the chicot is by some supposed not to be his. It is a splendid design splendidly carried out. "The Murder of the Innocents" is the print about which there is a legend that Marc Antonio was murdered for making the second plate by the owner of the first. The legend is, like many anecdotes of great persons, not founded on fact. It is hard to understand how an engraver that could catch the fire of the original artist—as has been the case in this example—could be so tame as in the St. Cecilia (116). We cannot be too thankful for the opportunity offered by the spirited members of the Burlington Club of enjoying the sight of this prince of engravers, more especially for the intimate acquaintance it gives us with the work of his greater master, Raphael. We should like at some future time to see in one room some of the masterpieces of the German school compared with the Italian. Such a comparison would greatly increase the profit and pleasure of the study of the engravings.

We are very glad to hear that it is arranged that under the joint auspices of the old British Institution and the members of the Burlington Club, the annual exhibition of pictures by old masters will be given. It would have been a great loss to us if these instructive loan collections had been abandoned. We have little doubt that, under the joint management of the two societies, they will be better than ever.

INTERNAL DECORATION.

DESIGNS FOR STENCILLING.

THE internal surface decoration of our domestic buildings is a subject well worthy attention and study. As regards the present and popular mode of embellishment I cannot speak very favourably. The usual treatment of a door, for instance, is, after it is well hung and warranted not to break off its hinges (and its stability is frequently its best feature), to paint it a dingy cream colour, being then considered to look very neat. Another way is to paint the aforesaid door two or three coats, and then grain it with a comb, and the result is as artistic as might be expected from such an uncouth instrument. The effect is usually that of a number of miniature pre-Adamite monsters in various painful positions, as if undergoing extreme torture. The last mode (and undoubtedly the best of the three) is to stain and varnish the wood.

Now, I ask, is there any *real* art in either of these three processes? I unhesitatingly assert there is not. Art was never intended to make an object look hideous or even plain. Art is a magic mantle given to man to cover the natural plainness or ugliness of objects, and to make them pleasing to the eye and affecting to the heart. Art is a glorious sunshine, which vivifies all objects. Art, in a word, is the embodiment of everything that is beautiful and true.

And what a glorious privilege it is for a man (however humble and obscure he may be) to be enabled to use his powers for the advancement of art in his country! How dignified is his office! To cultivate his mind by studying the finest works of his forerunners, to study their various styles and the *poetry* of their works, to feel habitually that deep and earnest love of the beautiful, to survey Nature with awe and admiration, to look up to her, to try and grasp the mysteries of her origin, and to endeavour to penetrate into her utmost depths—what can be more delightful to the thoughtful man than such refining and elevating studies?

The man who has, from his earliest years, been accustomed to view objects of truth and beauty will throw to the four winds the hideous monstrosities of too many of the (so-called) artistic productions of the present day. How rare is it that we can find even a decent wall paper! Look at even the more expensive kinds. Truly there is a vast amount of colour and gold, often tawdry enough; but how about the forms? You will see bunches of grapes and leaves shaded to resemble nature; full-length figures, to which even the *artistic* daubs on some of our cheap music are absolute gems; impossible fruits joined to no less impossible leaves and stems; historical subjects, scenes from gipsy life, robbers, hunters, wild, weird looking forest scenes, sunsets, moonlights, and numerous other subjects, all represented in the same detestable manner. Indeed, some of the wall papers I have seen resemble subjects taken from Verdi's fiery opera *Il Trovatore*. Take a wall paper, which is a kind of necessary evil. I hope the time will not be far distant when such a thing will be obsolete (unless the designs improve vastly). How much superior it would be to stucco the walls and then paint really artistic subjects, or else stencil the surface with natural or conventional forms treated *flatly* (for shading is opposed to the true principles of decoration). What can be more beautiful and yet simple than the adaptation of such plants as the ivy, jessamine, wild convolvuli, harebell, coltsfoot, bramble, wild rose, black thorn, white thorn, oak, and numerous others? Take the ivy, for instance. The leaf is simple enough so

but consider a few of its combinations. It may be enclosed in a circle, triangle, square, pentagon, hexagon, and other polygons. It may alternate with large and small leaves, with whole leaves and semi-leaves, and with leaves and buds. Its stems may also be variously curved and ramified. Then, again, the colours may be almost infinitely varied. And the same may be said of the remaining plants. Now, I ask the artistic decorator, does not this give you sufficient variety? Do you ever think you could exhaust the combinations of the few and simple plants I have mentioned? If you cannot do so how, I ask, can any one complain of want of sufficient materials for design? It is not materials for design that we require, but *designers*. What I have said respecting wall papers will apply with almost equal force to carpets, hangings, furniture, &c. It is very true that our ablest architects are turning their attention to these subjects, and very successfully, but the subject wants popularising.

Some people may think that the rage for novelty is the bane of true art. But such, I think, is not the case. Novelty for its own sake may be prejudicial, but if it merely arises from a desire of further improvement in design its tendency is undoubtedly good. Let your novelty-seekers, then, return to nature. Let them go to the nearest stream and thoughtfully study the weeds by its side, and in its bosom. Let them take a microscope, and look for one moment at the world of loveliness therein displayed. Or, let them wander in the sunny lane or shady wood, and look at the materials around them and beneath their feet, which seem to say, "We are nature's children; some of us show ourselves boldly to your gaze, others retire; but take any of us, from the noblest and most richly dyed flower to the humblest weed, and you will be well rewarded."

The "designs for stencilling" which accompany this paper do not require much explanation. They are partly conventional and partly natural. The natural ones are founded on the wild convolvuli, ivy, oak, blackthorn, starwort, and one or two other wild plants. They are intended to be stencilled in bright (though light) colours on a tertiary or negative ground. If the ground is maroon colour, bright green leaves and stems and pink flowers margined with white or green, or white flowers simply *lined* with crimson on green, would perhaps be effective. On a light grey ground the flowers might be either of the primary or secondary colours subdued by white, and margined with white or a complementary colour. The leaves and stems should be complementary to the flowers. On a cream-coloured ground both the flowers and leaves might be a delicate *lilac*, with lines and margins of bright yellow or white. It would much simplify the process if the stencillings were left *unmarginated*. The patterns would gain vigour, but lose delicacy.

The above are only a few of the almost infinite coloured combinations of which the above designs are capable; and it would be a pleasing experiment to stencil or copy the designs in the colours I have enumerated and observe the effect. Probably it might be found that much more effective harmonies of colour could be obtained than the above. The designs might be used for doors, cupboard fronts, skirtings, wood chimneypieces, walls, and modified to wood mouldings. In decorating the mouldings of an architrave, for instance, it would be well to colour the prominent members (as beads) with yellow, white, light blue, or pink, and the hollows with a somewhat negative hue of blue or red; *contrast* will then be obtained, which is a great source of beauty.

Birmingham. John Statham Davis.

LAACH ABBEY.

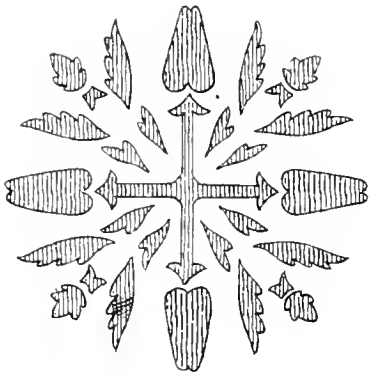
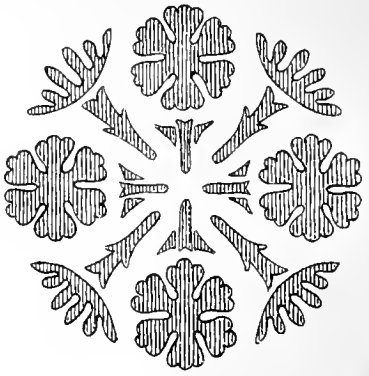
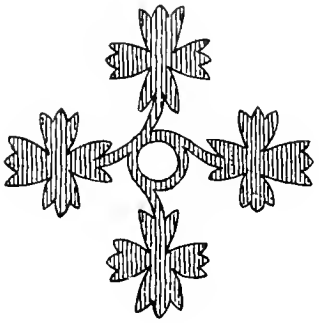
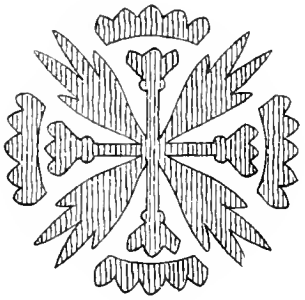
THE Abbey of Laach, the subject of one of our illustrations, is situate about ten miles inland from Andernach, a town on the border of the Rhine. It is said to have been built at the close of the eleventh century, by Henry II., first Count Palatine, on the Rhine, and his wife Adelaide. The site, as usual in those days, was indicated to them in a miraculous manner. The Abbey Church is a pure specimen of the Romanesque style, the semi-circular arch being used throughout, without any admixture of the pointed. It is not very large (215ft. by 62ft. internally, and the highest tower only 140ft. high), but by its completeness of plan and the fine grouping of its towers, it deserves to be ranked amongst the best examples of Rhenish architecture. Compared with the exterior the interior is mean and uninteresting. Externally, the grouping and variety of form of its towers are most pleasing. The principal western tower is square on plan, rising telescope-fashion above an outer casing, which is finished with an open arcaded gallery, and a lean-to roof. It is itself terminated by pediments, and a four-sided spire, with diamond-shaped faces. The circular turrets flanking it are at the cornice formed into octagons on arches springing from corbels, and have low octagonal spires. Over the crux the eastern cupola is covered by a large and well proportioned octagon tower and spire. Its flanking turrets are square, with pyramidal roofs. The continuous eaves line with bold cornice, enriched by cable and billet mouldings, and supported on arched corbel courses, the effective open arcades of the external galleries, with their coupled slender shafts, and the single columns, set in the midst of the wall, to bear the arches of the belfry openings, are conspicuous features of the style. Good Romanesque ornament and grotesque imagery are exhibited in the carving of the capitals of the western doorways and the archways of the parvis. The interior consists of a nave of five bays, each of which, unlike the usual Romanesque arrangement, is vaulted separately in an oblong compartment. Side aisles, with bays corresponding to those in the nave; a circular apse, projecting from the square western tower and transepts, flanked by the two western turrets; a fine western cloister-like porch, enclosing a square court, are of the few examples left of the ancient parvis, from which entrance is obtained into the side aisles. The monastic buildings are all comparatively modern and devoid of interest.

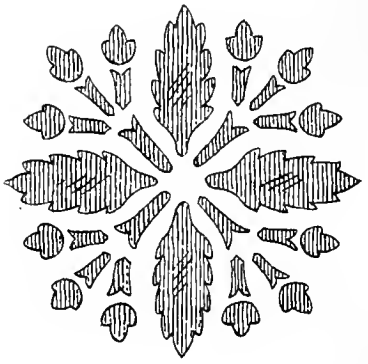
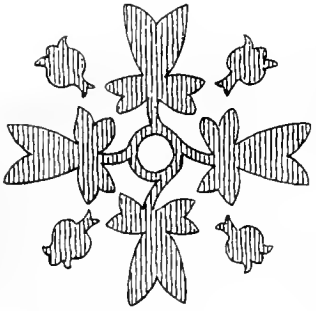
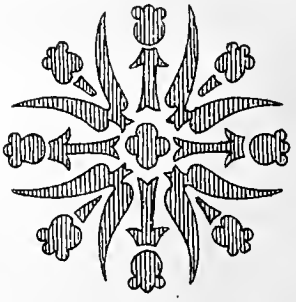
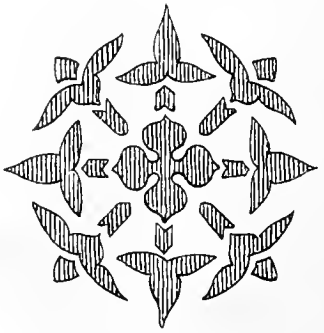
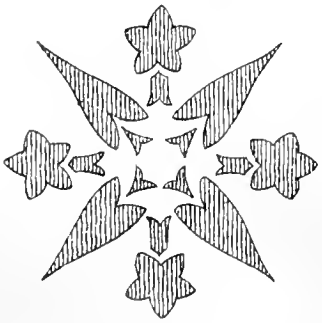
PUBLIC MORTUARIES.

THAT it is not only expedient but absolutely essential to the sanitary welfare of large towns, that public dead-houses should be erected in every parish, is a dictum which a constantly growing public opinion ratifies. The little dingy hovels and sheds now, by courtesy, termed parochial dead "houses," are shamefully inadequate to the requirements of large town populations. The "powers that be" seem to have something like an intuitive perception of the scanty provision made in this respect; for, as a general rule, the dead "houses" are poked away in some of the most inaccessible and out-of-the-way holes and corners that exist. At inquest after inquest jurymen are found complaining of the loathsomeness and repulsiveness of these confined temporary receptacles for the dead, which they, as jurymen, are called upon to visit to "view" the subjects of inquests. The Marylebone and Paddington dead "houses" have each been thus condemned. It is but justice to the vestry of the former parish, however, to state that they have determined to build a new mortuary, providing ampler accommodation, which, if not all that it ought to be, will at any rate be a great improvement. We trust that the lesson thus set will be imitated in other parishes, and be equalled, if not excelled. But what, after all, is required, is the establishment of *public* mortuaries. By "public" we mean not *parochial*—not in anywise connected with the workhouse authorities. Popular prejudice runs high against the "House" and all connected with it, and in no instance is the aversion to parochial assistance so great as in the interment of the dead. It thus constantly happens that while the money with which to pay the undertaker is being earned, borrowed, or collected by means of subscription lists, a corpse is kept for six, seven, or eight days in a room, and that room, be it remembered, at once the living room and sleeping apartment—the parlour, kitchen, and bedroom for sometimes as many as six persons.

An inquest held at Marylebone workhouse on Tuesday week fully demonstrated the abhorrence with which all things connected with the workhouse are regarded by the poor. The maintenance of this dread of things "porochial" is, we know, a main article in the creed of the school of parochial dignitaries of whom Mr. Bumble is not a very over-caricatured impersonation. But, as has been over and over again demonstrated, it is a penny wise and pound foolish policy, and in certain quarters this is slowly being recognised. At the inquest we have adverted to, it appeared that a man had refused to allow the corpse of a child to be taken to the parochial deadhouse. The description of the man's room and the recital of his objections to have the body removed to the deadhouse were corroborative of what we have written. We hope therefore soon to hear that steps are being taken to provide public mortuaries.

A contemporary has again mooted the question "What is to become of the Surrey Gardens?" Since St. Thomas's Hospital, London Bridge, was demolished to make way for the Charing-cross Railway, the gardens have afforded a temporary retreat for the sick and maimed under the care of the institution, but on the completion of the new hospital at Stangate, in a year or two, the gardens will be vacated. It is suggested that the dwellers of Walworth, Kennington, and Camberwell should take measures for securing the site for the purpose of a public park or recreation ground.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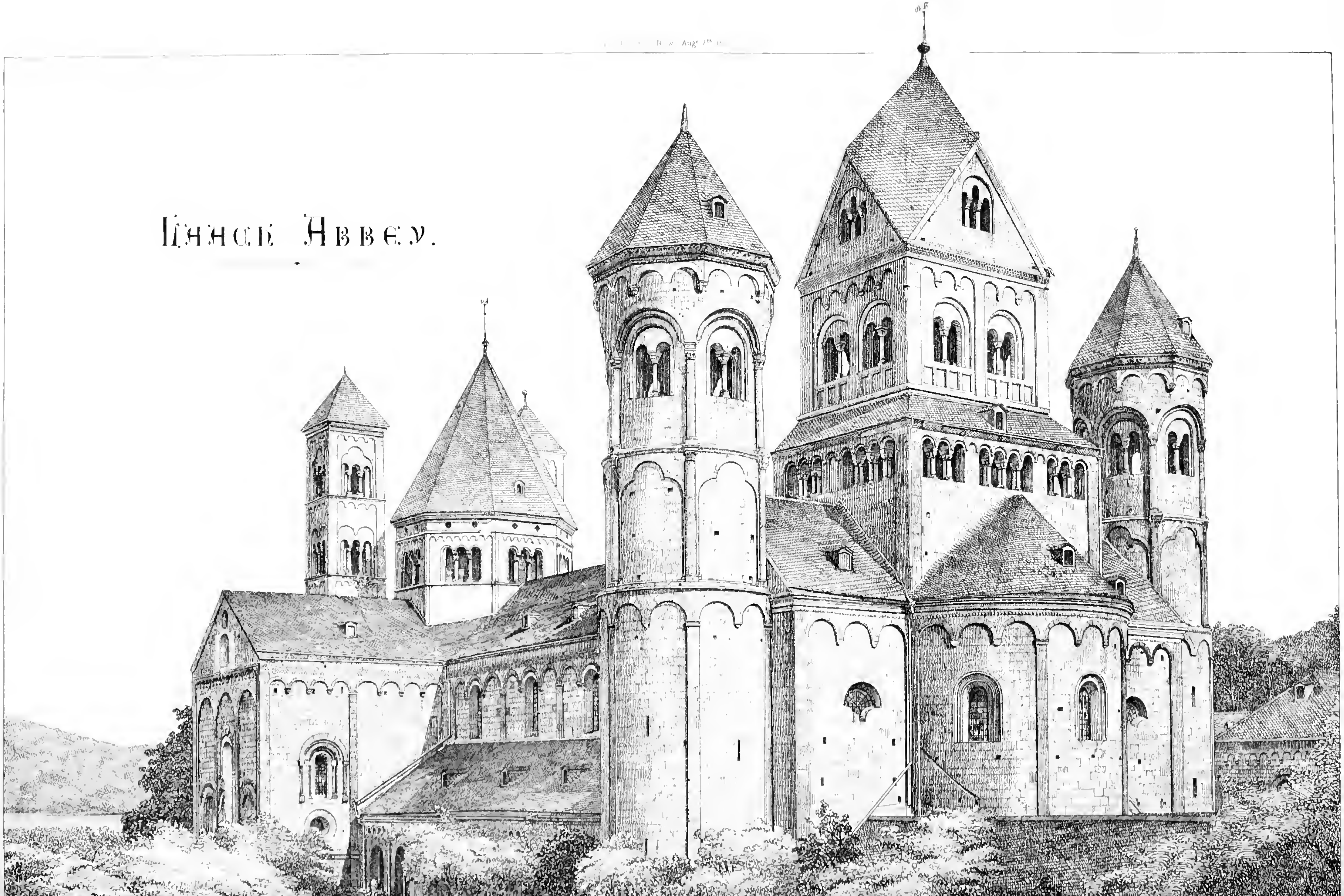


Laach Abbey.

CO-OPERATIVE BUILDING SOCIETIES.

SLOWLY, yet very surely, the principle of co-operation is advancing among us. The limits of its application seem to widen daily, and a movement which fifty—nay, twenty—years since was stigmatised as socialistic and revolutionary bids fair to create a new era in our commercial history. In the July number, taking as its texts Dr. Begg's book on "Happy Homes for Working Men," and the "Correspondence with Her Majesty's Missions Abroad regarding Industrial Questions and Trades Unions," the *Westminster Review* has an exhaustive article on co-operation applied to the dwellings of the people. The purpose of the writer is to define the influence of an experiment in house building which has changed the aspect of industrial life in Edinburgh, and which may, if rightly applied and honestly worked out, vastly improve the social condition of London and other cities. Past achievements are quoted as examples both at home and abroad.

Twenty years ago—in 1848—the "Association of Masons" was founded in France. It consists at present of eighty-four members, two of whom jointly manage the building and pecuniary departments, a third is assistant manager, two-thirds of the remaining 81 members labour with the hod and trowel, and the others are superintendents and distributors of work, or merely holders of capital. This society is now officially pronounced to be in a "remarkably prosperous" condition. In 1852 the business done amounted in value to £1,800, from which a profit was derived of £40, in 1858 the value of the business executed was £48,700 and the profit £8,000; a dividend being paid in that year of 56 per cent. Some of the finest mansions in Paris have been built by this company, and last year it contracted to build a new station in Paris for the Orleans railway at an estimated cost of 2,000,000 francs.

At Mulhouse, a little manufacturing town on the south-west frontier of France, we find the same principle worked out differently. In 1835, of the 17,000 workmen employed in the cotton factories nearly one-third had to lodge themselves as best they could in the adjacent villages, five and six miles distant from their work, and that when a working day consisted of fifteen hours, commencing at five a.m. and terminating at eight a.m. all the year round, summer and winter. To avoid the exhaustion consequent on these long walks, the operatives herded together in the most hideous hovels within the town—two and three families crowding in a room of very limited dimensions. So things continued for years, the employers amassing wealth, but adding nothing to the comfort of those employed. At length, in 1851, instigated by the sight of the model lodging-house exhibited by Prince Albert in that year, four small houses were built by M. Jean Dollfus, at the village of Dornach. These proved so successful that a company was formed with a capital of £12,000, in sixty shares of £200 each. To this the Government added £6,000; and in the following year the capital was augmented by eleven additional shares of £200 each, and by a second grant from the Government of £6,000. As the event proved, and as will always be found to be the case where men are self-dependent, the government aid could easily have been dispensed with. The results that have been achieved by this company now render the working men of Mulhouse as much objects of envy as they formerly were of compassion. In ten years the "Société des Cités Ouvrières" has built 692 houses, besides public baths, laundries, bakery, fountains, and gardens. Not only, too, have they benefited themselves, but their example has compelled house proprietors in general to pay more attention to the comfort and welfare of their tenants.

"A Cité Ouvrière," says M. Vernon, "is one of the most pleasant sights in the world. The streets intersect each other at right angles, are macadamised, and lighted with gas, those which run the length of the *cité* being nearly 28ft. wide, and the cross streets between 17ft. and 18ft. wide. Each group of houses, either two or four in number, is surrounded by a small garden, carefully cultivated and well stocked. Each house occupies about 45 square yards, and each garden three times that space. Generally the houses are one story high, though a fair proportion are of two stories." Nearly every house is the property of the occupant, and upon this seems to have turned the success of the scheme. A simple plan was adopted by which this was effected. The average cost price of each house was from £120 to £160. An immediate payment, therefore, was required of £10 or £12, and the balance was to be liquidated by monthly instalments, so that in thirteen years the occupant could become possessed of a house worth by that time double the amount he had paid for it.

We now look at home. In 1861, a serious dispute occurred in the Edinburgh building trades. A three months' strike was the result, which ended in the victory of the men. During the contest it had often been represented to the men that the money paid weekly to each man for upholding the common cause might, while maintaining a just struggle, have provided for themselves properly constructed houses, and effected a desirable social reform. The examples of English and French workmen in other departments were adduced, and the Edinburgh workmen were earnestly urged to apply this new power for the production of suitable dwellings for themselves. Their interest was at length aroused, and a spirit of inquiry was engendered that soon bore fruit.

One evening, in the month of April, 1861, six or seven masons met together in a dingy room for a long and anxious consultation. They fully realised the necessity of doing something; they plainly saw that for commercial purposes builders would not invest in workmen's houses, and, scorning to trust to charity, those half-dozen brave humble men parted from each other in faith, to meet a few days hence with clearer insight and firmer resolve, determined, with the assistance of their fellows, to try a new experiment in co-operative enterprise. At a not very largely attended meeting of masons, held April 17, 1861, a co-operative building company was formed, with a capital of £10,000, in shares of £1 each. The amount actually subscribed at first was £25. By 1865, all the shares were taken up, and the number of members is now 836. The working capital has been turned over ten or twelve times, at an average of 15 per cent., and the process goes on and may go on indefinitely. About 400 houses, providing good accommodation for 2,000 individuals, have been built and sold for £70,000. As a commercial undertaking, viewed altogether apart from its high moral and social influence, the Edinburgh Co-operative Building Company is a signal success.

These examples prove that the co-operation principle does not depend for success merely on local circumstances or national characteristics. Honesty of purpose, steady application, and an ordinary amount of business-like management are sufficient to ensure success; and the great merit of the principle is, that its very practice inculcates all these good qualities. When men manage their own property, the inducement to be dishonest ceases. None but a lazy workman will idle at a job, and working men are far more business-like than many people suppose. One thing is certain; at present there are no instances of gigantic fraud or shameful mismanagement to warn off intending investors. Can the same be said of the more purely middle class trade societies—insurance companies, railway companies, banking corporations, and the like? This is a point too often lost sight of.

The Artisans' and Labourers' Dwellings' Bill, which has lately received the assent of Parliament, affords striking proof of the difficulties which stand in the way of providing better house accommodation for the working classes of London. But it is only partial relief that will be derived from this or any other similar measure. Legislation is practically powerless, except to remove condemned uninhabitable dwellings, and to make possible the obtainment of building sites in suitable parts of the town. Let working men, however, once be taught that they can build and buy their own houses, at the same time providing work for themselves and bread for their families, and all Government aid can be dispensed with. A spirit of manly self-reliance will prevail, and the practical observance of the proverb that "God helps those who help themselves" will do more to fit the lower classes for the exercise of their rights as fellow men and citizens than all the pseudo-philanthropy of feeble-minded patrons, or yards of sedition from the pens of blatant demagogues.

GARDENS.

FRANCIS, Lord Bacon, philosopher, statesman, and lawyer, in his "Counsels Civil and Moral," has an essay on gardens, and this fact has caused much wonderment on the part of shallow-brained folks, who cannot comprehend what gardens have to do with things civil and moral. Its place amongst moral themes is justified by its first few lines. A garden was first planted by God Almighty, "and, indeed," says Bacon, "it is the purest of human pleasures; it is the greatest refreshment to the spirits of man, without which buildings and palaces are but gross handiworks." And yet, on the whole, people do not justly appreciate this purest of human pleasures. Nor will they do so whilst a Schneider or a Finette is idolised by them. The gardens at Sydenham attract a far less number of visitors than a Blondin, a prince, or a general. At the same time, says the *Pall Mall Gazette*, people who really plume themselves on their passion for gardens are constantly found not to know what a garden is; and to believe that a passion for gardens means a passion for acres of glass with countless flower-pots and endless supplies of heated air underneath. Horticulture is a misnomer for vitriculture. The glass-house did not enter into Bacon's conception of a garden, though he asked for thirty acres of space. But in his time the measure of refreshment of spirit which men could get out of a garden or a house was not simply the amount of money which could be put into it.

Gardening on a large scale is costly in the labour which it requires, even if land were cheap. Ample "health and sweetness" may be obtained in smaller plots than thirty acres, provided your garden be not surrounded by brick walls. Still, there are some charming old gardens in the Twickenham and Hampton country, though mostly as rigidly enclosed within four walls as a parlour or sleeping-room. Such gardens are in the nature of apartments, and very pleasant chambers they are. In the suburbs of great cities the little square spot at the back is not a garden in the sense which Hampton Court Palace or Kensington has gardens, but it is an open chamber in which a man and his wife may delude themselves most agreeably and profitably into the notion that they survey the loveliness of nature and the marvels of creation. And there is not nearly so much illusion here as in the costlier delights of more ambitious folk. Still, narrow and walled spaces, with flowers and strips of turf and gravel, are not gardens in the truest sense. For these space is essential. To acquire for a garden all that a Bacon could desire, the one thing needful is to plant it on a height overlooking a spreading weald or a pleasant valley, or to place it in a prospect of distant hills and downs. In such position it matters not whether the garden be thirty acres or half an acre. If rightly placed, a garden, to be full of delight, need be no more than a broad and ample piece of well-kept lawn, with flower borders and fragrant hedges. All that you want is a soft and pleasant carpet for the feet, little pieces of bright colour for the eye, gracious prospects, and the perfume of honeysuckle, thyme, and the like. There must also be a sheltered gravelled walk for winter days and nights. But it is a vile blunder to cut a garden up with gravel walks which are pleasant to no sense, and which in ninety-nine

cases out of a hundred are too narrow for three persons to walk abreast. A couple of narrow strips are unaccountably preferred to one broad alley. It is hardly a less blunder to take up space with craftily-devised flower-beds, of many cunning combinations of form and colour. As Bacon says, "you may see as good sights many times in tarts." The main point in a garden, if it is to be for the great refreshment of the spirit of man, is simplicity. The simpler it is the fewer chances are there of its getting out of order, and so disturbing the eye and mind of its possessor.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-first annual general meeting of the friends of this charity was held on the 30th ult., at Willis's Rooms, St. James's, Mr. W. R. Rogers, President, in the chair. From the report read by Mr. Bird, the secretary, it appeared that the subscriptions and donations had increased during the past year. Four pensioners had been elected, two males and two females, from a total of seventeen candidates. One death had taken place. The number of pensioners is now forty-eight—twenty-four men and twenty-four women. A satisfactory addition has been made to the funded stock, £1,525 19s. 3d. having been purchased for the Relief Fund, and £107 8s. for the Building Fund. The amounts now invested are £11,332 19s. 4d. stock for Relief Fund, and £2,939 19s. 9d. for the Building Fund, being a total of £14,272 19s. 1d. The report was unanimously adopted. On the motion of Mr. George Plucknett, the thanks of the meeting were given to the patrons of the institution, and the names of the following gentlemen, who had each contributed a donation of £100, were added to their number:—"A. Z." (per Mr. George Dines), Messrs. W. Webster, John Kelk, M.P., C. J. Freake, Lucas Brothers, Lawrence Brothers, Holland and Hannen, W. Cubitt and Co., G. Myers and Sons, and G. Smith and Co. A vote of thanks was next given to the retiring president (Mr. W. R. Rogers) for his services to the institution, especially in obtaining the above ten donations. The various officers having been elected (Mr. George F. Trollope being the new president), the proceedings terminated.

KENT ARCHÆOLOGICAL SOCIETY.

ON Thursday week one of the most successful annual meetings of the Kent Archæological Society was inaugurated at Canterbury. After the usual business, Professor Willis gave a lecture on the ancient monastery of Christ Church, which formerly surrounded the cathedral. Professor Willis said he had been enabled to satisfactorily decide on the uses of many buildings which hitherto, on less complete investigation, had been assigned to purposes for which they were not intended. For instance, what was called the Baptistery was, in fact, the great tower to which water was introduced from the north side, and from which the various lavatories of the monks were supplied. By reference to that remarkable and interesting work "The Rites of Durham," which was written by one of the monks, and which contained a minute description of the whole routine of their daily lives, the whole plan was rendered plain and comprehensible. There were the carefully contrived passages by which the holy fathers could pass to their diurnal and nocturnal services in the cathedral dryshod, carpets and wood flooring being unknown in those times; there were "the studious cloisters pale," where the more educated pored over ancient manuscripts or instructed the novices, or where the less instructed could think over their past faults and repeat their "Ave Marias" and "Paternosters." For these purposes the south alley of the cloisters was always enclosed, while the other three sides were generally left open. In his researches he had been able to make out quite distinctly the four hostels which were always provided for guests in large houses of this kind. The one for the ecclesiastics was at the east end of the cathedral, and near it, on the north side, that of the nobles, both being close to the more holy parts of the monastic pile. The question hall, for the middle classes, the merchants, and well-to-do, was at a considerable distance; while that of the pauper class was close by the entrance, and as far off as possible not only from the holier portions of the building, but from the other classes of society. The ecclesiastics and nobles were all under the care of the prior in this case, or the abbot at other places, while the middle class and poor had each officers appointed respectively to take care of them. Professor Willis then, by means of drawings laid before the audience, explained all the details of the ground plan which he had prepared, and, accompanying the members over the Cathedral Close, pointed out the particular localities of the building he had described.

On Friday morning, after Divine service at the cathedral, a large party met at St. Augustine's College, over which they were conducted by the Rev. the Warden. The members then went to the ancient church of St. Martin, founded by Queen Bertha or Ethelburga, the wife of Ethelbert, King of Kent. On the left side of the altar in this church, looking towards the east, is a tomb said to be that of Bertha, the Royal foundress, and it has several other extremely ancient memorials of those long past times. The font, although very old, is rather Norman than Saxon, and its ornamentation is of a very interesting character. Next they proceeded by way of the Dane John, along the city walls, and by the ancient mound to the ruins of the Norman Castle, near the gas works; thence to the hospital for poor priests, now the police station; and thence across the river to the refectory of the Grey Friars, built over another branch of the Stour, and to Eastbridge Hospital on King's Bridge. After evening service at the cathedral, the party was conducted over the sacred edifice by the dean, the inspection having special reference to the visit of Erasmus.

ST. PAUL'S CATHEDRAL.

WE have so often had reason to call attention to the neglect displayed by the authorities who have the care of our great cathedral that it is doubly pleasant to be able to record a change for the better. We alluded last week to a spirited attempt on the part of the priests and churchwardens of the Church of SS. Augustine and Faith to restore the churchyard to something like respectability. This attempt has been preceded by a very desirable reform in the interior of the building. The statues have been all washed or dusted. The outstretched arms and legs of the various angels and heroes no longer appear as if enveloped in dark-coloured sleeves and stockings. It is to be hoped that this is but the commencement of a general reform. The official authorities, however, are not entitled to all the blame for past neglect. To preserve the vast pile in anything like order funds are required, and we regret to learn that the means at their disposal are by no means ample. The "Fabric Fund" of the cathedral only amounts to £1,200 a year. Out of this, £240 is paid for fire insurance, and only £960 is left to keep up the inside and outside of the building. Let it be remembered that there are no less than 8,500 square feet of leadwork and 450,000 square feet of out side stone to be looked after and preserved. All of this material is exposed to the influence of our damp climate, and the leadwork especially needs constant reparation. It is impossible to do much with such limited means. Surely, however, the merchants of London need only to be asked to contribute liberally to their augmentation. Let the promoters of the scheme already started form an energetic committee, and accomplish a little vigorous canvassing, and we believe a handsome subscription list will be the result, and this great temple may assume its proper position as at once the greatest glory of our architecture and our Faith.

NATIONAL WEALTH AND NATIONAL EDUCATION.

THE following is the substance of a lecture delivered before the London Association of Schoolmistresses by Dr. W. B. Hodgson. The lecturer said:—There are two prevalent misconceptions respecting political economy,—the science which treats of the production, exchange, and distribution of wealth. The first consists in supposing that it is a purely abstract science, that it ignores the individual man, and looks wholly at general results. The second, strangely enough, is the very reverse of the first. It consists in supposing that economic science teaches individuals how they may most rapidly enrich themselves without regard to the rights of others. Political economy does not concern itself with the enrichment of the community at the expense of individuals who make up that community, nor does it aim at enriching the individual apart from the community to which he belongs. But it seeks to unite the interests of the individual and the community—to enrich the community through individuals, to enrich individuals for the sake of the community. By blending the individual and the general welfare it directs, exalts, and restrains the individual desire of gain; gives to personal effort a higher than personal aim, and shows that general well-being consists in the well-being of individuals. Social prosperity is the result of human acts, of human conduct—human conduct depends on character, and condition depends on both conduct and character. To ensure these the young must be taught and trained,—taught those economic principles which underlie, pervade, or dominate all transactions, and which together go far to make up that which we call civilisation. This teaching involves the study of the various relations of men to men, as producers and consumers, buyers and sellers, receivers and payers of wages, capitalists and labourers, borrowers and lenders, and much besides. By such teaching and training our young people will enter on life able and ready to adapt themselves to the system of things in which they are to take their place, and through which they are to work their way to personal independence and social usefulness.

ANCIENT ECCLESIASTICAL BRICKWORK IN ESSEX.

AT the recent meeting of the Essex Archæological Society, a paper on East Horndon Church (a peculiar structure, built externally of red brick, the principal features in the interior being the splendid mortuary chapels that remain), written by the Rev. E. L. Cutts, was read by Mr. King.

The county of Essex is rich in ancient brickwork. In the buildings at Colchester the most extensive specimens of Roman materials, used up by mediæval builders, are to be found, and St. Botolph's Priory has the most elaborate and successful of these examples. In Coggeshall Abbey is the earliest example of the mediæval manufacture and use of moulded brick. There are many other examples of more or less importance—for instance, the Saxon tower of Holy Trinity, Colchester; the Norman tower, Great Tey; the Early English Chapel in the Spital, Maldon; the Decorated quatrefoil in Lawford Church; and a few bricks are to be found used as rubble in a very large number of the Essex churches. It was not till the latter part of the fourteenth century that brick came into really common use in England, and was then introduced from the Low Countries. Essex possesses an unusually large number of examples of brickwork of this period in ecclesiastical architecture—Ingatestone, Billericay, Mountnessing, Rayleigh Porch, besides Faulkbourn Hall, Beckenham Hall, &c. East Horndon is one of the series of brick churches. Mr. King's researches into the wills of the Tyrell family enable him to fix the dates of various portions of this church. The tower is not so good in proportion as others, and we miss the ornamentation of parapet, &c., which is characteristic of the style. Some of these features will, however, be found in the small mortuary chapel on the north of the chancel. The features of especial interest are the two chapels, one on each side of the nave at its east end. These seem to have been chantry chapels, each with a living-room over it for the chantry priest. The one on the north shows the original staircase, and the one on the south has traces of the original fireplace. The altar tomb, which stood in the middle of the mortuary chapel on the north side of the chancel, was removed by the present rector, and the brass is hung on the wall; and it would be well if one result of the visit of the Essex Archæological Society was the restoration of the brass and inscription to their proper place on the slab, which now forms part of the flooring of the chapel.

THE STRENGTH OF CAST IRON.

MR. HODGKINSON was the first to notice that the behaviour of cast iron under extension differs from that presented by wrought iron. It has been already stated that practically the extension or elongation of a wrought-iron bar is in proportion to the weight or force tending to stretch it. This ratio does not hold in the case of a cast-iron bar, which, instead of being elongated the 1-10000th part of its length for every ton of strain per square inch, is stretched to

double this amount, or the 1-5000th part, and moreover does not obey the law as the magnitude of the strain is increased. Judging from the different internal structure of the two materials, one is at first inclined to consider the elongation of cast iron as somewhat paradoxical—to be surprised that it should be double that of wrought iron for the same strain and sectional area. A little reflection will point out that this proceeds from confounding the immediate effect of the strain upon the iron with that which it produces when the breaking weight is reached. Thus, although cast iron extends twice the amount of wrought with a given strain, yet its ultimate tensile strength is barely a third of that of the latter material. Briefly, cast iron may be said to extend too quickly—too much at a time, and consequently its ultimate powers of tensile resistance are very soon arrived at. Wrought iron, on the contrary, is not affected so rapidly or to the same extent, and is enabled to bear in consequence a greater strain before its resisting capabilities are overcome.

Although of little value for resisting strains of tension, cast iron compensates for its weakness in that particular by the enormous strength it possesses against those of a compressive nature. Were it not for other disadvantages connected with its use, this circumstance alone would ensure its adoption in every instance where strains of compression were to be resisted. Its treacherous nature has, however, put almost a ban upon its application to structures of any magnitude, particularly where its failure might be attended with risk to human life. Within certain limits, and when a form suitable for resisting compressive strains is bestowed upon it, there is no danger in employing it, and we continually witness instances where wrought iron is substituted for it at a great sacrifice of simplicity and economy. The crushing weight, or the ultimate resistance of cast iron to compression, may be taken at fifty tons per square inch of sectional area, and the general conditions permitting this constant to be employed in all calculations are that the strength is directly proportional to the sectional area, and independent of the length, provided the rod, bar, or whatever example may be selected, is perfectly secure against flexure. It will be seen hereafter that in long pillars these conditions do not hold, owing to the tendency they have to deflect, which produces an incipient degree of weakness. Long pillars, in addition to the direct compressive strain brought upon them, are also acted upon by one of a transverse nature. In any example of cast iron which is either too short to bend, or is secured from flexure by proper means, the crushing weight in tons is found by multiplying its sectional area in inches by fifty. Moreover, since the area of a round rod is proportional to the square of its diameter, the following short practical rule will give the breaking weight in tons:—Multiply the square of the diameter by the constant, 39. This rule gives a result rather less than the theoretical crushing weight, and consequently is upon the safe side. If we adopt the same proportion for the ratio of the working to the crushing load of cast iron that we have selected in our other instances, it ought to carry safely 12½ tons per square inch; but for many reasons it would be very injudicious to place more than eight tons upon a material so unreliable, particularly if it is likely, in addition to the load, to undergo any vibration or sudden shock. We may now tabulate the results hitherto arrived at. Tensile strength of wrought iron, 22 tons per square inch, and safe working load, 5 tons; compressive strength of wrought iron, 18 tons per square inch, and safe working strain, 4·5 tons; tensile strength of cast iron, 7·5 tons, and safe load, 1·5 tons per square inch; compressive strength of cast iron, 50 tons per square inch, and safe load, 8 tons.—*The Engineer.*

ARCHÆOLOGY.

AN important discovery has just been made of two Roman edifices at Héricourt-en-Caux, near Yvetot. There is in that district a well-known spring, called La Fontaine de St. Mellon, which, for many centuries past, has been a favourite place of pilgrimage. St. Mellon was the first bishop of Rouen, and, according to popular tradition, baptised the first Christians of these parts at the spring alluded to.

The Wiltshire Archæological and Natural History Society, at its meeting at Hungerford last year, decided upon Chippenham as the *locale* of its meeting this year; but on account of the British Archæological Association being about to hold its annual meeting on the borders of North Wiltshire (making Cirencester its headquarters), the Wiltshire Society has deferred its meeting at Chippenham until next year.

Simultaneously with the meeting of the British Association at Norwich, there is to be a gathering in the same city of the International Congress of Pre-historic Archæology for the promotion of their favourite science.

WATER SUPPLY AND SANITARY MATTERS.

ON Saturday, Colonel Sir William Denison and Dr. E. Frankland had an interview with the mayor and corporation of Preston relative to the river Ribble. The Commissioners left a number of questions for the purpose of their being answered, and intimated that on a future occasion they would re-visit the town and take evidence.

At the last meeting of the Lambeth Vestry letters were read from the Southwark and Vauxhall and the Lambeth Water Companies intimating that certain of the poorer localities in the parish would for the future have a Sunday supply of water.

Building Intelligence.

CHURCHES AND CHAPELS.

The new chapel of ease at Eddington, near Hungerford, dedicated to the Saviour, has been consecrated by the bishop of the diocese. It is erected in the Gothic style of architecture from the design of Mr. A. W. Blomfield, of London, the material being coloured brick with Bath stone dressings. The cost of the work is £2,220.

The church dedicated to St. Thomas-à-Becket, at Lapford, is now in course of restoration. It is supposed to have been founded about the year 1288, though certain parts of the buildings show traces of restoration at a much later date. The whole restoration of the building will cost about £1,800.

The restoration of the parish church at Montgomery is now completed. The west window, a very fine example of Perpendicular work, has been removed, in consequence of its very dilapidated condition, and replaced by new work in exact *fac simile* of the original. The whole of the work has been carried out by Mr. Morgan, of Llandinam, from the designs of Mr. E. Haycock, of Shrewsbury.

A new Roman Catholic Church, dedicated to SS. Joseph and Francis Xavier, was opened on Tuesday week, at Richmond, near Leeds, by the Archbishop of Westminster. The style is Early Decorated, and the plan consists of nave, two aisles, and an apsidal chancel. It seats about 500 persons, at a cost of £3,000. Mr. George Goldie was the architect.

The work of restoring the Cathedral of Nôtre Dame, at Paris, begun twenty years ago, is now being completed by fixing a railing all round it for protection from injury. This is the last operation of the whole of the work undertaken.

On the 28th ult. the Archbishop of York opened the new church of St. John the Baptist at East Acklam. The style is Early English, and the plan comprises nave, chancel, and western tower. Accommodation is provided for 200 persons, at a cost of £1,250. Messrs. J. W. and B. Atkinson, of York, were the architects.

St. Swithin's Church, Cannon-street, is now closed for repairs and alterations. The inside is to be entirely remodelled. The large oaken pews are to be removed, and open seats are to be put in their stead. When reopened the congregation will face the east, and not as they formerly sat, looking in nearly every direction. The pulpit in the church of St. Swithin is one of the finest in the city of London, and was in use long before the fire of London. The old "stone," as we stated some time since, will be specially cared for, as it will be surrounded by an ornamental iron railing.

The foundation stone of St. Mary's Church, Lichfield, was laid on Thursday week. Mr. James Fowler, of Louth, is the architect, and Messrs. Crutchlow and Ward, of Uttoxeter, are the builders. The style is Geometric Decorated Gothic. It will consist of a nave 70ft. long, with north and south aisles, with a chancel 30ft. long, and will seat between 800 and 900 persons.

On the 30th ult., the foundation stone of a new church was laid at the village of Windsor, near Liverpool. The style of the church is twelfth century Gothic, and the plan consists of nave and aisle, with apsidal chancel. It will seat 750 persons, at a cost of £3,600. Mr. D. Walker, of Liverpool, is the architect, and Mr. W. Murphy the contractor.

Castleford Church (Yorkshire) was reopened yesterday week, after thorough restoration. The building, which was on the site of an older one, erected in the twelfth century, was so dilapidated as to require almost rebuilding. The building now accommodates 600 persons, instead of 300, as formerly. Mr. H. Shepherd, of London, was the architect, and Messrs. Latham and Son, of Wakefield, were the contractors. The cost of the work was about £3,000.

On Thursday week the foundation stone of a Mariners' Church was laid in Corporation-street, Belfast, by the Lord Bishop of the diocese. The style is to be Gothic, from plans by Messrs. Welland and Gillespie, architects to the Ecclesiastical Commissioners. The church will accommodate about 600. Cost about £7,000. Mr. Walter Doelin is the contractor.

On Thursday week the new church of St. Paul, Old Brentford, was consecrated. The style is Early Decorated, and sittings are provided for 700 persons. Messrs. Francis were the architects, and Messrs. Nye, of Ealing, the contractors. The cost is between £7,000 and £8,000.

St. Mary's Church, Reading, was reopened on Sunday after restoration. The roof of the nave has been renewed and raised, and the north wall with the buttreses pointed and strengthened; the old tower has also had a new leaden roof. The work has been executed by Messrs. Wheeler Brothers, at a cost of £400.

A temporary iron church, capable of seating 350 persons, was opened on Monday week at Clapton. Messrs. Tupper, of Moorgate-street, were the contractors.

The paragraph which has appeared in ours, and several other papers, saying that the people of Banbury have declined accepting £1,500 towards rebuilding the chancel of Banbury parish church, is without foundation.

St. Paul's Church, Pooley Bridge, Westmoreland, was consecrated on Wednesday week. The style is Early English, the material used being the hard grey stone from quarries in the neighbourhood, relieved, in prominent parts, by a facing of red freestone. At the west end is a belfry, surmounted by a small spire. The nave is 47ft. 2in. long by 20ft. 8in. broad, and the chancel measures 9ft. by 15ft. The pulpit and lectern are of oak, and the font is of Caen stone, with marble pillars. The seats are varnished, with Dantzic oak ends. Messrs. Cory and Ferguson, of Carlisle, were the architects; Mr. Parker, of Penrith, being the contractor. The cost has been £800.

The contract for the restoration of the tower and transepts of Bampton Church has been taken by Messrs. Lord, Flasten, and Williams, of Oxford. The chancel has already been restored by Mr. Luckett, of Faringdon.

On Monday afternoon, at Thixendale, Yorkshire, Sir Tatton Sykes, Bart., laid the foundation stone of an Early English Church, designed by Mr. Street, A.R.A. According to ancient records there was formerly a church at Thixendale, but the only relic is a large Norman font, and even the site of the building is not known. The new church will seat 150 worshippers.

A new Congregational Chapel was opened at Calne, Wilts, on Tuesday week. The style is Early English. The extreme length is 91ft., width 37ft., width of chancel 21ft. The walls are built of native stone with Box dressings, and the interior faced with Farleigh stone. The building seats nearly 500 persons, at a cost of £5,000. Mr. Stent, of Warminster, was the architect, and Messrs. Light and Smith, of Chippenham, the contractors.

On Tuesday, the new church of Emmanuel, at Saltburn-by-the-Sea, was opened by the archbishop. The style is Early Decorated, and the plan consists of nave, north and south aisles, north and south transepts, chancel, and sacristy and organ chamber. The building seats 600 persons, at a cost of £3,500, only the nave, north aisle, and north transept being at present completed. Messrs. Pritchett and Sons were the architects.

The very interesting church of St. Leonard, Warwick, Cumberland, is about to be restored. The building is remarkable for its Romanesque circular apse, beautifully arcaded on the exterior. Mr. Withers is the architect to be employed.

On Tuesday last, the foundation stone for the rebuilding of the village church, Grasby, Lincolnshire, was laid by the rural dean, the old church having become both unsafe and unworthy for purposes of public worship. The new church, which is to have stone tower and spire, is from designs by Mr. C. Buckeridge, architect, Oxford. The church is of the Decorated order of the latter part of the thirteenth century, and the total cost of the restoration will be about £2,500. The builder is Mr. C. Cawthorne, of Retford, and the clerk of the works Mr. J. Pickering.

The quarterly meeting of the Oxford Diocesan Church Building Society was held in the County Hall, Oxford, on Tuesday, July 28. The following conditional grants were made:—Lee, Bucks, Church rebuilt, £80; Linslade, Bucks, Church, £100; Beaconsfield Church, Bucks, £130; Stoke Lyne Church, Oxon, £70; Quainton Church, Bucks, £150; West Hanney Church, Berks, £80; Westwell Church, Oxon, £30; Hampton Poyle Church, Oxon, £100; White Waltham Church, Berks, £100; Wooburn, Bucks, Church restoration, £25; St. Luke's, Maidenhead, Church, £150.

BUILDINGS.

The new Severn Bank Hotel, Newnham, Gloucestershire, has been opened. The building is executed in red brick, with Bath stone dressings, and consists of a basement and two stories. Mr. A. W. Maberley, of Gloucester, was the architect, and Mr. J. Coleman, of Chaxhill, the builder.

The guardians of the Leek Union have decided on the erection of male and female fever and convalescent wards, with nurses' rooms, baths, &c., in connection with the union workhouse at Leek. The arrangements of the proposed new buildings include such provisions as the experience in hospital construction of late years has shown to be indispensable in such buildings. Mr. Sugden, of Leek, is the architect.

The People's Hall, Framlingham, Suffolk, which, with its staircase turret, &c., forms a conspicuous object on entering the town from the railway, has lately been opened. It comprises large hall, reading and committee-rooms, and other conveniences. The works have been executed, under Mr. Sugden, of Leek, architect, by Mr. Bedwell, of Brandeston, near Wickham Market.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—W. B.—R. T. H.—L. J. D.—E. W.—E. P.—E. W. H.—T. G.—H. H. S., with MS.—I. S. D., with drawing.—I. D.—O. H. D.—J. H., with MS. returned. I. P. S.—I. C.—A. H. H—I. B. C. B. A.—G. and G.—E. and I. L. M.—J. R. and Sons.—E. O. P.—E. C. and Son.—A. A.—J. and W.—G. H. G.—I. M. S.—I. K. J.—I. M.—'. S. D.—G. R. and Co.—H. H. S.—O. W. D., with article.—W. P., with photograph &c., of Baptist Chapel.—F. H. H—I. H.—I. A.

Subscriber's inquiry on an overlooked exhibition is inserted in Intercommunication.

Correspondence.

THE ORIGIN OF THE POINTED ARCH.

To the Editor of the Building News.

Sir,—In reply to a short article in your last week's issue, let me remark that M. Viollet le Duc, in his *Dictionnaire de l'Architecture*, discusses the origin of the pointed arch. His explanation is this:—"Architects found that semi-circular vaulting yielded inwards at the crown, and outwards at the shoulders. With a view to remedy this, they raised the crown to a point, and depressed the shoulders to a flatter curve, the resulting section being almost exactly that of the two intersecting segments of circles,—the form which was finally adopted." He bears out his theory by reference to many specimens of vaulting executed during the period of transition, that is, about the beginning of the twelfth century, of which he has taken minute and exact measurements. His careful and logical remarks will be found in vol. 4, pp. 25-31 inclusive, under the head "Construction."—I am, &c.,

Student.

THE WALWORTH COMMON ESTATE COMPETITION PLANS.

Sir,—As a competitor in laying out the above estate, I most strongly protest against the absurd manner in which the guardians have awarded the premiums. I must agree with your correspondent of last week in stating that the guardians have gone directly in the face of their own conditions in every particular. One of the plans, obtaining the first premium, contains several plots short of the number written on it, some plots ranging only 13ft. from out to out, which, deducting half the two party walls, and the passage to the street door, leaves 8ft. 1½in. for a room, the depth of some of these plots being only 35ft., others 40ft. The designs obtaining second premiums have interfered with the workhouse property, have courts arranged totally regardless of light and ventilation, and have houses with no forecourts, when the guardians expressly state in their conditions that all houses are to have forecourts not less than 5ft. deep. So much for the decision of the guardians in this matter. Perhaps it is not too late to rectify the error.—I am, &c.,

F. J. W.

Sir,—As authors of the plans to which the first premium has been awarded, we feel bound to take notice of the remarks made by Mr. Klein in his letter to you of last week. In the first place, Mr. Klein says, "The facts are, that the three prizes have all been awarded to competitors who are connected with the parish." We can most unhesitatingly state that we are not connected in any way whatever, either with the parish or with any of the guardians. The two main roads on our plan are shown 60ft. and 55ft. wide, with the exception of a very short portion of one road, which is 50ft. wide, but this was referred to in our report as only a suggestion. With regard to some of the sites being only 35ft., 40ft., and 45ft. deep, Mr. Klein should in justice have added that those were only in cases where sites are shown for double-fronted houses, making the gardens proportionately wide.

With reference to other remarks made by Mr. Klein, we can only take them as his opinion, from which of course we differ entirely; and we think, with good reason, as the guardians, in their letter to us state, that, after mature consideration of the plans and elevations sent in, they have arrived at the conclusion that, the plans most in harmony with their instructions, and adapted to produce the greatest benefit to the parish generally, were those plans to which they had awarded the premiums.—We are, &c.,

M'Murdie, Rust, Wright, and Rolfe.
61, Kennington-road, S.E., August 5.

The following letter has been sent to the Guardians:

To the Guardians of the Poor of the Parish of St Mary, Newington, Surrey.

Gentlemen,—With reference to the following advertisement, which appeared in the Building News of April 4, 1868, viz.:—

TO SURVEYORS AND ARCHITECTS.

"Walworth Common Estate."—The Guardians of the Poor of the Parish of St. Mary, Newington, Surrey, are desirous of receiving plans for laying out the above estate of about 45 acres in new roads and streets, for the erection of private houses and shops. Premiums for *the best plans* will be given as follows:—For the first, 100 guineas; second, 75 guineas; third, 50 guineas. Further particulars and *copy of instructions* may be seen at the Clerk's office as under, between ten and four. The plans must be sent in to me on or before June 1 next.

By Order, Joseph Burgess, Clerk.
Vestry hall, Walworth, March 26, 1868.

We, the undersigned competitors, beg to state that, having sent in plans and designs for laying out the above estate in accordance with such advertisement in the manner required by the *printed instructions* issued to us, do hereby *strongly protest* against the decision lately arrived at by you, on the grounds of its being both inconsistent with the spirit of your advertisement and printed instructions, and most unjust to us. We complain that you have awarded premiums, especially the two first, for plans *which are not in accordance* with those printed instructions, and also do not comprise the sanitary arrangements *which are required* by the Metropolitan Building Act, whilst many of the rejected plans have fully complied with the instructions *and are* in accordance with the act. We are also not satisfied with the third premium awarded.

We therefore respectfully call upon you to appoint a professional gentleman of high standing and character to act as arbitrator, and decide upon the merits of all the plans sent in, and we further suggest that we may be allowed separately to explain our plans and designs before such professional man, and we shall then be perfectly satisfied with his decision.—Awaiting your reply,

We are, gentlemen,
Your obedient servants,

H. M. Burton, 14, Spring-gardens.
Thomas Edward Knightly, 106, Cannon-street, E.C.
Banister Fletcher, 7, Guilford-street, Russell-square.
Frederick A. Klein, C.E., 110, Cannon-street, E.C.
Lee and Walton, 6, Great College-street, N. W.
Arthur C. Pain, C.E., 7, Parliament-street, S.W.
A. A. Freeman, 25, St. Aubyns-road, Upper Norwood.
Thomas Jewell, 2, Cottage-green, Camberwell.
Richard Hopton, 2, Stanstead-road, Forest-hill.
W. H. Rawlings, 1, Walton-terrace, Palace-road, Upper Norwood.
A. G. Humell, 22, Southampton-buildings, Chancery-lane.
Ward and Usill, 10, King-street, Soho, W.
W. B. Moffatt, King-street, Whitehall.

EXHIBITION OF STUDENTS' WORKS, KENSINGTON MUSEUM.

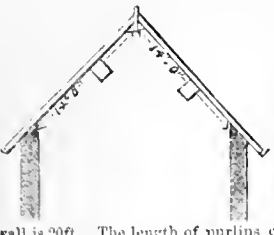
Sir,—This third article on the above works comprises a few remarks on the drawings, and the names of the successful competitors in the following stages, viz.:—(8 b 2) from the antique shaded; (9 a) anatomical studies; (13 a) painting from still life; (17 b) painting the human figure from nature, and a few other stages of less importance. It may be remarked that the above stages constituted the School of Art in its primitive condition; and I hope, but undoubtedly in vain (as long as the artistic fair sex exist), that some of them—such as painting dead birds and single flowers—will be erased from the catalogue. Let Manchester give us a few designs for articles of manufacture worthy of more importance than painting dead ducks, decayed leaves, pitchers, old baskets, and other such things, for which that school alone has this year been awarded one gold medal and four silver ditto, and, I believe, some bronze ones, to say nothing of prize books. The paintings from the group are undoubtedly all very good, both as regards their composition and colour, especially in the case of Mr. Bancroft, who, as an artist, deserves the highest praise. The following is a list of students to whom the authorities have thought fit to award prizes:—E. Bancroft, painting from the group; C. Murray, a drawing from the antique; and C. Locke, a large drawing from the cast—each having received the gold medal. The silver medal has been awarded to the following:—Miss Malcolm, from the group; W. Abbot, for drawing four flowers; Miss Southworth and Miss Ogden, still life; H. Foster, from antique; C. Johnson, a head from life; W. Oliver, from the antique; and to J. Noble, for an anatomical study of the figure. The bronze medallists are—Miss Bowser, E. Bancroft, and Miss Ramery, for drawings from the antique. W. E. Bancroft has also a bronze medal for a portrait study; Miss Haywood for a portrait; Miss Armitage, a study of flowers; T. Pearson, for painting two onions; Miss Jones, C. Gibson, and F. Seymour, from the group; Miss Freeman, for a water colour study of a few pears; Miss Mason, a head of a flower; H. Grant, a study of deal boarding with a dead pheasant; J. Robertson, C. Rough, and R. Thomas, from the east; and to W. Rhodes, for an anatomical study of human feet. Prize books having been given to such a number, I will not encroach on your space by mentioning the names. There are a few landscapes both in oil and water, but that branch, not being encouraged by the authorities, is far in the rear. The sculpture or modelling having been so fully and justly criticised by yourself, I make no comment upon it.—I am, &c.,

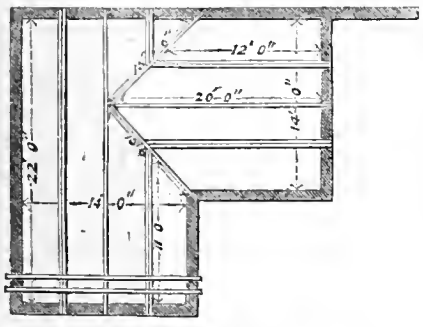
H. A. G.

Intercommunication.

QUESTIONS.

[951.]—ROOF OF NORWAY AND CHRISTIANA SPRUCE.—I have a gable roof to construct of Norway or Christiana spruce, and would feel much obliged if any of your mathematical readers could furnish me with formulæ and data for calculating the dimensions I should give the timbers. The length of ridge, clear of walls, is 22ft., and the length of the other from top of valley to outside of wall is 20ft. The length of purlins clear of bearings, and of spars and valley pieces clear of ditto, are as figured. The covering materials are slates. Required, formulæ for





calculating sizes of ridge-piece, spars, purlins, and valley-pieces. The spars are laid 13in. from centre to centre, and spiked to bond timber.—ENQUIRER.

[952.]—AN OVERLOOKED EXHIBITION.—In the article on this subject in the *Daily News* of the 31st ult., it is stated, in describing the "Iodia Mill," at Darwen, near Blackburn, in which the exhibition is being held—"It is built in the Italian style, and its chimney, which is 100ft. high, is worth a journey to see; its splendid proportions and fine design have no parallel in Europe." Now, if this be a correct description of the shaft, I should be very glad to see an illustration of it in the BUILDING NEWS; or if any sketches of it have already been published, perhaps some of your readers would be kind enough to state where such may be obtained?—SUBSCRIBER.

[953.]—DIMINUTIVE ECCLESIASTICAL EDIFICES.—I should feel obliged if your correspondent who furnished an account of the restoration and re opening of "The ancient little church at Frinton, Essex, the smallest, it is said in England," under heading of churches and chapels, last week, would oblige me and your readers generally with the dimensions thereof. In accordance with the general belief, I have hitherto considered the church of St. Lawrence, Isle of Wight, to be the smallest in England. The dimensions are set forth in the following doggerel, taken from a guide book, and imputed to John Green, the ex-parish clerk:—

"Its breadth from side to side above the bench
Is just eleven feet and half an inch,
Its height from pavement to the ceiling mortar,
Eleven feet, four inches, and a quarter;
And its length from east to the west end—
I tell the truth to you, you may depend,—
'Twas twenty five feet, four inches, quarters three;
But now 'tis forty feet, as you may see.
In eleven hundred and ninety-seven,
'Twas built that we might know the way to Heaven."

It seats 107 people. Although enlarged in 1842 it may still truthfully warrant its general appellation.—F.

[954.]—PRINCE CONSORT MEMORIAL FUND.—You or one of your readers would greatly oblige me by the name and address of the secretary to the National Memorial to the late Prince Consort in Hyde Park.—A. T. NUTT, Windsor.

[955.]—STANDARD CHAINS.—I wish to ask, through your columns, what is the standard surveying chain in France which answers to our Gunter's chain.—A BEGINNER.

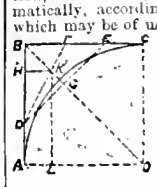
[956.]—SHORING-UP HOUSES.—Can any of your contributors to "Intercommunication" help me in the present difficulty? I have to shore up a couple of houses about 60ft. apart, and the shoring must be done above the ground, as there is not an inch of space available for poles or other timbers. I cannot get balks 60ft. long, and am at a loss to know how to proceed.—CONTRACTOR.

[957.]—TO PREVENT NOISE IN WORKING A BOX LIFT.—I should feel greatly obliged if any of your correspondents to "Intercommunication" would give me an idea of the means I should adopt to mitigate or stop the noise in working a single box lift. The noise is greatest when the box is only lightly loaded, and proceeds mostly from the swaying of the rope which is attached to the box while descending.—W.

[958.]—REMOVING LIMEWASH FROM BRICKWORK.—I shall be glad to learn, through your "Intercommunication" column, of a simple method by which lime whiting or colouring may be removed from the face of brickwork, so as to restore the original red colour.—M.

REPLIES.

[909.]—CENTRE OF GRAVITY.—I am much obliged to "Q. E. F." for his geometrical method of finding the centre of gravity K of the semi-arch. I find, by calculation, that the lengths of the lines in calculating it mathematically, according to his solution, are as follows, and which may be of use:—

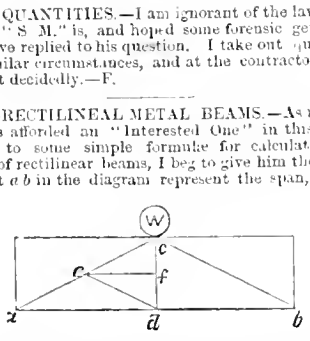


Let radius = A O = A B = 1.
B E = B D = .655.
B F = F E = .3275.
D E (equalising line) = .926.
D F = .782.
B G = .463. G O = .951
B K = .309.
H K = A L = .2183.
H A = K L = .7816. X + Y.

[919.]—FLUSHING HOUSE DRAINS.—In reference to the inquiry of "Tim" as to a method of flushing house drains, I may mention two plans, both of which I have adopted. When I have found a foul smell from my drains, I have taken that opportunity of cleansing my cistern. This should be done just before the water company's supply is turned on, so that when the cistern is emptied it may immediately be replenished. However well covered a cistern may be, it is requisite that it should be occasionally well cleansed, so as to remove all deposits. To this end I lift up the overflow pipe, and thus flush the drains and cleanse the cistern at the same time. I very often cleanse the kitchen boiler by taking several buckets of hot water and pouring them down the sink. This has the effect of removing lumps of grease, which often form the nucleus of offensive matter. As servants will not attend to these things I superintend it myself, and am never troubled with offensive smells from drains. Of course, I have taken special care that all my traps, pipes, &c., are of the best kind and properly fixed. I cleanse my cistern monthly. The other plan is what I call a tippling cistern. It is in use at Derby for the flushing of public water-closets, and effects a great deal of work with a moderate expenditure of water. It is a large vessel hung upon a pivot, and so constructed that when it becomes nearly full it tipples over and empties the whole contents down the flue or pipe where it is wanted. When emptied it regains its place. It is filled by a small screw-down cock, which may be turned partially or wholly on, according to the necessities of the case. I have had a small vessel of this kind constructed, holding about three gallons. This is placed in an enclosed place under my sink, so that all the liquids committed to the sink flow into it, and thus the water is emptied into the drains in a volume and not by driblets. I think I have seen a box of this description made for sale by Mr. Crump, of Derby; but it is so simple a matter that any zinc worker or tin man can make it.—JIM.

[930.]—QUANTITIES.—I am ignorant of the law on the point, as "S. M." is, and hoped some forensic gentleman would have replied to his question. I take out quantities under similar circumstances, and at the contractor's own risk, most decidedly.—F.

[931.]—RECTILINEAL METAL BEAMS.—As no information is afforded an "Interested One" in this week's issue as to some simple formulæ for calculating the strength of rectilinear beams, I beg to give him the following:—Let *a b* in the diagram represent the span, and *c d*



the depth of the beam or girder. Draw *a c* and *c b* and *e a* parallel to *c b* and the horizontal line *e f*. Taking *c d*, equal to the load on the centre (which is half the distributed load), *e f* will equal the horizontal strain caused there by compression on the top and tensile on the bottom flange. These lines, *c d* and *e f*, are proportional to the depth and one quarter the span of the beam. Thus, the following rule is deduced, in words:—as depth : half span : : half load on centre : horizontal strain; or $\frac{W\ L}{4\ D}$. W being load in tons, L span in inches, D depth in inches. For a cast-iron beam taking 6½ tons as the ultimate tensile strain per inch, the formula for finding area of bottom flange would be $\frac{W\ L}{26\ D}$, and for breaking weight $\frac{a\ D\ 26}{L}$, *a* being area of bottom flange. The relative value of tensile and compressive strains on cast iron being as 6 to 1, the bottom and top flanges must bear this proportion. The safe load is about one-third for a dead and one-sixth for a moving load. In a wrought iron beam, taking 20 tons per inch as the ultimate strain, we get $\frac{W\ L}{80\ D} = a$ and $\frac{a\ D\ 80}{L} = B\ W$, with the area of bottom and top flange in the proportion of 11 to 12; bearing in mind that on the top flange the rivets take their portion of the strain, whilst on the bottom flange deduction must be made for them. Another and readier method of finding the strain is to treat half the beam as a lever, *a d* being the long arm and *c d* the short arm, with half the load on centre applied as a force at *a*. Thus,—

$$\frac{W}{2}\ \frac{a\ d}{c\ d} = \frac{W\ L}{2\ D} = \frac{W\ L}{4\ D} = \text{horizontal strain.}$$

It is customary in practice to take D, the full depth of the beam, and ignore the middle web. The more accurate way would be to divide the sectional area into two parts, bearing a proportion to each other equal to the relative values of the compressive and tensile force capable of being resisted by the material of which the beam is composed, and to take D, equal to the distance of the centres of gravity of each part. In applying these formulæ to unflanged beams the latter course is absolutely necessary.—J. L. G.

[931.]—The description of cast-iron beam to which "An Interested One" alludes is, I imagine, accurately represented in fig. 1, and the formula for obtaining its strength is very simple. Let A equal the area of the bottom flange in square inches, L the span of the beam in feet, and D the depth, also in feet. Then the breaking weight at the centre is found by the formula deduced by Mr. Hodgkinson; $W = \frac{A \times D \times C}{L}$. The value of C is 26, where the areas of the top and bottom flanges are in the proportion of about 6 to 1. The beam will bear twice this weight distributed over it. As an example, let the breadth of the bottom

FIG. 1

FIG. 2

flange be 12in., and its thickness half an inch; then, supposing that there are no bolt holes, the area or value of A will be 12 × ½ = 6 square inches. Let the span be 20ft., and the depth 1ft. 6in.; then our calculation for the breaking weight at the centre is $W = \frac{6 \times 1.5 \times 26}{20} = 11.75$ tons.

The breaking weight uniformly distributed over the beam will therefore be in round numbers 23 tons. About one-sixth of this weight may be put upon the beam in practice; therefore 4 tons would be the safe working load in this case. To answer the second part of your correspondent's question we may use the same rule, but must employ a different constant or value for C, which will depend upon the kind of wrought iron to be used. In the kind shown in fig. 2 we may take C = 75, and the problem to be solved is—Given the same conditions as above, what is the value for A? Now W = 23 tons, and, inverting the formula, we have $A = \frac{23 \times 20}{75 \times 1.5} = 4$ square inches. This beam would be able to bear the same breaking load as the other, but we may load it in practice with more than the other, and might safely put 5½ or even 6 tons upon it.—GIRDER.

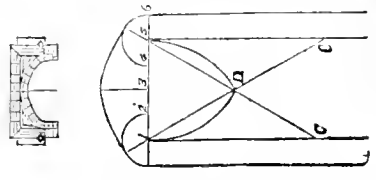
[935.]—REMOVING OLD STAINS AND VARNISH FROM FRAMEWORK.—Let me inform your correspondent that the only effectual way of cleaning the surface of woodwork is to have it scraped thoroughly and repolished. No washing of any kind will accomplish the purpose, and in many instances will only make bad worse.—S. M. P.

[939.]—ORNAMENTAL WATER.—"Hydraulic's" pond would contain about 6,000 gallons.—F.

[940.]—CAST-IRON PILLARS.—Three solid cast-iron columns, 3½in. diameter at the top and 4in. at the base, will be amply strong enough to carry 14 tons, as I have calculated them to a tenth of their breaking weight. There should be an 8in. square cap to a 9in. square base cast on each. I should suggest that they be solid, as the saving of metal in hollow columns of such small dimensions would hardly compensate for the extra expense of having cored castings.—GEO. C. WALTERS.

[940.]—Columns of ½in. metal, 4in. external diameter, would be sufficiently strong.—F.

[942.]—TUDOR ARCHITECTURE.—For the information of "Student," I beg to give a method of drawing the Tudor arch. Divide the width into six equal parts. Draw



the haunch arches from the centre 1 and 5; then describe the arcs 1 D and 5 D; draw straight lines from 1 and 5 through D; continue them to meet the perpendiculars at C C; then C C are the centres to finish the arch. This kind of arch is considered strong.—HOWELL.

[945.]—PAPERHANGERS' WORK.—A piece of paper is 21in. wide, 36ft. long, and contains 7 square yards, or 63 superficial feet. It is customary to allow one piece in every ten for waste. In small patterns, however, this is seldom necessary. French papers vary very much in length and breadth, depending upon the quality; but are generally 18in. wide, and 28½ft. long, containing 4¾ square yards, or 40½ superficial feet. A dozen of borders is 12yds., or 36ft. run. To find the number of pieces of paper to cover the walls of a room, ascertain the number of superficial feet of wall; dividing the same by 9, brings it into superficial yards, and this divided by 7 gives the number of pieces required.—PAPYRUS.

[945.]—Paper for walls and hanging is charged by the piece of 12 yards, and 20in. wide. Find the surface of the walls in feet, and divide by 5 for the number of yards run of paper, which again divide by 12, or by 60 in one operation, will give the number of pieces. Odd yards are charged as one piece. Take in the same manner and charge extra at per piece:—Pumicing and preparing the walls, lining paper and hanging the same; take borders and hangings at per dozen yards run. 4¾ square yards one French piece. French papers vary much in length and breadth, depending upon the quality, but are generally 9¾ yards long and 18in. wide. It is customary to allow 1 in 7 on ordinary papers, and 1 in 6 on satin and other expensive papers for waste.—F.

[945.]—In an excellent little work on quantities and measurements, by Mr. Beaton, we find the following practical directions:—Multiply the round of the room by the height, with all additions and deductions of doors, windows, etc. Divide by 9 to bring to yards, and then by 7 to make pieces. Do the same with lining paper, but with satin and dear papers divide by 6 instead of 7, as there is more waste in those kinds. Calculate all "borders" by the run of a dozen yards.—SURVEYOR'S CLERK.

[945.]—To find the number of yards running, or pieces of paper there are in a superficial quantity, divide the number of superficial feet by 5, which will give the number of yards, then divide the yards by 12, and the quotient will be

the number of pieces required. If any odd yards remain they are considered and charged as one piece. A piece of paper is generally considered to be 12 yards in length and 21in. wide, containing 7 square yards, or 63ft. superficial. It is customary to allow one piece in seven for waste. In small patterns the waste will be less. There are 4½ yards in a French piece; they vary much in length and breadth depending upon the quality, but are generally, 9½ yards long, and 18in. wide. "A Small Builder" should consult a "Builders' Price Book." The above is extracted from Laxton's.—J. J.

[946.]—BALTIC TIMBER.—Memel is, in size, the most useful of the Baltic timber for general use; Riga is superior in quality; Dantzic, if clear of dead knots, is the strongest; and Swedish is the toughest.—P. T.

[947.]—CLAY WALLS.—Clay for building should be a clay marl. If the clay is of indifferent or bad quality, chalk and road grit should be incorporated with it in proportions dependent upon its quality. With moderate clay, two tenths chalk and one tenth road grit will be found ample. The clay and chalk should be beaten to pieces by a heavy prong, and the stones picked out, and should then be formed into a circular bed of (say) one foot in depth and 18ft. or 20ft. in diameter. This bed should be well watered and trodden by horses, and while being trodden short straw should be scattered upon it with a fork, and a man should be employed to turn it over well, so as to bring it all in turn under the horses' hoofs, and a sufficiency of water should also be supplied. The clay should be well trodden, and afterwards rounded up and covered with straw until wanted. When used, it is somewhat moister than brick earth for mouldings. Walls of this description cost £2 5s. 4d. per rod.—J. E.

STATUES, MEMORIALS, ETC.

THE statue of the Duke of Cumberland in Cavendish-square has long been in an unsafe and dilapidated condition. The Duke of Portland has offered to have it re-cast at his own expense, and the Marylebone Vestry have accepted the offer.

A statue of Bernard Palissy has been executed for his birthplace, Saintes, by M. Taluer, and was inaugurated on Sunday last.

The statue of Lord Clyde was unveiled in George-square, Glasgow, on Wednesday. It represents the hero in undress uniform. He stands erect, with one foot advanced, resting his left hand, which grasps a telescope, on the stump of a tree, while his right, hanging by his side, holds an Indian helmet. The statue, which is in bronze, has been executed by Mr. J. H. Foley, R.A., London, at a cost of £1,200.

LAND AND BUILDING SOCIETIES.

THE first general meeting of the shareholders of the United Land Company was held last week. The directors have secured two highly eligible estates in East Surrey and Middlesex, and due notice will be given when these two estates are to be offered for sale.

On Monday evening, a soirée of the Manchester and Salford members of the Artisans, Labourers, and General Dwellings Company, Limited, was held at the Trevelyan Hotel, Manchester. The principal objects of the society (of which the Dean of Westminster is the president) are to provide the working classes with healthy and substantially-built dwellings, and to enable householders to convert their rent into purchase money, and so to purchase the houses they live in. There is a local council for Manchester and Salford, on which are the three hon. gentlemen who represent those boroughs, and to suit the Salford shareholders the company has secured a plot of land in Phœbe-street, Salford, where the building of improved dwellings for workmen will shortly be commenced. At the meeting the chair was taken by Mr. R. D. Rusden, and the assemblage, which was a numerous one, was addressed by a deputation from London, who explained the nature of the society's objects, and gave statistics as to its operations.

LEGAL INTELLIGENCE.

ACTION AGAINST THE OLDHAM CORPORATION FOR DEFECTIVE SEWERAGE.—This was an action brought by the plaintiffs, Messrs. Buckley and Procter, against the Mayor and Corporation of Oldham, to recover damages for injuries which had been occasioned to certain drapery goods in consequence of the negligence of the defendants in not keeping their drains in proper condition. The plaintiffs were drapers carrying on business at Mumps, which is part of the town of Oldham. On July 10, 1867, the town was visited by a heavy downfall of rain, and owing, as was alleged, to the defective character of the drainage, the plaintiffs' cellars were flooded, and a quantity of drapery goods which were stored therein considerably damaged. The town was originally drained by an old sewer, which terminated in Albert-street; but after the borough was incorporated, an act of Parliament was obtained by which the Corporation obtained powers to lay down a new system of drainage. The Corporation of Oldham borrowed considerable sums of money for the purpose of laying down a new system of sewerage; but those sewers were not only very badly planned, but also very badly constructed. They were wholly inadequate, even in cases of a very moderate downfall of rain. The corporation were bound to provide for the maximum amount of rainfall, but the counsel for the plaintiffs stated that the rainfall on July 10 which caused the damage complained of, was only .66 or .67, which was very much below the amount that had previously fallen. At the conclusion of the opening statement, the Lord Chief Baron said he did not think that any useful result could be obtained by trying the case. It was no doubt the duty of the Corporation to place the sewers in a proper condition. They might go on from time to time, case after case, and litigation after litigation, without, after all, coming to any satisfactory conclusion. It appeared to him that the proper course would be to refer the matter to some competent person to examine the sewers, and the question of liability would of course depend upon his award. The plaintiffs electing to take the opinion of the jury a verdict for the plaintiff was returned subject to reference.

NOTICES OF BOOKS.

Examination of a Report by Robert Rawlinson, Esq., C.B., to the Walton Local Board, on Messrs. Reade and Goodison's plans for the sewerage of the township of Walton. By READE and GOODISON, Civil Engineers, Liverpool.

IN publishing this examination of Mr. Rawlinson's report the author states they are prompted by a desire to let the public judge between the relative merits of the sea outlet proposed by the West Derby Board, and recommended by Mr. Rawlinson (as described in the BUILDING NEWS of July 3, 1868) and the one they propose along the course of the River Alt, in which utilisation by irrigation forms an essential part of the scheme. They allege that on the strength of a promise made by the chairman of the West Derby Board to the Walton authorities, to consider impartially any scheme which the latter board might lay before him, they received instructions to combine with the sewerage plans which they were then preparing for the Walton district, a joint scheme of outlet sewers with West Derby for the disposal of the sewage of both townships. The plans were accordingly completed and submitted to Mr. Rawlinson for him to report thereon, but, on the 29th of June, much to their surprise, at a public meeting held at the West Derby Board room, he, before sending in his report to the Walton Board, recommended the inhabitants of West Derby to decide at once upon the sea outlet. In his subsequent report to the Walton Board he recommended that body to join in the outlet scheme he had advocated at West Derby, and then at some future time, having secured a permanent means of preventing river pollution, to grant a concession of the sewage if it were applied for. In consequence of Mr. Rawlinson's opinion, the West Derby Board have resolved not to entertain the scheme proposed by Messrs. Reade and Goodison, and they, feeling that both themselves and the Walton Board have not been met with courtesy or good faith, are not prepared to let the utilisation question drop, until the public have had an opportunity of expressing an opinion upon it. The principal difficulties apprehended by Mr. Rawlinson in the application of sewage to land are, obtaining "a suitable soil, appropriate seed, fine weather, and economical manipulation." To these, Messrs. Reade and Goodison reply that when shown the ground upon which they proposed to operate, his opinion of it was favourable, both as to its capacity and its cost, that with regard to suitable seed, fine weather, and economy of management, the difficulties on their account are common alike to all farming operations. "Sewage irrigation," says Mr. Rawlinson, "must be a speciality if it is tied up with the absolute disposal of the entire sewage of any district." This statement the author of the pamphlet before us cannot reconcile with Mr. Rawlinson's own recommendation in a paper read by him before the Society of Arts, March 21, 1862:—I do not advocate the pollution of rivers, but the application of sewage to land for agricultural uses. If it will not pay in some cases as a commercial speculation make it compulsory, and pay the cost by a rate." The fact appears to be that, while generally in favour of utilisation, Mr. Rawlinson is of opinion that in the present case the outlet scheme would be more advantageous. This proposition Messrs. Reade and Goodison controvert at some length, and conclude by expressing their conviction that the proposed Rimrose outlet, if carried out, will prove a costly and gigantic blunder.

Works in Iron. By ANDREW HANDYSIDE and Co., Britannia Ironworks, Derby, and 32, Walbrook, London. Illustrated by photographs. London: E. and F. N. Spon, 48, Charing Cross, 1868. (Copyright.)

IT is often asserted that the constructive element is so strong in the engineer, the idea of the useful is so predominant in his mind, as to exclude nearly every other consideration that might concern the display of æsthetical principles. To some extent the statement is correct. Many years ago, at the first introduction of iron, before it assumed the position it now occupies as the chief material for construction, its application was necessarily limited to those examples which did not admit of any architectural treatment. But with the extended—we may say, universal—use of iron, instances are constantly presenting themselves in which it can be employed with considerable good taste and æsthetical effect. Consequently the assertion, which was perhaps really true when first put forward, is now no longer so, and every day tends to detract from its former veracity. In the little volume to which we allude in our present notice, the whole question of the application of cast and wrought iron to the purpose of construction and ornament is fully gone into. As will be readily understood, the same quality of iron is not always required for every different description of work. There is no necessity for insisting in a stringent specification that iron bars and plates should bear so severe a strain as twenty-four or twenty-six tons per square inch of sectional area, where a tensile strength of twenty to twenty-two tons will meet all the requirements of the case. This subject is well explained in Messrs. Handyside's little treatise, and the distinction where iron of a less tensile strength may be used is clearly defined. Several photographs illustrate the bridge work, both native and foreign, executed by the firm, and their colonial truss bridge, designed for rapid and easy erection abroad, is not only practically but also theoretically sound. The design is correct in principle and practicable in execution.

Passing on to roofs, we find the Agricultural Hall in London, the Amsterdam station of the Dutch Rhenish Railway, the Broad-street station of the North London line, and several other large and important works executed by the firm. The truss principle is that usually selected, as it offers the greatest facility for the employment of iron in those particular examples, and also presents a pleasing effect to the eye. The trussed, or open roof, bears the same analogy to the heavy massive timbers of olden times as the lattice girder does to the solid-sided system. In engines the Derby firm have supplied the power requisite for the Maidstone Waterworks Company, and also put up winding engines of very large dimensions for the Moira Colliery in Leicestershire. Pumping, mining, and hydraulic machinery is also manufactured upon a large scale at the Britannia Ironworks. It is a pity the operation of making lead pipes, which is carried on by the firm, was not more fully described in the volume, although there was probably no space available for so doing. The process is very peculiar, and illustrates in a remarkable manner the conclusions arrived at by M. Tresca respecting the floors of solid bodies. After perusing with much satisfaction that portion of the treatise relating to the constructive, we pass on to the part embracing the ornamental. We here find that the same material which can be cast in proportions sufficiently massive to resist the passage of the heaviest locomotive, can be made to assume all the delicacy and lightness of filagree work. Vases, fountains, lampposts, pillar letterboxes, gates, railings, and other examples bear witness to the almost Protean character of cast and wrought iron. Useful for reference, handy as a guide, and reliable as an authority upon estimates, the engineer, architect, and all those concerned in designing and erecting structures and buildings will find Messrs. Handyside's *brochure* valuable in their office. When it is considered how very seldom it occurs that any large work is executed at all within the original estimates, any reliable data upon which to frame them is of more service than all the drawings and theory that could be put together.

Our Office Table.

The general summer meeting of the Leicestershire Architectural and Archæological Society will be held at Kegworth in the last week of August.

At a meeting of the St. Pancras Board of Guardians on Thursday week a letter was read from Mr. Robins, architect, asking, as a favour, the return of certain designs for the proposed enlargement of the workhouse. As Mr. Robins had been paid his commission by the Guardians on the abandoned plans, the application was refused, except as to the designs for which payment had not been made.

The manorial rights over Peckham-rye, Goose-green, and Nunhead-common have, according to a local paper, been bought by the Camberwell Vestry for £1,000. These pieces of ground will, therefore, be preserved as parks or recreation grounds.

The sum borrowed by the Metropolitan Board of Works, since its formation, amounts to £8,073,000. Of this sum £400,000 have been required for the Covent Garden approach and the Southwark and Westminster communication: £4,200,000 for main drainage, and £2,480,000 for the Thames embankment. The sum already paid off is £1,520,633 6s. 8d.

M. Depleechins, who is at present engaged in the decoration of the New Opera House at Paris, has been commissioned by the directors of the Lyons and Mediterranean Railway to paint for their principal station four pictures, each 9 metres long by 5 metres in height, representing the four great towns on their line—Paris, Montpellier, Marseilles, and Geneva. It seems that, out of England, even railway stations are thought worth decorating, and with something more artistic than aristocratic-looking figures enveloped in "A. Lyne's 20s. overcoats."

Dean Stanley deprecates the suggested removal of St. Margaret's Church, Westminster, and recommends the addition to the abbey of a cloister, which should be connected with the abbey by Poet's-corner, and continued on the space behind Abingdon-street, facing the Palace of Westminster on one side and the College garden of the precincts of Westminster Abbey.

At the examination held by the Institute of British Architects on Thursday and Friday last, the following gentlemen were recommended for certificates of competency for district surveyorships:—Mr. Arthur Allom, Mr. Robert C. James, Mr. Lacy W. Ridge.

As usual, says the *Pall Mall Gazette*, the English public will become very talkative, if not very wise, over the Manchester catastrophe. No professional men seem to be so stupid as those planners and copiers who call themselves architects. It is all the more unfortunate that the Government should not bestir themselves on behalf of the public, and decide once for all that ill people will crowd and cram themselves into theatres, music-halls, and meeting houses of various kinds, the means of egress therefrom shall be of the amplest possible character. It is surely as easy to determine how a few thousand people may get out of a public building in five minutes as it would be to regulate and compute the emptying of a cistern of water through orifices around its edge; but this has not been thought of for centuries. Ancient Roman buildings might have supplied a hint to our architects, but it has not been taken. And at the present moment there is not a hall or theatre in London in which, when full, if a panic arose from fire or false alarm, less than a dozen people would certainly be killed. There is the Alhambra, for instance, a music hall of a singularly inflammable character, with flaring gas, tipsy smokers, and everything tending to promote combustion, and yet with, practically, only a single narrow and inconvenient exit. One shudders to think of what may happen there any night. If the threatened artisan is to appear in the new Parliament, let us pray that he may be a skilled bricklayer.

The special gas committee of the corporation of London have presented their report. They review the legislation of the past session, which, combined with the determination of the Metropolitan Board of Works to construct a solid embankment at Blackfriars, it is hoped will ultimately lead to the removal of the gas works from the neighbourhood of the Temple. The committee of the corporation were appointed in October, 1865, and the supply of gas was then regulated by the Gas Act of 1860, which fixed the illuminating power of common gas at 12 candles, and the price at 4s. 6d. per 1,000 cubic feet. The present price and illuminating power are 4s. and 14 candles, but in 1870 they will be 3s. 9d. and 16 candles. The price of cannel gas of 20 candles will also be reduced from 7s. 6d. to 5s. 6d. per 1,000 cubic feet to a rate proportional to the price of 3s. 9d. for 16 candle gas. There are provisions in the new act under which the price of gas and its illuminating power may, after January, 1870, be diminished or increased, but the committee are confident that if any change were made it would be by way of reduction in price. The committee, in conclusion, congratulate the Court of Common Council on the satisfactory termination of the contest in which they have been engaged during three sessions of parliament, and they believe the result of their labours will be to secure an abundant supply of gas of high illuminating power at a moderate price.

Mr. T. C. Clarke, late the assistant engineer to the borough of Portsmouth, has been appointed, out of 71 candidates, surveyor for the city of Oxford.

The third general meeting of the Architectural and Archæological Society of Durham and Northumberland was held on Thursday week at Blanchland. After visiting the Church of the Premonstratensian Canons, and other places of interest, the party proceeded to Shotley Bridge to dine, afterwards returning to Newcastle.

A correspondent calls attention to the shameful state of the Adelphi dark arches. The pestilential vapours which arise daily and nightly from these arches are enough to foster epidemic diseases. He calls on the Board of Health of the parish of St. Martin's to interfere, both for the sake of their own credit and the public health.

Mr. Henry Jarvis, surveyor of sewers to the Newington Vestry, has tendered his resignation, assigning as his reason for so doing the great increase of work lately thrown upon him.

The premiums for laying out the Walworth Common Estate have been awarded as follows:—Messrs. M'Mardie, Rust, Alfred Wright, and J. P. Rolfe, the first premium of one hundred guineas; Messrs. Jarvis and Son, the second premium of seventy-five guineas; and Mr. J. T. Lepard, the third premium of fifty guineas.

An International Congress of Archæology and History has been organised by the Society of Antiquaries of the Rhine, and is to be held at Bonn from the 11th to 21st of September, under the honorary presidency of Prince Frederick William of Prussia and the presidency of Herr Nöggerath, president of the society, and Herr von Quast, keeper of historical monuments in Prussia. The regulations are similar to those for the International Congress held last year at Antwerp. German is to be the official language of the meeting. There are to be three sections; primeval antiquities, pagan antiquities, and antiquities of the Christian era. In connection with the Congress, an exhibition of objects of art and antiquity (selected from special collections or churches which are little known and of peculiar interest) will be held. The churches of Schwarz-Rheindorf, Heisterbach, and Cologne will be visited, and excursions to various places of interest will be made. Persons wishing to take part in the Congress should address to the President of the Society of Antiquaries of the Rhine, at Bonn.

A new diamond drill for perforating rocks has recently been constructed by the Windsor (U.S.) Machine Manufacturing Company. Instead of setting the diamonds in the form of a ring, which when rotating forms a cone, and has proved a failure, the diamonds are so set as to form a solid drill head, cutting the full size of the hole. The drill is worked by a small oscillating steam engine, connected with the drill carriage. It is said that 500ft. have been bored in granite, marble, and quartz with one drill head, without the slightest appreciable wear in the diamond points.

Nothing is so charming and refreshing to the eye as an harmonious arrangement of colours. They are "like a sweet chord of music to the sense." The hand of nature never errs, whether it brings together scarlet and crimson, as in the cactus; scarlet and purple, in the fuschia; yellow and orange, as in the calceolaria; or the colours in the various plumage of exotic birds—the harmony is always beautiful, ever perfect. I will suggest a few contrasts:—1, black and warm brown; 2, violet and pale green; 3, violet and light rose colour; 4, deep blue and golden brown; 5, chocolate and bright blue; 6, deep red and gray; 7, maroon and warm green; 8, deep blue and pink; 9, chocolate and pea-green; 10, maroon and deep blue; 11, claret and buff; 12, black and warm green.

The new American railway constructor, which was described in the BUILDING NEWS some time since, is said to work very well in the States at a rate of about one mile per day. The chief contractor of the road gives it as his opinion that when the machine is improved by making a few changes in the method of handling rails and ties it will be able to put down five or six miles per day. This will render it possible to lay down track twelve times as fast as the usual rate by hand, and it will do the work at less expense.

Trade News.

TENDERS.

READING.—The town council of Reading have just received tenders for the erection of a new bridge over the Thames connecting the boundary of the borough with the village of Caversham. There were twenty tenders submitted, the highest being £13,400, and the lowest £5,995. The latter, by Messrs. Shaw, Head and Co., Cannon-street, was accepted. It is expected that the bridge will be completed by the end of the autumn.

BRIGHTON.—For alterations to shop in Black Lion-street, Brighton, for Messrs. Holders. Quantities supplied by H. Lansdown and Co. Messrs. Goulty and Gibbins, architects, London and Brighton:—

H. Parsons	£712
J. T. Chappell	681
G. Cheesman and Co. (accepted)	668

CHELTENHAM.—For the erection of the County Court and Offices. Mr. T. C. Sorby, architect:—

Billings and Sons	£6300 0 0

FITTLEWORTH.—For works at Fittleworth Rectory, for the Rev. — Cattley. Messrs. Waring and Nicholson, architects:—

King, Fittleworth	£412
Nightingale, Lambeth	359
Habbing, Petworth	348

HACKNEY.—For alterations, repairs, &c., to the Hackney-road Wesleyan chapel. John Tarring, architect, 69, Basinghall street, London:—

Dunn and Sons	£593
Sulman	591
Hill and Sons	549
Saunders	530
Hall	450
Shurmur	444

LONDON.—For alterations and additions to premises, Hampstead road, for Mr. Oetzmann. Mr. C. Eales, architect:—

Corsman	£3700
Bywaters	3653
Fish	3513
Clark and Co.	3400
Mudey and Rogers	3287
Mann	3275
Scrivener and White	3027
Kelly Brothers (accepted)	2974

WALTON-ON-THAMES.—For villa residence. Messrs. Bacon and Bell, architects:—

Jackson and Shaw	£3085
Patman and Fotheringham	2998
Nicholson	2980
Francis	2949
Higgs	2923
Sharpington and Cole	2877

WHALLEY (Derbyshire).—For the erection of a school &c., for the Rev. T. C. Hills. Mr. S. Rollinson, architect:—

Mason, &c.—Wragg and Dearnly (accepted)		£200
Joiner, &c.—Langley	,,	190
Slater.—Marjerrison	,,	30
		£420

COMPETITIONS.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HALIFAX.—Extension of time.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

STOKE-UPON-TRENT.—August 13.—For the erection of a new manufactory. C. Lynam, architect, Stoke-upon-Trent.

NOTTINGHAM.—August 18.—For the erection of a new bridge over the river Trent. W. Enfield, public offices, Nottingham.

GRANTHAM LOCAL BOARD.—August 11.—For the construction of sewers, &c. H. Beaumont, clerk, Grantham.

ABINGDON (Berks.).—For the erection of a boys' and girls' school. E. Dolby, architect, East St. Helen's, Abingdon.

LONDON, BRIGHTON, AND SOUTH COAST RAILWAY.—August 11.—For the construction of a locomotive running shed, &c., at Battersea. A. Sarle, London Bridge Station.

PORTSMOUTH.—August 22.—For laying down, constructing, and finishing various brick, pipe, and cast-iron sewers. S. J. Elliott, clerk to the Local Board.

CONTRACT DEPARTMENT, ADMIRALTY.—August 18.—For the supply of steel and files.—August 11.—For the purchase of English oak treenails. A. Brady, registrar.

SAINT ISSELL (Pembrokeshire.)—August 16.—For erecting a new British school room at Saundersfoot. Mr. T. Matthias, chemist, Saundersfoot.

LANCHESTER (Durham.)—For making a branch railway at Hamsteels Colliery, near Lanchester. Mr. John Boyd, on the premises.

CHATHAM EXTRA, KENT.—August 13.—For the erection of the chapel, walls, &c., of the new burial ground. T. Hills, clerk to the local board.

KIRBY, NEAR PRESCOT.—August 17.—For the erection of a church. Mr. E. G. Pale, architect, Lancaster.

CARNARVON.—August 15.—For the execution of the Carnarvon harbour works. F. Jackson, C.E., Nottingham.

HAMMERSMITH.—August 17.—For the erection of a chapel, entrance lodge, &c., at the burial ground in Fulham-fields. A. J. Roberts, clerk to the board.

NEWHAVEN, SUSSEX.—August 24.—For the erection of a Coastguard station. Tenders to the Coastguard office, Admiralty.

HEREFORDSHIRE COUNTY AND CITY ASYLUM.—September 14.—For the erection of the above named building. R. Griffiths, architect, 3, Martin-street, Stafford.

ISLE OF WIGHT.—August 13.—For the erection of artillery carriage sheds. Colonel W. C. Hadden, Royal Engineer office, Portsmouth.

ALDERSHOT.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

MARYPORT DISTRICT AND HARBOUR TRUST.—August 17.—For the erection of an engine and boiler house adjoining the Goat Mills, near Cockermouth. J. Barwise, clerk to the trustees.

WAR DEPARTMENT CONTRACT.—August 15.—For laying a new cast-iron water main at Royal Victoria hospital, Netley, Southampton

St. MATTHEW, BETHNAL-GREEN.—August 10.—For the erection of a lodge at Leytonstone House, Leytonstone. W. T. Howard, clerk to the board, Bishop's-road, Bethnal-green.

METROPOLITAN BOARD OF WORKS.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring-gardens.

CATERHAM.—August 29.—For the erection of an asylum. W. F. Jebb, 37, Norfolk-street, Strand.

SUNDERLAND.—August 17.—For the erection of new schools in connection with the Union workhouse. F. Hodgson, clerk to the guardians.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William George Boakes, Deal, painter, August 14, at 11—Robert Harradine, Edmonton, builder, August 14, at 12—Richard Watling, Romford, timber merchant, August 14, at 12—Alfred Charman, Croydon, carpenter, August 12, at 1.

TO SURRENDER IN THE COUNTRY.

John Amess, Bristol, timber merchant, August 14, at 11—Robert Daynes, Norwich, plasterer, August 17, at 11—Richard Hoad, South Shields, builder, August 15, at 12—Richard Robinson, Monk's Coppenhall, joiner, August 14, at 12—Robert Wilcock, Seacombe, plumber, August 14, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 21, W. Robins, Holloway, carpenter—October 27, G. Ford, Newman-street, Oxford-street, carpenter—October 28, T. Spearing, Hungerford road, Holloway, builder—August 24, W. Brown, Barnby-on-the-Marsh, Yorkshire, joiner—September 22, B. Bottomley and G. Spencely, Halifax, stonemasons—August 22, R. Fearns, Ormskirk, painter—August 19, G. Smith, Thurcaston, Leicestershire, carpenter—September 16, W. Cockram, Witheridge, Devonshire, carpenter.

PARTNERSHIPS DISSOLVED.

Parkinson and Brooks, Long lane, Bermondsey, engineers—Gibson and Fisher, Nottingham, stone and marble masons—Harding and Wilkinson, Commercial Chambers, Gracechurch-street, timber merchants—Graveley and Ewing, Upper East Smithfield, and East India road' engineers—Aviss and Son, Putney, builders—Cresswell and Williams, Tipton, brick manufacturers—Jenkins and Smith, Newport, masons.

DECLARATION OF DIVIDENDS.

Sir S. M. Peto, Great George-street, contractor, div. 2s. 7d.; E. L. Betts, Great George street, contractor, div. 2s. 2d.; Sir S. M. Peto and E. L. Betts, Great George-street, contractors, div. 1s. 10d.—August 5th, 6th, and 7th, or following Wednesday.—J. Smith, Litchurch, near Derby, engineer, div. 1s. 6d.—R. C. Moore, Harmiston, Lincolnshire, surveyor, div. 6s.

DIVIDENDS.

August 26, J. Sanders, Aston juxta-Birmingham, builder August 26, J. Ainsworth, West Ardsley, Yorkshire, mason—August 17, T. Machin, Walsall, journeyman bricklayer.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow ..	£11	0 £12 0
Quebec, red pine		3	5	4	15	St. Petersburg, yel...	10	0 12 0
,, yellow pine..		2	13	4	5	Finland	7	0 8 0
St. John N.B. yellow		0	0	0	0	Memel	0	0 0 0
Quebec Oak, white..		5	5	5	10	Gothenburg, yellow	8	0 9 10
,, birch		4	5	5	0	,, white	8	0 9 0
,, elm		3	15	5	10	Oefle, yellow	9	0 10 10
Dantzic oak		4	0	6	0	Soderham	9	0 10 10
,, fir		2	0	3	5	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir		3	0	4	5	yellow	14	0 20 0
Riga		3	0	3	3	Deck Plank, Dantzic,		
Swedish		2	5	2	8	per 40 ft. 3 in.	0	15 1 3
Masts, Quebec red pine		5	0	6	10	PUMICE STONE per ton	6	0 8 0
,, yellow pine..		5	0	6	0	OILS, &c.		
Lathwood, Dantzic, fm		6	10	7	10	Seal, pale.... per tun	36	0 0 0
,, St. Petersburg		5	10	9	10	Sperm body	95	0 0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Cod	38	0 0 0
Quebec, white spruce		13	0	20	0	Whale, 8th. Sea, pale	35	0 0 0
St. John, white spruce		13	10	15	10	Olive, Gallipoli	£8	0 73 0
Yellow pine, per reduced C.						Cocoanut, Cochin, too	53	0 55 0
Canada, 1st quality.		17	0	18	10	Palm, fine	40	0 40 0
2nd do		11	10	12	10	Linseed	31	10 34 0
						Rapeseed, Kog. pale..	34	0 0 0
						Cottonseed	32	0 38 0

METALS.

IRON :—

Welsh Bars in London	per ton	6	5	0	6	5	0
Nail Rod	do	7	10	0	7	12	6
Hoops	do	6	5	0	9	0	0
Hoops, Single	do	8	0	0	9	0	0
Staffordshire Bars	do	7	5	0	7	15	0
Bar, in Wales	do	5	10	0	6	0	0
Nailrods	do	7	10	0	7	15	0
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	0
Swedish Bars	do	9	17	6	10	10	0

STEEL :—

Swedish Keg, hammered	per ton	15	0	0	15	10	0
Swedish Faggot	do	0	0	0	0	0	0

COPPER :—

Sheet & Sheathing, & Bolt	per ton	79	0	0	82	0	0
Hammered Bottoms	do	97	0	0	0	0	0
Flat Bottoms, not Hammered	do	83	0	0	0	0	0
Cake and Tough Ingot	do	81	0	0	83	0	0
Best Selected	do	77	0	0	85	0	0
Australian	do	77	10	0	0	0	0
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7½

LEAD —

Pig, English	per ton	21	5	0	0	0	0
,, Spanish Soft	do	18	10	0	0	0	0
Shot, Patent	do	22	10	0	22	15	0
Sheet	do	20	0	0	20	15	0
White	do	27	0	0	30	0	0

REGULUS OF ANTIMONY

French	ton	43	0	0	0	0	

ZINC :—

English Sheet	per ton	25	10	0	26	10	0
Devaux's V. M. Roofing Zinc	do	25	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

SPELTER :—

On the Spot	per ton	20	0	0	0	0	0 nett
QUICKSILVER	per btl	6	17	0	0	0	0

TIN :—

English Block	per ton	95	0	0	0	0	0
do Bar	do	96	0	0	99	0	0
do Refined	do	97	0	0	0	0	0
Sanca	do	95	10	0	97	0	0
Straits	do	92	10	0	92	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 14, 1868.

BLUE-BOOK—SCIENCE AND ART.

THE Blue-book containing the fifteenth annual report of the Science and Art Department of the Committee of Council on Education, has just been published. It is a most interesting report of about three hundred and twenty-five pages, containing the reports of the official inspectors in the various branches, and statements of the expenditure of the several divisions of the Department of Science and Art. The report is arranged under the following heads :—1. Aid given to the industrial classes in obtaining instruction in the branches of science and art which have a direct bearing on their occupations. 2. The administration of the South Kensington Museum—the central repository for examples of science and art, which, as far as practicable, are made available throughout the United Kingdom. 3. Institutions for the promotion of science and art, which are subject to the superintendence of this department. As respects science, the satisfactory progress reported in former years, both as to number of schools and students, has been maintained. In 1860 there were 9 schools and 500 students; in 1864, 91 schools and 4,666 students; and in 1867, 212 schools and 10,230 students. The payment to teachers for the year 1867 was £7,976, or 15s. 6d. for each pupil. The number of teachers paid was 194. These figures speak for themselves. The report by Captain Donnelly, Appendix B, Science Instruction, occupies thirty-seven pages, giving a list of the schools, the subjects of study, the number of students, and the amount of money paid to science teachers. The reports of Dr. Sidney, occasional inspector, and Mr. Bartley, official examiner, are likewise given. The former inspected, in 1867, 31 science schools in England, 7 in Scotland, and 42 in Ireland. It is interesting to notice the classes to which the students belong in the respective countries.

In England the number of students of the artisan class was 490, of the industrial 466, and of the middle class 243. In Scotland there were 237 of the artisan, 94 of the industrial, and 32 of the middle class. In Ireland, 427 of the first, 1,094 of the second, and 191 of the last. Dr. Sidney then notices a wonderful fact, viz., that he has observed "the smaller proportion of bonâ fide artisans in attendance at these schools in Ireland as compared with the sister country, owing, of course, to the much greater development of manufacturing enterprise in England." If Dr. Sidney had observed nothing more remarkable than this he would be a very unfit occasional inspector, but he has observed something more serious than that England is a greater manufacturing country than Ireland. He bears testimony to the apathy of the local committees; he says, "even the secretaries are too often but ill-informed of the rules laid down for the guidance of their classes." Moreover, "the Irish committees have availed themselves only to a very small extent of the minute of the Department which grants 50 per cent. towards the purchase of apparatus for science classes; but this remark does not apply to the model schools, which are abundantly supplied with every requisite by the National Board." Of model schools in Dublin there appears to be one, but the report is not clear. In Galway one, in Belfast one, in Carrickfergus one, in Larne one (a model farm school), in Ballymena one, in Newtownlands, Trim, and Enniscorthy, one each. Still, with all the shortcomings of Ireland it is not explained why the total number of the schools visited by Dr. Sidney should be thirty-one in England, seven in Scotland, and forty-two in Ireland. It is true that at the Belfast model school, on the occasion of an examination, he found only one member of the committee present, and that at Newtownlands he had a candidate expelled for using what boys call a "crib;" and he noticed an extensive and organised system of fraud in connection with some of the Belfast examinations as well as at Clifden in Galway. Mr. Bartley's report on the same subject is confined to England, and to twelve counties only, including his attendance at the May examinations in Middlesex and the Bristol Trade School. He complains that so few schools of science exist in Yorkshire: "Considering the size and importance of many of the towns in this county it is to be regretted that so few classes have been formed, and that those which exist in such places as Leeds, Huddersfield, and Middlesboro, contain so few pupils. The reason generally given is the deficiency of elementary instruction among the persons for whose benefit the classes are formed; and though, no doubt, this cause acts very powerfully in reducing the attendance at the science classes, yet it certainly is not the entire cause, nor can it explain the attendance of under twenty artisans at the chemistry class in a town like Leeds, with over 200,000 inhabitants. I feel sure that if the Department scheme were taken up in Yorkshire as it is in Lancashire, by the union of Lancashire and Cheshire institutes, it would not be long before the classes and students were increased tenfold." With regard to the schools of science in the Midland counties, that is to say, the counties south and south-east of Yorkshire and north of London, there are only sixteen schools, and one of these, at Derby, is for the middle class, and merely sends up pupils for examination. Nine of these schools Mr. Bartley visited and found them, with the exception of those at Eastwood and Lincoln, in a flourishing condition, particularly that at Northampton, to which local advantages have conduced, the committee being most influential, and a museum existing in the same premises, supported by the application of the Public Libraries Act. The report bears testimony to the excellent effects produced by the fact that the local committee knows its duties and possesses an energetic secretary.

The report states that 98 schools of art are now in operation throughout the country. These give instruction to 17,341 students—a slight increase as compared with 1867. During the year one school at Abingdon has been closed; and another at Greenock, ceasing to fulfil the conditions of an art school, has become a night class for artisans. New schools have been established at Dorchester and Kilmarnock. The influence exercised by these schools will have been best estimated by those who visited the various works exhibited at the late national competition. The examiners state in their report that the work of these schools is acting satisfactorily upon the manufactures of the country. The large number of meritorious designs applied to manufactures induced them to award an additional gold medal; while in another class—that of modelling the figure from the antique—the inferior character of the examples submitted to them prevented them from awarding any gold medal at all. The examiners notice that in some cases students in the modelling classes, in executing bas-reliefs, have selected subjects incapable of being well treated in that manner; and they recommend that all such positions of the figure as require perspective foreshortening for their representation should be avoided, and that the action of figures in low relief should be so designed that they may lie in positions parallel to the ground on which they are modelled.

They notice with condemnation a few examples of injudicious misdirection of students' labours, in which fine examples of the best periods of art are carelessly rendered as mere accessories in the construction of half-pictorial backgrounds, a practice which has the bad effect of distracting the student's attention from the details of the figure before him.

In our remarks on the late competition at South Kensington we noticed the strange fact that Birmingham, Manchester, Sheffield, Leeds, and other large towns in the United Kingdom, from which most might be expected, contributed the worst and the fewest examples. We certainly expected that the report now before us would have alluded in some way to this fact. It does not; and we therefore suppose the point was not deemed worthy of attention, as it certainly could never have escaped notice.

The report of the master of the National Art Training Schools shows that twenty-eight students in training for masterships of schools of art have received allowances for maintenance. Four of these have been appointed to local schools. Free studentships were allowed to thirty-seven students who had succeeded in gaining medals or passing examinations. Sixteen sappers of the Royal Engineers and thirty other persons, either former students in training, national scholars, or persons employed by the Department, have attended the school without payment of fees. 422 students paid fees for the first session of the year, and 406 for the second session; the total amount paid being £1,946 2s. The total number of students in the year was 727, as compared with 807 in the preceding year. This decrease the Department attributed to a change in the admission rules, designed to exclude mere superficial amateurs desirous of taking "a few lessons" only.

The examinations conducted under the management or in connection with the committee during the year may be summarised as follows :—As respects schools for the children of the labouring poor, 788 schools were examined, being an increase of 200 on the number examined in 1867; 87,300 exercises worked by 58,000 children were examined, being an increase in the year of 17,300 exercises and 15,106 children. As respects schools of art and night classes, the number examined in 1868 was 204, being 38 more than in 1867; 8,500 students worked 16,700 exercises, an increase during the year of 1,700 students and 4,200 worked papers. 152 of these schools and classes sent up for examination 51,000 drawings, executed by 8,000 students in the ordinary course of the year's study, an increase of 24 schools, 19,000 works, and 1,500 students. In 1867, out of 44 candidates examined for the third grade, or art teacher's certificate, 15 were successful. In February, 1868, 62 candidates were examined, and 25 succeeded in passing the required examinations. The results show a total increase in twelve months of 240 schools examined, 18,306 candidates, and 40,500 works and exercises. In 1867 the number of persons receiving instruction in drawing from teachers holding drawing certificates granted by the Science and Art Department was, in public and other schools, 79,411; in provincial schools of art, 14,639; in metropolitan district schools of art (including those in connection with the National Art Training School), 2,702; students in training for masters and national scholars at South Kensington, 44; schoolmasters and pupil teachers, 1,651; in night classes for instruction in drawing, 2,553; in private schools, grammar schools, &c., 4,529. Total, 105,529.

The second portion of the report, which treats more especially of the Museum at South Kensington, states that the decorations of the exterior and interior of the lecture theatre buildings are now in a forward state; the designs, as far as possible, being carried out by the students of the Department, under the supervision of the various artists who have furnished them. A high degree of excellence is anticipated for the classes for modelling, mosaic work, painting on tiles, &c., which

will eventually prove of great service to the decorative arts of the country.

Among the various objects presented to the Museum during the period embraced by the report, an important series of illustrations of the method of instruction pursued in the schools established by Messrs. Schneider at their works at Creuzot, are specially worthy of notice. Acting on the recommendations of a Select Committee of the House of Commons, the Department availed itself of the opportunity afforded by the Paris Exhibition to acquire, among other interesting objects, a valuable collection of Arabian ornaments, which forms the subject of a special report by Mr. Reginald Stuart Poole, assistant keeper of coins and medals in the British Museum. The collection consists of a hard wood (possibly walnut) pulpit from the mosque of the Sultan El-Muyeiad, at Cairo, executed about the middle of the fifteenth century, and containing some extremely elegant specimens of Arabesque ornament; some carvings from the Mosque of Ahmad Ibn Tooloon (the oldest in Cairo), one specimen being, according to Mr. Poole, of the first period of Arab art in Egypt; a very fine table, also from a mosque; an ancient piece of lattice work; and a curious Arab bed inlaid with ivory. The collection also comprises some examples in metal, glass, and porcelain, and some very interesting manuscripts.

Among additions made to the casts and bronzes in the Museum, are an electrotype of the Gate at the Baptistry at Florence, by Lorenzo Ghiberti, a cast of the great bronze candlestick in the Cathedral at Milan, casts of various works of Italian art of the fifteenth century, and of Norwegian doors of the twelfth century, the originals of which were exhibited in Paris. The convention formed by the Prince of Wales and other princes of the reigning families of Europe, is looked forward to as "the most important occurrence of the year," as a medium for the promotion of the reproduction and exchange of works of art in different countries. We put not our trust in princes, and think that art is likely to derive less benefit from the convention than the Department anticipates. We are glad to observe that advantage is to be taken of the projected authorised survey of ancient Indian architecture, to obtain casts of some of the most important monuments for the national and principal local museums of the kingdom.

The collection of photographs has been largely increased, no less than 6,694 copies having been added, including a series of portraits lent to the National Portrait Exhibitions of 1866 and 1867, and a good collection of illustrations of Indian architecture and costume. An addition of 500 books and pamphlets has been made to the library, which now possesses 20,400 volumes.

The third portion of the report, dealing with scientific institutions, recounts at some length the progress of the Museum of Geology, the Royal School of Mines, and other similar institutions. The Lords of the Committee conclude their report with a confident expression of opinion that at no period since its establishment has the influence of the Department been so widely extended or its beneficial results so marked as during the past year. They trust that the increased grants made by Parliament, supplemented by various acts of private munificence, among which is specially mentioned the magnificent scheme of Mr. Whitworth, will enable them still further to afford a knowledge of science and art to all classes of Her Majesty's subjects.

THE ART OF BUILDING IN CONCRETE.—II.—MAY'S SYSTEM.

THE method of erecting buildings in concrete, invented and patented by Mr. Tall, formed the subject of a former article in our columns. In addition to his system, there are, as many of our readers are probably aware, others differing both in principle of construction, nature of material employed, and in the character of their details. Mr. Tall's method might be described as the plan of building a house all in one piece, since there is an absolute continuity and uniformity of the component parts not obtainable by any other recognised means of ordinary building. The walls are raised *in situ*, in a fluid or semi-fluid condition, and consolidate and set during the time occupied by the remaining work to be done to the dwelling. This is the true principle of concrete, and that to which, in fact, the heading of our article ought, if stringently interpreted, alone to apply; but as the material concrete is actually used in the methods we are about to bring under consideration it may bear a more extended application. To pass on to May's block system it is nothing more than the employment of concrete bricks, instead of those made from the usual description of clays. These bricks and blocks are much larger than the common bricks, and are designed specially so as to secure an equable distribution of headers and stretchers, and thus ensure the presence of a proper amount of bond throughout the work. Now the first question that will present itself, and which must be satisfactorily answered before the plan can be entertained with reference to the building of dwellings upon a cheap scale, is, can these concrete blocks be manufactured, bulk for bulk, at a less or the same rate as bricks? Upon this point we do not think there can be any doubt. Ordinary bricks cannot be made except from certain descriptions of clay, which is not to be found in every locality; but the concrete blocks may be manufactured of almost any hard material by the aid of a small proportion of Portland cement, to constitute the binding property. Gravel of every description, provided it be not too large, broken glass, china, clinkers, furnace slag, and a host of other substances may be utilised in this manner. There is this difference between the manufacture of these blocks and bricks, that whereas in the latter instance the material is only to be obtained in certain districts, in the former, there is no locality where some ingredients would not be encountered suitable for the purpose, and, what is more, totally unsuitable for any other.

It may be, therefore, safely conceded that their first cost will not exceed that of bricks, and our opinion is that it will be found considerably less. It must be borne in mind that all these principles of building in concrete, whether the blocks be solid, as in the method now under consideration, or hollow, as in Parr and Strong's, and in another that we shall treat of in its turn, they do not require the aid of any special framework or apparatus, and are, therefore, better suited for building upon a very small scale. There would be no saving effected by erecting some dozen of houses instead of only two or three, beyond what always accompanies the execution of a large number of similar examples compared with that of a few. It is always comparatively cheaper to build upon a large than a small scale, or, in other words, the two principles of operation might be considered to resemble wholesale and retail dealing. The majority cannot afford to build upon a gigantic or wholesale plan, and therefore benefit most by any method which affects the smaller or retail mode of operations. Taking for granted, therefore, that the material is as cheaply produced as the ordinary bricks, the next question includes that of labour or workmanship. There is very little necessity to inquire very deeply into this, as it is evident to anyone who has seen the blocks under notice that they could be set and walls built as cheaply as those of brick. From their size they would require rather more care in laying, and some additional attention would be necessary in ensuring the accuracy and straightness of the joints, but these trifling details of manipulation would soon be mastered by any bricklayer who was gifted with the commonest amount of intelligence. Mr. Tall asserts that one advantage of his fluid method of building, so to term it, is that regular bricklayers are not required. Here, as we have formerly stated, we differ from him, but there is no question that common labourers would not answer for building walls of solid concrete blocks. The close resemblance existing between this description of work and that of brickwork would not allow of any saving being effected in this particular. As more work could be done in a certain time there would, of course, be a slight balance on the side of economy in this respect, but it would also take some little time for a bricklayer or a mason to familiarise himself with the sizes and shape of materials which are truly neither bricks nor stones.

A great, and, many would assert, a fundamental objection to all descriptions of building in concrete, whether fluid or solid, is the unsightly appearance the walls present. We will say nothing about the want of any architectural effect, by which is not meant, as is usually considered in this country, the mere outline or proportions of a design, but simply refer to the rough, crude, hard, and raw appearance afforded by the sight of a concrete building, in which the walls stand naked as they were built. It may be accepted, as a rule, that all concrete walls must be covered with stucco, or, as Mr. Ruskin wittily calls it, slime, with paint or facing of some sort. We do not believe that any gentleman would like to erect upon his estate a large number of dwellings presenting the cold, stony, and rough appearance which characterises concrete walls. In a word, the concrete lacks the warm tint of brick, which contrasts so well with the prevailing colours of landscape scenes If we once accept as an inevitable accompaniment to the employment of concrete in the construction of cottages and dwellings for the labouring classes, that the walls must be covered with some kind of coating, the economy of their adoption becomes a matter of considerable doubt. Even if the face work were confined to the ruling of lines to represent joints, which would scarcely relieve the natural aspect of the concrete, the labour would be equivalent to that of pointing, which is rarely done in houses of a humble description. There is another solid method of building in concrete to be described, and we shall then pass on to consider what might be called the hollow method, in which moulds are first provided, into which the concrete is poured, and then the whole built up similar to the brick work we have been noticing. The Central Cottage Improvement Society are at present putting the concrete block system to an experimental test by the erection of a couple of cottages, which we shall take an opportunity of inspecting. One actual test of this nature is worth all the surmises and opinions in the world.

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.—III.

WE have hitherto been concerned with the commonest arrangement in Nonconformist churches,—that of a plain oblong or rectangular plan, and chiefly with the roofing of this one. Before passing on to other plans it may be as well to say something more on internal design. The gallery, of course, is the main difficulty inside,—just as the wide roof is externally. And it is a difficulty which, even more than the other one, it has been attempted to pass over and evade. It is seldom, indeed, that it is accepted as one of the main conditions of the case, and that it is really incorporated into the essence of the design. The idea that generally suggests itself is that the gallery was forced in against the architect's will. He had built his church with long windows and tall columns to divide it into nave and aisles, he had relied for effect throughout on unbroken vertical lines,—when

suddenly the committee stepped in and destroyed them all. They barbarously cut his windows in half, and hung a system of beams and framing to the middles of his columns; they obliterated all his verticality with a horizontal feature strong enough to overpower everything. And they had not even the grace to consult him as to the least objectionable way of doing this. They made their gallery here three seats wide and there six; so that even its junction with the wall is not quite horizontal, but steps up a yard or two higher in one place than in another. Nay, the very plan of it does not fit the building. There is not a piece of circular walling about the chapel, but the gallery front, or a great part of it, is curved on plan, and has no relation whatever to the forms which adjoin it. Perhaps this last fact explains the mystery. It was not made for the chapel after all. The committee, being, as some committees are, penny wise and pound foolish, doubtless bought it cheap at a sale of old materials, and had it put up in hopes of its being an improvement.

Unfortunately the case is too common to be accounted for thus. Chapel architects must bear their share of the blame for the absence of anything like unity and architectural composition in galleried interiors. In spite of that blind adherence to what has once become customary, that unreasoning conservatism which is just as prevalent among Nonconformists as elsewhere, their architects might have done much more than they have. There is no reason why the form of gallery which happened to be consecrated in some large chapel forty years ago should therefore be inflicted on us to the end of time. Of course, innovations affecting the seating of the congregation are not to be effected without a severe fight. They involve money in the shape of contributions or pew rents, and so come to be discussed more keenly than those in mere external design. It may be a question, however, whether the sacrificing too much to money in this way is not a policy that defeats itself. It is possible to spoil a building for the sake of additional seats, and to have it half empty after all. If Nonconformists really care to have churches which are not offensive to every one of the slightest sensibility, they must be willing to lose a little for the sake of gaining a great deal. A theatrical manager may be tempted to increase his receipts even by spoiling and overcrowding his house; but such a practice is simply repulsive in a place of worship.

The first thing that is wanted in a galleried interior seems to be to make the gallery an essential part of the design, a feature which every other part points to, and without which all would be incomplete. It is to arrange the whole for the sake of the result *with* a gallery, not to copy a one-storied church and hope that the gallery, when it is inserted, will be overlooked. A very little common sense will suffice to pass a judgment on such things as long windows only built to be cut across the middle by the feature in question. One rather pities than blames these feeble attempts at a sham; it is so evident that the poor people who perpetrated them were driven to it because they could not invent anything else. Their difficulties were too much for them, they could see no other way of dealing with the subject. How unfortunate that difficulties should ever have been given to such people to conquer. But leaving for the present matters of detail like this, there are at least three ways in which the interior of a galleried building may be treated. In the first, the gallery front and the work directly above and below it are made the principal surface in the design. The walls behind them are a mere background; it is the enclosure of the central area which assumes the chief importance. This is the system adopted in theatres. In the second way, the walls of the building retain their prominence, the gallery runs round them more or less as a balcony, and its columns do not go up to carry the roof. In the third, the gallery does not project from the sides of the building. It runs across it perhaps at one end, or it fills up recesses arranged for the purpose, but it is more subordinate than in either of the previous cases, and detracts less from the apparent height and verticality of the walls. The first system, we have said, is that on which theatres are usually planned. It is the front of the boxes there which form the visible interior; the actual walls are almost or quite out of sight. It appears perhaps at first that nothing at all analogous to this treatment can be found in mediæval churches. Yet the nave arches and triforium of a vaulted building show a principle not altogether dissimilar. In certain cases (Westminster Abbey for instance) the top of the aisle vaulting has actually been turned into a temporary gallery of which the triforium was the front. And though this would be unsuitable enough for permanent use, its height from the floor, the thickness of the piers, and the multiplicity of smaller shafts all interfering with the view, yet the principle is worth remembering. *This* gallery, such as it is, is an important element of beauty. Is it impossible to keep it so, and yet remove its practical inconveniences? One thing seems certain—it must either be above or below the main nave arcade, if there is one, whether this is supported on stone or iron columns. To put up long shafts and then fix a gallery across the middles of them is a bungling expedient sure to end in failure. Half measures like this spring from incompetence, and meet with their reward. If a gallery in the position of a triforium be too high up (though it need not be so high as many upper galleries now are), the best thing would be to make a radical change, and put it entirely below the nave arcade. We are not advocating the division into nave and aisles as the best possible one. It is, however, less objectionable acoustically than is often supposed, and where, as in some of the best modern churches, it only extends to two columns on each side, it need scarcely destroy the view of the pulpit from a single seat.

HIGH ART AND THE ACADEMY.

AMONG the many difficulties to be met in the effort to mend matters artistic—and their name is certainly legion—none is greater than the *absence* of any standard authority in the shape of books or otherwise. We have standard treatises, more or less complete, of most sciences—*e.g.*, astronomy, geology, &c., from the least important to the greatest, and standard histories to refer to in case of need or doubt; but of a standard art treatise what is to be said but simply that it does not exist? If anyone be in doubt or difficulty we cannot set him right by referring him to any certain authority, but at most can but tell him to consult such and such a one on some *controverted* point of art history or practice. Nothing is apparently certain in art matters, and consequently no treatise or authority on the "Elements of Art" at present exists. This is a very great difficulty, almost impossible to be overcome, for we have no starting point, and no certain ground whereon to found anything. There is, therefore, at present no way out of this first and primitive art difficulty but to refer to the modes of action and artistic opinions, as far as they can be gathered, of the various societies devoting themselves to art in its different phases. There is no other way. For this leading reason it is that the Royal Academy system and practice of art, as a matter of original reference, will be found so useful, and will assist the student to a better and far higher comprehension of the real nature and meaning of art than would be otherwise possible. No one will of course deny the importance and interest of such an inquiry as this, for all allow there is room for improvement, and even if they do not admit this with all readiness, the results of the late competitions will prove it.

Now the very first thing that must strike anyone, when looking at art generally from this most visible point of view, is that the Royal Academy has divided art into two distinct and widely separated divisions, high art and low art, or, in more distinct and broadly intelligible terms, into art by men of the highest artistic powers, properly and fully exercised, and consequently worthy of every possible honour, and, on the other hand, into art by men of altogether infinitely inferior powers, producing only results not worth the time and trouble they cost to bring into existence, and certainly unworthy of any sort of honour or credit the Academy itself is able to confer. In short, it is everything on the one side, and nothing on the other. If this be not interesting to artists and architects nothing is.

But there is, as I have said, no test whereby to try the truth or falsity of this claim on the part of the Royal Academy to divide artists into two divisions so widely separated; no book or authoritative statement by the Academy itself defining what is high art or the highest art, and what is low art or no art. We are simply left to find it all out for ourselves as best we may. There is but one way—viz., the annual Exhibition of Paintings, Sculpture, and Architecture, and it is there that we may see the solemn facts as they really and palpably exist before our very eyesight, and every man, woman, and child may judge, each one for himself and herself. It is very easy indeed to do this, for the full academicians are a very privileged body, and have so arranged matters that all their own works and results of their own art powers are ranged, more or less together, on what is termed the "line"—*i.e.*, on the wall space on a level with the eye of the spectators, thus to be most readily and easily seen. The inferior powers are all underneath or above this magic space. I say nothing at all of those who are altogether excluded or of those who never and cannot exhibit. And what is it, then, that is to be found by anyone looking at this magic line of high art, and at the lines both above and below it? Why, simply no difference whatever. It is simply impossible for the most knowing and the keenest eye to detect any difference in *degree* of artistic power between those works on the line and those above and under it. Of course, the size of the works may differ, and the subjects of them, and the pains taken, and the time they cost to do, and a hundred other points of difference there may be; but in degree and measure of art power there is in reality none whatever. They are for the most part generally all alike—the line above is as good as the line below, and these are every way equal to the works on the line itself. There is no high or low art visible, it may be all termed middle and level art; indeed, it is something wonderful to see so many paintings all alike, and with so little difference between them in the *degree* of artistic power. I say the *degree* of art power. This fact, not a little remarkable, must, I think, have struck everyone who regularly visits the Academy exhibition, and will not therefore be disputed. I think I can see some cause for this, but let that for the present be how it may. What, therefore, becomes of the Academy distinction between high and low art, between those who are said to practice high art and those who practice low art—in short, between Royal Academicians and common outsiders? There is really none whatever, for the time would seem to have produced a number of very clever painters, all pretty much on a level, and without any one or many of supercommanding capacities of powers, and the fact really is that all these *regular* contributors, to say nothing of others, are quite worthy of the honours, such as they are, of the Royal Academy. If truth must be told, there is in this age *no high art* in the sense of the results of the highest art powers, for even when men of the highest capacity now appear on the world's stage, false and foolish education and the circumstances and pressure of the time seem to be all bent upon *negativing* their

powers. If it be a subject of art interest to inquire into the capacity and work of the workman it is not less so or less important to ask how it is that this high power is lost when it exists in the more advanced and highly educated artist. If the ignorant and the dull workman cannot do anything to render him worthy of standing inside the door of the Academy by reason of his ignorance and dulness, what is that which makes the more clear-headed and educated artist worthy of all Academy honour, but whose actual works, when produced and before the public eye, fail to satisfy the critical sense of the spectator who is looking out for *high art*, and which high art he is told is only to be found within the walls of the institution he is then walking through? These are the poles of art—the workman and the artist—the artist guiding but not destroying the individuality of the workman; and it seems to me that it will not be wasting time to inquire, very shortly, how it is that such men so highly gifted as Turner, Marochetti, and Millais, fail to accomplish what is expected of them. How is it that the dull spectator, unable to do anything himself, fails of being fully excited and gratified with the infinitely superior and higher imaginative and artistic powers of such men as these? What more does he want? What does he, the spectator, mean by high art? and how is it the Royal Academy is not confined to three or four of such men so rarely gifted, and so in real truth to confine the Academy to high art or the highest art power, whether fully and properly exercised or no? An academy on this plan all ought to be satisfied with—*i.e.*, to consist only of the very limited few in each age and generation who manifest, in promise, if not in fulfilment, the highest powers an artist is capable of. The workman is of course out of the pale; the outside artists are almost out of the question, because they have no means of manifesting their powers to Academy circles and influences. The general body of regular exhibitors are out, because they are all on a level, so selection is barely possible. It therefore, from necessity, remains with those who manifest the highest powers, although they do not realise them in practice. A few words, therefore, on what *high art* is and means cannot be otherwise than useful in a search for a new system of fine art action and practice.

C. B. A.

ORNAMENTAL METAL WORK AT THE LEEDS EXHIBITION.

Of all the ornamental art at the Leeds Exhibition, no section is so well represented as metal work. The specimens, both in the precious metals and in iron and steel, are very numerous and important; the arrangement, however, in certain cases is most eccentric. Thus in the Celtic and Anglo-Saxon section we have the (62) Limerick crozier, 1418; (63) Limerick mitre, rather later; (87) a silver brooch, fifteenth century; (38) a silver bracelet with an oval seal-shaped medallion in front, latter end of fifteenth century, supposed to have been the seal of Thomas Burton, Bishop of Sodor and Man, 1452-1480, as the inscription on it is,—S. Thome Dei gracia episcopi Mannensis: it is a very beautiful specimen of cast work, chased up and finished afterwards in the most perfect manner, rivalling the later medals by Cellini and others. It will be a good day for us when we can get such work done. In another instance, the Hunterston brooch, a magnificent specimen of the Tara brooch order, dug up in Ayrshire, is described as Saxon, and though put in the catalogue pretty near to the only similar work of consequence in the exhibition, viz., the most valuable and interesting crozier (81) belonging to Dr. Moriarty, Bishop of Kerry, Killarney, is, in fact, placed in a different room. This is a pity, as it would have been very instructive carefully to have compared the workmanship of the two, especially the beautiful filagree work of gold. We cannot bring ourselves to believe in its Saxon origin, though we do not deny the possibility of it, remembering the close connection which exists between the style of some of the finest Saxon MSS., as the Durham Gospels, and the best of the Irish. Bishop Moriarty's crozier, being externally principally of thin plates of brass, has suffered a good deal from its burial in the ground, but still it is a most important specimen, and in point of execution perfectly admirable; fortunately the filagree is of gold on silver, and so this part is as fresh as the day it was made. The shape is that of the usual Irish type, with a head something like a horse's head. The whole surface is chased by hand in the most elaborate and delicate arabesques, relieved by filagree knots of as perfect execution as the best Greek work. In execution it is unsurpassable. The processes used are perfectly applicable to other dates of art, and if carefully studied and mastered might lead to important development, and help us out of the groove we seem unfortunately to be deepening for ourselves.

There is a good collection of ordinary Saxon fibulæ and such things, but nothing else of this kind worthy of comparing with these except the bell of St. Thura, which is later outside, though it is said to contain under the silver plates some earlier work. There are many good examples of Greek gold, which are worth study. All the best Greek work must improve the taste of any man wishing to be a true artist.

By the way, we may remark that Mr. Forman's collection of Greek pottery is astonishingly good. One would have hardly expected to find such work in a private collection. Especially admirable is No. 218, a large and very fine bowl, painted red and black, with the death of Hector,—it reminds one of the finest thirteenth century work, only far surpassing it. The whole collection should be examined, especially in some of the smaller pieces, where the comic element comes out strongly. As in every collection where it has been exhibited, so at Leeds, Mr. Haywood Hawkins' Greek bronze alto relievo, parts of which were restored in wax by Flaxman, stands out as the gem. There is nothing known to compare to it. It is thought to have been the cover to a mirror, and was found at Paramythia in Epirus in the year 1798. Whether we look at the correctness of drawing, grace and elegance, or to the wonderful power of execution, it is simply perfect.

But to return to the mediæval and other metal work. Of the tenth to thirteenth centuries we have few examples of note. There is an interesting little thirteenth century bit (846) found near Oxford—the top of a pyx, with Christ holding a book in high relief, cast and chased: and two or three fragments of candlesticks, somewhat similar, though inferior to the great Gloucester candlestick, about 1100; and two or three fine seals: of the fourteenth century we have two very important examples, belonging to Mr. W. Sneyd (853 A); two gilt book covers, chased with the Crucifixion, &c.,—the word chased hardly allows one to realise the process here employed, which really was to carve in brass,—the figures are truly carved and chiselled in low relief, and then chased. The practice began in the thirteenth century in the ornamentation usually of the sides of the enamelled reliquaries, probably with the same tools that cut away the surface of the champlevé enamels. When carried to the perfection of these two covers, the art is one of rare beauty, but would be very expensive,—almost the same effect could be produced by the more modern plan (a re-invention of a very ancient art) of knocking up the back of a thinner plate (repousse) and then chiselling and chasing the front. When we come to the fifteenth and sixteenth centuries, we get numerous examples, some very fine; and in the finest examples we find none of that affectation of severity, and confining oneself to one or two processes, which so distinguishes modern incapacity. All that the old men knew they employed: and if they had lived to our day, they would, as we fully believe, have employed, as far as they are true to the principles of art, the processes of the Cinque-Cento period, and especially of the different nations of the east, who seem almost incapable, except as far as they imitate modern European work, of doing anything in bad taste.

Oxford and Cambridge contribute some of their best plate. Two very beautiful and elegant cups are shown by Corpus Christi College, Cambridge, (1502-1503): the former is called the foundress cup, and is especially valuable as a specimen of surface-engraving, wanting the hardness and stiffness of what is usually done nowadays. The other, the gift of the Countess of Richmond, (1507), is a charming specimen of low relief and elaborate chasing and stippling. There also appears to be judicious use of die-stamping—all perfectly legitimate methods of treating metal. It is by the happy combination and perfection of all known ways of treatment that we can hope for real progress in art, but unfortunately in all connected with metal work we seem incapable of learning anything but some school lessons as to some particular time. What should it matter to us whether the fourteenth century man got such and such an effect by such and such means—if we can get as good or better by an easier and less costly process? Our present designers want elasticity as much as they do art. Of this they may be assured, that eccentricity, quaintness, or even picturesqueness can never take the place of fine art, however fashionable it may be for a time. Knotches and knobs—scrolls of contorted iron wire or bar unwrought and not even decently twisted, bull's eyes and bullet holes will not much longer be allowed to make believe for art and disguise the terrible art incapacity which exists among some of the most favoured architects of the day. Try to shut our eyes as much as we like to the matter—such an exhibition as the present unmistakably thrusts it before our eyes, that there is more art power as well as executive skill in many a piece of metal of the Cinque-Cento period, or of Oriental manufacture, than is exhibited in some of the most elaborate and expensive screens and grilles of our fashionable architects. Especially admirable for execution, though late and not altogether to be admired for its shape and design, is the 1540 English gilt cup, also belonging to Corpus Christi College. In this there is a beautiful combination of casting, chasing, *repousse*, and engraving.

We must not, while speaking of the later Gothic silver work, omit to notice Lady Otho Fitzgerald's silver badge of the order of St. Agatha, with the figures of St. Peter and St. Anthony, late fifteenth century. The chasing is good, and the foliage a good instance of sigillation. Some of the boldest chasing appears in Messrs. Hunt and Roskell's Italian silver-gilt chalice, dated 1419.

For surface chasing, nothing is more admirable than some of the early medals. Mr. T. G. Parry contributes a delightful little bit (1499), a silver circular medallet, with the Virgin seated, the groundwork diapered. Nothing can surpass the delicacy of this little treasure, and no one but a first-rate artist could have executed it. We can hardly, however, trust the date given in the catalogue, the thirteenth century. It is hard to decide upon such a point without comparison, and having the article in one's hands; but it appears to be considerably later.

As we get to the Renaissance period, the subject of metal is as thoroughly exemplified as one could wish. There is a splendid collection of wrought iron and steel, especially of damascened work. Among the richest specimens of iron is the pair of late fifteenth century ambry doors belonging to Mr. Forman. They are wonderful examples of skilful superposition of different layers of metal, and of artistic beating and twisting of iron, so as almost to rival the work of the most skilled goldsmith. Of Damascene, European, and Oriental, raised and flat, we have the finest possible specimens. Of the Cellini shield belonging to Her Majesty we need say nothing, as its perfection and condition are so well known. South Kensington shows the choice steel mirror of Diana of Poictiers, for which they gave £1,281. Such a work as this of course could only be executed for the very rich, but for all that the process is quite as well worth our attention as that of enamelling, especially as used by the Persians, who grave out the surface, leaving the arabesque in low relief, and then with gold and silver damascene the projecting parts; the effect being often not unlike some of the Irish work.

From what we have said it will be seen that even from our point of view as mediævalists, the exhibition at Leeds is full of instruction; but really the great feature of it is the truly magnificent collection of paintings, drawings, and engravings, which far exceeds in many ways what was shown at Manchester.

The series begins with the latter part of the fifteenth century, and contains some of the very finest things in the kingdom from that time to the present day. Lord Dudley's pictures alone are worth any amount of trouble to see. Notwithstanding all these glories, however, there can be no doubt that the Yorkshire mind is hardly trained up to the point of appreciating the highest art. The concerts, under the able direction of Mr. Charles Halle, which are excellent, are evidently the greatest attraction; after that,

the English pictures draw the greatest attention; works of early art, either painting or otherwise, are, by the majority, looked upon merely as curiosities.—*The Ecclesiologist.*

THE BENEDICTINE MONASTERY OF CHRIST CHURCH, CANTERBURY.

At the recent annual meeting of the Kent Archæologieal Society at Canterbury, the Rev. Professor Willis read a paper on this monastery, surrounding the church, the history and remains of which he has spent many years in investigating.

The Professor said that the great Cathedral of Canterbury was originally the cathedral of a large monastery—the earliest monastery of Benedictines organised in England, and which served as a model for others subsequently established. Its founder was Archbishop Lanfranc, who, at the end of the eleventh century, was the first of the Norman archbishops appointed to rule the Saxon monastery which had previously existed here. When he came to Canterbury he found the buildings in ruins, and he caused the monastery to be rebuilt according to the arrangement of the Benedictines at that time. It was he who set out the plan of the whole, and erected all the principal buildings. A number of remains of the Norman monastery had been brought to light by the pulling down of the prebendal houses, in consequence of the number of stalls having been diminished, and the ruins were sufficient to show the extent of the Benedictine monastery. It happened, moreover, that more copious and precise records existed of the Canterbury monastery than of any other ancient foundation with which he (Professor Willis) was acquainted. By a curious accident it became known that about the twelfth century the monastery acquired a grant of that great source of water—a magnificent stream running out of the hills—which supplies to this day the whole of the Chapter land. No sooner was this spring acquired than the prior of that day, who was a competent engineer, and knew something of hydraulics, completed a system of waterworks by which the water was conveyed to the monastery and distributed through the buildings. It fortunately happened that a Norman drawing was still in existence, containing a delineation of the whole system of water pipes. This drawing, which was on vellum, had, by some mysterious agency, found its way into the Library of Trinity College, Cambridge, where it was bound up in the great Psalter known as the Triple Psalter, which was not merely a reproduction in three languages of the Psalms of David, but a collection of all the psalms contained in the Scriptures. The Nicene Creed was also included. Some leaves had been torn out of the Psalter, and this drawing inserted in their place, so that it came between the middle of the Magnificat and the Nicene Creed. The drawing, which had been beautifully executed by a monk named Edwin, was a representation of the whole monastery, and had been engraved by Virtue for the Society of Antiquaries in the middle of the last century, and published in the *Vetusta Monumenta*. Virtue, however, took great liberties with the original, and produced a very inaccurate copy. On the original drawing the description of each of the buildings and water pipes was written in contractions, and in endeavouring to enlarge these inscriptions Virtue omitted some and turned others to a different aspect, so as to destroy their archaic value. He (Professor Willis) had therefore traced a fac-simile of the original drawing with great care. The plan he held in his hand was not his drawing, but a proof of the engraving which members of the society would receive in the next volume of the "Transactions," together with other engravings illustrating the subject. In order to understand this drawing he had made as careful a scrutiny as possible of the whole of the precincts, having, by the kindness of the Dean and of the other residents, without exception, received licence to penetrate every corner of every house. He made a drawing as the result of that survey, and after extracting from the drawing all the buildings of the monastery up to the time of the Reformation, he thought the best way of interpreting the Norman drawing would be to make another plan, including only remains of buildings which were on the ground at the time when the Norman drawing was made. In doing this he produced a plan which justified in every way the accuracy of the Norman artist. (The Professor here exhibited a copy of the Norman plan, and proceeded to describe by its aid the ancient waterworks.) The water was conveyed from the spring past a conduit house through four oblong reservoirs. In travelling slowly from one end to the other of these reservoirs, one after the other, the water deposited its mud. The fourth reservoir was under the city wall, and thence the water was conveyed directly by pipes into the monastery. Vitruvius recommends that water for the supply of towns should be made to pass through "settling tanks," and the members were evidently acquainted with Vitruvius's work, and carried out his principle. Stopcocks were also known to Vitruvius, and they are figured on the plan as attached to each of the tanks. The ancient water pipes passed through a cornfield, a vineyard, and an orchard, and then through the city wall, and along the course of a lane to the monastery. Professor Willis then proceeded to give a general description of the ancient monastery. (This portion of his address will be found in our last impression.)

THE PAINTED GLASS AT FAIRFORD, GLOUCESTERSHIRE.

The remarkable series of painted glass windows in the parish church of Fairford, Gloucestershire, formed on Wednesday last the object of a special visit from the members of the British Archæological Association, who are now holding their annual meeting at Cirencester. Previous to visiting the church a sectional meeting was held at head-quarters, at which Mr. H. F. Holt, who has devoted considerable attention to the subject for some time past, was present. The windows are twenty-eight in number, and the church was built in 1498 purposely for their reception, it being stated that they had been captured by one Captain Tame, in a ship which was conveying the glass to Rome, and that he had the church built for the purpose of fixing the glass in it. The subjects depicted are taken from both the Old and New Testaments, and, the situation of Fairford being very remote, the knowledge of their remarkable excellence has been confined almost to local fame. Mr. Holt described the different subjects in detail, all scriptural; and in his remarks to the archæologists observed that their artistic interest was twofold—first, for their intrinsic merit as pictures, and that they belonged to the style of glass painting in which the mere decorative effect was subservient to the capability of conveying noble design. He believed the windows might safely be ascribed to Albrecht Durer. Mr. Holt went on to observe that they had been "restored" in a shocking manner, and as they were exposed to further deadly risk and imminent peril from the same cause, he especially desired to call the attention of archæologists to them to crave their protection. He regarded these as the most interesting series of painted windows in existence in this country. At the end of last century these windows were alleged to belong to Albrecht Durer, but the idea was pooh-poohed by Bigland in 1791. He (Mr. Holt) now appeared before them in the character of a new and independent claimant on behalf of Albrecht Durer, and as being the first person who had compared these windows with Albrecht Durer's known works. He reviewed the life of Durer, and came to the deliberate conclusion that in the Fairford windows they had the only extant remains of his mastery in the art of glass painting; and that this was the work which occupied him at a period of his life when it appeared he must otherwise have been comparatively idle. He connected Durer with these windows by tradition, by the period of time when the church was built, and by the internal evidence afforded by the windows themselves, their similarity in various respects to known works by the same hand. The building of Fairford Church was begun in 1498, by John Tame, cloth manufacturer, who purchased the manor from Henry VII. The statement that Tame captured a ship on its voyage to Rome and took the glass out of it was full of improbabilities and inconsistencies. He did not purchase the manor until after the alleged seizure of the ship, which must have been, moreover, at a time when we were at peace, and such an act would be one of piracy. Nor was painted glass so uncommon at that time that a man should build a church in the English Perpendicular style to receive painted windows intended for Rome. Then it was a fact that some of these windows had among other designs that of the Prince of Wales's plumes. But although the story of the seizure of this glass might be altogether a myth, it might conceal the truth—viz., that John Tame might have had reason for "making his soul," as the Irishman would say, and, therefore, he built the church, procuring the glass from his Low Country agents. The glass was brought in a ship to Gloucester. Mr. Holt proceeded to notice some paintings on the walls of Fairford Church, some of which he said had been recently scraped off in deference to the anti-Ritualistic feelings of certain of the parishioners. He pointed out certain peculiarities in the details of treatment and arrangement of the subjects in the windows which he recognised as being Durer's. Durer had cultivated the art of cutting in wood, and, producing a copy of the *Chronicon Nurembergens* (1493), Mr. Holt pointed out certain wood engravings there which were undoubtedly Durer's, and in which among other things was frequently used a peculiar nimbus, which was also introduced in the windows of Fairford Church. Lastly, referring to the absence of any monogram of Durer (the D being placed within the A), he observed that, to his mind, those noble works required no monogram, for he read in every part of them, as if stamped in his own hand, the signature "Albrecht Durer." This new theory was regarded with a good deal of interest by the archæologists present, though not universally accepted, Mr. Joyce, the representative of the Vicar of Fairford, stating that notwithstanding a likeness in these windows to Durer's work, he could not, after long examination of the subject, come to the same conclusion as Mr. Holt. If they were Durer's they must have been done at a very early age. He also expressed the anxiety of the vicar to protect the windows from injury and "over restoration."

DISHONEST STUDENTS AND TEACHERS

In the Blue book of the Science and Art Department, Ireland, while obtaining through many of her schools of science and art a most honourable position, has also alone to bear the obloquy of containing four schools at which dishonest attempts have been made by the students and teachers to assist each other at the respective examinations. At one school in Belfast, another in Carrickfergus, and another in Galway, the whole of the candidates' examination papers have been cancelled, and the teachers implicated disqualified from earning any payments on results for three years. The teacher of another school in Belfast forfeits his certificate for making false entries in his attendance register and claiming payments from the Department for students who never attended his class. Instances like these cannot be too severely punished, and "My Lords" have done well in every instance to disqualify both students and teachers. It would be hard indeed if the commendable efforts now being made both by Government and private persons to induce in the people of this country a love for art and science were permitted to be hindered by the base designs of dishonest and false disciples.

THE THAMES EMBANKMENT.

To whatever cause attributable, it is certainly matter for profound regret that the contractors and engineers engaged in constructing this noble causeway have not been able to carry on their work conjointly with the contractors for the line of railway which is to run from Westminster to Blackfriars beneath the surface of the granite-cased embankment. Doubtless there are reasons and excuses for the mismanagement which will necessitate the excavation and removal of a vast quantity of the "filling-in" material of the new roadway, deposited there at great expense. Excuses and "explanations" there always are in abundance when officialism finds itself brought to book. Anyhow, a blunder has been committed, which will deprive the public of the real practical utility of the road for which they have already paid for another year. The section of the Metropolitan District Railway running from Tyburnia through South Kensington, Brompton, Chelsea, and Belgravia, to Westminster, will be opened for traffic before the end of October, and this announcement has induced us to reflect that had the contractors for the railway carried on their works simultaneously with those for the embankment, we might have had the whole of the works completed at about the same time.

PERPENDICULAR CARVED WOODWORK.

WHEN the wolf and the lamb lie down together, we may expect that mechanics and the fine arts will go hand in hand, for it certainly appears that the atmosphere of one is poisonous to the other.

The Perpendicular period of architecture is an instance of this. Workmen at that time were a far more educated class than their predecessors, and the rapid advance they made in construction—judging from the many fine examples they have left us—show how eagerly they cultivated the mechanical sciences. The mason was no longer the rude carpenter, and the wood carver, falling into his own groove, would appear to have had all his work to do in oak and chestnut. The carving—so utterly different from that which went before it—was a more or less direct importation from the East. Thus we find Oriental interpretations of the poppy, pine, pomegranate, &c., as also the florid manner of grouping them, in many cases almost identical. The embroidery of the time seems little more than a reproduction of old Saracenic work. Sculpture became at length so lavish of intricate and minute ornament in its efforts to produce a richness of diaper that the whole thing appears lost in mechanical repetition. Each leaf seems the result of a given number of strokes, and the carver becomes the slave of the tool instead of the tool being made the instrument to realise his ideas. But much of the early Perpendicular decoration had a delicious simplicity about it when taken in detail, and it was not wanting in elegance in the mass. The foliated cusp (No. 3) of the lithographic illustration is a good specimen of this latter description of wood carving. No. 4, although it has too much of the tool about it, is a very lively example of the style. These, together with the bird in spandrel (No. 1), are from the collection at the South Kensington Museum. Of later work I have selected portions of two linen pattern panels (Nos. 2 and 5), taken from fragments of framing I have found in Devonshire churches. The old Puritanical pews so prevalent in the churches of this country were often constructed of the *debris* of former frames and seats. The linen pattern is a capital union of the carpenter and carver's work, requiring the utmost delicacy of section, and a rigid decision in the carving of the ends, its exquisite flatness and outline reminding one very much of Greek drapery.

The Classic art invasion does not appear to have affected wood carving so early as it did ornament in other materials, particularly in the more remote counties, for there are many beautiful specimens about of screen and tabernacle work, the date of which it would be very difficult to decide were it not that the work often ranges with or runs into building materials of a seemingly later style.

C. W. D.

CARELESSNESS *v.* "SPONTANEOUS COMBUSTION."

"SPONTANEOUS combustion" is undoubtedly a culprit in many large conflagrations. Wharfs and warehouses, wherein were stowed hemp, jute, and such like commodities, have been destroyed by his visitation. Great as is the mischief in which he has had a hand, he is made to bear the blame of a vast deal of destruction of which he has been wholly guiltless. In many fires of which "spontaneous combustion" has been assigned as the cause, the surrounding indications have been but too suggestive of incendiarism with a view to defraud insurance companies. But greatly as the work of "spontaneous combustion" has been overrated, it is now sought by some people to attribute the destruction of acre after acre of heath and wheatfields to the same agency But "combustion by the sun's heat" is in reality "combustion through carelessness." This carelessness may be displayed either by individuals (smokers of tobacco) or by railway companies (owners of locomotive engines). The tobacco smoker is most probably the culprit concerned in the devastation of many of those fields and heaths which lay beyond the reach of sparks from a locomotive funnel. But the innumerable charred and blackened fields skirting the various lines of railway are beyond a doubt owing to the emission by the "iron horse" of showers of fiery sparks. In the days when coke was the fuel used for locomotives these showers of sparks and the volumes of smoke from the funnels were unknown. The first-named cause of the destruction of so much valuable property—the careless throwing down of "vesuvians," &c., by smokers—lies with individuals to remedy by displaying extra caution. As to the railway companies, it is probable that they will only be influenced by legislative enactment. They must either be made to burn coke or else adopt such mechanical contrivances (already within reach) as will render a volcanic shower of sparks from a locomotive funnel an impossibility.

THE BISHOP OF LONDON'S MODEL DWELLINGS AT FULHAM.

THIS building, which is now being erected from the plans and under the superintendence of Mr. Seddon, architect, consists of a block of cottages containing accommodation which may be considered equivalent to thirty-one dwellings. It is arranged as follows:—The lower floor, which may be called the basement (although it is above the level of the ground at the back and is sunk only as regards the access in front), contains six dwellings, each of which consists of one living room and one bedroom, with pantry and scullery and two water-closets for common use. There are also on the same floor cellarage compartments, which are well lighted and ventilated, and capable of being employed as stores, workshops, or bedrooms, and are equivalent to three dwellings in space. The dwellings on this floor look out upon a courtyard, which is intended as a playground for the children of the inhabitants. The ground floor—reached by a few steps from the street—has the main entrance to the building in the centre, with a stone staircase descending to the basement and rising to the roof and delivering to a balcony on each floor. Access is obtained to the several dwellings from the balconies. The living rooms are situated to the back, with a southern aspect. The ground and first floor each contains eight dwellings. Of these two have a living room 17ft. by 10ft., a bedroom 13ft. by 7ft., a scullery, and water-closet. The rest have each an additional bedroom—of somewhat smaller dimensions—as well. Thus the area being the same the accommodation is slightly varied to suit different classes of occupants. Another variation occurs in the wings upon the first floor, their space being appropriated as private sleeping rooms for ten single persons in two divisions, each of which is under the control of the occupier of the house which occupies the rest of the wing. There are common lavatories to each of these collections of dormitories. The wings on the highest floor, reached by winding staircases, are similarly arranged, and in the centre part of the building are two more houses, each consisting of rooms and a scullery reached from the same staircases as the wings. The remainder of this floor is appropriated as a common laundry and drying room, together with a bath room, to which access is obtained from the principal staircase. One point which has been carefully attended to is the provision generally to each dwelling of a separate water-closet, with ventilating shaft carried up to the roof; each house is also provided with a cistern, sink, shelf, and coal bin.

For the erection and completion of the entire block, providing accommodation for what may be considered the equivalent of thirty-one families, without considering the part appropriated for washing, the contract sum is £4,404. The whole cost will be about £4,800, inclusive of architect's fees and all expenses, but exclusive of the value of the site, which in this instance is free. The cost thus amounts to about £155 per dwelling. The rental expected is as follows:—

Attics,	10 single rooms at	2s.	... £1 0s.
„	2 dwellings „	5s.	... 10s.
„	2 dwellings „	4s.	... 8s.
1st floor,	10 single rooms „	2s.	... 1 0s.
„	6 dwellings „	5s. 6d.	... 1 13s.
Ground floor,	8 dwellings „	5s. 6d.	... 2 4s.
Basement,	2 do. „	5s. 6d.	... 11s.
„	7 do. or stores „	4s.	... 1 8s.
Total			£8 14s.

This gives the yearly rental of fifty-two weeks at £426 8s., and if one-sixth of this be deducted for expense of collection, rates, taxes, and repairs, it will leave rather more than 7 per cent. as a return for the outlay, or, if an ordinary ground rent be added, it would be somewhat less than that amount.

In examining these calculations it should, however, be taken into consideration that the position of the building, close to the entrance to the Bishop's palace, and adjoining his grounds, necessitated a somewhat more ornamental character than is absolutely necessary for structures of the class. The material of which it is built is ordinary stock brick, with stone heads and sills to the windows, and red brick bands and ornamental stringcourses. The work is being carried out by Mr. Thomas Williams, of Canton, near Cardiff, contractor. We may have occasion to refer again to this building in comparison with others of the class, efforts for the amelioration of the accommodation for the working classes having at the present time a special importance.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE twenty-fifth annual meeting of the British Archæological Association commenced at Cirencester on Monday. The meeting is held under the patronage of the Earl of Ducie, Lord-Lieutenant of Gloucestershire, and the Bishop of Gloucester and Bristol. Earl Bathurst is the president, and there is a list of thirty-three vice-presidents, including the Earls of Effingham, Eldon, Mar, and Suffolk, Lord Boston, Lord Houghton, D.C.L., Viscount Andover, M.P., Sir Michael Hicks Beach, Bart., M.P, Sir C. H. Rouse Boughton, Bart., Sir Gilbert East, Bart., Sir J. Gardner Wilkinson, Bart., D.C.L., F.R.S., the Right Hon. T. Sotheron-Estcourt, Mr. R. S. Holford, M.P., Mr. A. A. Bathurst, M.P., Mr. R. H. Dutton, M.P., Mr. Godwin, F.R.S., F.S.A., &c. The inaugural address was delivered by the noble president at half-past three in the afternoon. Half an hour was devoted to an examination of the church and townhall, and at seven o'clock the dinner took place at the Assembly Rooms. Tuesday was devoted to an inspection of the antiquities of the town. The three succeeding days were devoted to excursions:—1. To Trewsbury Camp, Akeman-street, Crudwell Church, Malmesbury Abbey, Church, and Cross, Athelstane Hall, Charlton Park, ancient stones at Kemble. 2. To Ranbury Rings, Merseyhampton Church, Fairford Church, and Bibury Church. 3. To Daglingworth Church, Dunstbourne Rouse, Elkstone Church, Brimpsfield Church and Castle, and Edgworth, &c. The excursions wind up with a closing one on Saturday to the newly-discovered Roman villa at Chedworth, of which the visitors are promised a description by a competent archæologist. Chedworth Church, Calmsden Wayside Cross, and North Amry Church were also included in the last day's programme. Among the papers read were the following:—Rev. W. F. Powell, M.A., and J. D. T. Niblett, M.A., F.S.A., "On Cirencester Church;" T. Wright, M.A., F.S.A., "On the Early History of Cirencester and on the Nature and Influence of the Roman Municipalities in Britain;" H. F. Holt, "On the remarkable Painted Glass in Fairford Church;" J. D. T. Niblett, M.A., F.S.A., "Fairford Church;" J. R. Planché, "On the Earl of Gloucester;" E. Roberts, F.S.A., "On Bibury and Merseyhampton Churches;" E. Levien, M.A., F.S.A., "On Richard of Cirencester and his Writings;" Gordon M. Hills, "On Malmesbury Abbey Church and other Antiquities at Malmesbury;" T. Blashill, "On the Churches of Daglingworth, Duntsbourne Rouse, and Elkstone."

A portion of the roadway of Grafton-street, Dublin, has just been paved with asphalte, whereby noise, dust, and dirt are reduced to a minimum.

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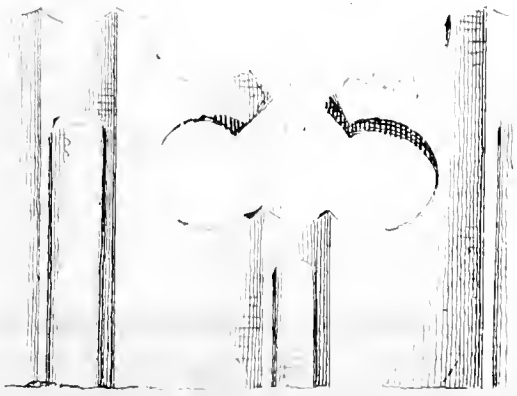

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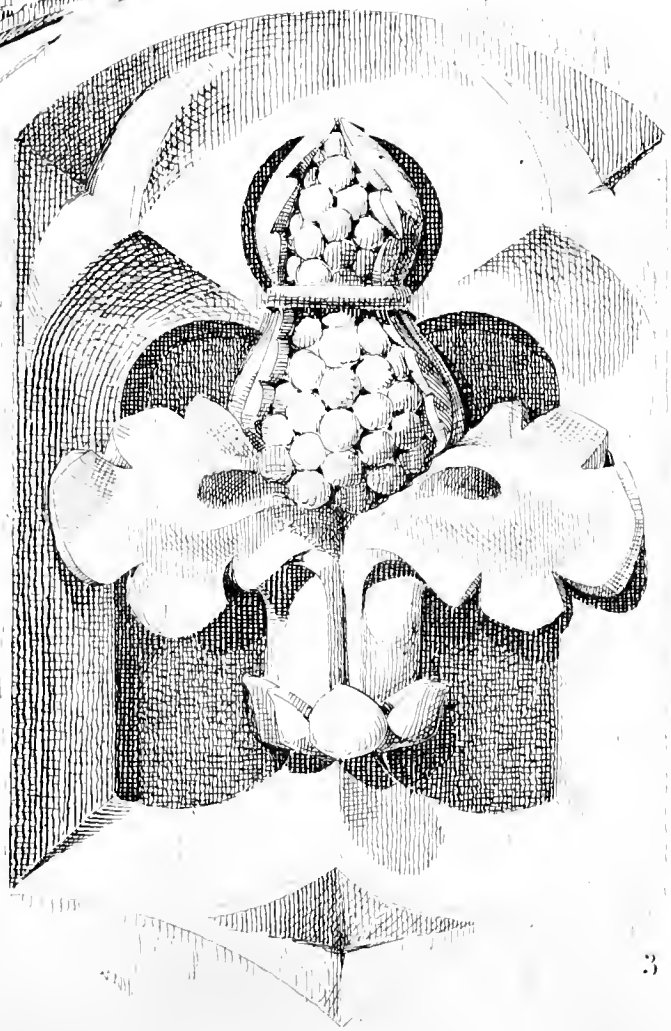

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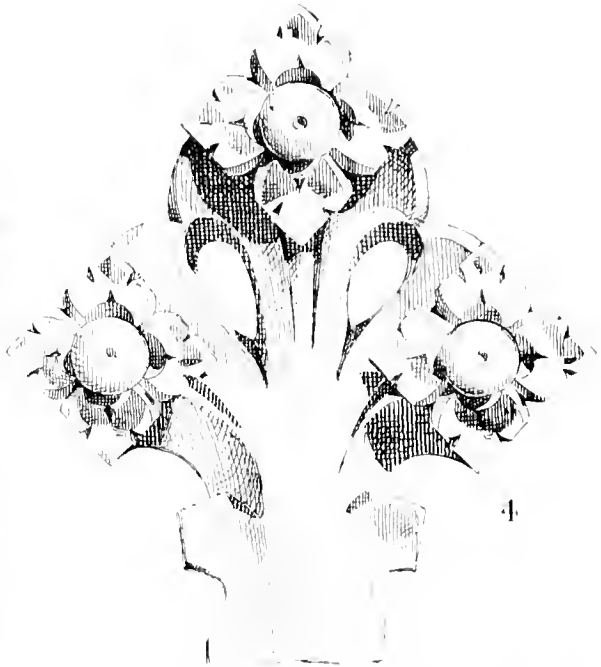

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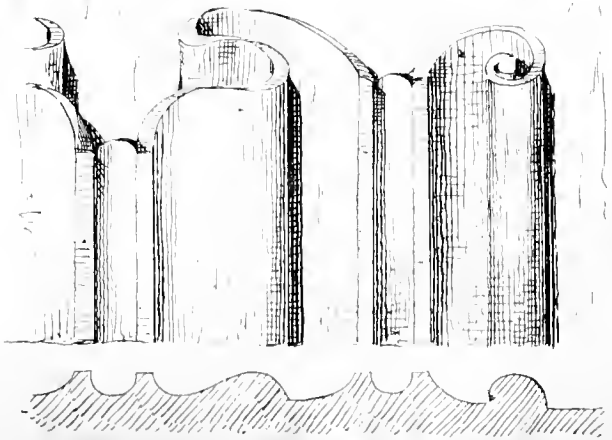


5

Section

PERPENDICULAR CARVED WOODWORK.

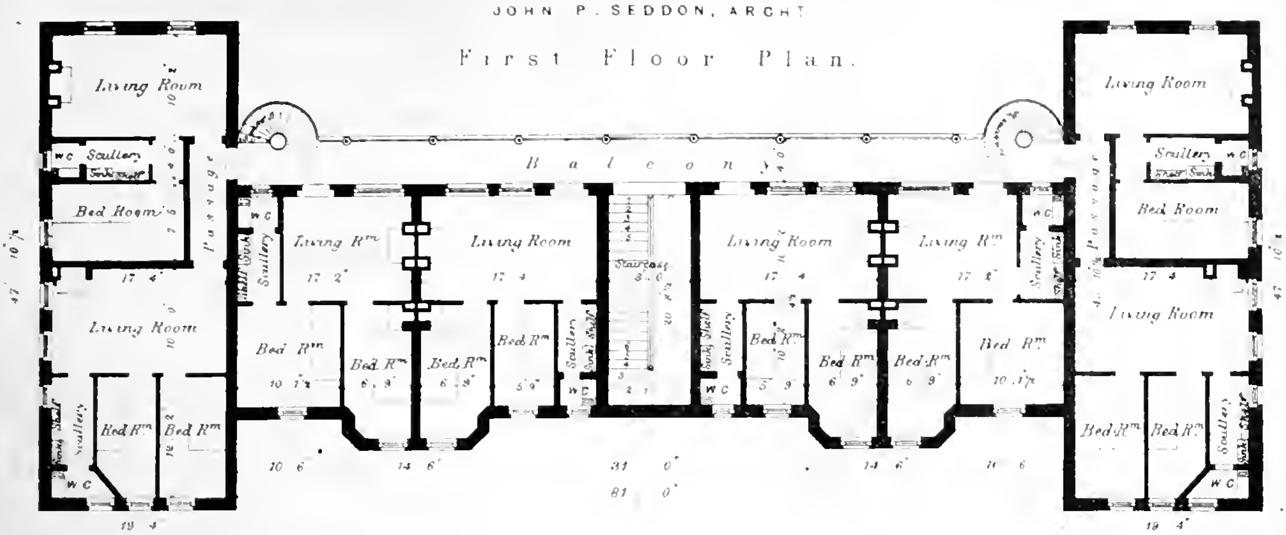
Owen W. Parris lith. Strand

Printed by Whiteman & Bass

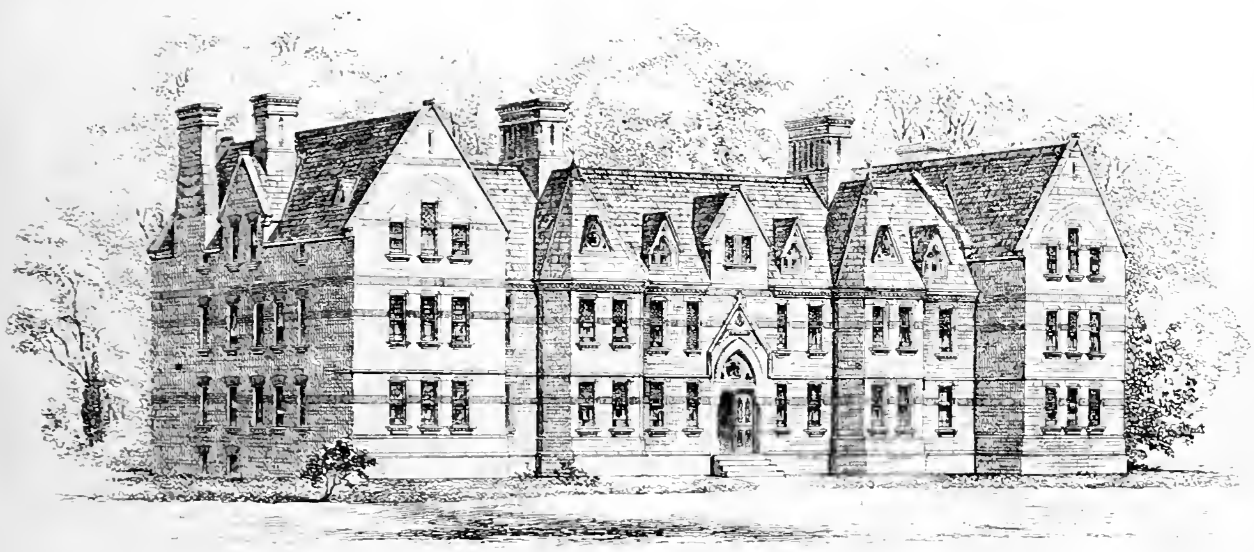
DESIGN FOR A BLOCK OF MODEL DWELLINGS AT FULHAM.

JOHN P. SEDDON, ARCHT

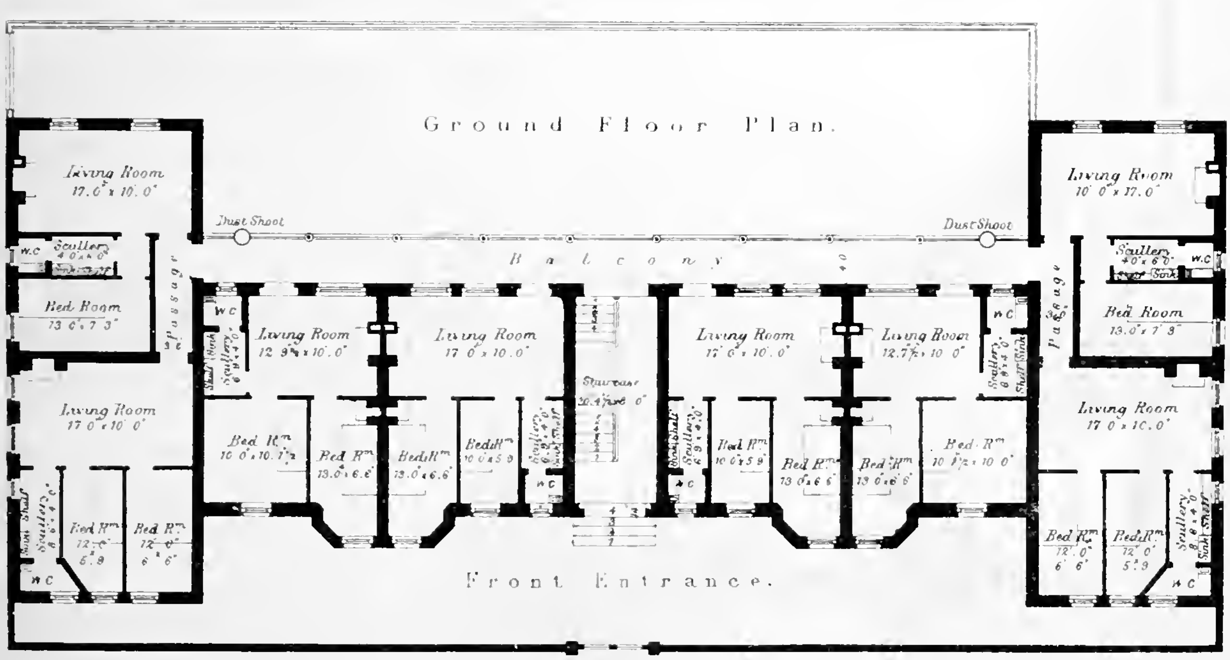
First Floor Plan.



Perspective View.



Ground Floor Plan.

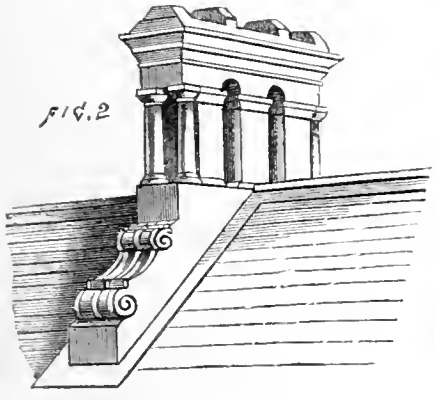


Front Entrance.

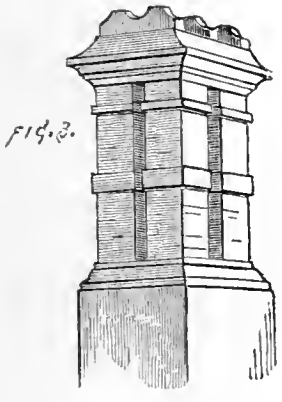
ROOF ACCESSORIES.

THE effect of wind on the stability of high chimney stacks should not be overlooked in design, as every practical man accustomed to superintend their erection must have repeatedly experienced the sensible tremor occasioned by very slight winds against wide and narrow structures of the kind. Hence the import-

ance of lateral stiffness—of concentrating the separate flues as much as possible in lofty situations, either by combining them in square stacks, or by building lateral shafts to give rigidity to a row, fig. 4. The plan of build-

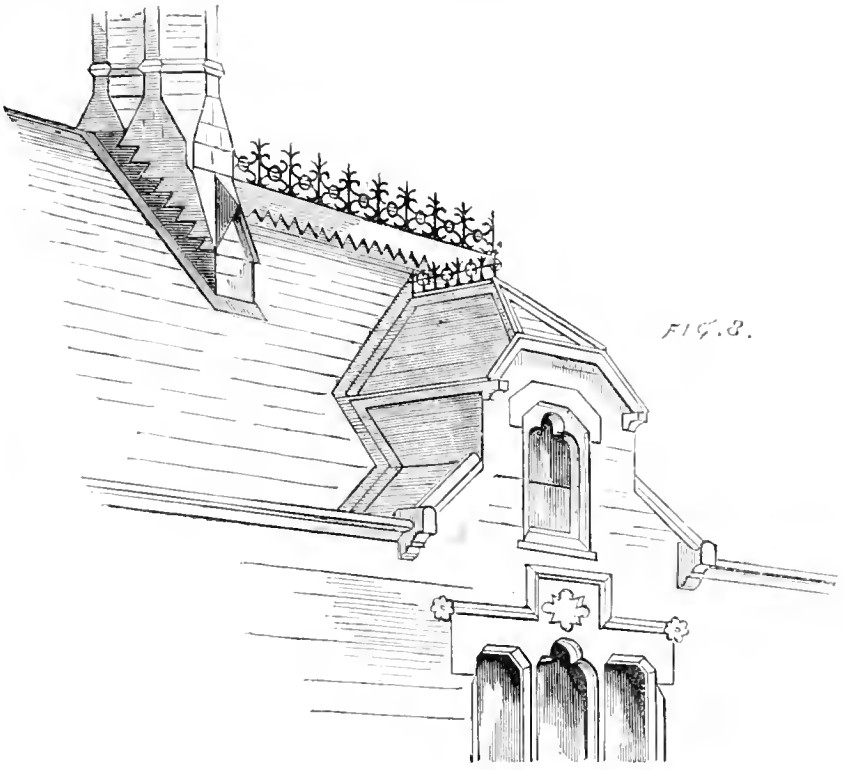


ing detached shafts, or leaving spaces between them, is perhaps the most effective way of combining strength and lightness of effect with simplicity of plan—a much more preferable mode than carrying up those huge flat blanks of brickwork that become such eyesores in large cities.

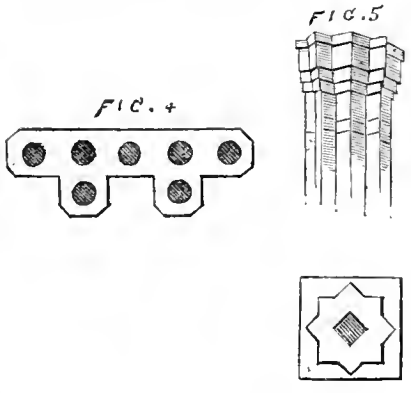


Of the many nostrums before the public for the cure of smoky chimneys it may be said that in the greater number of cases the evil is but partially remedied by the unsightly disfigurements to chimney tops, the chief cause being generally in the form of the flue or its throat, the latter being insufficiently contracted—at least, the writer's experience has decidedly been confirmatory of this view. Billing's patent termination is per-

ROOF ACCESSORIES.

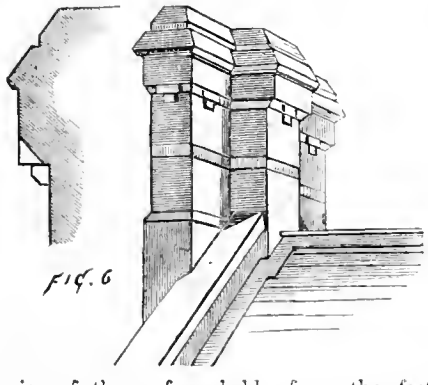


haps the least objectionable of the numerons terminals before the public. Nothing can be more hideous and often destructive to the appearance of chimney stacks than the employment of chimney pots or cowls, particularly as these after-substitutes of thought are

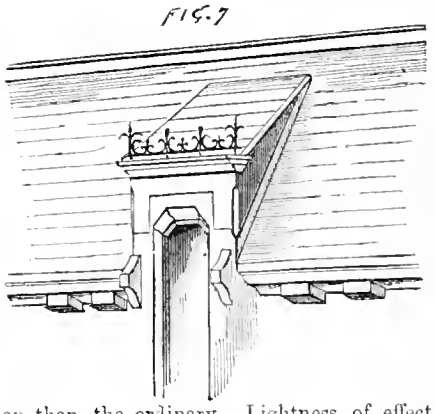


generally designed, and nothing detracts more from the look of a building than its stacks bristling with pots, like huge flat brnshes of hogs' bristles.

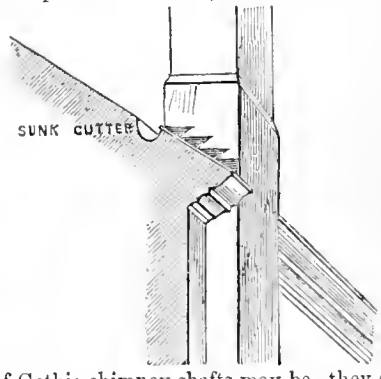
Artistically regarded, the Italians have always been "ahead" of us in these acces-



sories of the roof, probably from the fact of the clearness of their atmosphere, added to the important part the landscape has played in their architectural works. In Florence and elsewhere, examples of chimney terminations from which the smoke issues sideways under handsome sculptured ter-minals of varied design are frequent and suggestive of a new treatment, figs. 9, 10, and 11. Lateral apertures are sometimes seen among our own works, and it may be as well to note that this mode of outlet gives the architect greater scope for variety of chimney



top than the ordinary. Lightness of effect, besides another advantage, that of lessening the wind-catching surfaces of stacks, can be obtained by continuous or stopped splays to the angles, and, however unique and clever, as examples of brickwork, the fantastic shapes



of Gothic chimney shafts may be, they suffer in their acutely cut angles, the action of the elements quickly destroying their straight arrises and converting them into serrated edges. Thus, however well broken such a shaft as fig. 5 is, the plan of which is a figure of two intersecting squares, the angles wherein lies

the interest are the most exposed and the least durable in such a situation as that of a chimney; hence its unfitness.

As other examples of bases for chimney stacks in situations where they rise from the ridge or from the slope of a roof we give figs. 1 and 2, the former a treatment adapted to high-pitched roofs in the Pointed style, the latter well suited for buildings in the flatter or Italian style.

An awkward problem often presented to the architect is how to stop or interrupt his gable projections or coping for his chimney shafts, the latter being paramount. If the chimney projects as it generally does in Gothic erections, the difficulty is increased, for then the barge or verge boards of the gable must either stop abruptly or continue to a point; or, in the case of a coped gable, the shaft or stack must be of sufficient depth to stop the coping. If three flues are necessary one of them can be advantageously placed behind the other two and be made to stop the coping, as in fig 6. The same sort of difficulty more frequently arises in flank chimneys, where they interrupt the eaves' line by reason of their projection from the face of the wall. Where the projection totally cuts off the eaves, or where it obstructs all save the eaves' guttering—a not uncommon occurrence—it is far better constructively and æsthetically to form a sunk or blind gutter behind the stack altogether than to allow the mere line of guttering to cut off the stack.

Figs. 7 and 8 show designs for dormer windows, features, equally with chimney stacks, important accessories to roofs. In both cases the eaves' line is shown interrupted, and the fronts of the windows rise from the wall plane as integral parts of the structure rather than as excrescences that belong to the roof proper. In another part of our essay relating to composition, we shall have something more to say respecting roof gablets, the avoidance of little "prettinesses," and "dodges," and the pursuit of the simplest structural adaptation.

KING'S CROSS MARKET.

THIS new market, almost immediately adjoining the Great Northern and Midland Railway Stations, was inaugurated on Friday last. The new market occupies about an acre and a half in extent. It is divided into three principal areas. The general entrance is from the Old St. Pancras-road. In general appearance the market is very plain. The pillars supporting the roof are slender iron columns, painted in white and chocolate, with a band of blue round the capitals. A fountain of no great pretensions is situate in front of the retail department. Light, coolness, and ventilation are well provided for. The roof is so constructed as to shade the market entirely from the rays of the sun, while admitting a full supply of light and a free circulation of air. There are 86 stalls of shops, each having a frontage of 14ft. by 10ft. in depth. Every one of these is let at a rental of 14s. per week. Behind the fishmongers' shops are ice cellars, and above them are ranges of offices for the use of clerks and bookkeepers. The whole structure has cost about £41,000, and is let already at an annual rental of nearly £5,500.

THE ECOLE CENTRALE D'ARCHITECTURE, PARIS.

FROM Mr. Eyre Crowe's report in the "Science and Art Blue-book," lately published, we extract a few particulars respecting the above institution. Started only two years ago, it has already achieved considerable success. M. Trelat, the director, has formed around him a band of young architects, whose efforts are full of interest. The society is formed on the limited liability principle, with a capital of £16,000. The instruction is twofold—that given in the Ateliers, where the practice of architecture is taught, and in the lecture-room, where its theory is developed. To obtain admittance as a pupil a preliminary examination has to be passed, at which each candidate is required to execute a shaded drawing of ornament from bas-relief, a design (plan, section, and elevation) of some building drawn to scale from a sketch, and a written composition referring to architecture generally. He has also to pass an oral examination in arithmetic, algebra, geometry, and geography. On admittance the student has the free choice of two ateliers, taught by two different professors, with their staff of teachers. The hours of admittance are from 8.30 a.m. to 4 30 p.m, with one hour's interval. At the end of each month each student has to produce a finished architectural drawing from a copy, and one worked out from a descriptive programme. During the first two years six hours in each week have to be devoted elsewhere to object drawing. In the third year two hours a week are deemed sufficient. Each of the three years forms a class of instruction, the more advanced pupils helping by contact and counsel those of more recent entry. The advance of each student is noted with great care by a registering system, in which the whole course of every individual may be traced at a glance. During the summer vacation, which lasts three months, the students are expected to produce carefully-worked out designs of any buildings that may have struck their fancy. On the whole, each, during his three years' course, has to undergo from 270 to 280 examinations. At the end of the three years those who have given satisfactory proofs of their skill are admitted to the general competition, the object of which is the school's diploma, and which lasts fifty days. The results are determined by a jury consisting of five members or more, the public being allowed to view the designs, &c., exhibited, three days before the verdict of the jury is given. The salient features of the Ecole Centrale seem to consist in a judiciously balanced course of instruction, combined with a generous latitude of study, and the wide range of subjects descanted upon by the most competent authorities.

BUILDING SOCIETIES AND STAMP DUTIES.

IN our impression of the 24th ult. there appeared a letter from a building society's solicitor, drawing attention to a certain clause in a bill which was then before Parliament for amending the law relating to Inland Revenue. The writer expressed his conviction that if the bill was passed unaltered the effect would be to retard the beneficial results accruing from building societies. The clause referred to by our correspondent rendered all mortgages over £200 liable to stamp duty, and gentlemen learned in the law were of opinion that the ambiguous and peculiar wording of the clause rendered all amounts paid on account of mortgages liable to the duty. The building societies generally were for a long time blissfully unconscious that the bill was before the House. The Newcastle societies were the first to take the initiative, which they did by holding a public meeting and sending a deputation to London to request local members to oppose the obnoxious clause. The Birmingham societies did not begin to move in the matter until the bill had passed the Lords. Mr. Cowen and other northern members had, however, been in consultation with the law officers of the Crown, and ultimately, on the last day of Parliament, the Chancellor of the Exchequer agreed to exempt mortgages under £500, and it was promised that the clause should be so worded as clearly to exempt advances on account of mortgages. Mr. G. J. Holyoake, in a letter to the *Morning Star* on the subject, says that although it may be right, from a fiscal point of view, to modify the entire exemption from taxation originally conceded to these societies, he does not think they ought to be meddled with. Mr. Thomas Beggs, in a letter on the same subject, asks whether the societies really benefit by entire exemption from the stamp duty, and whether there is anything objectionable in principle in bringing them under the stamp duties. The question is not at this moment the amount of such duties. So long as indirect taxation must be resorted to a small stamp duty upon legal documents is a legitimate and just method of raising revenue. It is not easy to understand why a man investing his savings in the purchase of a piece of land should have to defray all the legal charges incidental to such a transaction, including a stamp, whilst the members of building societies are exempt from the stamp. Mr. Beggs can see no valid reason for giving to a number of men who may combine for the purpose of building houses and buying land privileges and immunities which are not accorded to a man who prefers to act for himself and by himself. Mr. Beggs very pertinently asks whether there is not a great mistake in assuming that there is any great encouragement given to building societies in what the legislature has done, and whether the encouragement that has been given is not more than counteracted by what has been left undone? Why should there be so much difficulty and expense in the transfer of land?

It is high time that building societies and freehold land societies were recognized by the law as commercial undertakings, and they are now large enough, numerous enough, and powerful enough to disencumber themselves of the Act of Parliament, which treats them as benevolent institutions. These societies are incorporated under the Benefit Societies' Act, 6 and 7 William IV., cap. 32; and section 4 provides that all the provisions of the Friendly Societies' Act, 10 Geo. IV., cap. 56, and the 4 and 5 Will. IV., cap. 40, so far as the same may be applicable to benefit building societies, and to the framing, enrolling, and altering the rules thereof, shall apply to benefit building societies. The Act of Geo. IV. includes the clauses which govern the rules of a building society, and the Act of 6 and 7 Will. IV. confers the ability to use them. The freehold land societies are conducting their business by an evasion of the law. It would be well, therefore, to consider whether the law, in relation to building and to freehold land societies, could not be revised and amended. It is mischievous to continue the present system, which was devised to meet exigencies not now existing. What was suited to small friendly societies becomes a check and an incumbrance to large investment societies, with incomes of from £30,000 to £100,000 per annum. Mr. Beggs would incorporate them under the Companies' Act of 1862, giving them power to purchase land, build houses, or carry out any of the purposes for which they are embodied, on their supplying the usual guarantees. He would also give to them a simple means of conveyance and transfer at a small charge. If the provisions of the Companies' Act are not wide enough they might be made so; and it would be wise that all the powers conferred upon them should be contained in one Act of Parliament.

Mr. Beggs regards the present as a proper time for the officers and members of building societies to look carefully into the matter. Possibly a conference (for which the approaching meeting of the Social Science Association at Birmingham would afford facilities) would be the best thing. A meeting of delegates might discuss such alterations in the law as appear desirable, so that the subject might be brought before the next Parliament. While not in favour of heavy stamp duties, Mr. Beggs would desire to see a small *pro rata* charge; but this should apply to all cases, whether in building societies or out of them, and be equally applicable to conveyances, transfers, and mortgages.

COMPETITIONS.

AT a meeting of the Metropolitan Asylum Board, held on Saturday week at the Board of Works' office, Spring Gardens, two lengthy reports of committee were submitted, embodying plans and arrangements for the erection of a fever hospital and small-pox hospital at Homerton. For the fever hospital it was decided to offer a prize of £200 for the best design, and another of £150 for the second best; the successful architect to carry out the plans for £1,000, but that he be not entitled to any prize or payment unless some substantial contractor undertake the work at a price not being more than 10 per cent. above his estimate of cost. Accommodation is to be provided for 182 patients. The internal dimensions of the rooms are to be such as to afford, at least, 130 superficial and 2,000 cubical feet of space to each patient. A prize of £180 has been offered for the best design for the proposed small-pox hospital, and another of £100 for the second best, the winner, as in the previous case, being bound within certain limits as to the cost of carrying out the design. The eight principal wards are to be built to contain twelve patients each, with a width of about 24ft., and are to afford 2,000 cubic and 140 superficial feet to each patient.

At a meeting of the Greenock Harbour Trust, held on Friday last, the premiums were awarded for the designs for the new docks to be built at Garvel Park. The competitors were 170 in number. The first premium (£300) was awarded to Mr. T. C. Fidler, of Ventnor, and the second premium

(£100) was assigned to Mr. Robert Kiniple, C.E., of Westminster. The plan which, in the opinion of the judges, came next in order of merit to those premiated, was that by Mr. Charles S. Beloe, of Lord-street, Liverpool.

ARBITRATION AT HUDDERSFIELD.

A MEETING promoted by the Council of the Huddersfield Chamber of Commerce, was held on Wednesday week, in the Council-room, to consider the question of establishing in the Huddersfield district boards of arbitration, to settle disputes that might arise in different trades between employers and employed. There were present representatives of the council of the Chamber of Commerce and workmen representing the following trades:—Printers, moulders, joiners, tailors, spinners, slubbers, dyers, and cloth dressers. The chairman stated that on April 8 last he received from Mr. Mundella, of Nottingham, a copy of rules adopted by the board of arbitration in that town, and the council of the Chamber of Commerce, at a meeting, recommended them to the consideration of the several trades in the district. Afterwards he received communications from the Cloth Dressers Association and others which shewed that the principle of arbitration in case of trade disputes was making progress in the public mind in this district; and the subject being again brought before the council, they decided to endeavour to bring together employers and employed, with a view to the formation in this district of boards of arbitration, which had effected such beneficial results at Nottingham, the Potteries, and elsewhere, and which a deputation from the trades of Manchester had desired the Chamber of Commerce of the city to establish there. One of the best modes of continuing and increasing harmonious feeling would be the establishment of boards of arbitration. A discussion, or rather a series of explanatory speeches, followed. All present agreed to the principle of arbitration, and ultimately the meeting was adjourned for a month, in the meantime the employers and workmen to be furnished with copies of the Nottingham rules for their consideration, and to hold meetings of each trade to consider what kind of rules would be required to meet the particular circumstances of the various trades.

SCHOOLS OF ART.

A MEETING has been held at Leith for the purpose of establishing a school of art in connection with the Science and Art Department. In Leith there was already a science school in connection with this department, which was better known as the Navigation School; but the desire at present is for an art school as well as a science school, the design of which would be to teach drawing, painting, modelling, and designing for architecture, manufactures, and decoration. Only a few townsmen attended, and it was determined to postpone the project for a year, and in the meantime to canvass for subscriptions.

ARCHÆOLOGY.

A FEW days ago two ancient swords of the bronze period were discovered beneath a rock on the brow of Simonside, Durham. They were leaf-shaped, with very small handles. One was 20½in. long; the other was broken. Some bronze rings, and two leaden ornaments, one of which appeared to be a *fibula*, were afterwards found at the same place.

The programme for the 20th annual meeting of the Somersetshire Archæological and Natural History Society is settled. It will take place at Williton on the 25th inst., and two following days. A local museum of objects of archæological interest will be formed. The first day will be devoted to business and the reading of papers. On Wednesday there will be an excursion to Cleeve Abbey, Dunster, &c., and the society will be joined by the Exeter Naturalists' Society. On Thursday the excursion will be in the opposite direction, over the Quantocks, visiting the old quarries, camps, &c.

WATER SUPPLY AND SANITARY MATTERS.

THE system of periodically watering all the narrow streets, courts, alleys, and other confined places in the parish of Marylebone with a solution of carbolic acid, and which has been going on for the past six weeks, is attended with considerable benefit; it effectually neutralises all offensive smells, and by its antiseptic properties arrests the decomposition of the animal and vegetable refuse which accumulates so rapidly in all poor and crowded localities. The disinfecting of houses in which death or sickness from contagious diseases have occurred is also persevered in; 42 houses have been thus treated during the month.

The Registrar-General tells us in his weekly report that during the month of July 113,263,837 gallons of water were supplied daily in the metropolis, rather more than a ton by weight to each house—36·2 gallons to each person.

The Rev. S. T. Nevill, the Masonic P.C.G. of Staffordshire, has broached a novel proposal. He suggests that Freemasons who have leisure should advance from the theory of their craft to practice, and, forming themselves into disciplined encampments, go out to Australia and New Zealand and build small churches in places destitute of places of worship. The Rev. gentleman has correspondents in New Zealand who have to travel fifty miles to church, and he feels certain that such a fraternity as he suggests would be welcomed in many villages as a blessing, and treated accordingly.

Building Intelligence.

CHURCHES AND CHAPELS.

On Friday last Tickhill parish church, Yorkshire, was reopened by the Archbishop of the diocese, after restoration under the direction of Mr. John Athron, of Doncaster.

Kildale parish church, Cleveland, Yorkshire, has been rebuilt, and was opened by the Primate of England on Monday week. The style is Early Geometric, and it is built of local stone. It consists of nave, chancel, and north aisle, with a tower 66ft. in height. The cost was about £2,000. All the stone being presented by a parishioner a considerable item of expense was avoided. Mr. G. F. Jones was the architect.

The new church of St. Lawrence, Stroud, Gloucestershire, was consecrated on Tuesday week. The edifice is partially erected on the foundations of the old church. The plan comprises nave, aisles, transepts, sanctuary, chancel aisles, sacristy, and porch, and is parallelogram in shape, the length being 101ft. by a width of 66ft., with projections for transepts, porch, and sanctuary. The nave is divided into four bays, each 13ft. wide, with wider arches at the intersections of the transepts, equal to the width of two bays, making the nave six bays long in appearance. Above the nave arches is a clerestory, with triplet lights. In the spandrels of the large arches opening into transepts spaces are reserved for carved medallions. The sanctuary is separated from the nave by a low stone screen and grilles, and is 27ft. long, and the same width as the nave. The eastern window is five-lighted. The steps of the sanctuary are of polished Devonshire black marble, and the floor is paved with encaustic tiles. The walls are lined with the old "bequest boards." The old tower and spire remain. Accommodation is provided for 1,200 persons, the cost being over £7,000. The roofs are of English oak, covered with plain Staffordshire tiles, with earthenware ridge cresting. The walls are built of Bisley stone, faced internally with Painswick. The dressings are of Bradford stone. The seats and desks are of English oak. Messrs. Wilson and Willcox, of London and Bath, are the architects, Messrs. Wall and Hook, of Brinscombe, being the builders.

The Countess of Huntingdon's Chapel, at Ashbourn, Staffordshire, is about to be restored and improved from plans by Mr. Sugden, of Leek. Messrs. Stonier Brothers, of Rochester, are the contractors. The cost will be £620.

The Methodist New Connexion Chapel, Sheriff-hill, Gateshead, has just been reopened after undergoing considerable alterations. The work has been carried out from the plans of Mr. Thomas Reay, architect, Newcastle, at a cost of £200, the principal contractors being Messrs. Metcalfe and Arnell, and Mr. Southern.

The contract for the enlargement of the Independent Chapel, Wells, Norfolk, has been taken by Mr. Thomas Spinks, builder, and will be carried out from the plans and under the superintendence of Mr. Darken, architect.

On Tuesday week the fine old parish church of Brampton, Derbyshire, was reopened after restoration. The church, which is dedicated to St. Peter, was partly rebuilt in the latter part of the fourteenth century upon the foundations of its predecessor, which was of semi-Norman character. The tower has been thrown open to the church. The roofs of the nave and south aisle, and the chancel aisle, have been restored, and the church re-pewed. The cost of the works was about £1,000. Mr. S. Rollinson, of Chesterfield, was the architect, and Mr. Marriott, of Staveley, the builder.

The foundation stone of a new Roman Catholic Church at Sunbury was recently laid. The entire length, including the chancel, is 84ft., and the width 24ft. The style is Gothic. Mr. Charles Buckler is the architect, and Messrs. Castle (Sunbury) and Whittle (Twickenham) the contractors.

The foundation stone of a new Presbyterian Church was laid at Eldad, near Plymouth, on Monday last. The dimensions of the edifice will be 100ft. by 55ft., and accommodation will be provided for 1,200 persons. The style is Italian, and the cost, including schools, will be about £4,200. Mr. J. L. Hodge, of Plymouth, is the architect, and Mr. Walter Lethbridge the contractor.

Linton parish church, North Devon, is about to undergo restoration. A new chaucel will be erected. Messrs. Oliver and Sons, of Barnstaple, are entrusted with the execution of the works, under the direction of the architect, Mr. Edwin Dolby, of Abingdon, Berks.

BUILDINGS.

The old tumble-down and wretchedly inadequate Clerkenwell workhouse, situate in Farringdon-road, is to be rebuilt at Upper Holloway.

No one who has been accustomed to scan the pages of publications especially devoted to mechanics and the applied sciences can fail to have remarked that as soon as any invention of great utility had been fully developed and was working successfully a greater or less number of claimants for the honour of the invention would spring up. Great public works, of course, are not exempt from this rule. The *Times*, in a notice of the Thames Embankment the other day, said that "to Sir Frederick Trench and Mr. Martin is due the first conception of the Thames Embankment." The next day letters in the *Times* claimed this honour for Mr. William Paterson (the founder of the Bank of England) and Mr. Frederick M. Eden.

Messrs. Hill, Keddell, and Waldram are the contractors for the erection of the buildings at the corner of the iron bridge over Farringdon street, in connection with the Holborn Viaduct.

Extensive alterations and additions are about to be made to Paddington workhouse. A new dispensary and a relieving office will form part of the plan. The contemplated outlay is £11,300.

An additional suite of rooms is in course of construction on the garden grounds south of the Athenæum Club, Waterloo-place, Pall Mall.

At the last meeting of the St. Luke's Vestry it was announced that the Metropolitan Board of Works have agreed to carry out the widening of Wilderness-row, leading from Goswell-road, to St. John-street, Clerkenwell. A new road, in continuation of Wilderness-row, will be carried through Clerkenwell into Holborn, and thus one continual thoroughfare, viâ Old-street and the New road, will be made from Shoreditch Church to Holborn. The new road will be 50ft. wide. This will be a great metropolitan improvement.

Several dwellings and cottages are now being pulled down in Duke-street, Norwich, for the purpose of erecting lecture, school, class-rooms, &c, in connection with St. Mary's Baptist Chapel. Mr. Edward Boardman, the architect, has adopted the Italian style,—front to be faced with red brick; stringcourses, dressings, &c., moulded white brick. The tender of Messrs. Brown and Bailey has been accepted.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—T. K.—I. P. S.—O. W. D.—I. A.—J. C. J.—R. R.—I. S. D.—H. L.—I. M. D.—E. C. and Sons—F. C. B.—I. A. H.—F. W. R.—G. E. S.—G. H. G., "Internal Decorations," by "A Subscriber"—E. C. B.—W. S.—P. J. and Co.—F. L. C. B.—I. C. J.—T. T.—W. B., "A Young Decorator."—W. S.—I. C.—I. B.—W. W.—E. C. B.—I. W. H.

F. A. K.—Enough has been said on the Walworth Common estate competition for the present.

I. P. S.—"Macon."

J. W., Cardiff.—The students' designs, &c., can be seen at the South Kensington Museum on Mondays, Tuesdays, and Saturdays, from 10 a.m. to 10 p.m., gratis, and on Wednesdays, Thursdays, and Fridays, from 10 to 6, on payment of 6d.

Correspondence.

WALTON AND WEST DERBY SEWERAGE —LIVERPOOL.

To the Editor of the BUILDING NEWS.

SIR,—You notice very briefly, but fairly, certain statements by Messrs. Reade and Goodison, relative to proposed works of main sewerage and sewage utilisation near Liverpool, for the adjoining townships of Walton and West Derby. I am not

going to argue the whole case over in public, but simply to state a few facts.

Walton and West Derby are to the east of Liverpool, which is on the eastern bank of the River Mersey. The natural drainage of Walton and West Derby is northwards by the sluggish River Alt. Liverpool and the townships named have an elevated dividing ridge nearly north and south, with, on the Liverpool side, a short cross valley line to the River Mersey by Rimrose Bridge. Sewage from Walton and West Derby may be dealt with in several ways. There may be a main sewer along the natural valley line of the River Alt to the Mersey, or there may be a tunnel sewer to the River Mersey at Rimrose Bridge, as adopted by the West Derby Board. Both these routes have been examined by the surveyor and chairman to the West Derby Local Board, assisted by the late W. Stubbs Plans, sections, and estimates have been most carefully made, not in any hurry or with any bias one way or another, but with deliberation and forethought to work out that plan which should be most economical for the township under all contingencies now and in the future. I may state that the late William Stubbs had made main sewering a study. The surveyor to the West Derby Board is an able man, and the chairman is one of our most eminent contractors for railway and other engineering works. These gentlemen, as the result of all their labour and knowledge, deliberately recommended the Rimrose Bridge outlet as in every engineering respect the best, safest, and cheapest, both in first cost and in prospective contigencies. Messrs. Reade and Goodison, as engineers for the township of Walton, devise a scheme of main sewerage for that township, and make utilisation of sewage the keynote of their plan. There must, however, even in this case, be outlets for flood waters; these are to be into the sluggish River Alt, and so to the River Mersey. Part of the area of Walton is to be sewered by pumping, and the entire sewage is to be dealt with partly in depositing tanks and partly in irrigation.

Both boards voluntarily consulted me as to their proposed works, and after due consideration I have recommended the Rimrose Bridge outlet as cheapest in first cost, the shortest line to deep water in the River Mersey, and as giving a permanent means of escape from contingent, legal, and other difficulties from sewage contamination now and in the future. Liverpool is growing at so rapid a rate that no man can predict how far the suburbs may extend, or the prices land may rise to for villa purposes, and sewage farming beyond a township boundary will not in most cases be desirable. Messrs. Reade and Goodison have, however, so read up this sewage utilisation question (and it has simply been reading) that they will take no other view. Walton and West Derby must either irrigate land in the district (one square yard of which has not been treated for), or they give the alternative of sewage tanks and disinfection of sewage. Sewage tanks and disinfection works are, so far as yet used, costly abominations, but, nevertheless, there are many places where they must be adopted if sewage cannot be wasted, as at Rimrose Bridge, which is direct into the River Mersey, and will be without injury to health or to property.

Sewage irrigation is the only true use for town sewage with any chance of paying, but there are many places where even irrigation cannot pay the town, and yet it will be the best alternative for the ratepayers. But because this is so, must local difficulties and costs be added to by making it imperative to utilise sewage under all conditions? Must it be a crime to waste sewage in any case? Will it be a crime to waste the sewage of West Derby, as the local board have decided to do? These are questions deserving of due consideration, because, if it can be dictated that under no such conditions shall sewage be wasted, as it is termed, Liverpool, Birkenhead, and scores of other places on the seashore or margins of large rivers must be compelled to close up their main sewer mouths, only using them for storm waters, and pump their sewage inland to utilise it by irrigation, no matter at what relative cost. The one proposition will be as reasonable as the other, but both are most unreasonable. Even in the case of town sewage "the value of a thing is just whatever it will bring," and if it saves money to waste sewage, then, according to the law of political economy, wasted it must be.

Messrs. Reade and Goodison, in their review of my very brief report to the Walton Local Board, treat me with more than disrespect. I am accused of having altered my opinions, or of saying and writing contradictions on this question of sewage utilisation. I maintain that my views are what experience has made them, and that they have been honestly expressed in this case. But, supposing I have altered in opinion, is this a crime? Messrs. Reade and Goodison submit their plan voluntarily for my opinion. I give it; and, because it is not such as they wished to have, I receive what I can only call professional abuse. I would rather have reported in favour of sewage application, but preferred to report that which I considered for the truest interests of the ratepayers.

ROBERT RAWLINSON.

ORIGIN OF THE POINTED ARCH.

SIR,—Without at all wishing to question the originality of the views put forth by M. Viollet le Duc with respect to the "origin of the Pointed arch," I must beg you to allow me to inform your correspondent of last week that in a lecture which I delivered to the Cambridge Camden Society, at Cambridge, in 1840, I not only gave the same reasons as those more recently urged by M. Viollet le Duc, in his *Dictionnaire Raisonné*, as among the *probable* causes of the introduction of the Pointed arch, but I proved—I think beyond a doubt—that its adoption by the builders of the twelfth century was due to those causes alone.

As this proof depends upon the citation and description of a large number of buildings situated in different parts of Europe, and as I have had many subsequent public opportunities of enforcing and enlarging my views on this point (as at the annual meeting of the Royal Archæological Institute at Winchester, in 1845, and at Chichester, in 1853; and at that of the Archæological Association, at Lancaster, in 1850), I will not occupy your space by repeating it; but, as the value of a theory depends much upon the extent to which it is examined and tested by others, I will take this opportunity of summarising the considerations which brought me to these conclusions twenty-eight years ago, and which subsequent experience and observation have abundantly confirmed. They are as follows:—

1. That there is a tendency in circular arches of large span to become depressed at the crown, and to lose their form.*

2. That depressed circular arches of the Romanesque period still remain in all parts of Europe.†

3. That the builders of the twelfth century discovered and applied a remedy for this inherent weakness of the circular arch by raising and slightly pointing its crown.

4. That a considerable number of the early *imperceptibly-pointed* arches, as Dr. Whewell calls them, of the Transitional period are thus formed from one and not from two centres.

5. That the true pointed arch, drawn from two centres, when first introduced, was used, not as a matter of preference, but as a matter of necessity and for purposes of utility, and that for this reason it was at first used in *arches of construction* alone, or those in which, as being essentially portions of the fabric, the stability of the building was involved, such as the pier arches, vaulting arches, and the great arches of the crossing; whilst in the *arches of decoration*, or those which only pierced or ornamented the walls, such as those of windows, doorways, and arcades, the circular arch was, as a matter of preference, retained.

6. That, in buildings erected during the first half of the Transitional period, the arches of construction were invariably pointed, and the arches of decoration circular.‡

I think it will be admitted that if these six propositions, or even if only the two last, can be maintained, the question as to the true cause of the adoption of the Pointed arch in Christian architecture may be looked upon as settled. The proofs which I already possess of their correctness, and which are derived wholly from buildings which I have myself visited, are too numerous and too conclusive to permit me to entertain any doubt on the subject; and I only regret that, for the reason I have already given, it is impossible for me to do justice to them in a communication like the present one.—I am, &c.,

EDMUND SHARPE.

* The reasons for this weakness are almost too obvious to require mention, but I may observe that the opposite sides of an 18in. voussoir of a circular arch of 15ft. radius (conditions by no means uncommon in the transverse vaulting arches of the Romanesque period), are so nearly parallel that with the broad mortar joints then in use it is not difficult to understand why so few circular arches of that date retain at the present day their original form, especially when we bear in mind the difficulty which these builders had in carrying up a sufficient abutment to so great a height.

† The chancel arch of Elkstone Church, in Gloucestershire, is a well known example of such a depressed arch in this country, whilst Laach Abbey, which was illustrated in your last number, and in which the whole of the transverse vaulting arches of the nave are similarly depressed, is a good German example.

‡ In the second half of the Transitional period, this rule was less rigidly observed, the pointed arch making its appearance frequently in arches of decoration, and the circular arch being found again occasionally in the arches of construction.

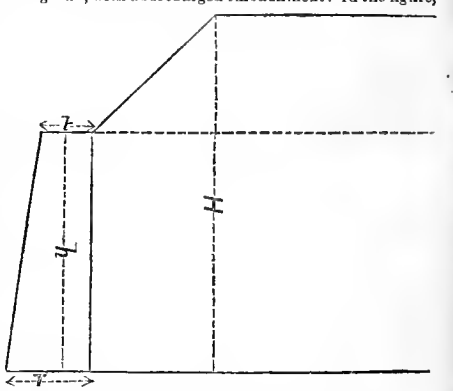
Intercommunication.

QUESTIONS.

[959.]—BLACK VARNISH FOR IRONWORK.—Can you recommend a good sightly black varnish for ironwork—one that will not lay on too thick, or take too long drying, or peel off?—F. SEAWARD.

[960.]—GOTHIC ARCHES.—I have a large job, in which I have to construct Gothic arches, circular on plan and circular on soffit. I would feel grateful to any of your numerous correspondents for information as to the manner of preparing moulds for the working of same on approved principles."—CLERK OF THE WORKS.

[961.]—RETAINING WALLS.—Will any correspondent oblige by informing me of a simple and accurate method of finding the thickness required at top and bottom of a retaining wall, with a surcharged embankment? In the figure,



let H be total height of the embankment; *h* that of the wall; *s* the ratio of the base to the height of the bank, the slope; W weight of a cubic foot of the embankment; *w* weight of a cubic foot of the wall; *b* the batter of the front of the wall when the back is vertical; and *b* and *b*¹ that of the front and back, when both batter. Is it best to calculate the thickness of the wall first for exact equilibrium, and then multiply by 2 or 9-4ths for stability, according to Vauban and Hann? For simplicity sake, I have shown the foot of the embankment resting against the edge of the wall, and not on the top.—X + Y.

[962.]—ST. PETERSBURG STANDARD DEALS.—I wish to ask what is the meaning of St. Petersburg standard of deals? Whether it is 120 deals 12ft. long, 9in. by 3in.; and whether planks that are 11in by 3in. are reduced to that, and all under 9in. by 3in. added. I was at the Baltic sale room a few days ago, and found they were selling deals at from £6 to £8 per St. Petersburg standard, which I thought was very cheap, if they were 120, 12ft. long, 9in. by 3in.—BUILDER.

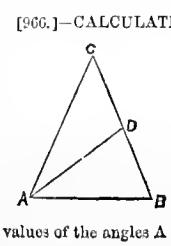
[963.]—WEIGHT OF FLAT AND ROUND WROUGHT IRON BARS.—Having been brought up in early life to hard work, I had no time to learn; it was all work from morning to night with me. For a few years past I have had the fortune to supervise works, and often when making my inspection I am puzzled to ascertain the weight of (say) a flat wrought iron bar 36in by 2½in. by 5-16in., and (say) a round wrought iron bar 39in. 2-16in. long by 1 3-16in. diameter. I can make it up by Mr. Hurst's book, but I cannot always keep it about with me. I shall feel grateful to some kind subscriber who will show me how to work by simple rules the above dimensions.—COLD BLAST.

[964.]—NORMAN SHAW'S VIEWS AND DETAILS.—I recently purchased Mr. R. Norman Shaw's "Book Views and Details from France, Italy, and Germany," dated August 1, 1858. There being no letterpress with it, I shall be glad if some kind subscriber can inform me the price, and where I may obtain printed matter on his beautiful illustrations of his book?—PROVINCIAL.

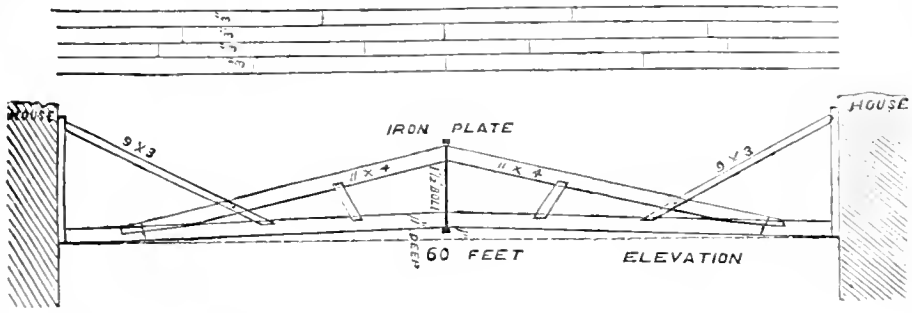
[We believe there is no descriptive matter published with this book.]

[965.]—WOODEN PILLARS.—Will any of your correspondents inform me of a rule to calculate the strength of wooden pillars, and whether a round or square pillar would be the strongest?—QUERY.

[966.]—CALCULATION OF A TRIANGLE.—I should be greatly obliged to you if you could procure me an answer to the following problem, which I have made several attempts to work out, but have not been able to succeed. In the figure, A D is equal to 725ft.; the angle A D C is a right angle; and the line B C is bisected in D. The distance A C is 1,140ft. I want to find the lengths of the lines A B and B D, and the values of the angles A B D, D A B.—TRIGONOMETRY.



SHORING-UP HOUSES. (956.



[967.]—FRICTION OF WATER.—Allow me to ask, through your valuable columns, what is the loss of velocity undergone by the water flowing in a pipe from the friction along the bed and side. How should I calculate what diminution would take place in the velocity, and consequently in the discharge also of water flowing for three miles through a 9-in. pipe.—HYDRAULIC ENGINEER.

[968.]—PUBLIC WATER-CLOSETS.—One of your correspondents refers to public water-closets used at Derby, where a flushing apparatus is applied to cleanse them. It would be a valuable contribution to our knowledge on such matters if he would give us a description of the construction. Are they on the principle of the cabinets, of which there are very many in Paris, and some few in Brussels?—A.

[969.]—WINDOW SASHES.—Can you inform me whether there is any improved means of lowering and raising sashes of windows, so as to supersede the rope and pulley, and where such may be seen in action?—TIM.

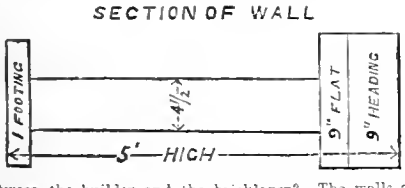
[970.]—RUSSIAN MOSAIC WORK.—Can any of your subscribers give me some particulars respecting the manufacture of Russian mosaics?—B. F. L.

[971.]—THE ARTIST "ECOUT."—Could you tell me whether "Ecout" was an artist of any particular merit? I have a painting done by him, and I should feel obliged if you could answer the above for me.—A SUBSCRIBER, Batley.

[972.]—CHARCOAL ON LEAD.—Will you kindly inform me, through your valuable paper, whether a layer of charcoal placed in the bottom of a cistern *lined with lead* would act upon the lead, and so make the water impure and unfit for drinking; or would it have the contrary effect, and act as a filter, and help to purify the water?—AN OLD SUBSCRIBER.

[973.]—MEASURING GARDEN WALLS.—Would you kindly inform me in your next the proper way to measure garden walls of this description, so as to be impartial

SECTION OF WALL



between the builder and the bricklayer? The walls are built with 14in. piers, 12ft. apart, and are struck jointed on both sides.—G. S. E.

[974.]—PAINTING COPPER GUTTERS AND ROOFS.—Is it essential to paint copper gutters and copper sheeting of roofs?—RED LEAD.

[975.]—NATIONAL ART TRAINING SCHOOL.—Can you inform me what are the fees payable by the general public at the National Art Training School at South Kensington, and whether admission is easily obtained?—J. S., Lambeth.

[The whole course of instruction in the training school is open to the general public, whether preparing for the art profession or amateurs. The year is divided into two sessions of five months each; the fees are payable either for two, three, or five months. By the artisan class only a monthly fee may be paid. Fees for classes studying for five whole days, including evenings, £5 for the session of five months, £4 for three months, £3 for two months. For three whole days, including evenings, £4 for the session of five months, £3 for three months, £2 for two months. For the half day, morning or afternoon, £4 for five months, £3 for three months, £2 for two months. To all these classes an entrance fee is required of 10s. Evening classes, male school, £2 per session; artisan class, 10s. per session, 3s. per month. Female school, £1 per session, three evenings per week.

[976.]—WATERTIGHT JOINTS.—I am told on good authority that glue boiled in linseed oil makes a watertight joint. I have tried to make it, but it comes too streaky to use. Can a correspondent set me right in the matter?—C. E.

[977.]—BRICKWORK.—What is the difference between the "Flemish" bond and the "English" bond in brickwork?—AMATEUR.

[978.]—HOLLOW WALLS.—I am about to build some cottages at the seaside, and it is essential to have hollow walls, but the cheap nature of the work precluses the use of copper or galvanised iron ties. Can any practical reader of "Intercommunication" inform me of a cheaper method of accomplishing the object desired?—W. B. T.

REPLIES.

[937.]—GAUGED ARCHES.—If the bricks be rubbed to the proper form they may be set with putty alone. If of a red colour, the joints should be set with white putty, which will have a very pleasing effect.—S. Y.

[943.]—CISTERNS.—Cisterns lined with lead are always dangerous, most waters having an action upon the metal. Slate is the best material, and should in all cases be used where the water is wanted for drinking and culinary purposes. Where slate is not used, galvanised iron cisterns will be much better than cisterns lined with lead or zinc, and these can be made to any size. D.

[944.]—WATER COLOUR.—"Student" can obtain what he requires in an excellent little work to be had from Windsor and Newton, of Rathbone-place, High Holborn. I think it is written by Aaron Penley, who is also the author of some capital treatises for beginners upon drawing and perspective.—LANDSCAPE.

[950.]—ART STUDENTS AT SOUTH KENSINGTON.—In reply to "A. F. G." I beg to inform him that in the national competition at South Kensington, the only conditions are that the student be a member of some school of art or night class in connection with the Department of Science and Art. There is no limit to age, and the drawings are to be prepared under the supervision of the master. He will also have to pass the second grade examination, but I believe it is not essential.—YORKSHIRE STUDENT.

[951.]—ROOF OF NORWAY AND CHRISTIANA SPRUCE.—The sketch is very imperfect, no purlins are required whatever. Your roof could be formed of 4 by 2½ framed couples and 6 by 1½ collar ties. "Enquirer" should give an architect 10s. 6d. for a sketch of purlin roof, or purchase Peter Nicholson's work on "Carpentry." Such simple questions as these should not occupy valuable space in the BUILDING NEWS, as they require a lengthy reply. Sick patients should employ a physician.—JOINER.

[952.]—AN OVERLOOKED EXHIBITION.—"Subscriber's" remark is very good. The illustration, with details, in BUILDING NEWS would be very interesting, and more particularly if it is in the (right) Gothic style. I have never seen any chimney shaft, or stalk, built only upon the circular or octagon plan, with common brick heading. Some time since Mr. Vale promised to give further report of his Smoke Tower, then in progress. An illustration, with details, of this, too, will be very acceptable.—F. H. D.

[955.]—STANDARD CHAINS.—The standard chain used in France which answers to our Gunter is what is called the "Décametre," or literally ten metre chain. Since 1 metre = 3.28ft., the length of the French standard chain will consequently be 10 × 3.28 = 32.8ft. This chain is unquestionably much too short, and possesses all the disadvantages belonging to that feature. The shorter the chain, therefore, the greater the number of shifts, or the greater the number of individual measurements to be made in measuring a long line. As every shift is attended with a small error, it is evident that at the end of a mile the error in chaining will be in the exact ratio to the number of different times the chain has been stretched; that is, the error in any given length will be concisely as the length of the chain.—SURVEYOR.

[956.]—SHORING-UP HOUSES.—I beg to give "Contractor" my opinion in the matter. He states in his question he cannot get balks 60ft. long. I should recommend him to bolt four plank deals together, with heading joints accurately fitted, but must be alternated, which I have shown in section No. 1. The elevation shows a truss girder, with a camber of 1S. If this plan is carefully constructed I think this will answer for all "Contractor" requires.—A BROTHER CONTRACTOR.

STATUES, MEMORIALS, ETC.

On Saturday a return was published of the public statues or public monuments in London belonging to the nation, exclusive of those in palaces other than St. Stephen's Hall, or in other parts of the Palace of Westminster, or cathedrals, and now under charge of the Commissioner of Works; specifying the dates of erection and names of artists, and from what funds purchased or erected. The statues are those of Sir J. M'Grigor at Chelsea Hospital, Sir John Franklin at Carlton House-terrace, Sir C. Barry, Westminster Palace, and King James I., Charles I., Charles II. (in plaster), William III., George IV., and William IV. The last five are in Westminster Hall and described as "unfinished." The statues of Sir John M'Grigor and Sir Charles Barry were paid for by public subscription; the others by parliamentary grants.

The strike of the masons at Halifax is practically at an end. Most of the masters have conceded the advance of 2s. to the men, making the wages 30s. a week.

BUILDING AND LAND SOCIETIES.

THE twenty ninth half-yearly general meeting of the shareholders of the Lands Improvement Company was held on Saturday at the company's offices, 3, Parliament-street, Westminster; Mr. W. Wynn, M.P., in the chair. The report of the directors stated that the new business for the half-year amounted to £116,921; the outlay by land-owners to £15,901; the commission and interest earned to £4,501; and that, after paying and providing for all current expenses, there remained a net profit for the half year of £1,689, which, with £129 carried forward from the half year ending December 31, 1867, made a total available balance of £1,818; the reserved fund on the interest account was £1,110; the general reserve fund £1,471; and the preliminary expense account amounts to £4,458. The directors recommended that a dividend at the rate of six per cent. per annum should be paid for the past half-year on the paid up capital of the company, free of income tax, and payable forthwith, and that a bonus at the rate of 2 per cent. per annum shall also at the same time be paid for the past half year on the paid up capital of the company, free of income tax, and payable forthwith.

An extraordinary general meeting of the Suburban Village and General Dwellings Company (Limited) was held at the Guildhall Tavern on Monday evening, Mr. C. Palmer, a share older, in the chair. The report of the shareholders' committee was read, from which it appeared that the petition to wind up the company had been dismissed, and that through the influence of Mr. W. G. Habershen the estate at Loughborough Park had been secured with the addition of a road at the farther end, rendering it as desirable an estate as could be procured for the purposes of the company. Four new directors, viz., Messrs. W. G. Habershen, Basil Woodd Smith, J. Faithful Fortiscue, and C. J. Cooke were unanimously elected. Votes of thanks were passed to Mr. W. G. Habershen for the valuable aid rendered the company in its emergency, to the committee for their labours, and to the officers of the company for their perseverance in conducting the affairs of the company under very trying circumstances. The meeting being made special, clause 52 of articles of association was altered, and clause 70 expunged. After some observations expressed of the conviction that the company must be a success, the meeting was dissolved.

The annual meeting of the Sheffield and North Derbyshire Building Society was held on Monday, at the Cutlers' Hall. From the financial statement of the society's affairs which was read, it appeared that a considerable amount of business had been transacted, £14,000 having been advanced on mortgage during the past year, making a total amount advanced since the society's existence of £41,000.

LEGAL INTELLIGENCE.

An action, arising out of the religious disturbances at Ashton, has elicited an important ruling from Mr. Justice Hannen at the Manchester assizes. The action was brought against the inhabitants of the Salford Hundred, to recover damages for the injuries done to St. Mary's Roman Catholic chapel and priest's house, at Ashton, during the riots of May 10 and 11. The judge held that the plaintiff could not recover unless he could prove that there was a felonious intention to destroy the chapel. If that was not what the rioters meant to do, the Hundred was not liable for the mere mischief done. The jury, therefore, returned a verdict for the defendants.

ACTION FOR TRESPASS AGAINST A LOCAL BOARD.—ALMOND V. THORNLEY, CLERK OF THE FARNWORTH LOCAL BOARD.—This was an action for trespass against the clerk to the local board for flagging, paving, and turning into the street, in 1864, a piece of ground 4ft. wide, which was claimed by the plaintiff. Several points were taken for the defendant—viz., that in 1866 local boards were made corporations, and, therefore, actions no longer lie against the clerks but should be brought against the local boards themselves; that notice of action was not given within one month, nor the action brought within six months of the trespass; and that the plaintiff, having been a member of the board and agreed to the resolution ordering this ground to be paved, had given leave and licence. In the end a verdict was taken for the plaintiff, subject to a special case.

THE VALUE OF LAND IN WESTMINSTER.—At the Guild hall, Westminster, on Tuesday, in a compensation case in which the claim was £24,600—"The Emanuel Hospital *v.* the Metropolitan District Railway"—some evidence was given on both sides on the value of land in Westminster. Whilst on one side the estimate was £22,000, on the other side it was about £8,305, with the 10 per cent. for compulsory sale. The land was in Victoria-street, and the charity was the gift of Lady Dacre, in the reign of Elizabeth, for the support of aged men and women, and for educational purposes as to the youth of both sexes. Mr. Lloyd and Mr. Thrupp were for the city of London, as governors of the charity. Mr. Hawkins, Q.C., and Mr. Stretten were for the railway company. After an investigation of two days before Mr. Toogood, the deputy high bailiff, and a special jury, the sum of £10,475 was assessed as the value of the land required by the company.

Our Office Table.

At the request of the Council of the Royal Scottish Society of Arts, Mr. Buckmaster, of the Science and Art Department, is about to lecture in various towns which he has not yet visited on the aid which the Department is prepared to give towards the scientific education of artisans. The leading men in a considerable number of places have earnestly taken up the matter.

The Liverpool Town Council, at their meeting on Wednesday, sanctioned the plans for a new local gallery of art, to cost not more than £10,000.

Mr. Greenstreet, late of the Chatham Local Board of Health, has been elected, out of forty-seven candidates, to the post of surveyor to the St. Saviour's, Southwark, Board of Works.

Mr. Mason, of 28, New Bond-street, has on exhibition at his studio probably the largest painted photograph in the world. It is an enlargement from an original photograph of the seventy-six bishops who attended the Pan-Anglican synod at Lambeth Palace, last year. It is certainly a remarkable picture, and is well worthy of a visit.

On Tuesday Prince Arthur opened the new Albert Park at Middlesborough, which has been presented to the inhabitants by Mr. Bolckow. It is about seventy-two acres in extent, and is well planted out with trees. A circular piece of ground in the centre is reserved for statuary, and three sides of the land are to be appropriated to the erection of villa residences.

Last week we alluded to a letter which Mr. E. C. Robins had sent to the St. Pancras Board of Works, asking as a favour the return of certain designs sent in for the enlargement of the workhouse. This was refused on the plea that Mr. Robins had been paid for the abandoned plans. Mr. Robins writes us and says "that while he would have felt obliged by the return of about twenty drawings in the possession of the Guardians of St. Pancras, he has not acknowledged the right of the Guardians to retain them, and could not do so in the face of the 17th paragraph of the Institute papers on 'Architectural Practice.'"

On Thursday week one of the conferences promoted by the Working Men's Club and Institute Union, on social and political questions, took place at 150, Strand, the subject for discussion being "Partnerships of Industry. Is there evidence that a system of division of profits between masters and workmen in a trading concern may be maintained so as to conduce to the welfare alike of workmen and capitalists?" The discussion was introduced by Mr. Edward Hall, F.S.A., who submitted that a complete affirmative answer was given to the question by the results of the partnership which M. Leclaire, house painter of Paris, had entered into with his workmen. This industrial partnership had existed since 1842, and among its advantages had been complete freedom from strikes, closer attention to work, and improved health and morality throughout the establishment. Others in France were following M. Leclaire's example, which differed from the industrial partnerships established in this country, in so far as it allowed the fullest inspection to all the partners. In the subsequent speeches a number of difficulties of detail were pointed out, but a general acquiescence was expressed in the principle of giving workmen an interest in the results of their labour.

The International Hotel, adjoining the London Bridge terminus of the Brighton Railway, has just become the property of the railway company, at a price of 30,000 guineas. The cost of its erection a few years ago was £147,000, so that the company has made a good bargain.

The *Standard*, reviewing the history of the numerous fires which took place in London last week, says:—We may justly, after scanning the statistics, attribute at least one-third of the disasters to indolence, and one-third to recklessness, leaving an ample proportion to unavoidable accident, to the tricks of children—though for these their parents are, more often than not, responsible; and to the phenomenon which it has been agreed to call "spontaneous combustion." We pay a heavy tax for wanton carelessness. Thus, is it not madness or worse to pour out, near a naked gaslight, volumes of a spirit known to emit inflammable vapours? Yet this was done, calamitously enough, last week. And, unless human life be lost, or there is a suspicion of arson, no inquiry takes place, no matter how enormous the amount of property destroyed.

Some sales effected at the Auction Mart on Wednesday week by Messrs. Edwin Fox and Bousfield attest the great value of land in the city. A freehold estate, including the whole of Dunster House, Mincing-lane, and other premises extending to Mark-lane, fetched £35,250. The property covers a superficial area of 15,200ft. Two freehold ground rents, of £350 per annum each, arising from Nos. 29 and 30, St. Paul's Churchyard, with the reversions to the rack rentals, obtained a price of £17,500.

At the last meeting of the Paddington Vestry it was mentioned that Mr. Roberts, one of the vestry, had offered to prepare plans and an estimate for the widening of the Harrow road without expense to the vestry. The offer is under consideration by the Highways Committee. If Mr. Roberts is a surveyor, some may consider this rather an unprofessional offer.

The directors of the London and County Bank have declared the usual dividend of 6 per cent., with a bonus of 2 per cent., for the half-year, free of income tax, equal to 16 per cent. per annum, which will absorb £75,884 5s. 4d., and leave £4,092 3s. 4d. to be carried forward to profit and loss new account. The dividend and bonus—together £1 12s. per share—will be payable at the head office, or at any of the branches, on and after Monday, the 17th inst. The amount of the bank's deposits is £12,000,000, and of rest in hand, or at notice, £3,196,000, with £1,207,000 on Government securities.

Trade News.

TENDERS.

Abingdon (Berks).—For erecting new schools for boys and girls, teacher's residence, boundary walls, &c., for the parish of St. Helen, Abingdon. Edwin Dolby, architect. Quantities by Mr. J. Crawley:—

Nightingale	£2585
Claridge	2185
Thomas and Dicks	1980
Bowler	1662

Battersea.—For Roman Catholic church at Battersea, for the Right Rev. Dr. Grant. C. A. Buckler, architect:—

Nightingale (accepted)	£800

Bill Quay.—For the erection of Wesleyan Chapel and School at Bill Quay, from plans prepared by Mr. Edward Fittes, builder, Hemworth-lane, near Gateshead:—

Masons.			
Arnold and Co.	£551	18	0
Knox Brothers	557	0	0
Hudson and Moad	555	0	0
Minto (accepted)	495	0	0
Joiners.			
Sanderson	395	0	0
Redhead	335	0	0
Sutherson	332	0	0
Lorane	330	0	0
Fittes (accepted)	327	0	0
Purvis and Ray	282	0	0

Birmingham.—For cow hairs, &c., Smithfield Market. After allowing for old materials. Mr. Edward Holmes, architect:—

Crocket	£2525	0	0
Parker and Son	2393	0	0
Partridge	2350	0	0
W. and J. Webb	2340	0	0
George	2250	0	0
Horsley Brothers	2199	0	0
Matthews	2185	6	7
Moffat	2190	0	0
Hilton	2188	3	7
Jones	2155	0	0
Preece	2138	0	0
Cresswell and Sons	2100	0	0
Hardwick and Son	2070	0	0
Jeffery and Pritchard	2064	0	0
Penston and Lidzey	2050	0	0
Surman	1966	0	0
Ditto, revised tender (accepted)	1868	0	0

Brighton.—For works at the Brighton riding school, for the Brighton Corporation. Quantities supplied by J. C. Lansdowne and Co:—

Gorringe	£810
Anscomb and Co.	675
Loader	650
Nightingale	625
Oliver	624
Lockyer	600
Dean and Dickenson	575
Chappell	566
Cheeseman	550

Cheltenham.—For new wing to Vallombrosa, Pittville. J. Thomas Darby, architect:—

Winstone (accepted)	£520

Cheltenham.—For stables and cottage for Henry Burgh, Esq. J. Thomas Darby, architect:—

Marchant (accepted)	£597

Dulwich.—For the erection of a detached villa at Dulwich. Mr. W. Sim, architect, 1, Danes Inn, Strand. Quantities supplied:—

Ebbs and Co.	£2070
Dove Brothers	2040
Fish	2000
Macey	1825

Hastings.—For the erection of a public house, St. Andrew's-road. Messrs. Voysey, Jeffery, and Skiller, architects:—

A. Vidler	£909	0	0
Longhurst	899	7	6
Sacre	895	0	0
Parks	865	0	0
Russell	813	0	0
Howell	810	0	0
Bourne (accepted)	780	0	0

Hernhill.—For new vicarage at Hernhill for the Rev. J. F. Thorpe. Messrs. Newman and Billing, architects, London:—

Judges, Boughton	£1319
Whiting, Ospringe	1295
Epps, Boughton	1250
Shrubsole, Faversham (accepted)	1243

Finchley.—For the construction of a sewage tank at Moss Hall. Mr. Stephen Hicksoe, surveyor:—

Fitch and Caughly	£417
Henry A. Evans	385
W. O. Wills	375
David King and Sons	360
George Wells	334
Faulkner and Cowley	325
W. H. Goodair	315
James Bloomfield	298
Eglington and Paulucci	266

Loughton Park.—For villa residence, coach house, and stabling, for Mr. Joseph Rooke. Mr. A Bridgman, architect:—

Bennett	£2330
Johnson	1295
Keepeace	1250
Pask	1180
Pavitt (accepted)	1050

Norwich.—For alterations and additions to Princes-street Chapel. Mr. Edward Boardman, architect:—

	Extension and alteration.	If seats in pitch pine.	Total.
Architect's estimate	£1912		
Stearman and Spinks	2120 0 0	£105 0 0	£2225 0
Lacey	2010 0 0	97 0 0	2107 0
Balls	2048 0 0	50 0 0	2093 0
Murray	1969 10 0	82 0 0	2051 10
Brown and Bailey	1947 0 0	89 0 0	2036 0
Rice	1953 16 0	43 0 0	1996 16
Harrison	1826 0 0	170 0 0	1996 0
Downing	1819 0 0	170 0 0	1989 0

Portmadoc.—For the erection of the British schools, boys', girls', and infant schools, two class-rooms, and teachers' residence. Grates not included. Mr. Owen M. Roberts, architect:—

W. Lloyd	£1283
Jones and Co.	1280
Griffith	1252
Jones and Roberts	1166
Robert Lloyd	1115
Roberts and Williams (accepted)	1100
Davies and Son	1100

Stratford-upon-Avon.—For new infirmary, &c., at Union Workhouse. Mr. Thomas J. Alleo, architect, Stratford-upon-Avon:—

Bennett	£2379	0	0
Dixon	2195	0	0
Adam and Sons	2189	0	0
Espley	2098	16	0
Hilton	2055	0	0
Clark and Smallwood	2000	0	0
Green	1983	9	0
J. and G. Callaway	1908	17	0
Holtom and Price (accepted)	1865	11	6

COMPETITIONS.

Lincolnshire (Lindsay).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

Hertford Cottage Prize Competition.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square, Westminster.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Halifax.—Extension of time.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

Nottingham.—August 18.—For the erection of a new bridge over the river Trent. W. Enfield, public offices, Nottingham.

Portsmouth.—August 22.—For laying down, constructing, and finishing various brick, pipe, and cast-iron sewers. S. J. Elliott, clerk to the Local Board.

Contract Department, Admiralty.—August 18.—For the supply of steel and files. A. Brady, registrar.

Newhaven, Sussex.—August 24.—For the erection of a Coastguard station. Tenders to the Coastguard office, Admiralty.

Herefordshire County and City Asylum.—September 14.—For the erection of the above named building R. Griffiths, architect, 3, Martin-street, Stafford.

Aldershot.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

Metropolitan Board of Works.—September 21.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring gardens.

Caterham.—August 29.—For the erection of an asylum. W. F. Jebb, 37, Norfolk-street, Strand.

Baentford Union.—August 26.—For carrying out certain alterations at the infirmary of this workhouse. W. Ruston, clerk, Brentford.

Fly Union.—August 26.—For altering workhouse, and other works. Mr. G. S. Claxton, clerk, Downham-lane, Ely.

Chesham, Bucks.—September 2.—For the restoration of the parish church. Rev. A. F. Aylward, Chesham, Bucks.

Southmolton (Devon).—September 1.—First, for constructing brick or masonry and pipe sewers, and laying cast-iron water mains, &c. Second, for providing and delivering about 85 tons cast-iron water pipes. R. M. Riccard, clerk to the board, Southmolton.

Reading Union Workhouse.—August 19.—For the alteration and improvement of the drainage of the union workhouse, together with the fitting up of Moule's patent earth closets, and other works. William Pike, clerk, Reading.

Hornsey.—August 19.—For the supply of about 200 iron lamp-posts and lanterns. W. Potter, clerk to the local board.

Local Board, West Derby.—August 24.—For the construction of Brocky-lane, West Derby-road. Messrs. Radcliffe and Layton, clerks to the board, public offices, West Derby.

SMETHWICK, NEAR BIRMINGHAM.—August 23.—For the construction of a new street. Messrs. Clarke and Barrows, 38, Cannon street, Birmingham.

Plan and estimate for heating a tepid swimming bath. Mr. J. Plowman, surveyor, Oxford.

PROPERTY SALES.

AUGUST 3.

AT THE MART.—By Messrs. Bromley, Son, and Kelday.—The beneficial lease of a baker's shop and premises, situate in Britannia street, City road, held on lease for 21 years from 1869, at £60 per annum—sold for £410.

Leasehold two houses, Nos. 1 and 2, Regent street, North Brunswick street, Blackwall, producing £26 per annum, term 22½ years unexpired, at £5 per annum—£100.

At the Guildhall Coffee-house.—By Messrs. Newson and Stanley.—Freehold and copyhold property, known as Fen Farm, Methwold, Norfolk, comprising a bailiff's house, with buildings, and 381a. 20p. of arable and grazing land—£5,500.

Freehold and copyhold farm, situate at Hinderclay, Suffolk, comprising a farm residence, orchard, and garden, buildings, and 143a. 1r. 18p. of arable and pasture land—£4,250.

By Mr. Whittingham.—Freehold building land, fronting Cecil road and Wingram's lane, Leytonstone, in 30 lots.—Lots to 138 comprised the previous sales.—Lot 143, sold for £110; lot 144, £65; lot 149, £44; lots 151 to 153, £42 each; lot 156, £40; lots 160 to 162, £40 each; lots 175 and 176, £42 each; lot 179, £69.

Freehold building land, being a portion of the Collier's Wood Estate, on the Rutland, Robinson, and Norfolk roads, Lower Tooting, Surrey, in 43 lots. Lots 1 to 230 comprised previous sales.—Lot 231, sold for £102; lot 239, £60; lot 240, £70; lot 241, £60; lot 242, £58; lot 243, £56 lot 255, £67; and lot 256, £58.

AUGUST 4.

At the Mart.—By Messrs. Edwin Fox and Bousfield.—Freehold property, producing the net ground rent of £300 per annum, for 36 years, with reversion, comprising the building No. 1, Dunster-court, Mark lane, City—£8,700.

Freehold estate known as Nos. 2 and 3, Dunster court, and Nos. 12 and 13, Mark lane, occupying the area of 11,880ft., and producing £1,605 5s. per annum—£26,500.

Freehold house and shop, situate in High street, Watford, Herts, let on lease at £40 per annum—£680.

Copyhold five cottages, situate in Water lane, Watford, Herts, producing £39 per annum—£300.

Copyhold meadow, 1½ acres, near the town of Watford, Herts, let at £10 per annum—£235.

Freehold house and shop, situate in High street, Watford, Herts, let at £27 per annum—£480.

Freehold three cottages, with shops, two houses and shops and four cottages, situate in High street, Watford, producing £98 per annum—£1,050.

Freehold cottage and shop, situate as above, let at £14 6s. per annum—£185.

Freehold garden, yard, barn, and pigsties, situate as above, let at £18 per annum—£260.

Freehold plot of building land, situate as above, let at £3 per annum—£125.

Freehold property situate at Bushey Heath, Herts, known as the "Retreat," comprising a residence with stabling and grounds of about 1a. 0r. 2p., let at £40 per annum £890.

By Messrs Dear and Son.—Leasehold two houses, Nos. 3 and 4, Princes row, Pimlico, producing £34 per annum, term 63 years from 1837, at £15 15s. per annum—£490.

Leasehold net improved rent of £50 10s. per annum, secured upon property in Munster square and Little Charles street, term 99 years from 1823—£900

Leasehold net improved rent of £90 6s. per annum, secured on property in Clarence gardens, term 99 years from 1854—£1,400.

Leasehold improved rent of £50 per annum, secured on property in Cumberland street East, Regent's Park, term 99 years from 1825—£715.

Leasehold improved rent of £36 per annum, secured on property in Redhill street, and Edward mews, term 99 years from 1824—£470.

Leasehold improved rent of £21 per annum, secured on property in Stanhope street, term 96 years from 1825—£315.

Leasehold improved rent of £21 per annum, secured on property in Stanhope street, term 99 years from 1825 £315.

Leasehold improved ground rent of £14 per annum, secured on property in Stanhope street, term 99 years from—1828—£230.

Leasehold improved ground rent of £30 per annum, secured on property in Stanhope street, term 97 years from 1825—£460.

Leasehold improved ground rent of £35 per annum, secured on property in Stanhope street, term 95 years from 1825—£620.

Leasehold improved ground rent of £90 6s. per annum, secured on property in Townshend road, St. John's wood, term 50½ years unexpired—£1514.

By Mr. V. Buckland.—The beneficial interest in the residue of the lease of the West Cwmerfin Lead Mine, situate in the parish of Llanbedarnfawr, Cardigan, held for 17 years unexpired, at a royalty of 1-14, together with the erections, plant, and machinery thereon—£300.

AUGUST 5.

At the Mart.—By Mr. Alfred Savill.—Freehold property situate in the parishes of South Benfleet and Thundersley, Essex, known as Jarvis Hall, and Hope's Green estate, comprising 219a. 3r. 33p. of arable and pasture land with residence, lodge, cottages, and two homesteads—£9,050.

By Mr. Cayley.—Freehold house, No. 190, Cambridge road, Bethnal green, producing £26 per annum—£350.

Freehold house, No. 261, Hackney road, annual value £42—£960.

Leasehold improved ground-rent of £11 per annum, secured on 12 houses in Elizabeth place, Hickman's Folly, Dockhead, term 70 years from 1817—£55.

AUGUST 6.

At the Mart.—By Mr. Newbon.—Leasehold four residences, Nos. 25 to 28, Grove lane, Camberwell, total estimated rental value £230, term 60 years from 1865, at £65 per annum—£1,500.

Freehold five houses, Nos. 3 to 7, Park street, Church street, Stoke Newington, producing £76 per annum—£900.

Freehold plot of building land situate in Park street aforesaid, let at £20 per annum—£1,930.

Leasehold three cottages situate at Willesden, Middlesex, producing £46 16s. per annum, term 52 years from Michaelmas next, at £9 per annum—£355.

By Messrs. H. Brown and T. A. Roberts.—Freehold residence, with stabling, coach house, and pleasure grounds, of about 1a. 2r. 8p., being No. 23, Clapham rise—£5,550.

Freehold 1a. 0r. 8p of meadow land, fronting the Bedford private road, Clapham rise—£2,550.

At the Guildhall Coffee house.—By Messrs. Furber and Price.—Leasehold house, No. 53, Lincoln's Inn fields, producing about £267 per annum, term 49 years unexpired, at £81 15s. per annum—£1,600.

Leasehold four houses, Nos. 2 to 5, Russell terrace, Holland road, Brixton, producing £114 per annum, term 55 years unexpired, at £22 per annum—£1,870.

AUGUST 7.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residence, No. 14, Uxbridge road, Surbiton, with coach house, stabling, greenhouses, and pleasure garden—£3,500.

Freehold residence, garden and land, containing nearly 8 acres, situate at Balham hill, Streatham, Surrey—£8,100.

Leasehold ground rent of £12 per annum, for about 67 years, secured upon a residence situate at Balham—£210.

Ditto of £12 per annum, for about 67 years, secured upon a residence situate at Balham—£12 0

Ditto of £20 per annum, for about 67 years, secured upon Hawthorne Villa, on the road from London to Tooting—£320.

Leasehold residence, known as Holmwood-house, Balham, annual value £120, term 72 years from 1865—£1,400.

Leasehold residence, adjoining above, annual value £120, term 72 years from 1863—£1,500.

By Mr. Frank Lewis.—Leasehold residence known as Torquay Villa, Redhill, term 99 years from 1863, at £20 per annum—£105.

Leasehold three houses, Nos. 1 to 3, Alfred place, Orchard street, Essex road, Islington, producing £78 13s. per annum, term 99 years from 1855, at £10 10s. per annum—£525.

Leasehold premises, No. 12, Desborough terrace, Harrow road, let at £32 per annum, term 500 years from 1865, at £7 per annum—£260.

AUGUST 10.

At the Mart.—By Messrs. Bromley, Son and Kelday.—Freehold premises, situate in Welclose square, producing £45 per annum—£710.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Isaac Kerridge, Basnet grove, Wandsworth, builder, August 26.—Henry Cridland, York road, Battersea, plasterer, August 18, at 12.—Robert Wood, Renshaw street, Wandsworth road, carpenter, August 18, at 11.

TO SURRENDER IN THE COUNTRY.

Henry Green, Cardiff, builder, August 21, at 11.—John George, Orleton, Herefordshire, carpenter, August 26, at 10.—Thomas Gregory, Alfreton, builder, September 2, at 12.—William Nightingale, West Bromwich, plumber, August 25, at 11.—William T. Randall, Ramsgate, builder, August 22, at 12.—William Smith, Hereford, painter, September 1, at 10.—Albert H. Baker, Bristol, plumber, August 21, at 12.—William Bastenfield, Cradley Heath, brick maker, August 19, at 12.—Jonah Bond, Crewe, brickmaker, August 19, at 11.—James Knott, Coombe, Cornwall, mason, August 24, at 11.—John Rathbone, Sheffield, joiner, August 14, at 1.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

August 26. R. Cooms, Worcester, plumber.—October 17, C. Church, Clarkson street, Bethnal green, builder.—October 23, D. Baron, Blyth terrace, Surrey, builder.—August 26, J. Barmore, Worcester, painter.—September 8, W. Murray, Carlisle, builder.—September 3, R. Smith, Britton Ferry road, near Neath, mining and civil engineer.

DIVIDENDS.

August 19, J. Adams, West Hadden, carpenter.—August 20, W. Belt, Hull, plumber.

DECLARATION OF DIVIDENDS.

J. Mackay and Son, Liverpool, timber merchants, div. 7d.—Foerster, Keir, and Brotherton, Stockton upon-Tees, timber merchants, div. 11s.

PARTNERSHIPS DISSOLVED.

Fiton and Taylor, Manchester, joiners.—Hayes Brothers, Liverpool, plumbers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11	0 £12 0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0 12 0
,, yellow pine		2	18	4	6	Finland	7	0 8 0
St. John N.B. yellow		0	0	0	0	Memel	0	0 0 0
Quebec Oak, white		5	0	5	10	Gothenburg, yellow	8	0 9 10
,, birch		4	0	5	0	,, white	8	0 9 0
,, elm		4	0	0	10	Gefle, yellow	9	0 10 10
Dantzic oak		4	0	6	0	Soderham	9	0 10 10
,, fir		2	5	3	5	Christiania, per C.,		
Memel fir		3	0	4	5	12 ft. by 3 by 9 in.		
Riga		3	0	3	3	yellow	11	0 13 0
Swedish		2	0	2	8	Deck Plank, Dantzic,		
Masts, Quebec red pine		4	10	6	10	per 40 ft. 3 in.	0	15 1 1
,, yellow pine		4	10	8	0	PUMICE STONE per ton	6	0 8 0
Lathwood, Dantzic, fm		6	10	7	10	Oils, &c.		
,, St. Petersburg		8	0	9	10	Seal, pale per tun	36	0 0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Sperm body	90	0 0 0
Quebec, white spruce		13	0	20	0	Cod	38	0 0 0
St. John, white spruce		13	10	16	10	Whale, Sth. Sea, pale	35	0 0 0
Yellow pine, per reduced C.						Olive, Gallipoli	48	0 73 0
Canada, 1st quality.		17	0	18	10	Cocoanut, Cochin, ton	53	0 55 0
2nd do.		11	10	12	10	Palm, fine	40	0 40 0
						Linseed	30	15 34 0
						Rapeseed, Eng. pale	34	0 0 0
						Cottonseed	29	10 38 0

METALS.

IRON:—							
Welsh Bars in London	per ton	6	5	0	6	5	0
Nail Rod	do	7	10	0	7	12	6
Hoops	do	8	5	0	9	0	0
Hoops, Single	do	8	0	0	9	0	0
Staffordshire Bars	do	7	5	0	7	15	0
Bar, in Wales	do	5	10	0	6	0	0
Nailrods	do	7	10	0	7	15	0
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	6
Swedish Bars	do	9	17	6	10	10	0
STEEL:—							
Swedish Keg, hammered	per ton	15	0	0	15	10	0
Swedish Faggot	do	0	0	0	0	0	0
COPPER:—							
Sheet & Sheathing, & Bolt	per ton	79	0	0	82	0	0
Hammered Bottoms	do	97	0	0	0	0	0
Flat Bottoms, not Hammered	do	81	0	0	0	0	0
Cake and Tough Ingot	do	81	0	0	83	0	0
Best Selected	do	77	0	0	85	0	0
Australian	do	77	10	0	0	0	0
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7¼
LEAD —							
Pig, English	per ton	21	5	0	0	0	0
,, Spanish Soft	do	18	10	0	0	0	0
Shot, Patent	do	22	10	0	23	15	0
Sheet	do	20	0	0	20	15	0
White	do	27	0	0	30	0	0
REGULUS OF ANTIMONY							
French	ton	43	0	0	0	0	0
ZINC:—							
English Sheet	per ton	25	10	0	26	10	0
Devaux's V. M. Boofing Zinc	do	25	0	0	0	0	0

* And 5 per cent. discount if laid upon the new system

SPELTER:—							
On the Spot	per ton	20	0	0	0	0	0 nett
QUICKSILVER	per bll	6	17	0	0	0	0
TIN:—							
English Block	per ton	95	0	0	0	0	0
do Bar	do	96	0	0	99	0	0
do Refined	do	97	0	0	0	0	0
Banca	do	95	10	0	97	0	0
Straits	do	92	10	0	93	0	0 nett

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 21, 1868.

ENGLISH ARCHITECTS IN INDIA.

SOME of our readers may have thought the subject we treated in our last number a trivial one, and our views little supported by evidence. Such opinions may well be entertained on a subject little discussed here, and the importance of which is not appreciated. The opening of such a matter, however, gives encouragement, and we are induced to pursue it. It is by making the profession here understand that they are treated as a nullity in India that they may be awakened, after they have understood from our previous observations the large amount of work handed over to engineers instead of to architects. When these points are comprehended, we may expect the profession to move, for it is from the architects the agitation and the reform must come. The engineers and royal engineers assuredly will not of themselves make a graceful surrender; the officials will make no change, and the public will take no self-action. It is, however, a topic in which nearly every member of the profession, young and old, is interested, for there is home work in various ways as well as work in India. How many young men are there who would be glad to spend seven or ten years of their junior time in India, acquiring knowledge and practice, to return here, not only with such stores, but with savings, which may assist their professional career.

However, to the point of what is actually done now. We, to some extent, portrayed what manner of persons do the duty of architects in India. A reform is taking place with regard to architecture there, and we will show what it is, and how the staff of engineers is to become competent in architecture. It is very well known that the body is called the Engineer Establishment of the Department of Public Works in India; that all candidates have to pass an examination; and that the examiner is a competent and conscientious member of the engineering profession of established reputation—Mr. George Preston White, C.E. Mr. White has a very difficult task to accomplish, and, as far as he is allowed, he does it well. His great endeavour is not to send out book men, but practical men, testing the candidates to the best of his means, according to the walk of practice in which they have been previously engaged. A competent degree of preliminary knowledge is required by other examiners, but Mr. White sticks to the practical. The consequence is a considerable proportion of rejections, and a large amount of complaining by young men and their friends of the unfair nature of the examinations, for which we can see no foundation. It would require a prodigy of memory and practice to answer all the questions: but that is not required, only an intelligent response to questions on the practice of the candidate. If he has had no practice, of course he will break down, and he is not the man to send to India.

Looking to the duties to be performed by the engineer in India, Mr. White has determined to introduce architecture into the course, and has made an essay, but, according to the nature of the system, it is impossible for him to accomplish anything effective; nevertheless, great credit is due to him for his constant efforts in this and other directions to improve the examinations. As there are so many important engineering subjects, architecture can be only one subject, and let no one complain that it is meagrely treated. The examination on that subject is thus dealt with.

With an earnestness that merits acknowledgment, Mr. White has printed at the back of one of his examination papers a series of extracts from an address of Sir John Rennie, when president of the Institution of Civil Engineers, recommending the study of various subjects to engineers, and showing their importance. Among these are mineralogy and geology, architecture, meteorology, and theory and practice. All these are of importance, and particularly for those devoted to the service of India. It is, as we have said, an impossibility for Mr. White to do more for the examinations in architecture than he has done. It will not be a pass subject, and in fact, as will be seen by his note, Mr. White trusts more to the future studies of the candidates by their giving "some attention to architecture" than to their positive proficiency in the examinations. It will occur to our readers how narrow is the examination limited to one example and style in architecture, and yet far too copious to be adequately answered by one who has to pass the gauntlet of a number of practical subjects. So far as construction is concerned, the man who can answer this paper "without any book or MSS.," and using "freehand sketches or diagrams wherever possible to illustrate the drawing, and carefully executed to show the candidate's proficiency in this style of drawing"—such a candidate must be a man of no mean practical training, and able to erect a church or other building.

Our readers will not be so satisfied on another point, as Mr. White warns the candidates an engineer in India is frequently required to design and erect churches and other buildings. This examination will afford no test for his capacity in designing. He has his design made for him in the engraving, he is required to describe the style and the period to which it belongs, but he is not required to design the church or provide for its ornamentation. Mr. White, we are sure, is the last man to suggest that in the case of a memorial or other church in India, an engineer, having had the style given to him, is justified in taking his ornamentation from some manual of that style, regardless of the circumstances of the country, or the elements of decoration which may be afforded to him by its flowers or foliage. It is, however, necessarily from books that the engineer architect must seek his inspirations, having no previous culture of taste, no acquaintance with the local styles, and no aptitude for the appreciation of natural details of situation, or the historic or archæological relations which ought to influence his composition. There is nothing to prevent him from pitching his spire into a beautiful group of domes or minarets, so as to destroy a picture consecrated by the admiration of centuries.

In holding the empire of India we have a natural and laudable expectation that in the fulness of time, when our rule shall have borne its fruits, the monuments of our sway shall be such as to commemorate our endowments and our merits, that they shall present something characteristic of our greatness, that they shall speak to the eyes of those in after generations who cannot read the pages of our history. Let them speak of us as a race not only ennobled by the prowess of war, by the might of hand, but by the endowments of the mind—a nation which it is true fought its way to power, but gave to benighted populations a largess of moral gifts to endure beyond the triumphs of war and the ostentation of wealth. Let them remind grateful nations that we bequeathed to them our liberty, our literature, and our arts, and that those who regenerated India were not meaner than any people who ever ruled the earth. To do this requires some care and tenderness. A lasting benefit is often fleeting in its creations; reform destroys itself by generating reform. The abolition of suttee, infanticide, and immolation to idols will be erased from the statute book when the manners and customs of the people have been moulded on the new law. Thus it may not strike the multitude who were the givers of such benefits, but some well-cemented monument of builder's Gothic may hold together and accuse us of barbarism for generations. We are the creators of the metropolises of India, Calcutta, Bombay, Madras, which were villages when we entered the country, and what do they speak for us now? Calcutta is the city of palaces, the city of pretension and of sham, of ignorant cliquism and unblushing want of taste. It is a place which reduces us to the level of the Romans in art, adopting the styles of others without acquiring the artistic capacity of the originators. Calcutta is a museum of the Classic, of the mediæval, and therefore of the barbarous. Is this a state of affairs to be justified or to be endured?

Provision is, however, made for its perpetuation. In that small matter of ornamentation, where fertility of creation should be displayed, what will the engineer candidates do? They will do like their elders, they will give liberal orders to the ironmonger or ironfounder; their largeness will be shown in the dozen and the gross. Just as one of the most costly monuments in the world, which admitted of appropriate commemoration of the historical associations of its site, has been pauperised by the administration of one hundred lions' heads in knockers, so will it be in India, unless some remedy be provided.

That remedy we have already indicated. We do not object to the introduction of architecture in the examinations of engineers; on the contrary, we think it highly to be approved, as extending the study of architecture. We do not advocate the abolition of engineers, but we do advocate the formation of an architectural establishment of the Department of Public Works in India, and the consignment of the architectural examination to architects. The memorials of the architects and their corporate bodies should be directed to these points—the employment of architects for architectural works in India, the constitution of a separate body of architects for India, the appointment of architects as examiners in architecture, and the reference of all architectural questions to architects. If this agitation be systematically carried out it must be successful, because we have reason and truth on our side, and public opinion must support us.

One very useful recommendation we can give to architects is to devote more attention to the study of the architecture and monuments of India. We observe that Mr. James Fergusson is to occupy one of the evenings of the British Association with the archæology of Buddhist architecture in India. Of course, few at present possess the special qualifications of Mr. Fergusson for the exemplification of Indian architecture, but we may enlarge the bounds of our knowledge. Greater facilities of travel have allowed architectural students to devote more time to the inspection of the monuments of Greece, Asia Minor, and Egypt, but it well merits consideration whether the monuments of Greece and Asia Minor, wrought up as they have been in detail by the Dilettanti Society and various expeditions, repay the labour of the student, and whether the same time devoted to India, so little explored, would not pay better. A voyage right out to India would give the student some months there, and it is more than likely that his stay there may be rewarded by some commission or attended by some professional occupation, while not one piastre is got out of the wilds of Greece or Asia Minor.

The notebooks of such travellers would bring them special reputation beyond the twentieth repetition of Thebes or Memphis, would do more good to the profession at home, and more good to the public. We say this with due deference to the hugger-mugger opinions of some individuals who are for bottling up what little they know, and will make nothing public they can help for fear of some other architect getting anything by it.

Our own view is that the bottler-up is most likely to lose by non-communication, for we have yet to learn that the publication of the classic studies of Cockerell, Donaldson, or Falkener has done one of them the least harm. It is a healthy and noble feeling which dictates a contribution to the public for those advantages which the student has gained by study from the accumulated stores of ages and from the institutions maintained by the community at large.

There must be many questions which ought to be decided here as to the treatment of metropolitan termini, bridges, and buildings in India, which must be determined by a due regard to local influences of climate, sky, light, convenience, fitness, conformity to grouping, a proper appreciation of which is only to be acquired by extended study. One of the grand designs, the execution of which is only a work of time, is the railway bridge over the Hooghly, uniting Calcutta with its opposite suburb of Howrah. This will be a hit or a miss, an addition to the architectural resources of the metropolis, or a blot and an eyesore. Hitherto no architect has expressed an opinion on this, and yet its cost will be enormous, and it will be one of the most striking objects to the Calcutta visitor, whether he arrives by land or sea. We say India is a great mine for architects, and we wish it to be explored.

ART OF BUILDING IN CONCRETE.—III.—NICOLL'S SYSTEM.

IT is true that we do not, like our continental neighbours, live under a paternal Government, but nevertheless the legislature does provide in some measure for the health, comfort, and welfare of the public. In all cities and towns, the authorities of which are amenable to the various enactments and clauses to be found in the "Building Act," an external wall of 9in. in thickness is ensured between the inmates of houses and the inclemencies of the season. The question may naturally arise, is an absolute thickness of 9in. necessary for the purpose of excluding damp, and indispensable as the standard thickness of all external walls? Mr. Nicoll would answer in the negative. He assures us that his patent concrete slabs, possessing 4½in. in thickness, are equal to 9in. brickwork in every particular required of them. It need not be accepted as a matter of fact that because a brick happens, by mere chance, so to speak, to be one of the national standards of construction, it should be therefore equally necessary that all external walls should be at least one brick in thickness. At the same time, from the innumerable communications made to us through our well-known channel "Intercommunication," it would certainly appear that 9in. is not by any means a thickness sufficient to keep out damp. It is a common interrogatory submitted to us, demanding what is to be done with walls 14in. and 18in. thick, that have allowed the damp to penetrate them, and, more than that, thoroughly saturate them. Were we inclined to pronounce an opinion upon the matter, we should be tempted to assert that a thickness of 9in. of brickwork was not sufficient in every instance to ensure that protection from external influences that an inhabitant of a house has a right to expect. What, then, must be said, when we find a patentee advocating an immunity from all the evils so continually complained of, by a simple wall 1in. in thickness? We shall consider the subject a little in detail, and leave our readers to form their own conclusions upon it.

The system consists of erecting the external walls of houses by means of these slabs fitted into frames, made of angle and other sections of iron that may be convenient. A skeleton house, as it were, is first put up, and then filled in with the patent concrete slabs, which are secured to the framework by screws. For mere temporary purposes, such an expedient might be useful, as the facility for erecting and taking down is apparent, but with respect to the employment of them in the construction of permanent dwellings, we confess we are somewhat sceptical. Comparing them to solid brickwork, they may be likened to the thin coating of veneer that is laid over ornamental cabinet work. So far as the cost of their manufacture is concerned, the remarks we made in our last article upon the cost of the production of May's blocks, apply equally to these, since their composition is nearly identical, the only difference being that May's blocks are simply concrete bricks of a larger size than the ordinary ones. Nicoll's slabs are thin flat masses, possessing a considerable superficial area in proportion to their thickness. We should imagine that, regarded cubically, the latter ought to cost more in their manufacture than the former, owing to the fact that their extreme thinness renders them more liable to crack and disintegrate, and would therefore naturally demand a larger proportion of cement to give a superior binding property. It must be borne in mind that in the manufacture of all these concretes the cement is the binding ingredient, and that it is quite possible to make a weak as well as a strong concrete. *Ceteris paribus*, the strength of a concrete will be in proportion to the quantity of cement used, and there is one fact to be borne in mind that is constantly lost sight of, and that is, that because concrete is employed, there is no necessary guarantee that it is the best, or even as good as it ought to be. Concrete can be made so as to be no better than mud, and the whole of its strength, impermeability, and other valuable qualities are altogether dependent upon the ingredients employed, and the care and attention bestowed upon their intimate union and complete incorporation. When concrete is employed solely for foundations, these precautions, although advisable, are not absolutely so indispensable as when the material is to be used for the construction of dwellings, whether it be adapted to their erection in the fluid state, as in Tall's principle, or first made into building blocks and slabs, in accordance with the systems of May and Nicoll. From the specimen we have seen of these slabs, their surface evidently labours under the same disadvantages as that belonging to all these concrete substitutions. All external walls built of them would require painting, plastering, or some other coat of concealment, to render them tolerable to the eye.

One of the principal items of expense connected with all works of construction is that of bringing the materials to the spot or site of the intended erection. Viewed in this light, May's blocks and the ordinary brick have a great advantage over the concrete slabs. Those the patentee anticipates a demand for will be 9ft. by 4ft., and it is quite clear that a slab of these large dimensions will require extra care and labour in loading and unloading. They can neither be packed in a manner so convenient and economical as bricks, nor can they be handled with anything approaching to the same facility. A slab weighing half a ton or more would require the use of a crane to lift it from one place to another, and, although these appliances are common enough in the erection of new bridges over the Thames and river embankments, they are not to be found as ordinary accessories to building on a smaller scale. There is no question but that a percentage of loss would have to be allowed for in the transport of these larger slabs, 9ft. by 4ft., particularly if a broken one could not be used, which is by no means certain. It is alleged that one of the great uses that might be made of these slabs would be in the internal walls or partitions of houses, and that for this purpose a thickness of from 1in. to 3in. would be sufficient. Probably this thickness would be quite enough, but unless the joists could all be laid upon the external walls, which is not always the case, it is not quite apparent how they could be supported, for the most intrepid builder would scarcely dare to lay his joists on a wall only 1in. in thickness. Sometimes, but not invariably, a cross beam can be got in, but in the first place for a large room the scantling would be excessive, and, in the second place, the floor of the ceiling would never be so sound as if a wall formed their support. The great objection to the employment of these slabs for roofing purposes would be their weight; weight would necessitate heavy rafters, and, in fact, require a heavy description of truss altogether. Otherwise, in situations where this item was not considered of importance, or rather where a thoroughly good roof was regarded as the chief desideratum, these slabs fulfil all the requirements, and, moreover possess the advantage of forming the ceiling as well. So far as impermeability to wet and resistance to all the injurious influences of the weather are concerned it is only actual experience that can decide the matter; but from the known qualities of good concrete in this respect there is very little doubt but that the slabs would fulfil these conditions. The patentee is in error when he asserts that "other kinds of construction" cannot be rendered available for habitable purposes so soon as those built upon his slab principle. Houses built upon Tall's fluid or May's block system would be perfectly dry upon the conclusion of the erection, as the former material sets, dries, and consolidates with great rapidity, and May's blocks are thoroughly dried when they are used and do not absorb moisture any more than the concrete slabs. This constitutes one of the differences between them and bricks, which all absorb moisture greedily, particularly those that are fresh from the kiln. Between Nicoll's and Tall's systems there is just this difference: the former uses a permanent frame, makes his walls at a distance, and puts them up on the site; the latter uses a temporary frame and builds his walls on the spot. The question to be solved is whether it is cheaper to construct the walls in large slabs 9ft. by 4ft., and carry them to the site of the building, or to obtain the materials at or near the site and erect the walls forthwith?

IN AND ABOUT BURY ST. EDMUNDS.

THERE is but little evidence of architectural progress, in the strict sense of the term, to be seen in the neat and clean town which has gradually sprung up on and around the site of what was once the grand monastery of St. Edmund. The "front" of a new chapel belonging to one of the varieties of Dissent, in a very violent dialect of round-arched Gothic of the modern type; the Bank, a pleasing and quiet late Gothic design (we believe by Messrs. Bacon and Bell), and one or two new and somewhat staring red brick residences with a certain flavour of architectural style about them, constitute almost the only pretensions to modern architecture to be seen in the town, unless we include the two chapels in the cemetery adjoining, which, like most recent cemetery chapels, are but neat miniature churches; in this case destitute even of the interest arising from diversity of expression, as the one intended for the celebration of the Church of England burial service is identical in design with that which is devoted to Nonconformist interments.

The architectural interest of Bury is therefore almost entirely that of the past, and in this it is richer than many places that are more visited. The sight, in a comparatively small town, of two very large churches, of almost the same date (late Perpendicular), standing parallel to and within a stone's throw of each other, and with an avenue of trees shading the path from the south door of the one to the north porch of the other, is in itself curious and picturesque. The south-

ernmost church, St. Mary's, is the later of the two, and in external design is very weak, but the porch just alluded to is worth attention from its rather peculiar design and the picturesque form of its angle buttresses—octagonal in the lower stage, breaking back into two rectangular buttresses above, and finishing in a kind of square pinnacle surmounted by some nondescript heraldic animal. Internally the piers and arcade are meagre and shallow in section, but are crowned by a very fine and rich single hammer-beam roof with very elaborately carved angels; the aisle roofs of similar description and equally good. This church is built entirely of the flint pebble walling common in the district, but the other church, St. James's, is of ashlar work, except the clerestory, which is of later date than the rest. The arcade is in every way superior to that of St. Mary's, but the roof, which is new, is a high-pitched one, quite out of keeping with the date and style of the substructure, a blunder which we need hardly say is not to be charged to Mr. G. G. Scott, under whose direction the church is being restored, but to certain wiseacres among the "natives" who would needs have things done their own way. The church has been reseated with open benches (the most comfortable and sensible church benches which we remember to have sat in), and the chancel is now being rebuilt from the designs of Mr. Scott, who has adopted the pebble and quoin walling for the work, which, except on economical grounds, seems to us a mistake, as it is surely reversing the proper order of things to build the chancel of rougher and cheaper material than the body of the church. The former chancel, including the west wall and chancel arch, was part of an older church, the floor of which was on a lower level, and which was filled up to the level of the present nave. Over the roof of this lower chancel some enterprising parishioners recently inserted a memorial window in the end wall of the nave, the retention of which window was insisted upon on the rebuilding of the chancel, so that the visitor now sees the new chancel roof hipped before it reaches the nave wall, to keep it below this window. However, the chancel arch is now being raised, and we were glad to learn that a compromise had been effected as to the offending window, which is to be taken out and rebuilt somewhere in the new chancel, the roof ridge of which will then assume its proper form. The tower of St. James's, which stands a few yards from the church, is a very fine and complete specimen of a Norman tower—a part of the old monastery which has been retained as the bell tower of the church, and which is rather too heavily weighted with bells, considering that the walls showed such signs of parting company towards the top that it was thought necessary a few years ago to insert strong iron ties at each stage and screw the whole thing together, and it is to be hoped it may now be considered safe for some time to come, in spite of the weekly bell ringing, though the divergence from the perpendicular is still quite perceptible. The stone, which is a beautiful grey oolite stone (not now to be found in the neighbourhood, whatever it may have been in the Norman period), is for the most part in splendid preservation. In a private garden, not far from the church, some huge, upright, shapeless, ivy-covered masses, with here and there the bases of the shafts attached to them, mark the great piers of the "crossing" of the old Abbey Church, and tell of its size and grandeur; while the base of a single pier of the choir points out the inclination of the latter towards the north. The architectural student will linger lovingly about the later abbey gateway, with its lofty buttresses triple shafted at the angles and the rich and elaborate jamb and arch mouldings of the inner gateway, telling of the finest period of Decorated Gothic; nor less will he appreciate the bit of half-ruin known as the "Abbot's Bridge," than which, simple as it is, it would be difficult to find a bit of masonry anywhere more thoroughly characteristic of the spirit of English Gothic.

A pleasant drive of about ten miles through some very pretty country brings the tourist to the splendid church at Lavenham, perhaps the finest specimen existing of a Perpendicular church, built just at the period when the style had blossomed into its characteristic richness of decoration, but before the mouldings and pier sections had fallen into that flat and tame character which belongs to the decadence of Gothic architecture. Lavenham being now also accessible by rail, will probably become more familiar to students than formerly. Those who have not visited the church can scarcely form an idea of the rich effect produced internally by the traceried spandrels of the nave arches, with a line of rich panelling over them, and, externally, by the panelling and canopies of the buttresses and the wonderfully elaborate and varied decoration of the nave and aisle parapets, showing Gothic conventionality of ornament in all its perfection. The tower at the west end of the nave, over 140ft. in height, and built of flints with the broken faces outwards, with stone dressings, is as remarkable for its admirable masonry as for the simplicity and boldness of its design. Two or three miles farther on is the village of Long Melford, possessing a church which will also repay a visit. Though of somewhat later date than Lavenham and far inferior in general design, it contains several points of peculiar interest, especially the Lady Chapel, which is well worth inspection, as also a small chapel to the north of the chancel, called the Clopton Chapel, where there are some niches with exqnisitely delicate carved canopy work. In the north wall of the nave is a curious and well-preserved bas-relief of "The Offering of the Wise Men" of some merit as to the lines of composition and drapery. The Virgin is represented about twice the size of the other figures, to give her proper dignity, and behind the three Wise Men Joseph leans on his staff, an old man with a very melancholy and resigned expression. A villanous tower, probably built during the last century, stands at the west end of the nave, into which an arch has been opened, evidently in imitation of the grand tower arch of Lavenham, but the mouldings curiously illustrate the utter incapability of the men of that period to catch the spirit of Gothic architecture, even when copying from an example before them. Patriotic persons may indulge their feelings before the monument of Sir Hyde Parker, of naval celebrity, whose family have long dwelt at Melford; and a "classic" monument in the chancel to the memory of a certain Sir W. Cordell, would, if placed in any building of the same style, attract admiration for its picturesque and effective design. About three miles' walk out of Bury is the church of Little Saxham, with its round Norman tower, which is the only interesting part of it (we may notice *en passant* that the church is in a very dirty, ill-kept, and dilapidated state); and a walk of about the same distance in another direction, through Hardwicke Park and some pleasant fields beyond, brings us to the pretty little village church of Hawstead, wherein are two Norman doorways* preserved in the newer masonry of Late Decorated date, which masonry, formed of broken flints of various shades of blue, yellow, and green, combines with the lichen to form a natural polychromy which would delight the heart of Mr. Seddon, who held forth so eloquently before the Institute some time since on the picturesque in walling. There are other larger and more important churches within an easy walk from Bury, and we can promise that anyone making Bury St. Edmunds his head-quarters for a few days will find himself in the centre of a considerable number of architectural and archæological attractions; among which we must not forget to specify Rushbrook Hall, a brick Elizabethan mansion forming three sides of a quadrangle, with a garden in the centre and a moat surrounding it; the latter very interesting to the antiquarian, but not, we should surmise, advantageous to the health of the inhabitants.

One can scarcely pass through Cambridge without turning aside for a glance at the new chapel of St. John's College, now approaching completion, and which has been built apparently quite regardless of expense. The general plan and design, somewhat resembling the choir and crossing of a large church with the nave deducted, express very happily the precise object and place of the structure among ecclesiastical edifices, and the internal effect of the entrance will certainly be a success, but externally we should have wished to see a style more in keeping with the *genius loci*, and with less of Continental suggestions about it; and Mr. Scott's good angel had certainly forsaken him when he designed the upper portion of the tower, with its heavy, awkwark-looking pinnacles connected by a disproportionately thin and meagre balustrade. We should scarcely have credited Mr. Scott with this tower had we met with it unclaimed. Very unsatisfactory too, internally, is the effect of the heavy feet of the roof principals brought down immediately on the top of a canopied niche, upon which they appear to rest; thus giving the appearance of weakness just where the greatest strength would seem necessary. No doubt the general effect of the interior will be fine, and the Johnians may reasonably be proud of their new chapel; but when we turn from this to give one more look at the magnificent breadth and unity of design displayed in King's Chapel, we cannot but feel the distinction between the modern Gothic erection, with all its variety of ornament and detail, and the grand monument of a period when men actually and un-affectedly *thought* in stone.

* Perhaps brought from the old Abbey, the remains of which are scattered about the country in various directions.

THE ROMAN VILLA AT CHEDWORTH.

On Saturday last the members of the British Archæological Association, who have been holding their annual congress at Cirencester during the past week, paid a visit to the newly-discovered Roman villa at Chedworth, when some new facts were disclosed and discussions provoked in reference to this interesting discovery, the situation and relative positions of the different apartments being described by the Rev. Prebendary Scarth, Mr. J. W. Grover, and Professor Buckman. This villa is situate on the great Foss-road, seven miles from Cirencester, and sixteen from Gloucester, in the valley of the River Colne. It forms three sides of a square. The villa is on the property of Lord Eldon, with whose sanction Mr. James Farrer has disinterred the Roman remains and caused a museum to be erected for the reception of the relics, a cottage being built for the residence of a curator. Here, with the exception of a few remains deposited in London, all the relics dug up have been deposited, and the beautiful tesselated pavements preserved. These relics are very various, and among them were a silver spoon 2½in. long, with an arched handle of 1½in., which was found in a heap of rubbish; two silver coins—one bore on the obverse the words "*Imperator Cæsar Antoninus Augustus*," a coin of Heliogabalus; the other was one of Valens; also bronze fibulæ, rings, implements, bone hairpins, bronze coins of Constantia, Constantinus, Urbs Roma, &c., nails, armlets, twisted chains with swivels, styles, and steelyards with lead weights attached; iron implements, knives, horseshoes, chisels, spearheads, crooks to suspend a kettle, and three pigs of iron, which would tend to show that these iron articles had been manufactured on the spot. Also various kinds of pottery, but only broken fragments; a few specimens of Samian ware, a perfect mortarium, a chafing dish, &c. Bones of the horse, ox, sheep, pig, and antlers of a large herd of deer, but only two fragments of human skulls. By way of preparing the visitors for what they were about to inspect, the Rev. Prebendary Scarth, M.A., read a paper on the subject, referring as he proceeded to a plan of the recently discovered villa, which had been placed at his disposal by Mr. Farrer.

The villa, he said, lay on the slope of a valley of the Cotswold Hills, on the River Colne, and although much of the villa had been brought to light, the whole had not been disclosed, for fresh foundations of walls were constantly being found. There were undoubted proofs that the villa had been destroyed by fire, and the discovery of 257 coins, mostly of the Roman period, enabled them to fix pretty accurately the date of its destruction. No Saxon coins had been found. The position of Chedworth was marked on the map of Roman Britain in *Monumenta Historica*, but it was not mentioned in Horsley's map. The rev. gentleman proceeded to describe the general plan of the villa, which appeared to be divided into two parts, one the residence of the owner, the other allotted to the servants of the farm which was generally attached to these rural villas. A perfect Roman villa, according to Columella, contained three parts :—1. The villa urbana, or owner's residence ; 2. The villa rustica, or residence of the bailiff and farm servants ; 3. The villa fructuaria, or barns and storehouses. Two of these portions appeared to have been laid open, but much more probably remained to be uncovered, as there were indications of other buildings on the sides of the hanging wood with which this villa was surrounded. Its peculiar situation had led to its preservation ; it was situated on the declivity of a hill, and after destruction had probably been left until the underwood had hid from view and gradually covered up the remains. This would account for so much good masonry being left undisturbed. The pavements were very perfect, and of a high order of merit, and probably were executed by the same artist who had laid down those found in and around Cirencester. One of these—viz., that adjoining the principal bath—had already been drawn and described by Mr. Grover, but there was another in the same line of building equally worthy of note, containing the figures of a dance somewhat resembling our present waltz. It consisted of eight compartments, but unhappily most of them had been destroyed. The arrangements for heating the rooms and baths of this villa were in a very perfect state, and well worthy of study. At one end of the villa was an isolated building containing an octagonal reservoir. This had also been drawn and described by Mr. Grover. In this building was found an altar without any inscription on it. The Christian monogram had been found upon three stones, one of which formed a step. It was inscribed in the under portion, and certainly indicated that the builder or possessor of the villa had been a Christian, and that it was built or repaired subsequent to the time of Constantine the Great. Another inscribed stone had been found with the letters PRASIATA on it. This, as well as the monogram, had already been handled by the Rev. Mr. Lysons, as might be seen in his published volume, "Our British Ancestors." The name was a curious and interesting confirmation of the truth of history, though, perhaps, it was too bold a conjecture to ascribe the possession of the villa to the husband of Boadicea, or the stamped tiles found in Listercombe, near at hand, to Arviragus, the king mentioned by Juvenal. Descendants of these two historical persons might have flourished at a later period, for all the remains found at the villa seemed to indicate a late date. Mr. Scarth then referred to the temple discovered in the wood, a short distance above the villa, and the sculpture found in it, and to the barrow opened beyond, and especially commending the museum on the spot, which had been so neatly and carefully arranged by Professor Buckman. He concluded by hoping that wherever Roman remains were laid open the same care would be taken in their preservation.

INTIMIDATION TRIAL AL LEEDS.

THE Sheffield intimidation case was tried at the Leeds assizes on Wednesday, the 12th. John Sheridan, Isaac Morton, John Morton *alias* Hall, Henry Hinchcliffe, Edward Beebe, James Butler, Alfred Staley, Joseph Armstrong, and Daniel Sanderson were indicted for unlawfully conspiring to injure James Powell in his trade of a mason and builder, by molesting, obstructing, and using threats and intimidation to such workmen as might be willing to be hired and employed by the said James Powell ; and also prejudicing, injuring, and oppressing the said James Powell in his said trade, and preventing certain workmen of the said James Powell from continuing to work for him, at Sheffield, on April 15, and on other dates. Mr. Maule, Q.C., Mr. Hannay, and Mr. Barker were for the prosecution ; and Mr. Digby Seymour, Q.C., Mr. Fitzjames Stephen, Q.C., and Mr. Vernon Blackburn were for the defendants.

After an elaborate trial the jury retired to consider their verdict, and returned into court finding Hinchcliffe, Armstrong, and Sanderson guilty, and acquitting the remainder of the prisoners.

His Lordship said he would consult with Mr. Baron Bramwell, and pass sentence on Thursday morning.

On Thursday, his lordship said :—My learned colleague and myself have considered the circumstances of your case, with a view of determining what sentence we ought to pass upon you, and we have come to the conclusion that we cannot deal with you as he (Mr. Baron Bramwell) dealt with the prisoners whom he tried at the Old Bailey some time ago for the same offence. The question of picketing came then for the first time before a criminal court—its legal quality had not previously been declared—and at the close of a long trial the defendants, and the other members of the union to which they belonged, expressed themselves satisfied that they had committed a breach of the law. Moreover, they saw they could not adopt the practice of picketing—so as to be of any use to themselves—without violating the law, and they therefore gave an assurance that the practice should be discontinued for the future : and upon that ground it was that my learned colleague felt himself justified in discharging them without passing any sentence at all, merely getting them to enter into their own recognisances to appear for judgment when called upon. You (to the defendants) have deliberately, and with knowledge of the case to which I have just been alluding, attempted to practice picketing ; and you have done it, according to the finding of the jury, upon which I must act, by means of intimidation and annoyance, and therefore brought yourselves within the criminal law. I can readily believe what was stated by your counsel—that you took legal advice before you so acted, and that you intended to keep yourselves within the limits of the law. But I cannot sympathise with persons who, for the purpose of injuring another, intended to go to the verge of the law, and happen to be betrayed beyond it. I hope this will be a warning to you and others not to enter upon a practice so perilous, because you cannot say how far you may be led beyond the point marked out for yourselves. I feel bound to pass a sentence upon you in order to deter others from following your example, and to teach you and others that the law, while it will protect you to the full enjoyment of your rights, will also compel you to respect the rights of others. The sentence upon each of you is, that you be imprisoned for four calendar months.

PHILOSOPHICAL VENTILATION.

THE *Scotsman* refers to a new system of philosophical ventilation, which has just been introduced by Mr. J. D. Morrison, surgeon-dentist, of Edinburgh.

A peculiarly constructed grate or stove is so arranged in the making that, while it shows a very large metal frontage for heating the air, by radiation and otherwise, does not draw air from the front, which is entirely devoted to heating the air of the entire room, but is fed entirely and altogether from below and behind. By this arrangement, a perfect hot air circulation is established, similar to a hot water circulation, which never by any chance meets any interruption, but continuously goes on drawing cold air from below and behind, which, supporting combustion, yields the heat which warms the air in front. This combustion apparatus is furnished with a damper, so as to regulate to any degree of nicety the amount of combustion, and consequently of the heating of the room. By another arrangement in the grate or stove, a large quantity of air is made to meet the heat at its hottest place, and so prevent smoke. The ash-pan which receives the incombustible residue of the coke is also peculiarly constructed, and performs a double function—viz., admits air in any quantity from all points except the front, whilst, at the same time, it of course receives and accommodates the ashes. From this construction of grate it is obvious that all draught in the room is done away with, so far as supplying the combustion of either stove or grate ; but there is still another provision made in this combustion apparatus, and that is, that the draught produced by the rarefaction is also supplied from below, behind, and all round the flame or hot bed of the stove or grate. There is, therefore, no air whatever supplied in front or from any part of the room. The air of the room is therefore simply warmed, and, taking an upward direction according to the gravitation of the particles, is of course warmest at the ceiling, where, meeting the apparatus now to be described, it performs a most important function.

The ceiling apparatus is a peculiarly constructed gas or oil lamp, which, while lighting the entire room by means of a reflector or reflectors, so collects all the heat which has been evolved during the illumination as to hand it over, by conduction, to the metal of a tube, which tube also receives not only the used warm air of the room, but also the entire products of combustion. This tube, which performs the ceiling part of the ventilation, is now converted into a shaft funnel, which, expanding into another much larger tube, made entirely of copper, delivers upwards all its heated air. This heated air, whilst being conveyed through the tube, uniting its heat with that of the heat itself, which is conducted along and by the copper, is all sufficient for the purposes of continuous ventilation into, through, and out of any chimney where no fire is in the fireplace—the front of the grate in this case being, like the other grate before described, simply covered in to prevent any admission of air from the front. Where there is a fire, the used air, however, vitiated by cancerous, scrofulous, or consumptive patients of a hospital, is passed through the flame bed of the grate or stove, and there entirely consumed—the air which accompanies the diseased breathings going to support the combustion, as in the other grate below, where it is cold and pure. In like manner, all the flats of a tenement, however high, can be perfectly ventilated—the street, in the first instance, supplying pure cold air to the ground flat, the vitiated air of this flat or room passing into the fires of the room or rooms of the flat above, and so on, till it finally escapes purified nitrogen and pure carbonic acid—ready-made food for the vegetable world.

THE MASTER BUILDERS AND OPERATIVE STONEMASONS AT WALSALL.

THESE men, in order to avoid strikes, have recently been conferring together, by delegates mutually appointed, to adopt rules and regulations for their future guidance. The following are the rules agreed upon on the 6th inst. :—

1.—Hours of Labour in the Summer Months.—That the hours of labour in the summer months shall commence on 7 a.m. on Mondays, and 6 a.m. on other days, and shall cease at 5.30 p.m. on all days except Saturday, when work shall cease at 1 p.m. throughout the year.

2.—Hours of Labour in the Winter Months.—That during the period between six weeks before Christmas and six weeks after Christmas work shall commence at daylight and cease at dark, and in no case to exceed the hours of 7 a.m. and 5 p.m., except where artificial light is used, where the hours of labour are to be the same as in the summer months.

3.—Meal Time.—That during those periods when summer time is worked, half an hour be allowed for breakfast, and one hour for dinner ; and when winter time is worked half an hour to be allowed for breakfast, and half an hour for dinner.

4.—The Rate of Wages.—That when summer time is worked the wages shall be at 31s. per week of 55½ hours ; and that when winter time is worked the wages shall be 29s. per week of 50½ hours ; and wages for each day to be as follows :—

Summer Time.

Monday.....9 hours.....	£0	5	0
Tuesday .....10 ,, ...	0	5	6
Wednesday...10 ,, ...	0	5	6
Thursday.....10 ,, ...	0	5	6
Friday.....10 ,, ...	0	5	6
Saturday..... 6½ ,, ...	0	3	10
55½	1	10	10

Winter Time.

Monday.....9 hours.....	£0	5	1
Tuesday .....9 ,, ...	£	5	1
Wednesday ...9 ,, ...	0	5	1
Thursday .....9 ,, ...	0	5	1
Friday.....9 ,, ...	0	5	1
Saturday .....5½ ,, ...	0	3	7
50½	1	9	0

5.—Time of Payment.—Time of payment not to be later than 1 p.m. on Saturday, and if not paid on the job, time to be allowed at the rate of three miles per hour to walk to the pay table.

6.—Setting Stone.—That all setting be paid for at the rate of 6d. per day extra on the current rate of wages.

7.—Walking Time.—Walking distance to be 1½ miles from the bridge ; beyond 1½ miles, and not exceeding 4 miles, walking time to be allowed by employers at the rate of 3 miles per hour.

8.—Lodgings.—That lodgings, at the rate of 2s. per week, be paid for on all jobs beyond four miles. If the men are sent from the shop, and at any greater distance than eight miles, third class railway fare shall be allowed as may be mutually agreed upon.

9.—Sheds and Mess Rooms.—Suitable sheds and mess rooms on all jobs where six masons are employed more than three weeks, shall be provided. Employers neglecting to comply with this rule to pay one-half of all time lost through such neglect.

10.—Apprentices. In the matter of apprentices, to be left to the mutual agreement of the employer and his operatives.

11.—Notice.—All men must give and take one week's notice, such notice to expire at the close of the day's work, but in case of drunkenness or neglect of work any workman may be discharged without notice.

12.—Alterations.—These rules shall come in force the first week of August, 1868, and should either party require any alteration in these rules, notice shall be given in the month of January in any year, so that any alteration may be made on May 1 following; but if no such notice be given or alterations made, then these rules shall continue in force until such notice be given and such alterations made.

BUILDERS.	STONEMASONS.
James Adkins	Joshua Far
James Rowley	B. R. Barlow
Daniel Moore	John Roberts
Edward Thomson	John Lindsley
	T. Amphlet, Secretary.

IMPROVED DWELLINGS FOR THE PEOPLE.

A PARLIAMENTARY paper shows that under the Act of 1866 the Public Works Loan Commissioners have agreed to advance £18,000 for the erection at Penge of thirty pairs of four-roomed cottages and thirty pairs of five-roomed cottages by the Metropolitan Association for Improving the Dwellings of the Industrial Classes; £2,500 for the erection at Highgate of forty-eight tenements of two rooms each, by the Highgate Dwellings Improvement Company; £22,000 for the erection of six blocks six stories high, on the Britannia Estate, King's Cross-road, by the Improved Industrial Dwellings Company, the blocks to comprise tenements of one, two, three, or four rooms each; £6,000 for the erection by the same company, at Greenwich, of two blocks to contain forty separate dwellings, twenty of two rooms, and twenty of three rooms; £20,000 for the erection by the same company, and also at Greenwich, of six blocks each, to contain twelve tenements of two rooms each, and twelve of three rooms each; and £13,000 for the erection at Liverpool by the Corporation, of one hundred and forty-six separate dwellings, eighty-four of two rooms each, forty-two of three rooms each, and twenty of four rooms each. The borrowers give security of the estimated value of double the amount of the loan.

THE GREAT PYRAMID OF EGYPT.

COLONEL HENRY JAMES, R.E., writes as follows to the editor of the *Athenæum*:—

In the *Athenæum* of November 16 last you were so kind as to insert my note respecting the proportions and dimensions of the Great Pyramid of Egypt, in which I stated, first, that a pyramid having a square base and a rise of nine parts in ten at the corners would have the exact proportions of the Great Pyramid; and, secondly, that the length of one side of the base was 360 derahs, or cubits of Egypt—the length of the derah being, according to Woolhouse in his "Weights and Measures of all Nations," 25·488in. This would make the side of the base equal to 764·64ft., the measured length by Colonel Howard Vyse being 764ft., and by M. Le Père and Colonel Coutell 763·6ft.

The accuracy of Woolhouse's length of the Egyptian cubit has since been questioned, and this has led me to a further investigation of the dimensions of this pyramid, or I should rather say of the units and measures employed in its design and execution, for we may consider 763·6ft. as the true length from corner to corner of the sockets which were cut into the rock at the four corners of the pyramid, to receive the corner stones. These sockets are 1in. deep, and the pyramid was surrounded with a pavement 1ft. 8in. in depth, by which the length of the sides would be reduced from 736·6ft. to 767·5ft.; and as no one ever designed or spoke of the dimensions of any building but with reference to the work which was visible and finished, we may consider 757·5 as the true length of the side of the base.

Now Herodotus tells us, "Euterpe," 168, that the arura, or Egyptian acre, "contains a square of 100 Egyptian cubits," and I infer that the side of the base was made 500 of these cubits, and that the area of the base was, therefore, exactly 25 aruræ. This would make the Egyptian cubit equal to 1·515 English feet, $500 \times 1{\cdot}515 = 757{\cdot}5$ft., the length as measured. But 1·515ft. equal 18·18in. and 18·181in. is the length of the Egyptian cubit given in the great work of the French *savants*, "Déscription de l'Egypte," and described by them as the "coudée des Grecs d'Hérodote, juste, médiocre, commune des Arabes, = 0·4618"—"the Egyptian cubit, according to Herodotus, being equal to that of Samos."

The height of the pyramid above the plane of the pavement was 481ft. The chambers and passages of the interior were set out with the cubit of 20·699in., i.e., of the same length as that of Karnak, which is preserved in the British Museum. The arrangement of the passages was obviously made to facilitate the transport of weights, including the king's body, in its case, from the entrance to the centre. The inclination of the ascending passage being made equal to that of the descending, a weight on a truck at the bottom would counterbalance, by means of a rope and pulley, a load descending from the entrance to the point where the passages meet, and be itself drawn up towards the same point, and it would counterbalance the same load when it was being drawn up the ascending passage to the centre, whilst in the same time it descended to its original position. A very slight amount of mechanical skill would be required to re establish such a mechanical arrangement for visitors to the interior of the pyramid.

PROPOSED MORTUARY, ST. MARYLEBONE.

IN a recent impression we referred to the necessity, as a sanitary measure, for establishing public mortuaries in all large towns—places that should far surpass the present inadequate and badly appointed dead-"houses." Since we wrote, Dr. Hardwicke, Medical Officer of Paddington, in a paper read before the British Medical Association, at Oxford, has ably advocated the views we put forth, and has offered many valuable suggestions to those who may have the designing of such works. We are glad to see that in St. Marylebone, where the existing "dead house" has been condemned more than once, the authorities are taking action in the matter. The following is a description of the proposed mortuary for this parish, as furnished to the Vestry by its chief surveyor, Mr. T. Gaull Browning:—

The style of the building is to be very plain Egyptian, 28ft. long, 19ft. wide, and 17ft. high, the walls of brickwork stuccoed, and the floor of stone, covered in by an iron roof, which will have the centre part only filled in with rough glass. The other portion of roof, measuring nearly three-fourths of the whole area, will be covered in with slates, boarding, and felt. For the purpose of admitting fresh air to the floor level there will be a trench the whole length on each side of the building, covered with an iron grating; each trench will have five communications with the external atmosphere by means of air bricks. For the escape of vitiated air there will be an opening at least 3in. wide all round the eaves of the roof, and the upper part will be entirely open, but protected from rain by means of a projecting frame, glazed with rough glass, and kept sufficiently high to admit of a very free escape of any impure air which may ascend into the upper part of the roof.

BAD BUILDING MATERIALS.

BUILDING operations always bring trouble to parochial boards. The Islington Board of Guardians, with their rising workhouse, are no exceptions. The churchwarden goes by chance into a brickfield to examine some bricks, and is told they are of so good a quality that 100,000 of them have been "worked in" instead of Cowley's bricks at the Islington workhouse yonder. Though stung to the quick, the churchwarden takes care not to wince, but comes home and unburdens himself to his brother guardians. A severe scrutiny is made; architect, contractors, and clerk of the works are interrogated, and it is found that there is some truth in it. Improper bricks had been delivered on the ground; some 3,000 or 4,000 had been sent away by the architect, and others by the clerk of the works; perhaps 10,000 bricks of this kind in all. The contractors are written to, and they "give a distinct assurance that such a thing shall not occur again." The answer of the contractors comes strangely on the ear. One is tempted to ask, in all simplicity, why couldn't they have given this distinct assurance before they commenced? The answer sounds as if what had been done hitherto was not entirely without their knowledge. But at that time they had not given their "distinct assurance." Before, the agreement was only a general one between gentlemen and gentlemen. Henceforward the "distinct assurance" raises the character of the agreement immensely above all that.

These contractors have a most perverse foreman. Some bad timber is brought upon the ground. The clerk of the works condemns it; the foreman takes no notice; but, in spite of the condemnation, he proceeds to work in the inferior timber. The clerk of the works (Mr. Lewis) calls in the assistance of the architect, Mr. Burden, and, with their united authority, they compel the foreman to take out the timber. Hearing this, the guardians send a complaint to the contractors, and another pretty answer comes back from them, that the foreman had done so "contrary to their wishes." But we do not hear that the foreman is dismissed or even censured, nor that the contractors have pledged their "distinct assurance" as regards the timber as well as the bricks. The guardians ought to see the necessity of at once securing this invulnerable *ægis* against imposition.

The guardians, in their anxiety about being preyed upon in this audacious way, could get no better word of comfort from the architect than that they should be watchful. This is not very complimentary to the parties concerned, but perhaps it is the only thing that can be done now. There is no reason, however, why other boards should not grow wise from the experience of the Islington guardians. The only way of getting at the contractors is in the drawing up of the contract. Let guardians turn a deaf ear to "the rules of the hon. society of contractors" and the like; and make an express stipulation, that for every load of inferior bricks or timber, the contractors shall be liable to a heavy fine. If they insist upon this they will not afterwards need to supplicate them for their "distinct assurance" that they are not to be cheated.—*The Parochial Critic.*

ARCHÆOLOGY.

"EXCAVATOR," dating from Gillingham Works, Kent, says in a letter to the *Times*:—"While excavating at the Burnt Oak Estate, Gillingham, for the purpose of procuring materials required in the construction of the new pier and landing place now in course of erection there, I have found a number of Roman interments, and near each of the mortuary urns were several small rude vases, differing in size and form. From one interment I took two very perfect specimens of Samian ware, on each of which the respective potters' names are legibly stamped—viz., "Calendus" on one, and "Reburrus" on the other. Last week I added to my discoveries a portion of a gold *torques*, an ornament worn round the neck, weighing nearly an ounce and a half, and near it a small gold ring, which I learn from page 43 of the fifth volume of the *Archæologia Cantiana*, possess a sort of money value, and was used as a medium of barter. The whole of the relics found are in the possession of Messrs. Ball and Gammon, who will be glad to show them and afford any further information respecting them on application at the works."

Mr. George Grove writes to say letters have been received from Lieutenant Warren from Jerusalem, July 21. He was settled in the city, and had found the two sappers in good health and the works making fair progress. The thanks of the society are due to Dr. Chaplin for his kind and careful superintendence during Mr. Warren's absence. Sergeant Birtles, who was obliged to come home for a few weeks for his health, returned from Southampton on July 18, with his wife, and is by this time, no doubt, again working with his old energy. Four additional sappers will leave Southampton on Saturday next.

SCHOOLS OF ART.

THE Lords of the Committee of Council on Education having, by a minute dated January 3, 1868, offered prizes—viz., one sum of £50, three sums of £40, five sums of £30, ten sums of £20, and twenty sums of £10—to the head masters of the schools of art in the United Kingdom in which the general amount of work, considered with reference to the number of students under instruction, should be found after the examinations to be most satisfactory, and having had the results of the recent examinations laid before them, have awarded the above prizes as follows:—Charles D. Hodder, Edinburgh, £50; J. S. Rawle, Nottingham, £40; J. P. Bacon, Stoke-on-Trent, £40; Edwin Lyne, Dublin, £40; D. W. Rambach, Birmingham, £30; Edward R. Taylor, Lincoln, £30; W. G. Muckley, Manchester, £30; C. M. Clarke, West London, £30; Louisa Gann, Bloomsbury, £30; W. L. Casey, St. Martin's, £20; Susan A. Ashworth, Edinburgh, £20; Joseph Kennedy, Kidderminster, £20; John Sparkes, Lambeth, £20; Robert Greenlees, Glasgow, £20; John Anderson, Coventry, £20; Herbert Gilbert, Lancaster, £20; Walter Smith, Leeds, £20; George Ryles, Warminster, £20; S. F. Mills, Spitalfields, £20; James Ford, Macclesfield, £10; J. S. Goepel, Frome, £10; John N. Smith, Bristol, £10; F. M. Black, Kilmarnock, £10; W. H. Sounes, Sheffield, £10; Samuel Eltoe, Darlington, £10; James Carter, Hanley, £10; F. F. Hosford, Llanelly, £10; William Stewart, Paisley, £10; Alexander Macdonald, Oxford, £10; W. H. Stopford, Halifax, £10; W. C. Way, Newcastle-on-Tyne, £10; John Parker, St. Thomas Charterhouse, £10; W. J. Baker, Southampton, £10; J. B. Birkmyer, Exeter, £10; Robert Cochrane, Norwich, £10; Edwin Chandler, Hull, £10; W. T. Griffiths, Ipswich, £10; John Finnie, Liverpool (south district), £10; R. C. Puckett, Bath, £10.

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.—IV.

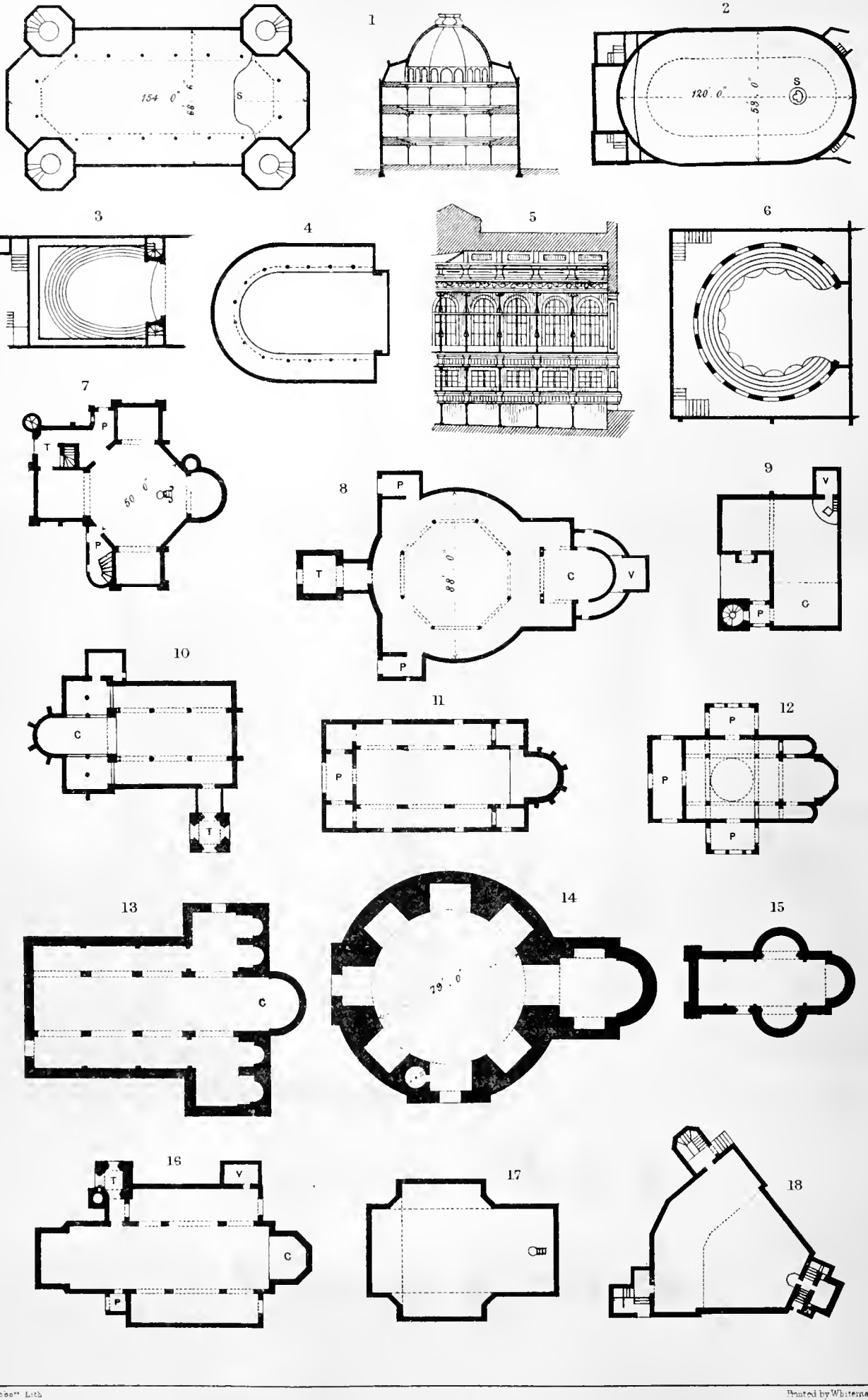
THE first thing to aim at in a galleried interior is to make the gallery an integral part of the design. It ought to appear plainly as a ruling motive for the whole arrangement, not as an afterthought thrust in to spoil it. There are three ways in which a gallery may be introduced, not all perhaps equally good, but all worth noticing. For the sake of shortness they may be described as the theatre system, the balcony system, and the transept system. In the first, the gallery runs round the central area (unless at the pulpit end) in a continuous line. It is generally curved on plan, so that its seats may, as far as possible, face the preacher. It is supported on columns, which run up above it to carry a girder or a series of arches, dividing the ceiling of the central area from that over the gallery. This last point, architecturally speaking, is the characteristic one of the system. The very essence of it consists in enclosing the central space, from floor to ceiling, by a kind of open screen, of which the gallery front forms part. The gallery is thus no longer detached and disconnected from everything else; it becomes one member of the enclosing surface. This, substituting boxes for a gallery, is clear enough in an ordinary theatre. There the actual walls of the building are hardly to be seen at all, and the fronts of the boxes become in effect the visible boundary. Where the light is obtained from side windows, and where there are open seats in place of boxes, the system cannot of course be carried to such an extreme as this. But it is still possible to make the idea clear enough. The interior can still be divided into a central area, open from top to bottom, and an aisle running round this, containing one or more galleries. The gallery colonnade will of course everywhere follow the plan of the gallery front, and will re-echo it above in the horizontal member, dividing the central roof or ceiling from that of the surrounding aisle. This arrangement, at any rate, possesses unity and consistency. It may be spoiled, as it commonly has been, and as the best system may, by falling into incapable hands, but there is a possibility of architectural effect in it which has hardly yet been understood. Nos. 4 and 5 in our illustration (a plan and section slightly modified from those of the Victoria Summer Theatre, Berlin) will show one instance of its application, and the former Surrey Music-hall (No. 1) another. In neither case, of course, is the system carried out in the way that would be desirable in a religious edifice, but examples may be suggestive when they would be quite unfit for literal reproduction. In the Victoria Theatre, some dignity and impressiveness, indeed, is given by the lofty proportions of the upper stage of columns. The walls, too, follow the line of the boxes or gallery front, and this alone is a wonderful gain in unity and repose. The want of all relation between the plan of the gallery and that of the walls is one of those gross barbarisms which are always obtruding themselves through the thin disguises of chapel architecture. A curved gallery in a square chapel is generally bad enough, but if the square is to be further broken into for staircases, and the gallery made to rise and fall in all sorts of ill-contrived ways, it is absurd to waste money or thought on a building so radically hopeless.

The system just described has, of course, no pretensions to novelty as a system. The only novelty would be to see it carried out ably and thoroughly. Parts of it are common enough in existing chapels—No. 1, for instance, in our previous illustration; but, like everything else, in the great majority of them it is not worked out in a masterly, consistent way. The principle is followed, perhaps, to a certain point. There some little difficulty comes in; it is cast aside in a moment, and an opposite principle taken up, to be abandoned in its turn as soon as it becomes troublesome. For instance, the designer starts with a circular-ended gallery like that in No. 4. He runs up his columns to the roof along the straight sides of the plan, and thus divides the central ceiling from that of the gallery aisle. But, when he comes to the circular end, the question arises, "What is to be made of the chapel front outside?" To show this honestly as a part of the aisle would be too great a novelty to venture on. The "front" would not have the orthodox resemblance to that of a common church; so, to make the exterior a sham, he completely spoils the interior, continues the central ceiling right across the end gallery, and turns out another miserable compromise between custom and common sense. Now, all this is just the opposite of what is meant by the term "workmanlike." There is no power shown in it, no capacity for bringing things into order—for *designing*, in short. It ends in a kind of chaos, or what in plain English is called a muddle. There is no elaborate theory of the fine arts wanted in criticising such a result as this. Everyone with an eye for businesslike, straightforward work would condemn it instantly were it less familiar. It is not a question of ornament; it is a question of going right through on one uniform system, or of doing a little bit in this way and a little bit in that, as it seems easiest at the time. Suppose the plan starts with a gallery all round, as in Westminster Chapel (No. 2.) The objection arises, that behind the pulpit is a bad place for hearing; or that, for some other reason, the fewer seats there are there the better. Here one might suppose is a case for study—how to remove the failing and not spoil the design. Nothing of the sort. What is easier than to narrow the gallery there by two or three seats? True, the curve of the gallery will no longer fit the curve of the walls—it will look like an enormous blunder, and will be an eyesore to everyone who sees it. No matter; trifles of this kind are too common in Nonconformist churches to be talked of much, and what is the use of ornament except to cover them up? Now, it really does not need an architect to arrange a building, if *this* be arranging it; a day labourer would be quite equal to such expedients. The example quoted is not worse than hundreds of others, though it may be more conspicuous; it is a fair instance of the general practice. We are speaking here, as in other places, of the great mass of chapels built by the more educated class of Nonconformists. It is needless to be constantly repeating that there are a few bright exceptions to the remarks made; unfortunately very few in most parts of England. On the other hand, we have taken no notice of the "Little Bethels" and "Ebenezer Chapels," with their cement fronts and sham porticos. There is a certain point at which people are unassailable by any argument; and the architectural marvels last named must simply be endured while there is a class to whose capacity and stage of cultivation Little Bethelism in any of its forms happens to be the appropriate creed.

To return, however, to the subject of gallery arrangement. The system under notice admits of considerable variety in form. Fig. 3—a plan of the Queen's Theatre, Longacre—shows about the average proportion of length to breadth adopted in theatres. Much has been said at different times about their excellence as models for Nonconformist places of worship. A closer study of the subject would probably show that the system of gallery design, which we have named after them, is the principal thing worth examination, and even this needs great change and development. Much greater length is admissible in buildings only intended for speaking in than in those where a clear view of the stage is the first requirement. In the Surrey Hall (No. 1) a good voice was found to be perfectly audible throughout, the extreme length being over 150ft. It is true that the farther seats in the side galleries are not the most convenient for facing the speaker, but this objection in practice is not so serious as it looks on paper. The number of columns above and below the gallery is a weaker point in the theatre system; and if they are too small, or too far apart, a very meagre effect is apt to follow. But the greatest difficulty which a competent architect would find in perfecting it is the prejudice against carrying the principle to its logical results on the exterior. Internally the system would find favour among many Nonconformists, but they shrink from exhibiting it on the outside. They do not see that the first step towards making their buildings impressive is to make them honest. They would like them to resemble theatres within and churches without, and so they halt halfway between the two, and miss the best points of both. They would be perfectly right, indeed, in claiming that the system should be worked out in a style befitting a place of worship; but this is a very different thing from insisting that it should have the "regulation front" of a common Gothic church.

The second way in which a gallery can be introduced is on what we have called the "balcony system." The name does not perfectly define it, but will be useful for the purpose of reference. On the previous plan, it will be remembered, the gallery front was merely a horizontal member in the screen of columns dividing the central area from the gallery aisle. On the present plan there is no such division between the central and lateral spaces. The gallery simply projects from the walls of the building. The whole roof is usually in one span. There are no columns at all, or in any case none above the gallery level; and there is, therefore, no screen at all analogous to the nave arcade of a church or the box fronts of a theatre. On the former method the enclosing screen or colonnade tended to become the most important surface of the interior. On this one all the importance remains with the actual walls of the building. The fault to be guarded against now, even more than in the last case, is the want of apparent connection between the gallery and the rest of the design. Every possible means of uniting and harmonising them will be urgently needed. The plan of the gallery, for instance, should closely follow that of the building. Its horizontal lines will strongly call for a similar tendency in the chief features of the wall from which it springs, something to re-echo its form, and save it from being discordant and isolated. How to give this will of course be a special problem for the architect in each separate case; but it is plain that the conditions involved are very unfavourable to the vertical aspirations of "chapel Gothic." The windows, instead of being long, narrow, and detached, would naturally be banded together in arcades. Cornices, strings, and dados might continue the same principle, and a roof of a pitch only moderately steep would be needed to complete the whole. The more lofty the structure, indeed, the better. Here, as everywhere else, height is needed to give nobleness of effect, and to prevent our churches from being thrust out of sight by warehouses and shops. But on this system the main lines must be chiefly horizontal. The internal design requires it, and it is by the interior, in all architecture that is anything but a sham, that external character is first of all regulated.

A fire broke out at Northumberland House, Charing Cross, on Wednesday night, and the ballroom and picture gallery, 150ft. long and 50ft. high, was totally destroyed. It contained pictures, frescoes, tapestries, vases, and other articles of *vertu*, many of them of a unique and rare description, most of which have perished. A Sevres vase, 3ft. high, a gift from Charles X. of France to Duke Hugh of Northumberland, valued at £10,000, and some frescoes from the antique, have been destroyed.

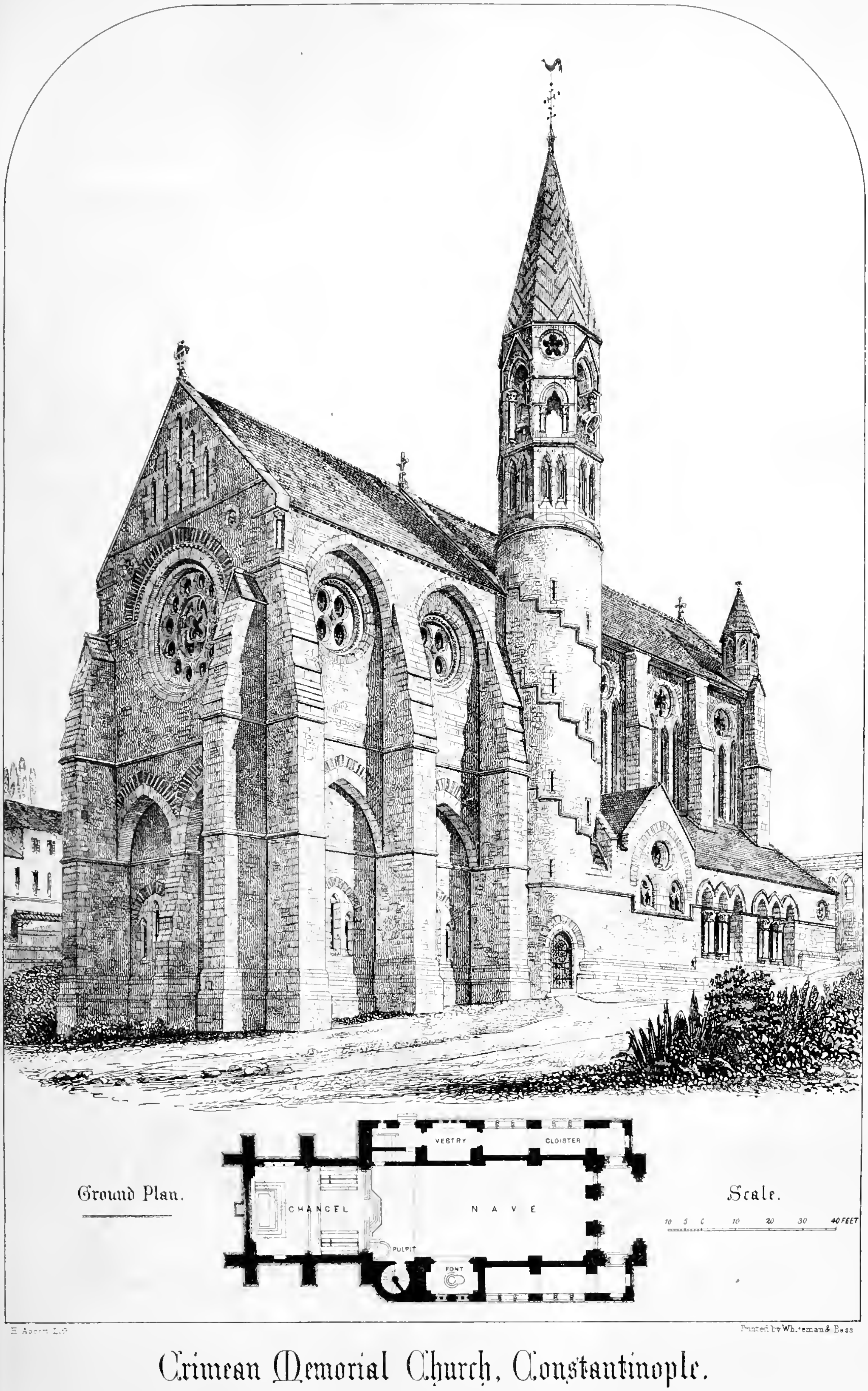


H. Abbott Lith.

Printed by Whiteman & Bass

DEVELOPEMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.

Nº 2.



Printed by Whiteman & Bass

Crimean Memorial Church, Constantinople.

GEORGE EDMUND STREET, ARCHT

ART SCHOOLS.

NOT the least interesting parts of the Report of the Science and Art Department, the main features of which we called attention to last week, are the returns of the art schools throughout the kingdom. Art schools are very much like other institutions and earthly things in general in that they cannot without suffering be left entirely to their own resources. In many of our provincial towns aid is afforded by the local corporations in addition to that given by the Science and Art Department. Still even then some difficulty is found in making headway; and in cases where the school is self-dependent this difficulty of course increases. A great deal of course depends on the conductors of these institutions; nevertheless, it is hard to expect them to make bricks without straw, as seems to be the case in some instances that have fallen under our notice. A master can scarcely be expected to devote his time to collecting subscriptions or soliciting support in addition to art teaching.

It is rather discouraging to read through the returns so many "decreases" both in funds and students from the returns of last year. True the total number of students exhibits a slight increase, but the result might have been much better if many of the schools had not fallen off in their attendance returns. Something is wrong, it is clear. Either the master cannot succeed in inspiring confidence, or the people are not thoroughly awakened to the importance of art teaching. Let which will be the case, steps should be taken to remedy it. We feel almost inclined to print in two columns side by side the names of the schools and masters that have advanced in position and numbers along with those that have retrograded. In some cases the decrease in numbers is serious. Brighton, for instance, with an attendance of 99, exhibits a decrease of 36 since last year. The result is apparent in the last words of the return, "No examination of the school took place in 1867."

PLATFORM ACCIDENTS.

TOO often the erection of raised platforms for spectacular purposes is left in the hands of incompetent men—men with whom "the rule of thumb" is all potent. The spectators of a review, a race, or of the laying of a foundation stone, are often placed "within an inch of their lives" for want of some supervision of such structures. The scantlings employed are often far too small. It would seem as if merely the dead weight of the people to be accommodated was taken into account, and that no consideration whatever was paid to the other conditions which should be regarded in the erection of platforms. If no provision is allowed by the constructors of a platform for the enthusiasm of those who are to assemble upon it, that enthusiasm will assuredly receive an untimely check. A sudden rising to the feet by the spectators will suffice to bring down all such erections in which dead-weight only is allowed for. It is highly important, therefore, that no structure of the kind should be allowed to be erected without the supervision of a professional man. In the case we are about to allude to, however, an architect was employed in erecting the platform, but the propensity for meddling and muddling was so strong in a certain subcommittee that the architect's plan was altered without his consent and in his absence.

The foundation stone of the new Townhall at Gateshead was laid on the 11th of June. The "gentlemen's" platform fell. Many persons received very serious injuries, and one of the victims has just died. Immediately on the accident taking place, the Corporation of Gateshead commenced an inquiry into the cause of the accident. But it soon became apparent to that body that it, by its subcommittee appointed to superintend the arrangements for laying the foundation stone, might find the blame resting upon its own shoulders. The fact of the architect's plans being altered had evidently oozed out, and, therefore, the corporation found that in pursuing the inquiry it would heap the blame upon itself. It seems that the architect, Mr. Johnstone, was assailed by the corporation in a most extraordinary manner. The death of a victim, however, brought the coroner on the scene. The verdict of the jury was to the effect that the deceased met his death by the falling of the platform; that the falling of the platform was caused by the want of proper struts at a certain part, and that the sub-committee were to blame for altering the plan in the absence of the architect, and for not seeing that the platform was properly inspected.

CRIMEAN MEMORIAL CHURCH, CONSTANTINOPLE.

ONE of our lithographic engravings this week represents the Crimean Memorial Church, which has just been erected at Constantinople. A competition was invited, and Mr. Burges's design was selected as the best. Some difficulties having arisen about the expense of erecting a church after Mr. Burges's design, the work was given to Mr. Street, who was second in the race. The cost of the church is about £1,800. The contractors were Messrs. Roger and Worth, Gosport; and Mr. S. Wallis, of London, clerk of the works.

ANOTHER NEW PLAN FOR THE CHANNEL RAILWAY.

MR. G. REMINGTON proposes the construction of a railway from the South-Eastern Railway at Appledore to the town of Lydd, a descending gradient of 1 in 70 for 3½ miles to Dungeness, where the level of the railway tunnel intended to pass under the English Channel would be 240ft. below the level of low water spring tides; from the latter level the line was to rise at the rate of 1 in 3,795 for about seven miles, then a descending gradient at the rate of 1 in 1,200 for about eight miles to the centre shaft, and thence another descending gradient of 1 in 3,265 for eleven miles to Cape Grisnez. From this point rising gradients of 1 in 70 and 1 in 81 to join the French railways. The height of the tunnel would be 30ft. from the soffit of the arch to the centre of the invert, leaving a clear headway of 20ft. for the trains; the space between the rails and the invert would be occupied by a spacious sewer, running along the central line of the tunnel, and on each side of it two air tunnels for the purpose of providing ventilation. The width of the tunnel was to be 25ft. It was proposed to carry the tunnel through the Wealdon formation, consisting of very strong clay, beds of freestone, and fresh-water limestone all the way. The estimated cost of the works, allowing £638,000 for contingencies, was £7,000,000. The probable income of the railway was estimated by Mr. Remington at £1 625,900 per annum, the working at £650,360, and the nett profit at £975,540.

IMPROVED CONSTRUCTION OF CHURCH ORGANS.

AT the recent opening of the church of St. Augustin, in Paris, the inauguration music was performed by an organ that, from the novelties introduced into its construction and the power of its tone, has probably few equals in any country. It was built by M. Barker, who has designed and carried out a new principle of transmission by means of electro-mechanism, which he substitutes for the usual method of mechanical transmission maintained by the agency of wooden rods, which establish the connection between the keyboard and the wind box. By obviating the necessity for employing these rods, which are a great source of danger when the instrument is being repaired or put in order, in consequence of the absolute necessity for using lights, one advantage is already gained, and the facility with which the transmission is effected is another. It is accomplished by the agency of an electrical pile, through the means of wires covered with gutta-percha. The keys act upon electro-magnets, which are attached to pneumatic levers, also the invention of M. Barker. This magnificent organ is furnished with three keyboards, each of which can sound 54 notes in every one of the 43 rows of pipes belonging to the instrument. The pedal board commands 27 bass notes, no less than 15 pedals being required to afford the necessary connection. That electricity and its various modifications is ultimately destined to play a far more important part as a prime motor than it has hitherto done there cannot be a doubt. By commencing with examples requiring only small power, as in the present instance, the way will eventually be made clear for instances upon a more extended scale.

PALACE OF THE SULTAN AT CHERAGAN.

THE works of the kiosks attached to the Palace of Cheragan, or, as the French write it, Teheragan, which have for so long a time been suspended, are now actively resumed. The Sultan takes a personal interest in them, and he has given directions for some new features not Oriental. These are rooms in the kiosks and main saloons in the palace which are to be decorated, in commemoration of his visit to France, as exact counterparts of chambers he saw or occupied at the Elysée or Tuileries. H. S. M. has, it appears, too good taste to commemorate the Georgian or Albertine decorations of Buckingham Palace, though we must own that on the occasion of the Sultan's occupation it was furnished as an imperial palace and worthy of the country. Cheragan will therefore have less of an Oriental character, but that will be made up for by the kiosks at the Seraskierat or Horse Guards, though for that matter the style of Dolma Bagcheh Palace and other modern buildings is a pleasing kind of Italian, modified by rococo, and applied in accordance with Armenian and Levantine ideas.

NEW STEAMBOAT PIERS AT WESTMINSTER AND WATERLOO BRIDGES.

SINCE the Thames Embankment has been opened for foot passengers efforts have been made to bring the magnificent piles of granite where the steamers stop also into use, and already two splendid piers have been placed in the recesses provided for them in the granite wall—one at Westminster Bridge and the other at Waterloo Bridge. Others are about to be placed at Hungerford Bridge and the Temple, and, when the embankment is completed to that point, at Blackfriars Bridge. The new piers are entirely of iron, and are as ornamental as the purpose for which they are required will permit. Of the two, that at Hungerford is the longest, and apparently most complete. It is furnished with waiting-rooms, which add considerably to its appearance, and will be very acceptable to passengers in wet or inclement weather. It is understood that the new piers will be managed by an additional number of piermen. Chains are to be placed in front of the piers to guard against accident, and they are all to be supplied with life-belts and other life-saving apparatus.

Building Intelligence.

CHURCHES AND CHAPELS.

The London correspondent of a Dublin paper says that a new Catholic Cathedral is about to be erected in the metropolis as a memorial of the late Cardinal Wiseman. A piece of ground of nearly three acres in extent has been secured in Westminster, near Buckingham Palace and the range of buildings now in course of erection on the Belgravian estate of the Marquis of Westminster. The site of the proposed church, which will be the first cathedral which the Catholics of the metropolis have been able to build since the Reformation, will cost £50,000. The committee charged with the duty of procuring funds hope to be able to push on the works in the spring.

The foundation stone for the rebuilding of the village church, Grasby, was laid on the 4th inst. The new church, which is to have stone tower and spire, is from designs by Mr. C. Buckeridge, architect, Oxford. The church is of the Decorated order of the latter part of the thirteenth century, and the total cost of the restoration will be about £2,500.

The Wesleyans have made a very decided progress in chapel building during the last year. They have built, since the conference of 1867, 126 chapels, and they have enlarged 74 others. Of these 200, as many as 78 were built in places where no Wesleyan chapel had previously existed. These 78 chapels were to accommodate 22,137 hearers; and by the other enlargements and rebuildings, some 12,000 or 15,000 other hearers would be accommodated.

Christ Church, Highfield, Hants, was reopened on Friday last, after undergoing alterations and repairs, under the direction of Mr. Colson, architect, Winchester, at a cost of from £600 to £700.

On Thursday week, the Church of the Resurrection, at Eastleigh, Barton, near Bishopstoke, was consecrated. The edifice (which has been built from designs by Mr. G. E. Street) is Early English in style, and comprises nave, chancel, and south transept. Sittings are provided for 288 persons.

Wycliffe's Church, Lutterworth, is undergoing restoration, at a contemplated cost of £7,500. Mr. G. G. Scott is the architect.

The church of Holy Trinity, New Barnet, was consecrated on Thursday week. The church, which was erected from the designs of Mr. Christian, of Whitehall-place, consists of a nave, north and south aisles, and apsidal chancel, with aisles, the southern one of which is used for the organ, with the vestry behind. Open benches of stained deal accommodate about 420 persons. The cost has been £2,996. Messrs. Dove Brothers, of Islington, were the contractors. The organ was supplied by Messrs. Bevington and Sons, at a cost of £182.

Thorpe Langton Church was reopened on the 12th inst., after restoration. In addition to a tower and spire of the Early English period, the edifice comprises a nave of three bays, and north and south aisles, with one row of seats in each. A new porch has been erected on the north side. The interior walls and the bays of the aisles have been cleared of the plaster which covered them, and the stones newly pointed. Seats of varnished deal have been substituted for the old pews, and a new roof has been erected. The pulpit, a Jacobin one, is of great rarity. Mr. J. Goddard is the architect; and the contractors were Mr. J. Stanyon, of Harborough, for the stonework, and Mr. Loveday, of Kibworth, for the woodwork.

Whitburn Church was reopened on Thursday week, after undergoing complete renovation and considerable enlargement. Increased accommodation has been afforded by widening the aisles. The general character of the new work is Early Geometrical. The east window and all the side windows are filled with glass by Clayton and Bell; the west window of the tower is by Wailes. There is also a single light, by Clayton and Bell, in the south aisle. Messrs. Austin and Johnson, of Newcastle, were the architects. The general contractor was Mr. R. Allison, of Whitburn; the joiners' work being executed by Messrs. Rankin, of Sunderland. The font, pulpit, and reredos are the work of Mr. John Roddis, of Birmingham. Mr. J. E. Hurlston was the clerk of the works.

St. Andrew's Church, Hertford, is about to be rebuilt. Mr. Johnson is the architect.

Mr. Colson, the architect to the Dean and Chapter of Winchester Cathedral, has designed new decorated iron standards for the lighting of the choir of the cathedral. The work will be executed at Coventry.

Llanfair Caereinion parish church was reopened on Tuesday week, having been rebuilt as far as possible on the old foundations. The new structure comprises nave, chancel, and north aisle, with vestry and south porch. Sittings are provided for 420 persons. Local bluestone is used for the walling, with red Shelvoke dressings. Messrs. Heaton and Co. supplied a window, and Messrs. Maw the encaustic tiles, and Messrs. Done and Davies, of Shrewsbury, glazed all the windows with green cathedral glass. Mr. E. Haycock, jun., of Shrewsbury, was the architect, and Mr. R. Lloyd, of Welshpool, the contractor. The cost is £1,900.

On Monday, August 17, the fine old parish church of South Hayling, Hants, was reopened by the Bishop of Oxford. The church has been repewed and restored, under the superintendance of Mr. G. E. Street, at the cost of £1,500. Messrs. Booth and Rogers are the builders. The subscriptions are about £300 short of the sum expended.

The new church at Llandysilio was consecrated on Saturday week. The style is Gothic, the materials being Welshpool stone with Cefn stone dressings. The bell tower and steeple are at the west end. The church is lighted by fifteen traceried windows. The interior consists of a principal nave, 20ft. wide by 80ft. long, and a north aisle 16ft. wide by 80ft. long. The altar is constructed of cedar, by Mr. George James, jun., of 25, Stephen-street, Tottenham Court-road, London. The reredos is of Caen stone, by Mr. Earp, of London. The choir is divided from the chancel by a stone screen. The seats are open, and are of Baltic timber varnished, accommodating 300 persons. The roof is open, of Baltic timber, but not varnished. The chancel contains a sedilia and piscina on the south side. There is a vestry on the north of the chancel, divided from the latter by a cusp arch and oak screen. The flooring is of encaustic tiles, by Mr. Godwin, of Hereford. The heating apparatus is by Mr. Dodwell, of Shrewsbury. The east window is by Messrs. Clayton and Bell, of London. The roof is covered with Whitland Abbey slate, with coloured ridge crests. The church has been built by Mr. J. Potter, of Welshpool, from plans of Mr. G. E. Street, A.R.A., and Mr. W. James, of London, was the clerk of the works. The cost will be £2,220.

St. Matthew's Church, Ardwick, was consecrated on Saturday last. The style is Early Decorated, and sittings are provided for 750 persons. The exterior is faced with Yorkshire stone, relieved with red Runcorn stone. The interior is lined with white brick, relieved in bands, diapers, &c., with red brick. All the stone carving has been done by Messrs. T. R. and E. Williams. The east window is by Messrs. Ward and Hughes, and the windows of the baptistery by Messrs. Lavers and Barraud. The architects are Messrs. Medland, Taylor, and Henry Taylor, St. Anne's Churchyard, Manchester.

BUILDINGS.

The corner stone of the new wing of the Girls' Orphanage, at Pantasaph, near Holywell, was laid on Wednesday, the 12th inst., by the Lady Clare Feilding. The new buildings are from the designs of Mr. Edmund Kirby, architect, A.R.I.B.A., Liverpool.

The Junior Carlton Club, having frontages to Pall Mall and St. James's-square, is rapidly approaching completion. Messrs. Lucas are the contractors, and Mr. David Brandon, of Berkeley-square, the architect. The material used is Portland stone, with enrichments of red granite and various native and foreign marbles. The cost, exclusive of furniture, fittings, gas, and decorations, will be £40,000. The warming and ventilating apparatus is by Messrs. Benham and Co., of Wigmore-street.

Scientific instruction is making decided progress in Yorkshire. At Bradford, a new Mechanics' Institution is about to be erected, at a cost of £25,000, and the directors hope that "it will rise to the rank of a People's College for Bradford, worthy of the town, and ready to do its part in that advanced education upon which, happily, the nation has set its heart." From the proceeds of the late exhibition at Wakefield, an Industrial and Fine Art Institution is in course of organisation. The rising town of Keighley is building a new Mechanics' Institution and School of Art, while the smaller towns of Otley, Eccleshill, Rothwell, and others are erecting Mechanics' Institutions for the direct purpose of advanced education.

A great improvement has just been made at Bristol by the extension of Park-row. The new road commences at the top of Lodge-street, and continues between Church-lane and Griffin-lane to the "King David." The construction of the roadway has been designed and carried out by Mr. Frederick Ashmead, M.I.C.E., engineer and surveyor to the Bristol Local Board of Health. Mr. T. H. Yabbicom was assistant engineer, and Mr. Henry Jones, the clerk of the works.

On Tuesday week the foundation stone of new parish schools at Darlaston was laid. The building, of which Mr. A. B. Brevitt is the architect, and Mr. Job Wilkes the builder, will be about 130ft. long and 68ft. broad, and it will be capable of holding 500 children. The style will be Gothic, and will be built of blue, red, and enamelled bricks. The estimated cost of the building is £2,430.

The new relief offices and dispensary for the parish of St. Pancras have just been opened. They are the first erected under the provisions of the new act, and are situate between Hunter and Compton streets, Brunswick-square. The site is L-shaped, and the rooms, which are compactly arranged, are all on the ground floor. The general waiting room is upwards of 600 square feet in area, and is lighted by lantern skylights. Doors on every side of this apartment admit to the men's and women's lavatories, fuel store, doctors' consulting-room, committee-room, and dispensary. All the rooms are very lofty and are open to the roof, the under side of the rafters being ceiled. The side walls are nowhere less than 12ft. high. All the fireplaces are fitted with Welch's patent ventilating stoves, which admit of fresh air from without being passed through the warm air chamber at the back of each into the rooms through "hit or miss" ventilators over the chimney-pieces. All the passages are paved with stone or tiles, and the floors of the rooms are of wood, under which a current of air is continually passing. The materials and the workmanship are of the best description. The cost has been £1,348. Mr. E. C. Robins was the architect, and Messrs. Scrivener and White the contractors.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—I. S. L.—E.—W. W.—E. W.—D. G. L.—I. A. H.—I. M'D.—H. C.—S. G. and Son.—W. R. S.—I. A. H.—I. C.—G. W.—I. R.—C. B A.—H. C.—R. and G.—I. M. S.—I. A. D.—H. R. T.—H. K. and W.

Correspondence.

HIDDEN TREASURES IN THE BRITISH MUSEUM.

To the Editor of the Building News.

Sir,—Desirous of seeing the chalice by Cellini which has been so successfully imitated by the Messrs. Elkington, I went to the British Museum, where I had been told it was. On inquiring in the hall, I found no one knew of its whereabouts, and was recommended to apply at the Gem room. I did so, but the cup was not there, nor had the attendants any knowledge of such a thing. By them I was directed to the Vase room, with the same result; from there I was sent to the British Antiquities room, and with as little success—no one knew anything of it. At last, as a *dernier ressort*, I applied at the Print room, and having overcome the difficulty of not having a special order for that department, was admitted, and at last found the object of my search. It was under a glass shade, and carefully locked up in a cupboard. I should like to know, Sir, what is the intention in thus closely hoarding a fine work of art? It ought, I think, to be freely exhibited as a model of art design and workmanship. Is not education the chief use and end in collecting such things? And what is true of this particular thing is no less so of the greater part of the contents of the Print room. What a wealth of beauty is there locked up, kept for the occasional gratification of a limited *dilettanti*, instead of being shown for the delectation and improvement of the many! There is room down the middle of the King's library for screens, which would hold some hundreds of engravings and drawings. Here might be a most interesting exhibition, and after an interval the series might be changed. As a treat the public (the owners of the works) might see the masterpieces of Rembrandt's magic needle, Marc Antonio's invaluable Raphael renderings, &c. A good beginning would be made if the better part of the Slade bequest was thus made known. True it is a limited exhibition is even now in the library, but formed on the principle of Sam Weller's epistolary efforts, "making you wish there was more." Amongst these drawings is a chalice by

Holbein, an exquisite design most skilfully drawn; and are there not other designs of his furnishing valuable lessons to the draughtsman and designer?

Considering the primary importance now, in our world-wide trade competition, to improve in artistic qualities our manufactures generally, it behoves the Government to use every means by which public taste can be improved, and the education of the artist assisted. And one important means to this end would be the exhibition I propose.—I am, &c., P. E. M.

COMPETITIONS.

SIR,—In your impression of last week, the Metropolitan Asylum Board offer a prize of £200 for the best design for erecting a fever hospital at Homerton. The accommodation is to provide for 182 patients; the internal dimensions of the rooms are such as to afford at least 2,000 cubic feet to each patient, which would require a hospital of 364,000 cubic feet; and all that building to be erected for £1,000, not quite three-farthings per foot cube, very little more than half the value of building a common cow-shed or barn-house.—I am, &c., W. G.

THE WALWORTH COMMON ESTATE COMPETITION.

SIR,—Having attentively read the correspondence which appeared in the several journals for the past weeks on the above subject, I cannot refrain from asking permission to make one or two remarks. No doubt in competitions of the kind one or two competitors will be dissatisfied with the result, and will vent themselves through the columns of a newspaper, and after which no further notice is taken. But when an entire body of competitors complain of a great injustice being done to them, and expose it by every means in their power, and by a formal protest, published in many journals, calling upon the board of guardians to do them justice, by reconsidering their decision, and pointing out to them their mistake, it becomes a very different matter indeed; and the public, as well as the profession, cannot shut their eyes to such facts, and naturally will look for a satisfactory explanation. But what has been the result? The guardians of St. Mary, Newington, have refused to give these gentlemen any satisfaction beyond telling them "the matter is decided."

I would ask is this the proper course for a public board to adopt? and are they at liberty to induce, by advertisement and printed instructions, a number of professional gentlemen to expend two months of their time and money in getting up plans for an honest competition, to find that the only two plans out of twenty-two sent in which have not complied with those instructions and are pronounced of inferior merit are the ones to which the principal premiums are awarded, and then to be told "the matter is decided?" Is there no redress for such injustice? Are the ratepayers aware of this fact, and do they agree with the selection made by the guardians (which has been pronounced by everyone who saw the plans to be the most outrageous)? I cannot believe it. Much credit is due to those gentlemen who have so determinedly remonstrated against this board of guardians, and I am sure the public, as well as every member of the profession, will bear them out, in having justice done to them, and I hope they will be able to make the guardians pay for it.—I am, &c., E. F.

SIR,—In your paper of the 7th instant you inserted a letter sent to the guardians by the unsuccessful competitors protesting against their award, premiums having been given to plans which in several important points did not comply with their printed instructions, and at the same time asking them to appoint a professional man to go through the plans and decide on the merits

Enclosed I send the reply received from the clerk to the board, and as it is evident that any further appeal to them on moral or equitable grounds would be utterly useless, the only course left open to us is to take such legal steps to enforce a fair adjustment of our claims as we may be advised.
—I am, &c., A. G. HENNELL.
22, Southampton buildings, Chancery-lane, W.C.,
August 19.

[COPY.]
WALWORTH COMMON ESTATE.

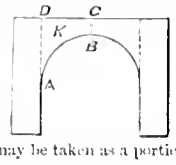
DEAR SIR,—In reply to the letter of the 3rd instant, addressed to the Guardians and signed by yourself and other gentlemen on the subject of the premiums for laying out this estate, I am directed to forward to you the accompanying resolution passed by the guardians at their last meeting.—I am, Sir, yours truly,
(Signed) JOSEPH BURGESS, Clerk.
Poor Law Offices, Vestry hall, Walworth.
August 17, 1868.

A. G. Hennell, Esq., 22, Southampton-buildings, W.C.
Resolution above referred to:—
"That the Board have already decided the question and see no reason to reopen it."

Intercommunication.

QUESTIONS.

[979.]—CENTRE OF GRAVITY OF ARCH.—Would Q. E. F., or any other correspondent, again further oblige by informing me how the centre of gravity, K, of a semi arch with a level extrados, A B C D, can be found? In the former case, a semi arch only was considered. I suppose that the part of the arch resting on the pier may be taken as a portion of the pier itself.—X + Y.



[980.]—PRIZES FOR YOUNG ARCHITECTS.—Can any of your readers tell me what are, and what the subjects and conditions, of the various prizes open to young architects? and so oblige—K. C.

[981.]—MODELLING IN CLAY.—Can any of your readers furnish me with the title and price of a good work on modelling in clay?—J. S. DAVIS.

[982.]—STRENGTH OF BRICKS.—Will you, or some of your numerous correspondents, be good enough to solve the following question:—If it requires 800lbs. to the square inch to crush a brick, how much will it take to crush 1½ cube; also the crushing weight for a brick (9 × 4½ × 3), and how it is calculated?—HYDRAULICS.

[983.]—PARTY WALLS.—I should feel obliged by a reply in your Intercommunication column to the following questions:—When there are no footings to a building forming a party wall, and there are existing eaves, in the case of the wall being pulled down what is to be considered the boundary line? The wall having been pulled down, in which there was a small light to a cellar about 1ft. square, has the proprietor of the wall a right to construct another light 4ft. by 3ft. in any other position; and having once bricked up the old opening by the building of a new wall, has he again the right of reopening it in its former position?—H. R. T.

[984.]—FISH PONDS.—Can any of your readers give me the information how to make a place hold water? It is 100ft. long by 40ft. wide, 3ft. 6in. deep. It is a clay bottom, but will not hold water. I want to preserve the fish.—FRANCIS R. CAPON.

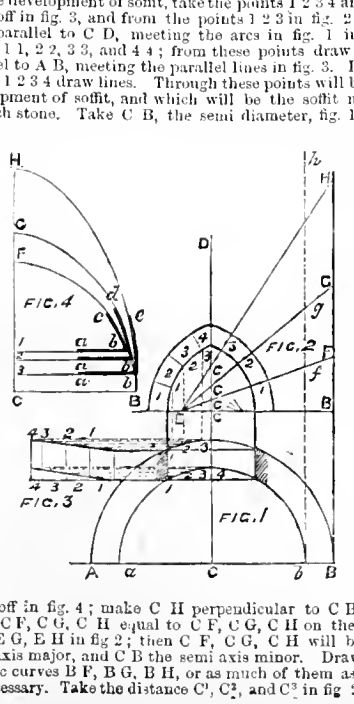
REPLIES.

[958.]—REMOVING LIMEWASH FROM BRICKWORK.—The only effectual way for "M." to restore the original colour of the brickwork and make the walls look decent, is to have them rubbed thoroughly, and the joints neatly pointed No washing with any solution would make a clean job of it.—BUILDER.

[959.]—BLACK VARNISH FOR IRONWORK.—A black varnish suitable for F Seward may be obtained from the Maritime Improvement Company, of 9, Bush-lane, E.C. It is called Hay's Protective Varnish.—E. W.

[959.]—Dr. Lunge has lately published a good recipe for black varnish. He distils gas tar till nearly all the volatile products are eliminated. He then dissolves the residual pitch either in the heavier oils, or, if a very quick drying varnish is wanted, in the light oils or naphtha. This varnish is the original tar, minus the ammoonia, water, carbolic acid, and other things which give it its disagreeable odour and cause it to be so long in drying.—SIGMA.

[960.]—GOTHIC ARCHES.—Having set out your plan, fig. 1, and elevation, fig. 2, C D being perpendicular to A B, make B H parallel to C D. Divide the arch into the number of stones required; draw the radiating joint lines E F, E G, E H to meet B H in the points F G and H. To get the development of soffit, take the points 1 2 3 4 and set them off in fig. 3, and from the points 1 2 3 in fig. 2 draw lines parallel to C D, meeting the arcs in fig. 1 in the points 1 1, 2 2, 3 3, and 4 4; from these points draw lines parallel to A B, meeting the parallel lines in fig. 3. In the points 1 2 3 4 draw lines. Through these points will be the development of soffit, and which will be the soffit mould for each stone. Take C B, the semi diameter, fig. 1, and



set it off in fig. 4; make C H perpendicular to C B, and make C F, C G, C H equal to C F, C G, C H on the lines E F, E G, E H in fig 2; then C F, C G, C H will be the semi axis major, and C B the semi axis minor. Draw the elliptic curves B F, B G, B H, or as much of them as may be necessary. Take the distance C^1, C^2, and C^3 in fig. 2, and set them on the line C H, fig. 4, at the points 1 2 and 3. From these points draw lines parallel to C B, meeting the several curves in the points $b\ b\ b$; then the angles $a\ b\ c$, $a\ b\ d$, $a\ b\ e$ will be the bed moulds to work the face of each stone from the soffit. The same operation applies to get the internal moulds from the internal diameter of plan $a\ b$. I have shown the dotted line, $b\ h$, where it intersects the radiating joint lines in the points $f\ g\ h$. Should there be a joint in the centre of arch that section will be square.
S. LEWIS.

[962.]—ST. PETERSBURG STANDARD DEALS.—A Petersburg standard C is 120 planks 12ft. 1 in. by 11in., or 60 planks 12ft. 3in. by 11in., equal to 8·0ft. run of 3ft. by 9in., or 73 deals 12ft. 3in. by 9in. and 4ft. over. All deal planks, deals, battens, and boards are reduced to this standard at importation. Deals and battens are sometimes sold by the 120; 12fts. by their respective squares; boards by the customary square. W. L——D.

[963.]—WEIGHT OF FLAT AND ROUND WROUGHT-IRON BARS.—In answer to "Cold Blast" I beg to send the following rules, viz:—To find the weight of flat malleable iron, multiply the breadth by the thickness by the length in inches, divide the product by 3·6; the quotient is the weight in pounds. For round malleable iron Multiply the square of the diameter by ·7854 by the length in inches, and divide the product by 3·6, the quotient is the weight in pounds. By these rules the metal is first reduced to cubic inches, then divided by 3.6; there being 3·6 cubic inches in 1lb. of malleable iron.—R P., Edinburgh.

[963.]—The simplest way for "Cold Blast" to proceed is to find, by calculating, the number of cubic inches in a foot length of the bar, and then multiply by the constant 0·27 for cast iron, and 0.28 for wrought To prove this rule, let us take the examples he himself gives. Firstly, what is the weight in pounds of one lineal foot of a bar 2¼in. broad by 5-16in. in thickness? The calculation will stand thus:—Weight in pounds = 2¼ × 5 16 × 12 × 0·28, or by decimals, = 2.25 × 0.312 × 12 × 0·28. Making the multiplication, we find the weight in pounds per foot run equal to 2·358 Consequently, the whole weight of the bar given by "Cold Blast," which is 3ft. long, is equal to 3 × 2·358 = 7.0.1lb., or, in round numbers, just 7lb. We proceed in a similar manner for the next example, which is of a round bar. As this bar has a total length of 39 2-16in., it will be simpler to first get the weight of one inch in length, and then multiply by the total length in inches. The area, or number of square inches of any round bar is equal to the square of its diameter multiplied by the constant number 0·7854. Since the diameter is 1 3-16in. it may be written $\frac{19}{16}$, and the calculation for the weight in pounds of one cubic inch will stand thus: $\left(\frac{19}{16}\right)^2 \times 0\ 7854 \times 1 \times 0.28$. Bearing in mind that $\left(\frac{19}{16}\right)^2$ is equal to $\frac{19}{16} \times \frac{19}{16}$ equal to the decimal 1.41, we have the calculation for the whole weight of the bar in pounds = 1.41 × 0.7854 × 1 × 0.28 × 39 2-2 = 12.08lb., or in round numbers 12lb. As a general rule, first find the weight of an inch or foot in length of the bar, and then multiply by the total length.
—X. X.

[965.]—WOODEN PILLARS.—The strength of round wooden pillars may be thus estimated:—Let P = weight in pounds which the pillar is to be loaded with, = its total length, D the diameter, and C a constant which depends for its value upon the kind of timber used. Then

$$D = \sqrt{L^2 \times \sqrt{P \times C}}$$

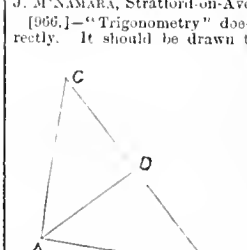
For oak, the value of C is 0 0026, and for memel 0 0023, which are practically the two woods used; for ash, a higher value of 0.0029 might be taken, but it is not possible to obtain this wood in sizes sufficiently large to serve as posts or pillars, so that it is of little or no practical use.—CARPENTER.

[966.]—CALCULATION OF A TRIANGLE.—The calculation of a triangle asked for by "Trigonometry" is very simple. The angle A D C being a right angle, we know from Euc. i., 47, that the difference between the squares of A C and A D is equal to the square of D C, i.e.

$$D C^2 = A C^2 - A D^2$$
$$= 1140^2 - 725^2$$
$$= 773975$$
$$\therefore D C = \sqrt{773975}$$
$$= 879.75$$

which, according to the question, is equal to D B And it is also clear from Euc. i., 4, that, if the base B C is bisected by the perpendicular A D, the sides A C and A B are equal, making of course the triangles A D C and A D B equal in all respects. ∴ the angle A B D is equal to the angle A C D, and the angle C A D to the angle of B A D.—J. M'NAMARA, Stratford-on-Avon.

[966.]—"Trigonometry" does not draw his figure correctly. It should be drawn thus. If A D C is a right angle, then A D B also is; and if B C be bisected at D, then in the two triangles, A D C, A D B, the two sides A D, D C are respectively equal to the two sides A D, D B, and the angles contained by them equal; therefore the triangles are equal in every respect, and the side A C = A B; then ∠ C = ∠ B, and D A C = D A B The triangle C A B is an isosceles triangle. ∴ A B is found, or rather given, by hypotheses = A C. ∠ C can be found thus:—A C : A D : : sine A D C sine A C D; ∠ C is equal to ∠ B, and ∴ A B D is found. C A B is equal ∠ C + ∠ B subtracted from 180°, and D A B = half the difference. B D is found thus: sine ∠ B : sine D A B : : A D : B D.—EUCLID.

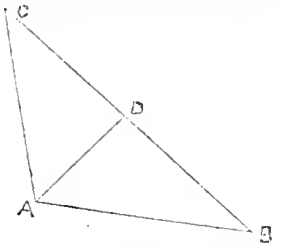


[966.]—If the triangle were properly constructed according to the particulars furnished by your correspondent, No 966, in your last number, the line A B must be equal to the line A C, and therefore 1.140ft. The angle A D C being a right angle, the line D C (to which D B is equal) must be the square root of the difference of the squares of 725 and

1.140;* and the value of the angles in right angled triangles is as the squares of the subtending sides to 90. I need scarcely add that A D C being a right angle, so also is A D B, and that the triangle A D C is equal to the triangle A D D in every particular.—A Constant Reader, Combe Down, Bath.

* 879ft. 9in. and a point so small as to be scarcely appreciable. I have not time to work out the decimal.

[966.]—"Trigonometry" has drawn his figure very incorrectly. If A D is perpendicular to B C, and B D = C D,



$\therefore$ A B = A C = 1140ft.

$$B D = C D = \sqrt{A C^2 - A D^2} = 879.75\text{ft.}$$

$$\text{Sin. A B D} = \frac{A D}{A B} = \frac{725}{1140} = .635964$$, which by the table of natural sines, is nearly equal to 39° 30'. The angle D A B is $\therefore$ = 50° 30'.—R. L. B.

[967.]—FRICTION OF WATER.—The hydraulic engineer who asks what is the "loss of velocity" in water passing through three miles of 9in. pipe, should consider that a thing cannot lose a quality which it never had. The actual velocity that the water has when passing through the pipe is the only possible one for it, and is that due to the actual size, length, and head of water. If the pipe had less length, or if it had more size or more head of water, there would be a greater velocity; but then the velocity would not be that due to the circumstances stated. The velocity in any case—that is, the mean velocity—is the square root of the following dimensions, viz.: $\frac{2{,}500\ d\ h}{l + 50}$, when d = the diameter of the pipe in feet, h = the head of water in feet, l the length of the pipe in feet, and the velocity being sought in feet per second.—S.

[969.]—WINDOW SASHES.—I beg to enclose system of working sashes with screws either one sash or double sashed windows. May be seen at Crieff Hydropathic establishment in operation; St Leonard's works Dunfermline; Mr. James Wall's, Harrie Prae Mills, Dunfermline; Mr. Srobie's, architect, Dunfermline; also savings' bank. Messrs. Blyth and Son, Liverpool, got two sent as an idea of what they were; Messrs. Dickson and Walker, 53, Frederick-street, Edinburgh have one of each kind in their warehouse; Mr. Andrew Dongan, 31, Argyle-street, Glasgow, has one of each. I will be glad to send samples of windows, say 8ft. by 3ft. 9in. or thereby, to any party at 1s. per foot, the price as yet being 2s. 6d. per foot (no glass); single sash, 1s. 10d per foot. Tracings may be sent on application. I have been busy making improvements in the mounting for some time past, so as to get a good working article, which Messrs. Beveridge and Co., St. Leonard's works, and Mr. Walls and Srobie, &c., Dunfermline, or Messrs. David Kidd and Son, builders, Dundee, &c., can testify. Everything taken into consideration this window, where plate glass is used, will be the cheapest.—James Carter, Chalmers-street, Dunfermline.

[969.]—An improved method of raising and lowering window sashes, by means of a small handle, can be seen at work at the Museum of Building Applhances, 23, Maddox-street, W.—S. T.

[970.]—RUSSIAN MOSAIC WORK.—The following is a short sketch of the process adopted at the Imperial Mosaic factory at St. Petersburg. The picture to be executed is first drawn in outline on paper or canvas, divided by lines into squares the sizes of the intended tesseræ which are coloured in with water colours. A strong wooden frame is then prepared about 6in. or 8in in depth, clamped at the angles with iron. This frame is laid on a smooth stone table and filled with mixed plaster of Paris, which is left to dry, after which it is turned, and the surface next the stone rendered quite smooth by scraping. An outline of the picture is drawn upon the stucco and lines ruled corresponding with those on the cartoon and the artist proceeds to set the tesseræ. Cutting out the stucco one square at the time within the outline sufficiently deep to take a quantity of mastic made of powdered marble and oil he inserts the tesseræ, keeping the upper surface perfectly level. The picture is then turned over on its face, and all the stucco removed from the back until the rough surfaces of the tesseræ are exposed. Roman or Portland cement is then filled in to form a solid back.—B. B.

[972.]—CHARCOAL ON LEAD.—The charcoal in the position mentioned by "An Old Subscriber" would not act in the slightest degree upon lead. In fact, charcoal has no chemical action upon any substance. It is constantly used for filtering purposes, both in cisterns, small domestic filters, and even in large waterwork reservoirs. It answers best upon a small scale, as proposed by your correspondent, as it is apt to become inactive and useless when tried too severely.—C. C.

[974.]—PAINTING COPPER GUTTERS AND ROOFS.—It is not absolutely necessary to paint copper work, as that material does not oxidise very rapidly in dry air, but considering the dampness of our climate, it is usually covered with some protecting coat, and I should strongly advise it to be always done.—Electrical Engineer.

[976.]—WATERTIGHT JOINTS.—For a good watertight joint, take glue and white lead, in equal proportions, boiled in linseed oil and water.—Haffolk Moke.

[977.]—BRICKWORK.—English bond is that in which one course is laid as headers only, and the following course as stretchers. Flemish bond consists in laying one header between every two stretchers, and in the following course one stretcher between every two headers.—V. D.

[978.]—HOLLOW WALLS.—Mr. F. Rogers, in his remarks on brickwork in "Atchley's Price Book" for 1868, says:—A very simple and effectual method is to leave a hollow space of 2in., building in alternate courses of header and stretcher, and in the header courses bonding the two walls together by bonders, which will be 14in. in the inside wall, and 2½in. in the outside; these bonders being 18in. apart, and breaking joint every other course. By this means, with the same quantity of bricks as required for 14in. work, a wall 16in. thick may be obtained with very slight addition to the labour of laying, and with a perfectly fair and even face inside and out, adding much to the effect in additional depth to the reveals, and having a hollow space, which will break the force of the wind, and will be as effectual in keeping out the weather as a hollow or double floor is found to be in preventing the transmission of sound.—J. M. W.

WATER SUPPLY AND SANITARY MATTERS.

New sewerage works have just been completed at Warwick. The sewage is applied to the irrigation of land. The works, comprising engine house, filtering tanks, "liquid tanks," &c, have been carried out under the directions of Mr. Baldwin Latham, and under the immediate superintendence of his assistant, Mr Brabazon, at a cost of £10,000.

The works connected with the thorough sewerage of Rugeley are now completed, after six months' labour. The work has been carried out by the Local Board under the direction of the resident engineer, Mr. Bonney.

WAGES MOVEMENT.

A meeting of the Wolverhampton painters was held on Saturday week, to promote union with the Manchester Alliance of house painters. Mr. Mold, the president of the Birmingham branch, stated that its labours in Birmingham during the past three years had resulted in taking three hours off the working day and raising the wages 4s. 3d. Mr. Vaughan quoted from the evidence of the secretary to the Alliance to the effect that during one year the painters had gained an increase in wages and less hours representing £9,000 by an outlay of £74 9s. 2d. If the men had struck without the Alliance to support them they would have lost £9,650, and would have gained £74 9s. 2d. The men present were urged to join the Alliance.

The committee of the Free Labour Registration Society have presented their first report. They say that during six months they have provided permanent employment for upwards of one thousand workmen in various trades, "thus showing an average of more than £150,000 a year as the wages obtained for members." The names, ages, addresses, and references as to character and ability of upwards of 14,000 non-union workmen have been up to the present time registered in the books of the society. Complaint is made that while workmen have not been slow to avail themselves of the advantages held out by this society employers of labour have not evinced an equal alacrity.

The strike in the wrought nail trade of East Worcestershire still continues. At Lye Waste, Old Hill, Cradley, Rowley, and Hales Owen, the smithies are, with few exceptions, closed, and labour is suspended.

The plate lock makers of Wolverhampton have intimated their intention to reduce the present rate of wages. The artisans engaged in the trade are already taking steps to resist any interference with their interests.

A Board of Arbitration for the settlement of disputes between masters and men in the pottery trade is in course of formation. A conference took place some short time since between a committee of the Chamber of Commerce and a select body of workmen, when the resolution to form this board was adopted, and it was agreed that the Chamber should nominate ten members and the workmen ten. The following gentlemen have been appointed on behalf of the Chamber: Mr. W. Brownfield and Mr. J. Edge, Burslem; Mr. E. Challinor, Fenton; Mr. E. Powell and Mr. F. Wedgwood, Hanley; Mr. J. Green, and Mr. J. Lockett, Longton; Mr. M. D. Hollins, Stoke; Mr. E. Clarke and Mr. E. Wedgwood, Tunstall. The names of the representatives chosen by the men have not yet been received.

STATUES, MEMORIALS, ETC.

Last week a colossal statue of John the Baptist, executed by Mr. George Burn, sculptor, Neville Arcade, was removed from Newcastle to Felling, to be placed in a niche in the gable end of the Catholic church at the latter place. The statue is 7½ft. high, and has been cut out of a solid block of Pradham stone.

A statue of Simon de Montford, Earl of Leicester, was on Thursday week placed in a niche in the Haymarket Clock tower, Worcester. The statue is of Portland stone, and stands under a canopy of Ketton stone, supported by polished serpentine columns. Mr Birlical is the sculptor. Three other statues are to be added.

STAINED GLASS.

A new stained glass window has been erected in Whitchurch parish church. At the top opening of the window is a representation of Jacob meeting his son Joseph, and below Jacob blessing his children. The window is by Messrs Ward and Hughes, of London.

LEGAL INTELLIGENCE.

Gas Companies and Street Pavements.—We think it may now be regarded as finally settled by the decision of Vice-Chancellor Malins, in Attorney General *v.* Cambridge Gas Consumers' Company, that the breaking up of the streets of a town without parliamentary authority, for the purpose of laying down pipes is such a public nuisance as will be restrained by injunction at the suit of the Attorney-General. The case is reported, 16 W. R. 1007. Few, probably, of our readers, at any rate of those who live in paved and lighted regions, will regret that the Vice-Chancellor should have arrived at this decision; yet inasmuch as the full court of appeal came to a contrary conclusion in Attorney-General *v.* Sheffield Gas Company, 3 D. M. and G. 507, a case, in many respects, upon all fours with the Cambridge case, we do not wonder that the defendants in the latter case should have proceeded with so much confidence, and have expressed so much disappointment at the issue. Still the cases are distinguishable, and the state of public feeling has, no doubt, undergone a change with respect to the nuisance occasioned by gas companies disturbing the streets, since the year of the Sheffield decision; and we take it, on the authority of Lord Cottenham, that the Court of Chancery, like every other institution, must accommodate itself to the demands of the age. We cannot, therefore, regret that another precedent has been established for the interference of the court with nuisances of this description.

Islington New Workhouse.—On the 31st ult., at the Clerkenwell Police court, Mr. Cumber, one of the partners in the firm of Messrs. John Nutt and Co., of 192, Albany-street, the contractors for the erection of the above named building, appeared in answer to a complaint preferred against them by Mr. John Turner, the district surveyor of the eastern division of Islington, under the Metropolitan Building Act, for that they had not given him a proper and sufficient notice, under the 38th section of the said act; whereby he was unable to carry out the duties of his office in reference to public buildings. Mr. Joseph E. Turner, solicitor, of 36, Gresham-street, in stating the case on behalf of the district surveyor, said that he (the district surveyor) had written to Messrs. Nutt and Co. in reference to the insufficiency of information given in the notice, and requesting them to submit the drawings and plans of the proposed work for his approval, and had also laid the case before the superintending architect of the Metropolitan Board of Works, who had communicated to Messrs. Nutt and Co. that the usual practice of builders was to give the district surveyor in such cases as this copies of the plans, &c., and that as they had failed to supply that information, and the building was in course of erection, he, the district surveyor, had, therefore, deemed it necessary to take these proceedings, and contended that the notice given by Messrs. Nutt was not a sufficient notice, inasmuch that the area, height, &c., of the proposed building or buildings were not given, and that, consequently it was impossible for the district surveyor to approve of the construction thereof, as required by the 30th section of the act, which provides that "every public building, including the walls, roofs, floors, galleries, and staircases shall be constructed in such manner as approved by the district surveyor." The notice given was then put in. Mr. Cumber, on the part of Messrs. Nutt, admitted the insufficiency of the notice, but submitted they could give no further information, as the plans and drawings were not in their hands, and the architect to the buildings had prohibited any copies being made of them. An adjournment was agreed to at the suggestion of the magistrate (Mr. Barker) to enable the defendant to supply the necessary information and particulars. At the adjourned hearing of the case on the 14th inst., it was stated by Mr. Joseph E. Turner, some further particulars had been given to the district surveyor of the buildings in course of erection, but that these were not sufficient to enable the district surveyor to approve, or otherwise, of the construction of the buildings. Mr. Cumber said Messrs. Nutt had written to the Board of Guardians acquainting them of these proceedings, and requesting that copies of the plans might be forwarded to the district surveyor, and that the district surveyor had been informed the plans could be inspected at the clerk of the works office, on the ground, and that they had never before been required to furnish such plans, &c. Mr. Barker expressed his sense of the hardship it was upon Messrs. Nutt to have to supply particulars, &c., which they had not received from the architect, and that he should have arranged by this time to give the information necessary for the district surveyor, and decided the notice was not sufficient, and imposed a penalty of £5 and 2s. costs.

Shea *v.* M'Swiney.—Cork Assizes, before Mr. Justice O'Hagan and a special jury.—This was an action for alleged fraudulent misrepresentation respecting the sale of some logs of mahogany. Plaintiff is a cabinet maker residing at Broad-lane; defendant, Mr. Eugene M'Swiney, is a timber merchant carrying on business in Cork. It transpired in the course of the evidence that it was believed by other persons in the trade in Cork that Mr. M'Swiney was connected with the Messrs. Martin, of the North Wall in Dublin, and the periodical sales of timber established by defendant were thought to interfere with the trade as theretofore carried on in Cork. The plaintiff received a catalogue of some mahogany which defendant advertised for sale in May last, and shortly after had his attention called by a Mr. O'Connor, a local timber merchant to the manner in which the measurements were given, which, it was alleged, was calculated to mislead the purchaser. Subsequently two logs were purchased at the May sale, and at a subsequent sale four logs. On receiving the invoices the plaintiff had them measured by Mr. O'Connor, and on the result of that measurement he claimed a considerable deduction from the price, alleging that his agreement was that the Liverpool system should be followed in the sale. This the defendant denied. The question mainly turned on the intention of defendant in issuing a second catalogue of the mahogany to be sold, the measurements in which varied from those in a previous catalogue. The latter was (according to the evidence of Mr. James Martin, to whom the cargo belonged) grossly and palpably inaccurate, and the evidence of defendant negatived that of plaintiff to the effect that "Liverpool measurement" was to have been allowed. Counsel for defendant contended that on the evidence the jury must come to the conclusion that the alleged misrepresentation had not been made; that plaintiff was aware at the time of his purchase of the inaccuracies in the first catalogue, and that the whole transaction was concerted by parties interested in the timber trade in Cork, with a view to putting an end to the system of periodical sales in Cork, which had been introduced by Mr. M'Swiney, as agent for the Messrs. Martin. The jury returned a verdict for defendant.

A Fine Arts and Industrial Exhibition is to be held at Wolverhampton during the spring and summer of next year. The proceeds will be applied in aid of the funds of the Wolverhampton School of Art and the South Staffordshire Educational Association.

NOTICES OF BOOKS.

The Plague of Beggars: A Dissuasive from Indiscriminate Almsgiving. By a London Physician. London: Henry Renshaw, 356, Strand.

SOUND in argument and terse in expression, this pamphlet has only to be read to awaken indiscriminate almsgivers to the fact that their conduct directly tends to foster a great social ulcer. The author's main principle is, never to give away a halfpenny but to those who are really known to be in want. By this course, as he very lucidly shows, mendicancy would be exterminated. We heartily commend a perusal of the work to our readers.

Instructions in Wood Carving, for Amateurs, with hints on design. By a Lady. Lockwood and Co.

THIS is the third work on wood carving published within the last few months. It is the last and least of the three. It is, however, what it purports to be—an unpretentious, useful little volume, compiled evidently by one who understands the subject practically. It contains information on tools and wood, instructions in pit work, carving, polishing, and staining, and several illustrations.

A Treatise on the Metallurgy of Iron. By H. BAUERMAN, F.G.S. London: Virtue and Co.

THIS is a concise history of the iron manufacture. It gives the different processes of assay and analyses of iron ores. It is illustrated with good wood engravings, and will be found a cheap and useful companion to students, practical workers in iron, and iron mine proprietors. The vast importance of this subject has called into existence many valuable works, but they are mostly of an expensive kind, whilst the one before us is inexpensive.

Illustrated Catalogue of John Weeks and Co., Horticultural Builders, King's-road, Chelsea.

THIS is the twelfth edition of a catalogue issued by Weeks and Co., horticultural builders and hot water apparatus manufacturers, King's-road, Chelsea. The catalogue consists of designs, plain and coloured, for winter gardens, conservatories, hot houses, forcing houses, vineries, &c. We can scarcely conceive of a taste or a necessity which could not find something to satisfy it in this catalogue. It shows, in fact, what remarkable progress has been made of late in the construction of horticultural buildings.

Our Office Table.

The Town Council of Walsall are taking steps to secure eighteen acres of the Lammas lands adjoining the race-course, for the purpose of forming public recreation grounds and gardens.

Mr. J. H. Cotterell, of the firm of Cotterell and Spackman, surveyors, of Bath, died on Friday last, at Weston-super-Mare, after a short illness. Mr. Cotterell was known throughout the West of England as an able and experienced member of his profession. As secretary of the Bath Centre of the Oxford Local Middle Class Examinations he laboured assiduously.

They have a curious and original way of testing the strength of bridges in Russia, that we should imagine is peculiar to that country. One of these structures was recently completed over the Moskowa River, and has been officially examined. After loading it with several hundred tons of stone, the people who had assembled to witness the trial were invited to come and stand upon it, which they did. The bridge, which was a good one, stood the test—but suppose it had not! This possible contingency, with its fatal consequences, does not appear to have suggested itself to the minds of the engineers or the people. We doubt if a similar experiment was ever made outside of England, where the Crystal Palace at Sydenham was tested by marching the Coldstream Guards through the galleries and around the dome, at quick time and in step.

By one of the last acts of Parliament passed, the tower of St. Mary Somerset, in the City, is to be preserved, and, with part of the burial-ground, to vest in the Corporation of the City of London, and part of the churchyard may be appropriated to the widening of Upper Thames-street.

The Manchester Patent Law Reform Association, at a meeting held on Friday, adopted a memorial to the Lord Chancellor praying for a remedy for certain evils in connection with the patenting of inventions. The memorialists urged the appointment of commissioners to represent mechanical, chemical, and natural science, and express a belief that facility of access to the library of the Patent Office, and a moderate supervision, under the control of law officers, would lead to a voluntary abandonment or the revision of many applications for patents.

Mr. Cumming, late city surveyor at Exeter, is dead. His successor is to be appointed at the next monthly meeting of the Town Council.

The annual meeting of the General Builders' Association will be held at the Station Hotel, Hull, on Wednesday next, at two o'clock p.m.

About 5 50 a.m. on the morning of Sunday, smoke was observed to come from the tower and spire of the parish church of Oundle, Northampton. By great exertions in two hours the flames were got under. The peal of bells (the finest in the whole county) has suffered much, the first, second, third, and tenor being cracked, one of them, through the heat, being literally broken in two. The fire is attributed to spontaneous combustion, originating in a platform filled with sawdust, which, when the church was restored, was placed there to deaden the sound of the bells on the ringers.

Considerable dissatisfaction exists amongst the trades' societies consequent upon the recent decision of Vice-Chancellor Malins in the case of the Lancashire cotton spinners, and because of the law laid down by Mr. Justice Lush, at the trial of the Sheffield masons last week, at Leeds assizes; and the leaders of the various trade societies in the metropolis are taking active measures for calling together a conference of delegates from every trade society in the metropolitan district for the purpose of considering what measures shall be adopted under the circumstances.

We read, says the *Mechanics' Magazine*, in the *Bulletin de la Societe Industrielle*, of Mulhouse, of a very simple way of making a fireproof flooring, applicable to warehouses and granaries. It consists in first spreading upon the planks a layer of clay about an inch in thickness, and running upon this a layer of asphalte about half an inch thick. Numerous experiments, we are told, have proved the efficacy of this as a protection against the spread of fire, and it has been adopted in all the corn stores of the General Omnibus Company of Paris.

Mr. Charles Turner, chairman of the board of directors, presided at the annual meeting of the shareholders of the Royal Insurance Company, which was held on Friday week at the company's offices in Liverpool. The report stated that in the fire branch the premiums received during the year 1867 amounted to £460,553, being an increase on the preceding year of £13,282. The losses which accrued during the same period were £292,125 against £379,405 in 1866. The result of the year's working showed a net profit on the British and foreign business of £43 286 and on the American business of £13,087. In the life department the progress had been very satisfactory. During the year 1867 the increase to their funds was £128,000, and the total sums now invested on the life account were £1,031,329. After paying the usual dividend of 3s. and the usual bonus of 4s. per share, they were able to carry £23,000 to the credit of profit and loss.

The arbitration movement is gradually extending itself, and is in all probability destined to be universally adopted. Last week we called attention to what was done at Huddersfield. This week we have to record that an equally encouraging step has been taken in the Potteries. A similar step has been taken at Walsall. Co-operation and Arbitration should now be the watchwords of the producers of wealth.

A sea-wall is now being constructed at Shanklin, Isle of Wight Commencing at Osborne House, the wall will be continued for 370 yards in the direction of Sandown. An esplanade will be formed from end to end, 50ft. wide. The stone is conveyed from the quarry to the top of the cliff, where there is a tunnel (the bottom of which is lined with sheet iron) through which it is shot on to the beach below, thus saving much labour. The contractor is Mr. William Summerhays.

Mr. Matthew Wardle, builder, Durham, has just died, aged 97. He was the oldest citizen.

The onion, according to an American writer, is a valuable disinfectant. He states that in the spring of 1849 he was in charge of 100 men on shipboard, with the cholera raging among them. They had onions, which a number of the men ate freely, and those who did so were soon attacked, and nearly all died. As soon as this discovery was made their use was forbidden. After mature reflection Mr. Wolff came to the conclusion that onions should never be eaten during the prevalence of epidemics, for the reason that they absorb the virus and communicate the disease; and that the proper use for them is sliced and placed in the sick room, and replaced with fresh ones every few hours. He has found the following well attested: Onions placed in the room where there is smallpox will blister and decompose with great rapidity, not only so, but will prevent the spread of the disease. As a disinfectant he believes they have no equal, when properly used; but they must be kept out of the stomach.

The Leicestershire Architectural and Archæological Society will hold its annual summer meeting at Kegworth on Wednesday, the 26th instant. The summer meetings of this society, held in the more central towns of the county, have hitherto been most successful and replete with interest; but, though Kegworth is in a remote part of the county, it is anticipated that the present gathering will be as successful as usual. Mr. M. H. Bloxam, F.S.A., is to dilate upon the features of the fine parish church; a temporary museum is to be formed, and at a public meeting to be held in the evening the Rev. Jos. Clarke, the rector, will read "Memorials of Kegworth;" Mr. James Thomson will discourse upon the objects of the Leicestershire Architectural and Archæological Society; the Rev. E. Tower will give (from a curious diary) an insight into Middle Class Life at Freestone Shore at the commencement of the present century; and Mr. Bloxam will relate some discoveries made at Lutterworth Church during the present restoration and repairs.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3552 W. E. NEWTON. IMPROVEMENTS IN BENCH PLANES AND MOULDING TOOLS. (A communication.) Dated December 13, 1867.

This invention consists, first, in constructing an ordinary bench or other plane so that the throat or opening through which the bit projects shall be of variable size to suit the pitch of the bit and the nature of the work to be performed. The invention further consists in supporting the bit upon a movable bed, the lower end of which is pivoted or hinged to the frame or stock of the plane in rear of and close to the throat. The invention also consists in supporting the heel or lower part of the bit against a solid bed or backing of metal, such as lead (or other suitable material of sufficient hardness) formed between it and the back of the throat. Lastly, the invention consists in the construction and arrangement of a detachable and independent cap or "break iron" for turning or bending the shavings up out of the way.—Patent completed.

3571 J., J., AND J. BOOTH. IMPROVEMENTS IN MEANS OR APPARATUS FOR EFFECTING THE CUTTING OR DRESSING OF STONE. Dated December 13, 1867.

Here the cutting or dressing stools are formed, by preference, with stems to pass into sockets of lever holders, and these stems have each a thread to receive a nut, by which the tool is retained in position. Keys or wedges may, however, be used in place of the screw adjustment, and the keys or wedges may have spring ends to pass into teeth provided for them on the tool, and thereby hold them in position. Each tool may be applied to a separate lever, or there may be several tools to each lever, and the levers are used in a series arranged side by side, and they are operated by tappets or cams, which may be adjustable to raise all the levers of a series at the same or at different times, so that the action of the tools carried by them may be simultaneous, or in succession. Adjustable stops are applied to regulate depth of cut. There is much detail included in the specification.—Patent completed.

Trade News.

TENDERS.

CHATHAM.—For the erection of the chapels, lodge, boundary-walls, and other buildings at the new cemetery, Chatham:—

Carter and Son	£1593
G. Sollett	4088
R. West	4000
Wilkins and Son	3479
J. G. Naylor	3393
A. Stump (accepted)	3267

Bow (Middlesex).— For the erection of a new Passenger Station for the North London Railway Company:—

Crockett	£24,500
Myers	22,463
Dann and Sons	22,350
Mansfield and Price	22,048
Abrams	21,6 6
Dickenson and Oliver	21,660
Perry and Co.	21,287
Hill, Keddell, and Waldram	20,695
Oxford	20 5?5
Scrivener and White	20,550
Palmer	20,250
Watts	20,200
Wicks, Bangs, and Co.	19,445
Hedges (accepted)	19,400
Nightingale	14,557

BURSLEM.—For new house and shop premises, in the Waterloo-road, for Mr. James Kirkham. Quantities supplied. Mr. Ralph Dain, architect:—

Matthews	£668 0 0
Watkin	645 0 0
Blackhurst	607 12 0
Bennett and Cooke	570 0 0

LEAVESDEN ASYLUM.—Messrs. John Giles and Biven, architects. The quantities supplied by Mr. D. W Young:

	Tender.	Extra of Facing.
Thomas & Son	£90,150	£10,400
Piper & Co.	89,596	10,000
Eunor	86,790	12,350
Newman and Mann	86,478	12,485
Horsman	90,923	7,934
W. & J. Webb	88,200	9,000
Webster	95,000	—
Mayers & Sons	85,659	6,875
Warburton Brothers	87,368	7,000
Killby	87,430	6,150
Nightingale	87,000	5,500
Chappell	81,386	11,536
Wagstaff & Son	88,625	3,341
Perry & Co.	83,400	8,460
Hill, Keddell & Waldram	82,900	8,200
Kirk & Parry	78,787	11,113
Hart	44,350	3,500
Nixon & Sons	84,337	3,100
Kirk	81,500	4,987
Gammon & Sons	83,225	2,847
King & Sons	81,860	3,990
Henshaw	80,105	3,350
Nicholson (accepted)	79,650	4,250

LONDON.—For the erection of dwelling houses, Great Garden-street, Whitechapel, for Messrs. Edwards. Mr. J Hudson, architect. Quantities by Mr. W. A. Longmore:—

Furnival	£4290
Jacobs	3635
Read and Son	3625
F. and F. J. Wood	3570
Langmead	3540
Hedges	34 8
Eunor	3339
Little	3315
Hill, Keddell, and Waldram	3196
Palmer	3100

LONDON.—For the erection of buildings over the public staircases of the Holborn Valley Viaduct. Mr. W. Haywood, engineer. Quantities by Mr. F W. Stent:—
Hill, Keddell, and Waldram (accepted)... £20,291

LONDON.—For the erection of house and offices at Strond Green Lane, Islington, for Mr. W. Jenkinson. Mr. F. Waller, architect. Quantities supplied by Messrs. Franklin and Andrews:—
Hill, Keddell, and Waldram (accepted) £2623

LONDON —Painting, &c., the premises of the Metropolitan Board of Works, Spring Gardens: —

Patrick and Son	£1445
Beard and Morrison	1288
T. Husey	1200
T. Rider and Son	1192
W. Downs	1150
C. W. Andrew	1100
E. Thirst	975
S. Nixon and Son	805

LONDON.—For building foundry wharf at Wapping, for Innes Brothers and Co. Mr. D. Cubitt Nicholls, architect. Quantities supplied:—

Myers	£2115
Macey	1996
Conder	1969
Rider and Son	1889
Ennor	1701
Newman and Mann	1671
Coleman	1645
Brass and Sons	1594
Hill, Keddell, and Waldram (accepted)	1582

STOURBRIDGE.—For new church at Humber Hill. Mr T. Smith, architect:—

G. and F. Higam	£3015 0 0
Stockton and Co	2517 7 0
Nelson	2347 0 0
Ife	2315 0 0
Chapman	1850 0 0

STREATHAM.—For the erection of two houses at Streatham, for George Pratt, Esq. Henry Jarvis and Son, architects:—

Rider and Sons	£5450
Downs	5390
Loat	5380
Macey	5091
Higgs	4987
Myers and Sons	4985
Tarrant	4927
Browne and Robinson	4798
Henshaw	4689
Thompson	4370

THATCHAM (Berks).—For house for Rev. H. Martin. Messrs Newman and Billing, architects. Quantities not supplied:—

Elliott	£2645
Wells	2590
Alloway (too late)	2550
Wheeler	2301

STOW MARIES (Essex).—For additions and repairs to the rectory house, buildings, and chancel of church. Mr. Fred. P. Walters, architect:—

Killby	£1176
Saunders	1100

TEDDINGTON.—For mansion, banks of the Thames, Teddington, for B. Higgs, Esq. Walker and Elsam, architects and surveyors:—

Dunkey	£12,705
Staines and Son	11,883
Nightingale	11,821
Ratkins	11,485
Foale	11,130
Gibson	11,119
Turner	10,700
Munday and Hutchinson	10,300

WEST CROYDON.—For erecting St. George's Presbyterian church and schools, West Croydon. Mr. J. T. Barker, architect. Quantities supplied by Mr. D. J. Brown:—

Knight	£3345
Myers	3018
Dove Brothers	2645
Mansfield, Price, and Co.	3161
Hill, Keddell, and Waldram	3408
Longmire and Burge	3379
Sewell and Son	3350
Carter and Sons	3348
Pollard	2765

COMPETITIONS.

LINCOLNSHIRE (LINDSAY).—Extension of time till September 1.—Plans for the erection of a gaol and house of correction. J. H. Holloway, Clerk of the Peace, Spilsby.

HERTFORD COTTAGE PRIZE COMPETITION.—Sept. 1.—Design for model cottages for agricultural labourers. Premium, £20. R. Dimsdale, Esq., M.P, 9, Queen-square, Westminster.

STROUD LOCAL BOARD OF HEALTH —For plan and estimate of a covered reservoir to hold 1,000,000 gallons, and arrangements for filtering the water. Premium £10. Mr. E. Mitchell, clerk to the board.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HALIFAX.—Extension of time.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

HEREFORDSHIRE COUNTY AND CITY ASYLUM.—September 14.—For the erection of the above named building R. Griffiths, architect, 3, Martin-street, Stafford.

ALDERSHOT.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

METROPOLITAN BOARD OF WORKS.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring gardens.

CATERHAM.—August 29.—For the erection of an asylum. W. F. Jebb, 37, Norfolk-street, Strand.

BRENTFORD UNION.—August 26.—For carrying out certain alterations at the infirmary of this workhouse. W. Ruston, clerk, Brentford.

FLY UNION.—August 26.—For altering workhouse, and other works. Mr. G. S. Claxton, clerk, Downham-Lane, Ely.

CHESHAM, BUCKS.—September 2.—For the restoration of the parish church. Rev. A. F. Aylward, Chesham, Bucks.

SOUTHMOLTON (Devon).—September 1.—First, for constructing brick or masonry and pipe sewers, and laying cast-iron water mains, &c. Second, for providing and delivering about 85 tons cast-iron water pipes. R. M. Riccard, clerk to the board, Southmolton.

Plan and estimate for heating a tepid swimming bath. Mr. J. Plowman, surveyor, Oxford.

PADDINGTON WORKHOUSE.—September 1.—For the erection of works for enlargement of infirmary. H. Aveling, clerk to the guardians.

EDMONTON UNION.—August 26.—For providing and fixing all necessary fittings to lavatories at the workhouse schools, Enfield. W. Pulley, clerk.

HIGH HAM, NEAR LANGPORT, SOMERSET.—August 25.—For work to be done in restoring the church. Messrs. Foster and Wood, architects, 6, Park street, Bristol.

BIRKENHEAD.—August 26.—For the erection and completion of a bridge over the Birkenhead railway. A. Walm, clerk to the Improvement Commissioners.

OXFORD-ROAD, MANCHESTER.—For the erection of a new catholic church J. A Hansom, architect.

BURTON-ON-TRENT.—September 12.—For alterations and additions to police station. R. Griffiths, architect, 3, Martin street, Stafford.

WIMBLEDON LOCAL BOARD.—August 26.—For the construction of about 1,100 yards, 12in. pipe sewer, and about 900 yards, 18in. pipe sewer, &c. Messrs. Batt and Son, clerk to the board.

ALDERSHOT.—September 1.—For the erection of married soldiers' quarters and east infantry barracks. Director of contracts, War Office, Pall Mall.

HIGHGATE.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

LEAVESDEN WOODSIDE (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

ST. PANCRAS.—September 3.—For the erection of a mortuary house and other works on the burial ground adjoining the workhouse. J. Moore, clerk, vestry hall, St. Pancras.

TEIGNMOUTH, DEVON.—For the erection of a coast guard station. Drawings, &c., at coast guard watch room. Tenders to the Admiralty coast guard office.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas M'Lean Knollmann Cathrey, Arthur road, Mostyn, Brixton, engineer, August 26, at 1—Robert Fitch, Dulwich, builder August 27, at 11—Philip Anley, Manor-road, Stoke Newington and Whitecross street, St. Luke's, contractor, September 2, at 12—Alfred Bacon, Hornchurch, builder, August 28, at 11—William Joseph Birtchnell, Clapham-park-road, mason, August 28, at 12—Thomas Fleming, Greenwich and Southsea, builder, September 2, at 12—John Frederick Kent, Thornton heath, carpenter, September 2, at 12—Joseph Perigoe, Tunbridge Wells, builder, August 28, at 12.

TO SURRENDER IN THE COUNTRY.

Henry Dashwood, Birkenhead, decorative painter, August 25, at 2—John Douglass, Aston, boat builder, Augus 27, at 10—George Johnson Hull, joiner, August 26, at 12—John Marsh, Moorfields, Gloucestershire, carpenter, September 11, at 12—Joseph Walter Meatyard, Mere, Wilts, carpenter, August 29, at 11—Joseph Oliver, Everton, builder, August 24, at 2—Henry Sparks, Exmouth, brick and tile maker, August 29, at 11—George and James Cox, Worcester, builders, September 2, at 11—John Rathbone, Sheffield, joiner, September 2, at 1—Jonathan Shaw, Golcar, painter, August 28, at 10—George William Smith, Huddersfield, brick and tile maker August 28, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

September 25, H Allen, Chessets Wood, Warwickshire, bricklayer—September 2, J. Langley, Rochester, bricklayer—September 4, A. Crosland, Salford, engineer—October 21, C. Davis, Church Gresley, Derbyshire, builder—August 27, E Evans, Llandudno, joiner—October 6, J. Hall, Bloxwich, near Walsall, bricklayer.

DIVIDENDS.

August 31, R. Brown, Beddington, Northumberland, joiner—August 28, R. Rimington, Sheffield, joiners' tool manufacturer.

PARTNERSHIPS DISSOLVED.

Snawdon and Co., East Stonehouse, cabinet makers; and Yealmpton, timber dealers—Robinson and Wilson, Hawton and Newark, brickmakers—Rankin and Spence, Battersea Railway Wharf, brick merchants Wright and Vickers, Brushes Clough, near Oldham, fire brick manufacturers—J. and T. Ellis, Mirfield, stonemasons—Minton and Co., Stoke upon Trent, encaustic tile manufacturers—Worssam and Co., Kings-road, Chelsea, engineers.

DECLARATION OF DIVIDEND.

M. Mason, Cambridge, contractor, div. 2s. 2d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12	10	Archangel, yellow	£11 0 £12 0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10 0 12 0
,, yellow pine		2	18	4	5	Finland	7 0 8 0
St. John N.B. yellow		0	0	0	0	Memel	0 0 0 0
Quebec Oak, white		5	0	5	10	Gothenburg, yellow	8 0 9 10
,, birch		4	0	5	0	,, white	8 0 9 10
,, elm		4	0	5	10	Gefle, yellow	8 0 10 10
Dantzic oak		4	0	6	0	Soderham	9 0 10 10
,, fir		2	5	3	5	Christiania, per C., 12 ft. by 8 by 9 in.	
Memel fir		3	0	4	5	yellow	11 0 13 0
Riga		3	0	3	3	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15 1 1
Swedish		2	0	2	8	Pumice Stone per ton	8 0 8 0
Masts, Quebec red pine		4	10	6	10	Oils, &c.	
,, yellow pine		4	10	6	0	Seal, pale, per tun	36 0 0 0
Lathwood, Dantzic, fm		6	10	7	10	Sperm body	90 0 0 0
,, St. Petersburg		3	0	9	10	Cod	38 0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, 8th, Sea, pale	53 0 0 0
Quebec, white spruce		13	0	20	0	Olive, Gallipoli	48 0 73 0
St. John, white spruce		13	10	15	10	Cocoanut, Cochin, ton	53 0 55 0
Yellow pine, per reduced C.						Palm, fine	40 0 40 0
Canada, 1st quality.		17	0	18	10	Linseed	30 15 34 0
2nd do.		11	10	12	10	Rapeseed, Eng. pale	34 0 0 0
						Cottonseed	29 10 38 0

METALS.

IRON:—

Welsh Bars in London	per ton	6 5 0	8 5 0	8	
Nail Rod	do	7 10 0	7 12 6		
Hoops	do	8 5 0	9 0 0	2½	
Hoops, Single	do	8 0 0	9 0 0		
Staffordshire Bars	do	7 5 0	7 15 0		
Bar, in Wales	do	7 10 0	8 0 0	8	
Railrods	do	7 10 0	7 15 0	2½	
Foundry Pigs, at Glasg. No 1	do	2 12 3	2 17 6	8 nett.	
Swedish Bars	do	9 17 6	10 10 0	2½	

STEEL:—

Swedish Keg, hammered	per ton	15 0 0	15 10 0	2½
Swedish Faggot	do	0 0 0	0 0 0	

COPPER:—

Sheet & Sheathing, & Bolt	per ton	79 0	2 0	
Hammered Bottoms	do	97 0 0	0 0 0	
Flat Bottoms, not Hammered	do	83 0 0	0 0 0	
Cake and Tough Ingot	do	1 0 0	3 0 0	3
Best Selected	do	77 0 0	85 0 0	
Australian	do	77 10 0	0 0 0	
Yel. Metal Sheathing & Rods	per lb	0 0 ¾	0 0 7½	

LEAD —

Pig, English	per ton	21 5 0	0 0 0	
,, Spanish Soft	do	18 10 0	0 0 0	2½
Shot, Patent	do	22 10 0	22 15 0	
Sheet	do	20 0 0	20 15 0	5
White	do	27 0 0	30 0 0	

REGULUS OF ANTIMONY

French	ton	43 0 0	0	

ZINC:—

English Sheet	per ton	25 10 0	26 10 0	2½
Devaux's V. M. Roofing Zinc	do	25 0 0	0 0	

* And 5 per cent. discount if laid upon the new system

SPELTER:—

On the Spot	per ton	20 0 0	0 0 0	
QUICKSILVER	per btl	6 17 0	0 0 0	

TIN:—

English Block	per ton	95 0 0	0 0 0	
do Bar	do	96 0 0	99 0 0	2½
do Refined	do	97 0 0	0 0 0	
Banca	do	95 10 0	97 0 0	
Straits	do	92 10 0	92 0 0	no

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 28, 1868.

THE ART OF BUILDING IN CONCRETE.—IV.—THE HOLLOW SYSTEM.

WE have reserved for a concluding article the consideration of what may be correctly termed the hollow system of concrete building. By this designation it must not be understood that the walls are built of concrete with a hollow space in the middle, or that their construction resembles in any manner that of hollow walls of brickwork, where, by employing a proper arrangement of headers and stretchers, a sufficient amount of "bond" is obtained together with the requisite number of interstices. Manifestly, walls built of concrete could not be constructed in this way, as it would be next to impossible to insert the headers in their proper places. Of the two or three principles of this method of concrete building, that of Messrs. Parr and Strong's occupies a prominent place. It consists, firstly, in the manufacture of hollow polygonally-shaped short lengths of earthenware pipes; secondly, in filling these with concrete; and, thirdly, in building walls of the pieces thus filled. The length of the box, as these receptacles for concrete may be called, determines the thickness of the walls, and can, of course be varied to adapt themselves to the circumstances of any particular case. It is difficult to arrive at the exact comprehension of the object aimed at, and supposed to be gained, by the use of hollow tiles, which are intended to be filled with concrete. One would be inclined to imagine that if the hollow box requires to be filled with concrete to give it strength enough to act as a building material, it would be simpler to omit the enclosing envelope, and use the concrete in the shape of a solid block, as in May's system. There appears to be very little use in enclosing so cheap a material as concrete in so expensive an envelope as that composed of pottery ware. It may be assumed at once that in every description of concrete work, similar to that under notice, it cannot be for a moment intended to compete with ordinary brickwork, so far as cheapness is concerned. The first cost of moulding the hollow shapes to hold the concrete would, estimated cubically, equal, if not exceed, that of the manufacture of bricks.

It will not fail to strike the reflective mind that the tendency of all "building in concrete" is to effect a kind of compromise between brickwork and masonry. The common brick is considered to be too small, and to give rise to too great a multiplicity of parts, while very large and heavy stonework errs, in an economical point of view, on the other side, and is not, therefore, suitable for constructive purposes upon a small scale. The object has, therefore, been to discover a mean between the two extremes, which, while possessing all the advantages of the hardness and durability of stonework, should also be endowed with that ready manipulation and facility of execution which has rendered, and always will render, bricks the favourite material for small buildings. Notwithstanding the various methods tried, it cannot be said that the happy medium has been arrived at. One advantage is invariably gained at the sacrifice of some other. If a large cubical content be obtained by the use of larger pieces, there is an increased difficulty and risk in the carriage, setting, and stability. If, on the contrary, small component parts be employed, the cost of them must be relatively very small, as there would be no advantage gained over brickwork in the labour and workmanship expended. Brickwork possesses one great advantage over hollow boxes filled with concrete, and, in fact, over concrete blocks, slabs, and other forms in general, and that is, the broken ones can always be used, and in certain parts of the building are just as valuable as when entire. This is not the case with the hollow boxes, tiles, and shapes. Once broken they are comparatively useless, and cannot be employed for holding concrete. In fact, one might just as well expect a broken pipe to hold water. It is needless to point out that this would prove a serious objection to their extensive introduction as a building material. Looking for a moment at the strength of a wall built upon Parr and Strong's principle, and comparing it with one of brickwork or concrete, a considerable difference would be observed. In the latter case, neglecting the joints, the strength will be, for any given unit of dimension, nearly as the absolute strength of the material. But in the former the strength is dependent upon that of two substances very different in their powers of ultimate resistance. The wall might fail, either by the failing of the concrete or of the hollow envelopes enclosing it. It is quite clear that if the envelope gave way by crushing or any other cause, the concrete would not suffice to keep the wall up. It might not exactly fall immediately, but it would become so distorted that it would be necessary to shore it up, and it is questionable if it would be possible to restore it permanently to a state of perpendicularity. There is always this danger to be feared in the intimate combination of two materials possessing different powers of resistance, and varying in other qualities besides. A cause which might not produce the slightest effect upon one might seriously damage the other, and the former would therefore suffer in consequence of the inferiority of its companion. The experience of engineers in compound structures composed of cast and wrought iron has taught them this practical lesson, and the principle holds true when applied not only to these two metals, but to any other substances having different relative properties. It is true that one of the chief causes affecting the union of cast and wrought iron does not operate in this particular instance—namely, the different degrees of expansion and contraction; but still the powers of durability, resistance to crushing, and damp, vary considerably. There would, of course, be theoretically a difference between the expansive and contractile powers of the concrete and its surrounding envelope, but it would be practically inappreciable.

A glance at the hollow systems is sufficient to demonstrate that their claims do not rest upon any merit they may possess for building upon a small scale, since independently of cost they are not adapted for cottage or ordinary house building. In a word, they are not cheap methods of construction. Omitting, therefore, this comparison, they unquestionably possess advantages, when regarded in a more extended light, and there is abundance of scope for a description of building material which may be well adapted for gentlemen's country residences and rural mansions, although not necessarily suitable for the erection of labourers' dwellings or model lodging-houses. One peculiarity of Messrs. Parr and Strong's work is that the component parts are all headers—there are no stretchers; the bond is the depth of the wall and continuous. In a constructive point of view this is a defect. A certain proportion of headers to stretchers is absolutely necessary to make sound work. A wall all stretcher, like a half brick wall, unless set in cement, has little or no strength, and is only fit when built in mortar for panel work. But although this is the case, yet it by no means follows that a wall all headers should possess the maximum amount of strength. Quite the contrary; a certain number of stretchers are just as important and indispensable to sound work as a due proportion of headers. The one bind the wall in a longitudinal direction, and the other in a transverse direction, and from their combination proceeds that almost indestructible incorporation which is always a sign of first-rate brickwork. Thus it is that a half-brick wall has no strength. Although bonded longitudinally, it is not so transversely, and, consequently, fails by lateral distortion or sagging with a slight pressure.

Not merely so far as this, but as all other principles of building in concrete which we have noticed are concerned, further actual trial and experiment are necessary before a reliable conclusion can be arrived at respecting their relative merits and the several advantages they possess, with regard to their durability and general fitness for the purposes they are intended. It is one thing to assert that a certain material will resist all the influences of climate and moisture, last longer than any other, and another thing to actually put it to the test for a given time and observe the actual effect produced upon it. Our Houses of Parliament are a standing example of the difference between the assumed properties of a building material and its actual behaviour under trial. That magnificent structure is literally "perishing by inches," and it appears as if nothing can be done to arrest its inevitable decay. Another and still more important advantage will be gained when some concrete buildings are erected, and that is the determination of the cost, the most deceptive item in the whole system, and one which nothing but a crucial test will finally decide.

THE FAIRFORD WINDOWS AND ALBERT DURER.

THE meeting of the British Archæological Association, this year, at Cirencester, has been something more than a mere summer picnic. Good and true service has been done to art by Mr. Henry F. Holt in his attempt to dispel the apathy with which the painted windows at Fairford Church have been regarded for the past 300 years. The windows are 28 in number, the majority being divided into several compartments, and the subjects, which are taken from the Old and New Testaments and the Apocryphal Gospel, are all to be found, with one or two exceptions, in the "Biblia Pauperum" and the "Speculum Humanæ Salvationis," two well-known early repertories of popular Scriptural woodcuts. The popular origin ascribed to them is well known. John Tame, the founder of the church, is said to have taken in 1492 a Flemish ship bound from some port in the Low Countries which had on board the glass of the windows and the workmen entrusted with their erection at Rome. He carried both glass and workmen to Fairford, and built there a church to receive the windows, which were fixed soon after, A.D. 1500.

The legend contains, as Mr. Holt says, many improbabilities and inconsistencies. He points out that John Tame did not purchase the manor till 1498, at which time England was at peace with both the Pope and the Flemings, and, therefore, he was not likely to attack a Flemish vessel; in the next place, painted glass was then by no means so uncommon that a man should especially build a church to accommodate a set of windows. Moreover, the windows contain the ostrich feathers and "Ich Dien" motto of the Prince of Wales in honour either of Prince Arthur, or of Prince Henry, afterwards Henry VIII.

The probability is, as Mr. Holt suggests, that Tame, who was a rich merchant, sent to Flanders for his windows, and that the work was entrusted to and executed by a foreign artist, this artist being, Mr. Holt contends, no other than Albert Durer.

Mr. Holt's principal argument in favour of his proposition is the strong similarity between several peculiar forms of nimbi of the Deity, as shown in the windows, and those contained in the earliest copies of the Scriptural illustrated books before referred to

—the "Biblia Pauperum" and the "Speculum Humanæ Salvationis," and which he also believes to have been executed by Albert Durer. With regard to this Mr. H. Noel Humphries states that it is impossible that Albert Durer could have executed them, as the date on a well-known copy of the first edition of the "Biblia Pauperum" fixes it at between 1420 and 1430, and Albert Durer's father did not settle at Nuremberg until 1455, and was then only a young man. Neither this nor the similarity in the form of the nimbus, in his opinion, proves anything whatever as to whether Albert Durer designed the Fairford windows or not.

Another correspondent expresses his belief, supported by a careful examination into dates and other records, that the windows are the work of the Brothers Crabeth, who also executed a similar series of thirty-one windows for the Cathedral of St. John the Baptist, in the City of Gouda, situate at the junction of the Rhine with the Zer Gond. Mr. R. N. Garfit publishes an extract from a "Traveller's Guide," published in 1805, which assigns the windows to Albert Durer, and records Vandycke's opinion that the colouring of the drapery and some of the figures is so well performed that the pencil could not exceed it.

Whether the work of Durer or some other equally gifted but less known artist, none can gainsay the singular beauty of the windows, marred as they are by decay and "restorations." Now that the attention of the British Archæological Association has been called to them, it is to be hoped that some speedy and effectual steps will be taken to save them from further decay, and to find the means necessary for careful restoration under competent superintendence. As another correspondent remarks, this is a case in which all lovers of art, English and continental alike, might be appealed to for subscriptions and practical help. Meanwhile we repeat that the public are under considerable obligations to Mr. Holt for directing attention to a valuable collection of art treasures, of which many of us were before totally ignorant.

ARCHITECTURE AND ARCHITECTS.*

UNFORTUNATELY for both architecture and architects, a large proportion of those for whose comfort, enjoyment, or advantage the art is to be called into exercise, care little, and really understand less, of what is meant by the term architecture, and confound it either with mere building of the commonest utilitarian kind, or with the mere surface decoration which stucco or paint can cheaply and rapidly add to the surface of such work. By clients such as these, though often requiring structures of a scale and class which should demand full exercise of an architect's power of design, the merely useful is alone seen as their own aim, and in so far, and in so far only, as the works produced suit their needs in respect of accommodation in space and convenience in communication, do they believe that architectural art is present; and vainly bestowed, inasmuch as the inmates are concerned, are all the nice studies of vista, effect, proportion, and succession of parts, which the anxious architect has lavished on the, perhaps, costly edifice which is to be coupled with his name and skill in art while its parts shall hold together. The merely everyday uses of common life are the real of architecture to such possessors of its examples, and their unappreciative acquiescence in its simple fitness falls cold on the senses of the lowly estimated, though perhaps highly-paid, artist.

I hold it vain to attempt the task of defining how much instinctive feeling, association, or education may have to do, individually or generally, with the acknowledged power of architecture on the human mind; and I proceed to express, weakly and imperfectly it must be, my own view of what, through all these channels, carries this force of ideal impression deep into thousands of differently disposed and variously cultivated minds.

This source of the power of architecture as an art of imagination rests, I am convinced, in its consonance with those laws of effect, infinite in the variety of their results, which the Creator has impressed on the material universe, and specifically for us on the surface of the globe which we inhabit.

Form, light (with its complement, shade), and colour are the material source of all those enchanting landscapes with which this world can gladden the eye of him who seeks such pure enjoyment. Form, light, and colour give architecture, as I have said, place and power among the arts. Contrast, proportion, and gradation in form—alike in the mountain, the headland, the islet, and the cathedral—arrest the eye and interest the mind. Why, we can scarcely tell, but so it is, and often with overwhelming force. Light, shadow, half light, reflexion, alike mark out, define, and enrich the broken cliff, the waving forest, the palace front, and the village spire; and colour no less, in its endless harmonies, gives life and vividness alike to natural and architectural objects.

The limits within which this strong and close analogy between nature and architecture can be said to prevail, must vary as widely as can the objects of architectural production; and the actual idea may range from rustic simplicity, comfort, elegance, through the whole scale of the beautiful, the grand, the magnificent, and the sublime.

In each class of the architect's works, under these many forms of the ideal, must the degree in which the elements of form, light, and colour contribute to his effects, vary and interchange; and seldom as it falls to the lot of any of us to have the opportunity of achieving what can be placed in the category of the grand or the sublime, yet such opportunities do, at long intervals, occur for our profession; and happy may that man esteem himself in his generation who leaves behind him on the surface of this troubled globe something which is hailed by his fellow-beings as a gem in the midst of its monotony, and as calculated to call that least cultivated, yet, perhaps, most essentially characteristic element of his high place in creation—his imagination—into full and happy exercise, raising him for the moment above the common-place interests of speeding time, and leading him, even through a material source, to recognise his alliance with that which is surely superior to time in its essence, though decreed to perish with it in its substance.

I class architecture most nearly with music among the arts, in respect of its directly elevating power upon the human mind; and it will be frequently found that the intellect most awake to the power of the one is sensitive also to the other; though I think observation will prove that insensibility to architectural impressions is a less common defect than indifference to those of music, the latter arising apparently from a not infrequent absolute deficiency in the organisation, I mean of brain rather than of ear, concerned in conveying these impressions to the mind. Architecture is in its associations of wider interest to the greater portion of mankind than the art of music; but though many professing the latter art will be found skilled in its execution, and even clever in its technical arrangements, without any feeling, or very little, for its higher forms of imaginative power, I hardly think you could find indifference to grand effects in architecture in anyone who could enter into and lose himself for the time in the "disembodied" flow of a fugue of Bach's, the sublime transitions and cadences of a chorus by Handel, or the pathetic and heart-searching strains of one of Beethoven's great symphonies.

I dare not permit myself to pursue this captivating theme of the analogies of the arts, but I feel sure that scope exists for the production of a work of immense interest to anyone who would devote time to illustrate the connection of the arts as Mrs. Somerville has that of the sciences, and Mr. Grove of physical forces.

Briefly to notice some of the forms of the ideal I have enumerated, I should say that, in respect to that essential element of an Englishman's home—that untranslatable word of his social vocabulary, comfort—the architect, who must in many cases have this ideal most frequently of all proposed to him in his practice will find that gentle play of light and shade, and a very restricted and chastened use of sober colour, with little dependence on the higher and stronger effects of architectural form, will best assist him in securing its effect. The structures to which the epithet mostly applies are not large in scale, and all strong and forcible effects of form produce, on a small scale, an impression of movement and unrest which does by no means attach to the same when applied to buildings on a great scale.

Elegance or grace—the characteristic which attaches strictly to structures connected with the lighter scenes of human life and its intellectual recreations—would be in a measure wearisome, if markedly pervading the whole domestic range of a dwelling house, however finished in style; but in the detached concert-room, the saloon, the theatre for the most part; yes, and the ball-room—externally and internally—this may be sought and secured. Greater play of form in small masses, less contrast by effect of light and shadow, and more and livelier employment of colour, will be found, I think, to conduce to this end; and, in contrast with the quieter effects of comfort and home feeling, the application of this style of effect may often prove most happy and artistically useful as applied to the parts of domestic or, as in the club-house, of less private buildings' which are to be devoted to such uses as I have alluded to.

Beauty, the next step below the grand, is surely not a result to be obtained in architecture without the expenditure of long and anxious study in design, and no less anxious experiment in respect of detail. Independence of scale is a characteristic of this high and captivating character of art, and, though applicable to a great extent, even to large structures of certain classes, yet in those of moderate scale it seems best to commend itself to our love and admiration. Here, form, in some of its most recondite relations—chiaroscuro in its most subtle effects, and every variety of harmonious colouring, may, according to the varying circumstances of the design, be called to his aid by the architect as means to secure his end.

Form—effective rather by gradation and proportion than by contrast—and effect of light, rather diffused than concentrated, seem appropriate to impressions of architectural beauty; while, in the use of colour, let the artist beware that only as applied to beautiful forms can this be otherwise than at least semi-barbarous; and let him look at and take warning by the, alas! too many examples in modern English structures, where, in the desire to fall in with a prevalent but passing fashion, the architect has marred a perhaps otherwise meritorious design by the use of strongly-contrasted and even coarse colour, applied in hard and graceless forms, and sometimes with a force of crude opposition sufficient to overbear and destroy all that the really architectural features of his work had to offer of beauty or of grace.

Grandeur of effect, unlike beauty, must, as the term implies, enlist large scale among its constituent elements. Here, strong contrasts and bold gradations of form find place, forcible and concentrated effects of light and shade, while colour again falls into comparative abeyance, and where employed must be made strictly ancillary to the bolder effects dependent on form and chiaroscuro, as in deepening the effect of purposely-shadowed parts of a design by its retiring shades of purple or violet, or bringing into prominence what it is sought to press on the eye by distinct but yet mellow tints of a warmer character, and pointedly by the studied use of gold in an unburnished form of etching. But here must be avoided, save in the smallest measure, the use of the primaries—red, yellow, or blue—or their negative and positive neutrals—black and white.

* From a paper on the "Real and the Ideal of Architecture," read by Mr. H. P. Horner, before the Manchester Architectural Association.

THE RESTORATION OF WESTMINSTER CHAPTER-HOUSE.

THE restoration of this most beautiful adjunct to the grand old Abbey of St. Peter's may more properly be called a resuscitation than a restoration. It is not being rebuilt, or even, in the strict sense of the term, being renovated—a word which is dreaded by all true antiquarians and archæologists; it is simply being restored to the condition in which it existed more than five centuries ago, but without any modern accessory, alteration, or improvement whatever. It is only being cleaned, strengthened, and revealed in all its beauty, and the Vandalisms which have hitherto, in the way of stairs and shelves and blocked-up windows, desecrated its exquisite proportions, are being removed for good and all. The cost of what may be called literally cleaning and

strengthening it will be in all about £30,000, and there are few even of the most economical members of Parliament or their constituents who will grudge this sum. The great mass of the rents of the old Abbots of Westminster goes now to the Crown—that is to say, to the country, and it is not unfair that the country generally should bear the expense of maintaining in all its ancient integrity even the smallest vestige of the great Abbey, which is without its equal, either for antiquity or historical associations, in the world. The Chapter-house was once one of its most beautiful accessories. It is larger, but on almost the same plan and style as the celebrated Chapter-houses of Wells and Salisbury. The latter is known among all architects here and abroad for its beauty; but that at Westminster, though finer, has been little seen and still less known. In fact, till now it has never been much regarded, and it was not till it threatened to crumble into ruins that efforts were made to keep it from literally falling in a heap. Yet there was much even in its associations, apart from its rare architectural beauty, to justify its preservation. It was, at the latest, built in the reign of Henry III., and in it the House of Commons used to meet in 1377, and continued to meet till they were moved over the way to St. Stephen's Chapel, now St. Stephen's Hall, in the crypt under which, at its building, Chaucer was clerk of the works. In the Chapter-house, also, was kept the Doomsday Book, with the original wills of Richard II., Henry V., Henry VII., Henry VIII., the Golden Bull of Clement VII., giving the title of Defender of the Faith to Henry VIII. for his treatise against Luther and the Reformation, and the treaty of perpetual peace signed on the Field of the Cloth of Gold between Henry VIII. and Francis I., the exquisite gold seal to which, six inches in diameter, is said to be the work of Cellini. But "*Tempus edax rerum*," and the old historic Chapter-house came to be disused, and in process of time to be dismantled and almost destroyed. It was and still is octagon in shape, with eight large and lofty traceried windows in the richest Gothic style. The thrust of its light roof was held by a peculiar bracing of three stout wrought-iron rods, each nearly two inches in diameter, passing round the walls above the tapering windows, and being joined in a most peculiar manner by iron rings. These were removed during some ill-advised and most antique improvements, and at once the roof began to thrust the walls outwards, and flying buttresses had to be built to retain them. There is no record as to the time when these buttresses were built, and all differ much as to periods, and vary in strength from 9ft. to 18ft. thick, the last having apparently been built up as late as 200 years ago. After this, in spite of its exquisite tempera paintings and carvings, its rich tracery, and brilliant windows, it sank into neglect, and became at last a mere storehouse for Government records, and this was almost the ruin of one of the noblest structures connected with the Abbey.

The Westminster Chapter-house, like that at Salisbury, may be described as a gigantic octagon lantern, about 64ft. in diameter and 64ft. high, with a rich groined roof, meeting in the centre, as at Salisbury and Wells, on a clustered pillar of black Purbeck marble. Such a building, of course, did not suit the requirements of a great Record Office, so the windows were broken out and bricked up, an upper story was made by a common deal floor let into the walls, and the paintings and carved groined arches were hidden in by presses to hold the books. Only one good came of this change, which is that the encaustic pavement was boarded over, and thus there remains to us one of the finest examples of mediæval tiling that exists in England. That this is the original pavement is evident from the recurrence of the arms of Henry III. Its colouring is superb, and its flowing patterns are burnt in with a delicacy and brightness which would do credit to Minton even now. Among the patterns are little figures of kings and queens, saints, ecclesiastics, and minstrels. This preservation, however, is all we have to thank the Record Office of those times for, and we should perhaps have not had even that but for the fact that boarding was warmer to the feet than tiles. In all other matters it was misused with neglect which one would hardly think even the most untaught clowns would have been guilty of. For the sake of gaining a few inches for the wooden shelves, all the exquisite carving of the capitals of the black marble columns was hacked away,—even the groining of the arches above them, all gilded, coloured, and beautifully carved like the "diaper" patterns of the Alhambra Palace, was in most cases chiselled out to make room for a beam or a wooden shelf. Some good, however, was effected even by this, for the shelves protected the paintings on the walls, though not entirely, for a doorway was cut through one of the best, just as in Italy a doorway was cut in one of Domenichino's great frescoes of the Last Supper. The paintings in the Chapter-house are evidently the work of an Italian artist, and are in a tolerable state of preservation, thanks to the shelves which were in front of them. In some parts the colours are wonderfully brilliant, and the heads are painted with great force and character. In one bay, evidently reserved as a seat for the Abbot, the groinings of the arches are beautifully coloured and gilded, but these, like the others, have been hacked and hewn and chiselled and defaced to make room for shelves. Here, and on other portions of the carvings and walls, are ample remains of colour and gilding. Some of the caps of the columns, both here and elsewhere, are simply moulded, but all are graceful. It will be very easy to restore these columns and groined arches to their original condition. Art critics are proverbially hard to please, however, and it is contended that to restore these mutilated walls is to falsify history and sophisticate art. As well might one complain of mending a rare old Wedgwood vase, or repairing a rent in a painting of one of the old masters. Much interest attaches to the once double portal at the top of the steps of the vestibule which connects the Chapter-house with the cloisters. The pillar dividing this portal has disappeared, as also its head, which once enclosed in a large centre quatrefoil a figure of our Saviour. A confirmation of this last fact is furnished by an antique record, which directs the monks on entering the Chapter-house to bow to such a statue. In the wall space to the right and left of this door head are figures of saints and angels, which, strange to say, have escaped both the Puritans and the keepers of the records. The bronze wings of the angel Gabriel, however, have been carried off, though the removal of a vast mass of whitewash has brought to light many figures which it at once concealed while it protected them. After all these devastations the Chapter-house soon began to yield to what might have been its fate. The buttresses gave way, and the side wall sank to the south. The outer walls bowed out in an alarming manner, some as much as nearly 10in. from the perpendicular, while the central column, of black Purbeck marble, with its clustered shafts, was not only bent aside, but even twisted. The place, too, became too small for the records of which it was full, and they were at last removed. Still, even lightened of this weight on its walls, the structure continued to yield, and at last to save it from ultimate ruin, Mr. Gilbert Scott was called in. Mr. Scott is about the most conservative architect in his profession. He neither renovates nor restores, in the architectural sense of the words, but only replaces, and even that only as far as is possible consistent with the strength and durability of the structure. With the Chapter-house it was a difficult thing, for the buttresses were literally rotten, and were so built around that it was difficult to get at many of them, for all the stone, which was of a soft kind, was so decayed that more than 3in. of the material was eaten into, and the foundations too had given way to some extent under them, so that new buttresses were absolutely necessary. These were erected by raising the modern roof of the Chapter-house, and then substituting for the old buttresses new ones in Chilmark stone from the Wiltshire quarries. This stone is peculiarly hard, but it has not yet been tried much in that hardest of all ordeals, the atmosphere of London. A very ingenious specimen of cross centring scaffold takes the inward thrust of these flying buttresses till the groined roof is finished, and will rest upon the centre cluster of marble columns. These columns have been sadly misused, and, though finely polished, were during the time of their degradation as a Record Office painted black. They were bound round with copper wire at the capitals and bases as the tall shaft began to bend and twist in olden times, but beyond this nothing was done to repair the fabric which they mainly upheld. The restoration of these columns to their proper position will be one of the most difficult works in all the building. For the rest, every atom of the stone in the old structure has been used again in the new. It has simply been "redressed" in the interior, and in the external buttresses a harder stone has been substituted for that which was found to be decayed. Beyond this no alterations have been attempted. The groined roof over the centre will be the same as that which covered the House of Commons nearly 500 years ago. Above this will rise a pointed roof of iron, cased with lead. The main ribs of this are so tied in with cross braces that there is no thrust upon the walls below, which have only to bear its weight. The windows are to be filled in with coloured glass, and enough has fortunately remained of the old lights—that is, of portions of them—to show how they were once filled with grisaille, ruby, blue, and other colours. The style of the period on the spot is known. It consists of a sort of mosaic of grisaille, with small coloured pieces at rather wide intervals. There is an example of the style in the Jerusalem Chamber, and, curiously enough, a portion of a window of the required date situated in the apsidal chapel of the Abbey, but built in by Henry VII.'s chapel, was recently discovered. Altogether the restoration of the Chapter-house to its pristine beauty will cost some £30,000; but, as we have said, there are few who will grudge this for the preservation of a building which is not much younger and scarcely less historic than the venerable Minster itself, to which it will now add new glories. Beneath the Chapter-house is a crypt which is little known or seldom mentioned even in the most ancient or modern histories of archæology. This crypt is about 30ft. square and some 12ft. high. It has no windows to it, and the walls in some parts round it are as much as 15ft. thick. This is, perhaps, the only part connected with the Abbey which has anything like vaulting under it. The ceiling of this crypt has a plain groined roof, the arches of which meet in the centre on a splendid column of black Purbeck marble, about 8ft. high and some 4ft. in diameter. This crypt, however, like the fabric it supports, has met with cruel misusage. The great marble column has actually been cut into gaps, so that little more than a shell of it remains, in some parts not more than 5in. or 6in. thick. These were used as safes for the most precious of the records deposited there. All these chasms will now be filled up, and the pillar put in a fair position to do its duty in supporting one of the most ancient and most beautiful portions of the famous Abbey of Westminster.—*Times*.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ON Monday, Mr. Thorold, C.E., read a paper on an "Auxiliary Railway for Turnpike Roads, and passing through Towns." The author stated that his object was to utilise the existing highways for the purpose of a tramway; and to accomplish this object he proposed laying down a single rail on one side of the existing roads, out of the way of the ordinary traffic, and as this rail would admit of curves of 20ft. radius, it would be peculiarly adapted for new countries by passing up ravines and mountain sides with any gradient not exceeding 1 in 12. It was proposed to have four wheels following each other along the centre of the truck, which wheels would carry the load, and the balance would be preserved by a pair of ordinary wheels, so arranged that they would act equally well upon level and uneven surfaces. The carriages it was proposed to propel by means of a traction engine, but the system was equally available for drawing by elephants and other beasts of burden. The adhesion of the traction wheel could be regulated to any weight, and by an arrangement of the other wheels the engine could even lift its traction wheels out of a soft place. The cost of a tramway of this description is estimated at £500 per mile. The details of the invention were explained by the aid of a number of diagrams and models. It was proposed to use a hollow rail, and carry in the cavity a telegraph for communicating from one end of the system to the other; the telegraph being not only cheaply laid, but secured from all interference or danger of injury from storms or other causes.

LONDON STREET TRAMWAYS.

A paper by Mr. Bright, C.E., was also read on "London Street Tramways." It referred to the inconvenience arising from the increased traffic in the streets, and the defects of the omnibus system as at present carried out, and suggested the draw-

ing of carriages conveying large numbers of persons along a tramway. They might be drawn by horses, and could be stopped at any point desired, and not necessarily driven from station to station, as was the case with the Metropolitan railways. Wherever possible, the tramways should run along bye-streets, catching the main thoroughfares at the point of junction. To avoid interfering with the contour of the roads it was proposed to adopt a bevelled rail, laid on a level with the roadway, the depression not exceeding an inch, and the wheels bevelled to fit the rails, with an apparatus for enabling the carriages to leave the rails whenever the exigencies of the street traffic should require it. It was proposed to use horse power for drawing the carriages, and adopt a system of brakes that would enable a train to be stopped whenever required. He expressed an opinion that some system of tramways would speedily force itself upon the attention of the people of London.

The next paper was by Mr. W. J. Cooper, on an "Improvement in Watering Roads." He pointed out the defects of the present system of watering by carts, and referred to the necessity for some more efficient means than that which has already been adopted, which had cost London £100,000 during the last summer without succeeding in laying the dust; and recommended the adoption of a solution of chlorides of soda and calcium in the water, which would prevent the roads drying so rapidly as was the case with water only, and thus avoid the necessity for such frequent waterings as at present, thereby saving expense, and at the same time increasing the binding character of the road materials, and consequently rendering them more durable.

A paper, by Professor Archer, describing the successful working of Mr. Thompson's patent road steamer in India, was read by Mr. Le Neve Foster, in the absence of its author; but no discussion took place upon either of the above four papers.

On Tuesday, Mr. T. Login, C.E., F.R.S.E., read a paper on "The Abrading and Transporting Power of Water." After referring to the importance of water as an agent in adapting the world to a condition suitable for the habitation of man, the author observed that the power derivable from water and the resistance of water to bodies passing through it had been well investigated; but of the transporting power of water at different velocities very little was known. In illustration of this fact he spoke of the great controversy now going on between Sir Arthur Cotton and Sir Probey Cautley, two of the greatest engineers India had ever produced, with reference to the Great Ganges Canal, and observed that on the correct settlement of this dispute great interest depended. Not only was it a subject for the philosopher to study, but for the politician, the philanthropist, and Christian, as the future prosperity of that great continent was bound up in it. Having entered into a minute account of observations taken in India with reference to the slope required to transport the earthy matters held in suspension and prevent the canals from silting up, he arrived at the following conclusions:—That the transporting power of water must depend to some extent on the nature of the earthy matters to be transported; that water containing large quantities of such matters required greater slope than those containing small quantities, and that without a sufficient slope the earthy matters became deposited on the bed of the stream; that any obstruction in a silt-bearing stream will at once cause a deposit, which, if allowed to accumulate, will eventually cause an alteration in the course of the current; that water containing no such matter would continually deepen its bed had not nature provided that at certain seasons the rivers flowed under both conditions, and so preserved the balance. These observations led to the deduction that the slope of every canal intended for irrigation purposes should depend upon the velocity of the stream, the amount of earthy matter held in suspension, and the character of such matter.

Professor Rankine observed upon the necessity that existed for greater attention being paid to irrigation in this country. Anyone who travelled through the country within the last few weeks must have seen land where vegetation had been dried up, although in many cases there was an abundant supply of water within a few yards, which, however, was not available for want of the means of applying it. He suggested the appointment of a committee to investigate the power of water in transporting matters of different kinds, which distinction had not previously been known to science. Mr. Vigooles agreed in the desirability of irrigation, which was more especially valuable in Italy, Spain, and other countries, but in England he thought there was not uniformly such a scarcity of water as would render necessary any extensive works of the kind.

The Chairman also enforced the necessity of irrigation, especially in India, and congratulated the section on having begun the last day of its sitting with papers on subjects so important.

Sewage.

A recommendation forwarded to the Economic Section was read by the President, and was to the effect that impartial reports should be made and communicated to the British Association on the treatment and utilisation of sewage in connection with the drainage of towns, in order that such facts and information as may guide future operations may be recorded from time to time. It was, therefore, proposed that some member of the committee out of the three following sections should be appointed a committee to draw up the report:—Section B, J. H. Gilbert, F.R.S., F.C.S.; Section F, W. D. Harding, C.E.; Section G, Richard B. Grantham, C.E., F.G.S., with power to add to their number; and that a sum of £30 be granted for the payment of such expenses as are incurred in the course of the investigations. The committee should be requested to include in the details of each report—

1. The special circumstances of each case, such as the extent of district, the population, and the number of houses with or without the benefit of drainage.

2. The character of the sewage and water supply adopted in the district; and the quantity of sewage at disposal.

3. The mode of disposing of the sewage, with description of the works and their cost.

4. The result pecuniarily to the district, and to those who are selling or applying the sewage to the land or otherwise in any form whatever.

The recommendation was adopted by the section.

On Wednesday a paper on "Education and Science" was read by Dr. Grierson, who said that the only effectual mode of education was that which appeals to nature. He recommended teachers to take their pupils to a museum, a garden, or the sea-shore; direct them to observe what was before them, and on their return make them enumerate and explain as much as they could. In like manner, stuffed animals and skeletons might be placed before the pupils, who should be required to mark the points of difference in size, colour, and other characteristics, and also the points of resemblance. In this way, he said, the mind would be trained to habits of observation, self-reliance, a love of knowledge, and a capacity for progress.

ROAD TRAMWAYS.

As two of the great railway companies have outraged public opinion and exhausted public patience by exorbitantly raising railway fares, people are discussing the best plans to contravene the directors' intentions. Some are giving up their houses and coming nearer London to live, others are riding in the omnibus instead of the railway carriage; some are riding in third class instead of first class carriages, and others are walking. No doubt these modes combined will bring the directors to their senses. In all probability the directors would not have taken the step they have if they had expected they would have subjected themselves to so much odium. And it is not unlikely they will embrace the first favourable opportunity to retrace their steps. But what more than anything else likely to induce them to walk in this direction would be wholesome competition. Road tramways were started in London under somewhat unfavourable auspices. Mr. Train almost went out of his way to make enemies, though he did a great many out-of-the-way things to conciliate friends. His being a bragging American did not facilitate his intentions. But he nevertheless commenced a good work, which may now be improved upon, and we know nothing more calculated to induce railway directors to be more sparing of railway funds in future, and to be less disposed to raise fares, than the laying down of road tramways. At present the railways have it almost all their own way, there is no road in the field. A writer in the *Times* says:—

"There is no power at present that can compete with steam in cheapness, and it is only by using steam against steam that any competition can be successfully carried out. Remove the existing absurd legislative enactments against the use of steam on the common roads, and shortly would appear on the different suburban routes steam omnibuses, which would pay well at 2d. ahead for inside and 1d. to 1½d. for outside passengers, on journeys of four miles.

"It may be said that steam has been tried years ago on the common road, and failed. Quite true. But the difference between the light steam-engine of the present day and its ancestor is something like that of the elephant and racehorse. An engine of two horse power effective (about equal to the power of three omnibus horses) may be made, with boiler, &c., complete, within 10cwt. Such an engine will consume 10lb. of gas coke an hour, value 1d. The cost of working would be as follows:—Driver at 35s. a week of six days of twelve hours, or seventy-two hours, or per hour about 6d.; conductor, the like amount, 6d; fireman or engineer, the like, 6d; fuel per hour, (when in work only), 1d; wear and tear per hour, 2d.; shed, cleaning, &c, and all other contingencies would be covered by 3d —total, 2s. Supposing the 'bus to run eight miles an hour, or two journeys of from three to four miles an hour, with six passengers inside at 2d. and six outsids at 1½d., on each journey the receipts would amount to 3s. 6d. per hour. But most probably the average number of passengers would be much more than double; but say double or 7s. per hour. This would give a clear profit of 5s. an hour, or £18 a week, or £936 per annum from a single omnibus. The omnibuses I should propose for the present roads would carry about forty passengers, but with tramways nearly double the number would be easily drawn by the same power and at the same expense. The economical advantages, as against railways, would be in the absence of nearly all expense except of the carriages in actual use, but which forms only a small item in railway expenditure. Many omnibus proprietors are quite alive to the advantages of steam, and several have told me of their willingness to start steam omnibuses on the common roads as soon as the legislative restrictions are removed. The steam-engine I allude to would be free from noise, smoke, or other nuisance, and, therefore, quite different from the railway locomotive."

Another writer in the same paper says:—"I am pleased to see this subject ventilated in your columns. The principal objections to the tramways now in use in this country are:—

"1. The rails standing either on the outside or inside above the level of the road cause serious obstructions to the ordinary carriage traffic.

"2. The impossibility of the flanged wheels of the tramway vehicle running on the ordinary rood, necessitating a change of wheels (as in Paris) where the vehicle has to traverse both tramway and road.

"3. The difficulty of vehicles on the tramway passing each other necessitating a double line to carry a large traffic, such as would probably result in the suburbs of London, and in the country increasing the cost of a single line by the numerous passing stations which would be required, as well as impeding the traffic.

"A tramway in operation at Geneva appears to me to obviate all these difficulties.

"Objection 1 is removed by the rails being perfectly level with the ground, so that all carriages can pass over them without obstruction.

"Objection 2 is also removed, as the wheels to the tramway vehicles have no flange. The carriage is kept on the rails by a centre wheel of about two feet in diameter (I believe of steel), which runs in an iron groove level with the road. This wheel is thin at the edge, and can be lifted clear of the road at the pleasure of the driver.

"Thus objection 3 is got over. On two vehicles meeting each other one of the drivers raises his centre wheel and leaves the tramway, regaining it after passing, and dropping the centre wheel into its place.

"As this system has been some little time in use in Geneva the objections to it can be ascertained from practical experience, and perhaps remedied."

The Chester Cathedral Restoration Fund now amounts to nearly £28,000. This includes the grant of £10,000 from the Ecclesiastical Commissioners.

RUST'S PATENT MATERIAL FOR DECORATIVE PURPOSES.

WE have this week inspected, at the office of Messrs. D. and G. Latimer, 29, St. Swithin's-lane, specimens of a new material for decorative purposes, likely, we think, to prove of considerable service to architects, and in many cases to supersede the use of tiles or scaghola. The composition, which is patented, consists of broken glass, mixed with as much sand as it will take up, together with colouring matters or pigments. These are melted in a crucible or glass furnace, and afterwards moulded into the required shapes by the aid of pressure. In order to colour the material, a small quantity of oxide of cobalt is used to give the pattern and colour of lapis lazuli; oxide of copper will give brown, dull red, green, or iron colour, according to the quantity used; oxide of iron gives yellow, or amber; and oxide of manganese a purple, grey, or brown. The light and dark green materials mixed in the crucible produce the shades for malachite, and the lapis lazuli is produced by a similar mixture of light and dark blue. Imitations of serpentine marbles are produced by mixing the colours in the crucible or pot at one time, and moulding them into shapes or forms.

The various imitations of marbles, agates, &c., are almost perfect, not only to the eye, but also to the touch. We especially remarked one specimen of pavement, the outside border of which was formed to imitate light coloured marble unpolished, and which we were told has been extensively used on some work done at Newcastle.

The application of the material is practically unlimited. Bosses, dados, tiles, panels, and mosaic work for reredoses, and other similar purposes, are the uses to which it is at present principally applied. When used unpolished for pavements it possesses a roughness of surface and foothold entirely wanting in most of the tiles in general use. On the other hand, it is capable of receiving quite as high a polish as granite or marble, and it possesses a depth of colour and solidity of appearance quite unattainable in tiles.

It has also the merit of being extremely cheap. A 9-inch boss in imitation of polished granite or marble can be produced at just about half the cost of the real material; for paving, also, it can be produced at a cost much less than that of ordinary tiles.

Considerable use has been already made of the material by Mr. G. Gilbert Scott, in the shape of ornamental bosses for the Albert Memorial at Hyde Park, entirely, we believe, to his satisfaction.

We are told by the manufacturers that with increased experience and the use of larger and improved plant, they expect considerably to extend the number of shapes and combinations of colours which they are at present able to effect.

We trust the material will receive a fair trial at the hands of architects, believing as we do that it will prove an acquisition to art and of considerable service to the profession.

NEW SYSTEM OF VENTILATION.

MR. J. D. MORRIS, surgeon-dentist, of Edinburgh, has devised another new system of ventilation, which he thus describes:—"A peculiarly constructed grate or stove is so arranged in the making that, while it shows a very large metal frontage for heating the air, by radiation and otherwise, it does not draw air from the front, which is entirely devoted to heating the air of the entire room, but is fed entirely and altogether from below and behind. By this arrangement, a perfect hot air circulation is established, similar to a hot water circulation, which never by any chance meets any interruption, but continuously goes on drawing cold air from below and behind, which, supporting combustion, yields the heat which warms the air in front. This combustion apparatus is furnished with a damper, so as to regulate to any degree of nicety the amount of combustion, and consequently of the heating of the room. By another arrangement in the grate or stove, a large quantity of air is made to meet the heat at its hottest place, and so prevent smoke. The ashpan which receives the incombustible residue of the coke is also peculiarly constructed, and performs a double function—viz., admits air in any quantity from all points except the front, whilst, at the same time, it of course receives and accommodates the ashes. From this construction of grate it is obvious that all draught in the room is done away with, so far as supplying the combustion of either stove or grate; but there is still another provision made in this combustion apparatus, and that is, that the draught proposed by the rarefaction is also supplied from below behind, and all round the flame or hot bed of the stove or grate. There is, therefore, no air whatever supplied in front or from any part of the room. The air of the room is, therefore, simply warmed, and, taking an upward direction, according to the gravitation of the particles, is of course warmest at the ceiling, where, meeting the apparatus now to be described, it performs a most important function. The ceiling apparatus is a peculiarly constructed gas or oil lamp, which, while lighting the entire room by means of a reflector or reflectors, so collects all the heat which has been evolved during the illumination as to hand it over, by conduction, to the metal of a tube, which tube also receives not only the used warm air of the room, but also the entire products of combustion. This tube, which performs the ceiling part of the ventilation, is now converted into a shaft funnel, which, expanding into another much larger tube, made entirely of copper, delivers upwards all its heated air. This heated air whilst being conveyed through the tube, uniting its heat with that of the heat itself, which is conducted along and by the copper, is all sufficient for the purposes of continuous ventilation into, through, and out of any chimney where no fire is in the fireplace—the front of the grate in this case being, like the other grate before described, simply covered in to prevent any admission of air from the front. Where there is a fire, the used air, however vitiated by cancerous, scrofulous, or consumptive patients of a hospital, is passed through the flame bed of the grate or stove, and there entirely consumed—the air which accompanies the diseased breathings going to support the combustion, as in the other grate below, where it is cold and pure. In like manner, all the flats of a tenement, however high, can be carefully ventilated—the street, in the first instance, supplying pure cold air to the ground flat, the vitiated air of this flat or room passing into the fires of the room or rooms of the flat above, and so on, till it finally escapes purified nitrogen and pure carbonic acid—ready-made food for the vegetable world."

LEICESTER SEWAGE EXPERIMENTS.

SOME important experiments in the purification of sewage by a new process, which have just been tried at Leicester at the request of the Royal Rivers Commission, deserve attention and further investigation. The sewage of Leicester has been treated for many years with lime, and the tanks constructed for this process rendered it a very suitable place to try the new A B C mixture, as it is called. The compound consists chiefly of animal charcoal, clay, and blood, with a small quantity of alum. Its action when added to sewage is remarkable—the impurities seem instantly attracted to each other, and in two or three minutes form into large flakes, and sink, leaving the supernatant water clear and free from taste or smell.

Laboratory experiments showed that this water was comparatively pure, and a trial at Tottenham confirmed this view; but the Rivers Commission, anxious to see the process tried on a larger scale, requested the patentees, Messrs. Sillar and Wigner, to undertake an experiment at Leicester extending over a week. The trial took place a few days since; one-half of the Leicester sewage was treated with lime, and the other half, in a corresponding set of tanks, by the A B C process. During the week more than ten million gallons were purified, and the effluent water was so clear, and apparently pure, that several of the visitors tasted it, and fish put into it only ten minutes after it was drawn from the sewer lived for hours.

The average of Mr. Wigner's analyses of sixteen samples, taken at intervals of one hour during the day, is as follows:—The sewage contained 111.92 grains per gallon of solid matter, of which 42.56 were organic and 69.36 inorganic. The effluent water, after treatment by the A B C process, and unfiltered, contained 68.61 grains, only 10.20 of which were organic and 58.41 inorganic. The result of the removal of so large a proportion of the organic matter is, of course, the formation of a residuum rich in the very ingredients which are wanted for manure. The analysis of a sample from Leicester is as follows:—Water, 14.00; organic matter, 47.10; alkaline salts, 4.76; earthy salts, containing phosphoric acid, 1.31, 12.71; silica, 21.43—100.00. The nitrogen in this sample is equal to more than 4½ per cent. of ammonia. A considerable resemblance is at once apparent between this result and the analysis of a sample of guano. About 90 tons of the manure were produced at Leicester, which possesses an agricultural value sufficient to cover all the expenses of the process and to leave a large surplus for profit. The report of the Rivers Commissions is not yet published, but if their opinion on their own speciality, the purification of the water, is satisfactory, the process will doubtless be largely adopted; and the sewage of large towns, hitherto looked on only as a nuisance to be got rid of at any cost, will be considered as a valuable article, and a source of considerable revenue.

THE ROYAL BIRMINGHAM SOCIETY OF ARTISTS.

THE "private view" of this society's exhibition—the first since it obtained a mark of royal favour—was held on Wednesday. The collection of paintings is large, and there are some good specimens of sculpture. Among the pictures exhibited are the productions of some of our most famous modern artists. The collection includes "Lady Jane Grey in the Tower," W. F. Yeames, A.R.A.; "Herod's Birthday Feast," E. Armitage; "Margaret of Anjou intrusting her Son to the Robber," C. Lucy; "The Sleep of Duncan," C. D. Maclise; "Rent Day in the Wilderness," Sir E. Landseer; "The First-born," H. O'Neile; "The Restoration, 29th of May, 1660," A. B. Clay; "Jonathan's Token to David," F. Leighton; "Ophelia," E. C. Barnes; "The Tuileries, 20th of June, 1792," A. Elmore; "Before Waterloo," Henry O'Neile, &c. There are also fine productions by G. E. T. Poynter, C. Baxter, H. T. Munn, G. Sant, E. Hargitt, Sir Francis Grant, J. Pettie, A.R.A., J. T. Woolmer, Henry Moore, George Cole, T. Sydney Cooper, R.A., and W. H. Vernon (by whom there is exhibited a fine picture, "Sheep on a Moorland Road"); also P. M. Feeney, C. Loyeux, D. W. Wynfield, J. T. Hill, J. H. S. Mann, J. C. Naish, J. P. Pettet, W. Maw Egley, P. Livin, Charles Baxter, Haynes King, E. Kennedy, W. Bromley, &c. Among the best known local artists whose works figure prominently are Allen E. Everitt, C. T. Burt, F. H. Henshaw, W. T. Roden, C. W. Radclyffe, A. Johnston, H. H. Lines, Charles R. Aston, Howard Harris, W. H. Hall, R. S. Chattock, P. Deakin, John Steeple, &c. Among the sculpture is a marble statue of Sir Rowland Hill, by Peter Hollis, "to be erected in Birmingham by public subscription, in recognition of his eminent services in connection with the postal system." The likeness is good, and the general arrangement of the work satisfactory.

ARCHÆOLOGY.

THE Sussex Archæological Society had its annual excursion on Thursday week, the places selected being Rotherfield and Mayfield, about eight miles south of Tunbridge Wells. The ancient palace of the Archbishops of Canterbury was visited. The business meeting was afterwards held. It appears that, although the society numbers 148 members, it is in arrears, financially, to the extent of £74. A committee was appointed to look into matters, and a sub-committee was also appointed to consider what improvements, in their opinion, could be made in the present system of management of the business of the society.

The twentieth annual meeting of the Somersetshire Archæological and Natural History Society commenced at Williton on Tuesday, and the weather being fine there was a good attendance. The business meeting was held at the national schoolroom. The president, in his address, alluded to the peculiar objects of interest in geology and natural history for which the neighbourhood was noted. The report referred to the labours of Mr. Sanford in compiling the first volume descriptive of the contents of the Somersetshire caves, and a vote of thanks was passed to him on that account. The treasurer's statement accounted for the expenditure of nearly £309, leaving a balance in hand of £32. Mr. Freeman described the almost unique construction of Dunster Church half of which belonged to the parishioners and the other moiety to the old monastery. The arrangements for the next place of meeting, and the selection of a president for 1869, were left to the committee, and the officers for the ensuing year were appointed. In the afternoon an excursion was made to Bicknoller Halsey Manor House, Crowcombe Court and Church, and Stogumber, returning to Williton to dine at the Egremont Hotel. After dinner the Rev. Mr. Hugo read a paper on "Ina, King of the West Saxons." Wednesday and Thursday were devoted to excursions—in the first instance to Cleeve Abbey, Dunster Castle, &c., and then eastward to the Quantocks-mines, marble quarries, old camps, &c. At Dunster Castle and at Fairfield the members were entertained at luncheon.

HIGH ART *VERSUS* LOW ART.

IN my last communication I ventured to hint at the great difficulty there necessarily is in treating on so difficult a subject as high art, consequent on the strange fact of their being in existence no authoritative statement showing what it really is in the opinion of those who are now thought to produce it. We are almost wholly in the dark, and can only come to a sort of general conclusion that what is said by the artistic world at large is true, and that the public voice has, in sober fact, done all the work for us and finally settled for itself and for us this very difficult question, and that, in short, what everybody says *must* be true. This, at least, will be found to be so far comforting and satisfactory as it gives us some ground though it be unstable, to stand on, and a point of departure. No one will, of course, doubt of the difficulty of the subject, or will be likely to complain of its insufficient treatment in so short a space as we can command, where so much else claims attention. What, then, is high art, or the highest art? or what is the highest artistic power which an artist or a workman is capable of manifesting? and what are its results?

So many are the books, treatises, and flying sheets that have been written on the one subject of art that it would seem impossible to ask so simple a question as, "What is the highest artistic result in this country visible to the public?" without finding an answer, and even an authoritative command to look at and to study it. But the question would be vain, so that we are compelled to commence dogmatically, and to assume as proved the very point to be discussed. First, then, it has always seemed to me (and most people will agree with it) that the Greek marbles from the Parthenon, in the British Museum, are the best artistic results which this country possesses and the highest efforts of the artist's mind and hand. There are, of course, many reasons that might be adduced in support of this assertion generally, and one or two special ones which might have some novelty if worked out; but it will be enough for the present purpose to assume the fact that these marbles, more particularly the frieze from the Cella, are examples of magnificent *high art*. I do not know how the Academy catalogues its sculpture, whether or no the Torso comes first, or where the Hercules stands, or why it stands where it does; but, at any rate, the Theseus and horses' heads and frieze have been admitted, though barely admitted, into this antique society. The question, therefore, now is, "Why are the horsemen and cattle sculptured on this frieze considered by the orthodox as *high* art at all?" This is a most curious question, and will be found to open up a series of difficulties not a little perplexing and instructive. Everybody by this time knows that the ordinary artistic and Academy and school idea of art, painting, and sculpture is, that the highest efforts in them are always the results of "*imagination*," as it is called; indeed, no mere copying or mere representation of natural objects is thought by very many to have any artistic merit whatever. This was so firmly and consistently the opinion of the artists of the past generation that men like Fusili despised *portrait* painting itself, as merely so much copying of worthless nature, and said that, so far from nature being any assistance to him as an artist, "*nature put him out.*" In these more enlightened days it is thought a little useful to occasionally refer to natural forms, human and otherwise, but vain in itself unless purified and refined and improved by a constant appeal to the imaginative powers in the artist's mind. "Nature we can see all around us, it is said; what we want, therefore, is not a copy of it in stone or on canvas simply, but something more in addition, and that something out of the head of the artist." This opinion, as all know, is universal, from the biggest to the least, and, as if this were not enough to seal it into an absolute verity, Mr. Ruskin through all his writings is perpetually dwelling upon it, and urging it on the attention of the artistic world. "Artists," he says, "may be divided into three broad divisions—the false and feeble, who can do nothing of any value whatever; the men of literal fact, who can only copy what they see around them; and the great imaginative men, who adorn and illustrate what they see." His beautiful, but I am afraid altogether erroneous, volume, on the "imaginative faculty," many, it is to be hoped, will recollect, and more especially for the present purpose those portions of it where he dwells with such delight on the magnificence of this human faculty and on its wonderful results. All will remember the passage in it where the great spiritual thrones of art (high art) are seen occupied by the mighty presence of the great trio of artists: Michael Angelo, Dante, and Phidias—painter, poet, and sculptor—lording it over the whole world of art. Nothing can be prettier to read, and that heart must be made of the hardest of adamant that is not touched by it. For my part, I confess I revel in that second volume of modern painters as in a delightful dream, but still, ought we not to preserve our senses even in dreams?—if we can! But, alas for the "imaginative faculty," for the dreams it creates, and for Phidias himself, the mighty occupant of one of these supreme spiritual thrones! like the baseless fabric of a cloud vision, it must needs vanish. Phidias, poor mortal, was a working man evidently; work himself in his own proper person he must; there was no deputing such work to others, so that he must have been, not like our sculptors nowadays, a gentlemanly superintendent over the work of "men of fact," but a bonâ fide, matter-of-fact *working sculptor*. A painful reflection, but, as I take it, a matter of certainty and open to absolute proof. How much, therefore, of the imagination of the workman Phidias came into play in the production of this high art frieze sculpture and marble cutting? Nothing. It is all literal fact and fact only, eyesight, power of observation, and skill of hand—in short, mere copying of that in nature which was worth copying. It will not be disputed by anyone who has thought of the subject at all that the Greeks were an imitative people and borrowed wherever they could, and that they borrowed freely from Assyria and Persia. So that the fact really is that, as the Assyrian and Persian artists copied on the wall surfaces of palace rooms and staircases the forms and actions of those who in life occupied and moved in them, as we see in the sculptures from Nineveh and Persepolis, so did Phidias *copy* on this frieze, doubtless taking the idea from the Persian, the forms and actions, and the dresses as well, of those who made up the great procession which it is the object of the sculptures to represent and commemorate. There is in sober reality in this frieze from one end to the other no one single instance of "*invention;*" it is all literal fact and fact only, fully as much so as the sculptures on the Persepolitan staircase, which no one will, I suppose, call imaginative. Where, then, we would respectfully ask, is the *high art* in it according to orthodoxy? It does not exist, it must be sought in some other qualities which it remains for *a future art analysis* to find out. No man will say it is not high art, nay, the very highest, but it is not imaginative. Phidias is not, and cannot be, of those who sit on spiritual and imaginative thrones, but of that more commonplace order of intelligences who are content to go by eyesight, and if by fortune blind to feel their way.

I do not know, without going into detailed particulars, how to make all this absolutely clear, but I would refer those who are interested in art, high and low, and in the Academy mode of dividing artists, to the marbles themselves (not to woodcuts and engravings), where they will see how very, very literal and matter of fact everything is. Phidias was not a *perfect* artist, for there is little or no expression or variety of expression in the faces, none of those wonderful traits of character which Hogarth, had he been a sculptor, would have thrown into them, or observed in their living originals, nor is there that intensity of life in them which Velasquez saw everywhere. Further, I am quite sure that had Phidias existence at this hour, and sent in to our Royal Academy any one of the magnificent "cattle" panels, the hanging committee of that great institution would not take it in or give it either wall, or floor, or cellar space.

Surely high art has yet to be approached by another and a new road, and another order of artistic intelligence has to accept or reject what is offered every year for its acceptance or rejection, for the highest artistic teaching of the public mind comes from, *as yet*, this annual Academy show. In my next note I hope to draw the attention of your readers to another artist of Phidian powers, but whose work, I fear, would hardly find acceptance as high art at all, but it may lead to it.

C. B. A.

CHURCH OF ST. OURS, LOCHES.

THE subject of one of our illustrations is the south chapel of the church of St. Ours, in the picturesque town of Loches in Touraine. It is late Romanesque in style, and comprises a nave of two large bays each about 31ft. square, between western and central towers of like dimensions; also small transept, and a semicircular apsidal chancel, with north and south apsidal chapels. The latter is the subject of our lithograph. The chief entrance is from the west, under a large square porch, by a fine doorway very elaborately sculptured. The chief peculiarity of this church consists in the octagonal stone pyramids which roof the two bays of the nave, forming a conspicuous feature externally not altogether pleasing, we think, but nevertheless with remarkably fine effect to the interior. The sculpture to the capitals, string courses, and other parts is good, and the mouldings are very bold and effective.

ENAMELS, ETC.

THE five subjects given in one page of this week's illustrations are intended to be executed after the manner of the mediæval enamels of the twelfth or thirteenth century. They might, however, be done in the more fashionable *cloisonné*, and with slight modifications could be reproduced in inlay, painting, or even carving. Of the five, the two upper subjects are most suitable for enamel. The first is a conventional rendering of the now extinct dodo, and if a title were wanted for this sketch it might truly be called "An Early Bird." In like manner, the subjects with the orols might be named "Birds of a Feather." The central cross is founded on a Celtic model, but is not carried out rigidly in that style. It might be executed in any of the ways above mentioned, but is perhaps best adapted for carving. The two designs at the foot of the page are for enamelled iron, but with modification they could be done in a variety of ways.

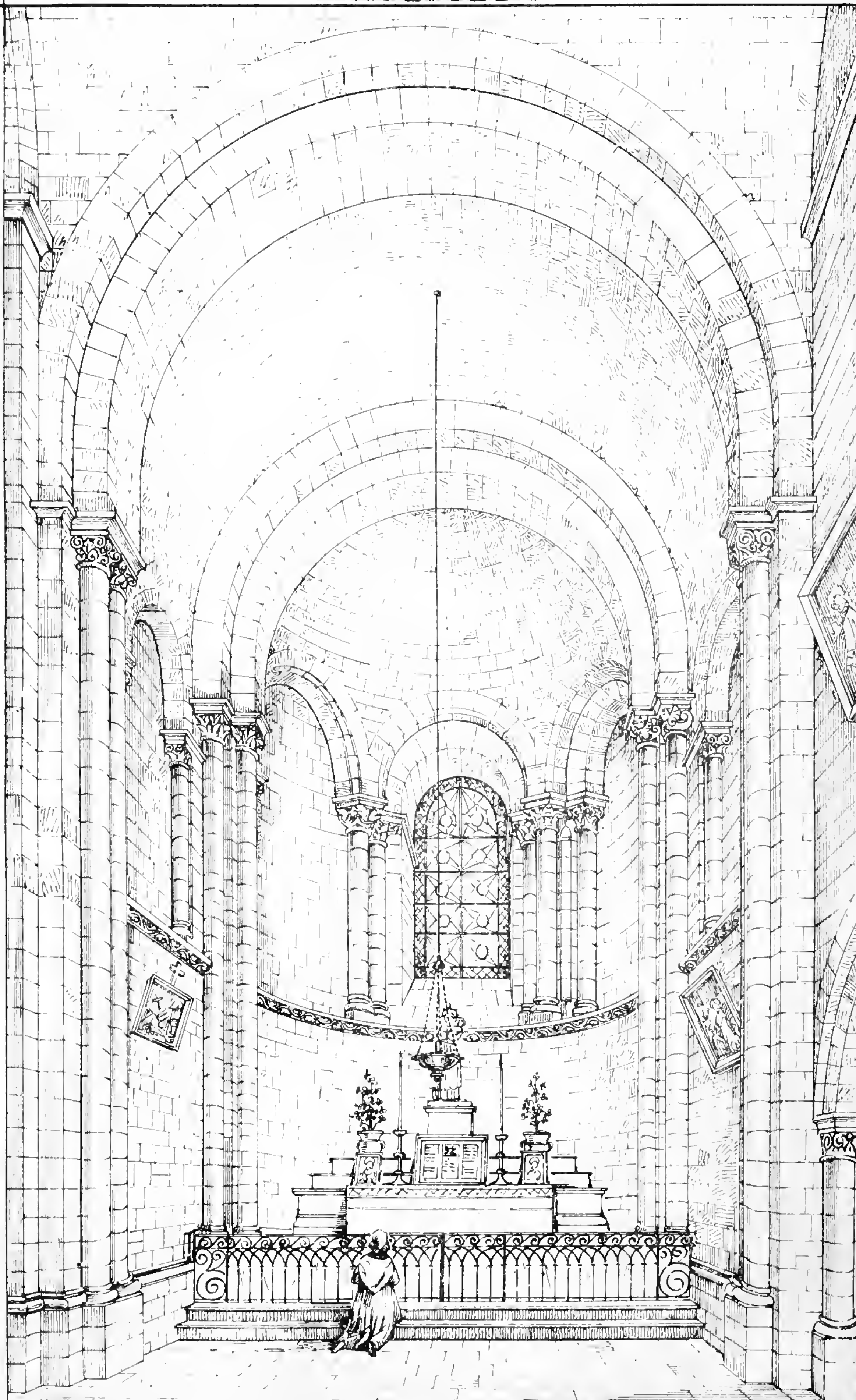
J. M. S.

SCHOOLS OF ART.

On Thursday week the President of the Science and Art School at Torquay gave an open air entertainment to the subscribers and pupils of the science school, in his grounds at Woodfield. Addresses were delivered by Mr. Sheppard, Mr. Strong, and Mr. Buckmaster. From the statement of the latter speaker it appears that more than 100 pupils have passed through the science classes in three years, and that one pupil walked nearly 500 miles to attend a class in animal physiology. He obtained a medal from the Science and Art Department at the last May examination. The success of the classes is mainly due to the earnestness of the teacher, who is also the master of the British school and the co-operation of a very active committee. The classes are held in the evening, during the winter months, at the Science and Art School, and are chiefly attended by young men who are engaged in the day time. After the usual votes of thanks the meeting separated.

A meeting of school teachers and others was held at the Bath Forum School, Bath, on Saturday, for the purpose of considering the scheme of the Science and Art Department. Mr. Buckmaster delivered an explanatory address, which was followed by a discussion of some interest on the recent Science and Art Scholarships of £5 and £10 each for boys in elementary schools.

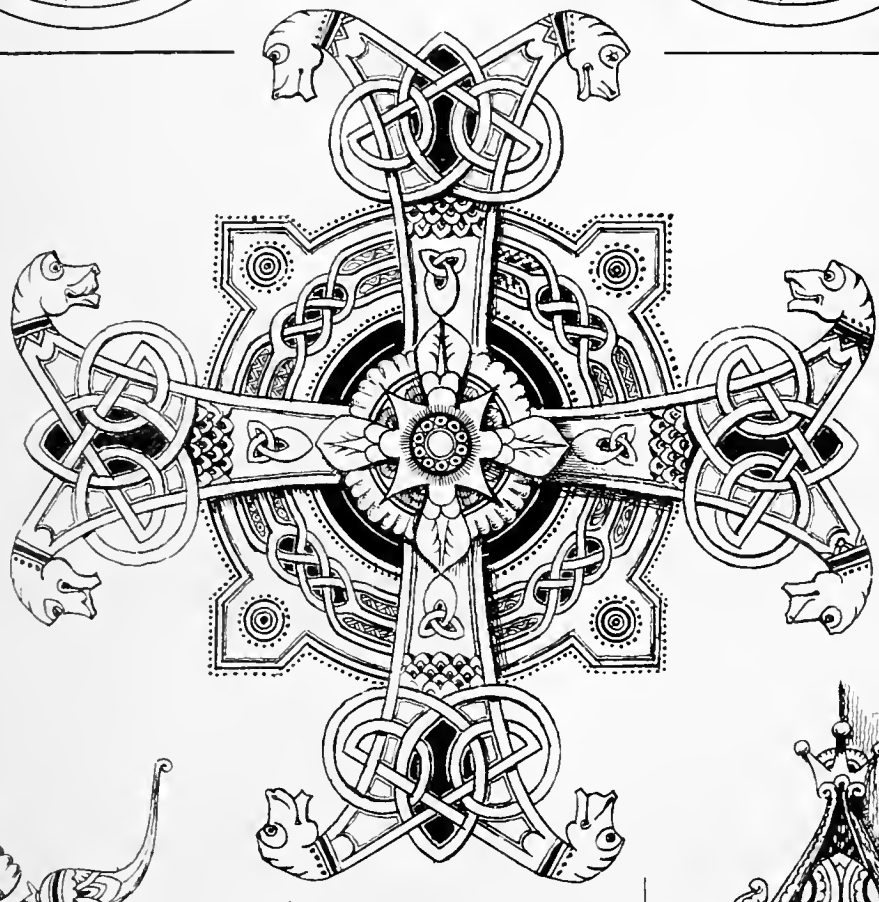
LOCHES



VIEW·OF·ONE·OF·SIDE·CHAPELS : CH^n· OF·S·OVRS :

Printed by Whiteman & Bass

ENAMELS &c.



BY MOYR SMITH

J. Moyr Smith, Del.

Printed by Whiteman & Rees

THE THAMES EMBANKMENT.—ARCH AT TEMPLE STAIRS.

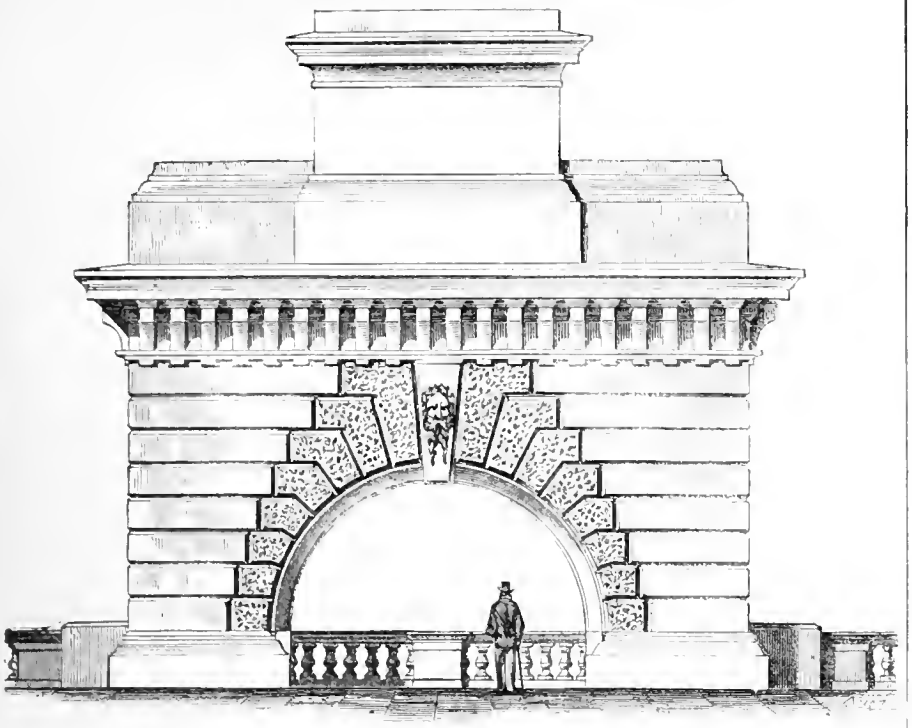


FIG. 1

THE THAMES EMBANKMENT.

THIS great engineering work was partially opened to the public on Thursday, August the 7th. Leisurely conceived, swiftly, but not hurriedly executed, its progress marred by no delay and saddened by no accident, it is, as far as engineering can make it, a work of which the metropolis may be proud. With its merits, as the work of an engineer, praise must perforce cease, and of its lamentable deficiencies in all that is architectural, fit, becoming, elegant, or even coldly correct, all architects and not a few engineers must be painfully aware. It is seldom in a generation or even a century that a work of this importance is executed. We might expect to find that excessive care has been taken

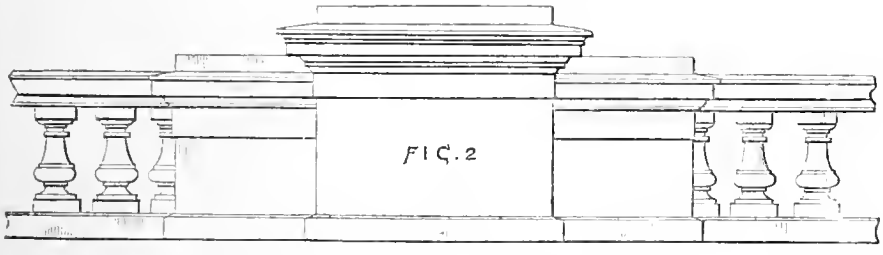


FIG. 2

in the selection of the engineer, and especially in the selection of the Board. The constitution of the latter has long been a scandal to the metropolis and a disgrace to the nation. Burghers and vestrymen, however honest, are not the men who should control great metropolitan improvements. In such a board, entrusted as it is with almost unlimited powers, we have a clear right to expect the highest professional talent, unimpeachable fidelity to public duty, and the soundest judgment, not without a touch of state-craft though unwarped by political bias. Its members should be men of more than average intelligence, and on some patent grounds worthy of the post they fill. Their proceedings should be thoroughly open, and their appointments and accounts alike able to bear scrutiny. Had this been the case we should not be called upon to condemn utterly in the Thames Embankment everything above high water mark and not a little that is below it. Of the latter we may cite the sharp angles of the projections, so liable to injury, and the carved keystone at Whitehall Stairs, which is actually submerged for some hours every tide and seems to court destruction.

That portion of the embankment which is in the most finished state and whose ugliness may therefore be most readily perceived is undoubtedly the arch at the Temple Stairs. The cut, fig. 1, does not give an unfair idea of this extraordinary production of the hand—we will not say the mind, of man. The reader will observe its just proportions, graceful outline, and delicate mouldings. Besides, the thing itself is to be seen. Those who run to catch the boat to Westminster or London Bridge may see and mark, they cannot learn much, and can digest less, but they can plainly see that they are approaching an extremely ill-proportioned structure, the like of which will not be found elsewhere on this earth, and they will on inquiry be informed that it emanated from Mr. Bazalgette and the Board of Works. If they are strangers they will wonder who is the former, and what manner of men are the latter. If they ask is Mr. Bazalgette an architect of eminence that he should be entrusted with the architectural decoration of this great work, what answer will they get? Do they seek to know something of the responsible Board, what will they learn? If they put these questions to an architect, or even an amateur of judgment, they will get an expression of pity for the one and contempt for the other. In Mr. Bazalgette's place most engineers would have done as he has done. Totally ignorant of architecture, and therefore undeterred by considerations which would fetter the merest tyro in the art, he has caused to be executed in the best and most durable material the very worst architecture to be seen in any public work of this or any other age. It is not too much to say that, as far as architectural design goes, of things purely architectural, such as balustrade with piers, handrail, parapet, ornamental arches, and the like, there is not a redeeming feature in this vast work. The material, granite of the best quality, has been misunderstood and misapplied. The parts, instead of being massive, almost without break, continuous and broad, and rounded at the angles below high water-mark like a dock, are small, broken up, treated like Bath stone and alike liable to inflict injury within and receive it from without. Fig. 2 shows the treatment of the centre of one of the bastions on each side of the arch, fig. 1, flanking the pontoon. Besides the unpardonable fault of having a pier in the centre of a bay or space, as in fig. 1, the manner in which the central portion is raised is clumsy beyond measure. Fig. 3 exhibits a section of the rail and a baluster to scale of ½in. to the foot. The outside, it will be perceived, varies from the inside, and is infinitely uglier. A cornice composed of a cymatium and two or three other members without a corona, is not architecture at all, still less is it design. The projection of the cymatium renders it singularly liable to injury from a drifting barge or even a grappling boathook. On the inside the

FIG. 3

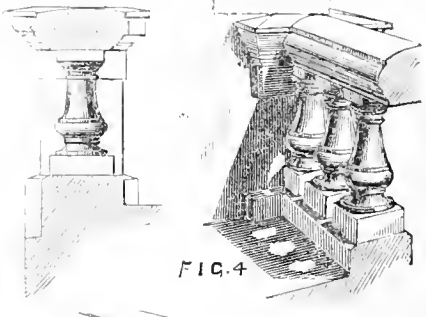


FIG. 4

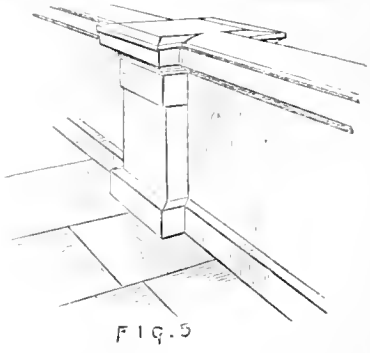


FIG. 5

projection is less, but it is full 5in. and forms a sharp and dangerous corner. The plinth likewise, which is as ill-proportioned as possible, being only 5½in. high, has 5in. projection into the footpath. Common sense, dealing with granite, would have made the balusters square, as they are to be seen in the terrace at Trafalgar-square; and common sense would have made the inside face of the parapet either perfectly plain without breaks, or with such slight ones as are in the same terrace. Common sense would have avoided excessive projections and undue delicacy of mouldings. The external portion of the rail, which is worked into a very bad species of *quasi* Gothic moulding, is ruinous to the effect as seen from the river. Had the rail been rounded on the inside there would have been reason for it, as being more comfortable to lean against, less liable to wanton injury, and incapable of hurting an incautious passenger. Of the baluster little need be said, it speaks for itself. The topmost member is 10in. square, and the lowermost 12in. This is quite sufficient to show the qualifications of the inventor. Fig. 4 is the balustrade within the arch, fig. 1. It is a fair represen-

tation. It will be seen that there is no half or quarter pier against the arch, and that the centre pier stands alone and unassisted in the centre. Its gratuitousness is forced on the beholder by every device. Comment on such rubbish is criticism thrown away. Fig. 5 represents one of the ordinary intermediate piers. It is 3ft. wide in the narrowest part. The plinth has a projection of 2¾in., with a height of 5½in. The effect may be imagined. The cornice, apart from its excessive projection, is as good as need be, plain and bold; the handrail is far from being bad. If both had been continued inside and out we should have been contented. At the Westminster end, where there is no imitation, or rather caricature, of Classic forms, the mouldings and general effect are better, but the jointing of the stone in the stairs from the bridge and the way in which the handrails run into the piers at top and bottom of the steps is the work of a carpenter accustomed to *mitre* his material. Treatises have been written on this very subject of jointing stone, the golden rule being never to cut a joint to less than a right angle. A comic artist who understood architecture as an art, not a trade, might amuse himself and others by spending an hour near Westminster Bridge, yet we doubt if he would amuse the reflective portion of the community. Illustrations of a great national work, which to those who have not seen it would certainly pass for caricatures, would not be productive of mirth to such as wish well to the cause of art and hoped we were in the midst of the much talked of revival. There are architects in London who would not have grudged to give Mr. Bazalgette, or the Metropolitan Board of Works perhaps, an hour or two of time and half a dozen words of advice, and even, if need be, a few rough sketches, to prevent the Thames Embankment from being irretrievably disfigured and the architectural profession irretrievably discouraged. It is no very difficult thing to measure the overflow of a drowned dam or estimate the outfall of a sewer, but architects rarely undertake these duties. There appears, however, to be no branch of architecture at which engineers fear to try their hands, and none in which they do not fail signally.

THE NEW LAW ON COMPENSATIONS.

In the new Regulation of Railways Act an alteration has been made as to the law of compensation for lands purchased or injuriously affected by railways, and which amendment, if adopted, will materially change the practice in "compensation cases." By the 41st section (31 and 32 Vic., cap. 119), it is declared that whenever, in the case of any lands, purchased or taken otherwise than by agreement, for the purpose of any public railway, any question of compensation in respect thereof, or any question of compensation in respect of lands injuriously affected by the execution of the works on any public railway, is, under the provisions of the Lands' Clauses Consolidation Act of 1845, to be settled by the verdict of a jury impanelled and summoned as in that act mentioned; the company or the party entitled to the compensation may at any time, before the issuing by the company to the sheriff, as by that act directed, apply to a judge of any one of the superior courts of common law at Westminster, who shall, if he think fit, make an order for trial of the question in one of the superior courts, upon such terms and in such manner as to him seem fit, and the question between the parties to be stated in the issue to be settled, in case of difference, by the judge or as he directs, and such issue may be entered for trial and tried accordingly in the same manner as an issue joined in an ordinary action, at such place as the judge directs, and the proceedings to be under the control of the court, as an ordinary action. Furthermore, it is provided that whenever a company is called upon or liable, under the act mentioned, to issue their warrant to the sheriff in the case of any disputed compensation, and the company obtains a judge's order, the obtaining of the same and notice thereof to the opposite party is to be a satisfaction of the company's duty in respect of the issue of the warrant. The verdict of the jury and the judgment of the court upon the issue, as regards costs, &c., to be entitled to the same effect as if the verdict had been obtained before the sheriff on a warrant issued by the company under the recited act. The provisions as to compensation cases have immediate operation.

THE SEWAGE OF GLASGOW.

The report by Messrs. Bateman and Bazalgette on the disposal of the sewage of Glasgow has been printed. The scheme which they recommend is the construction of a series of intercepting sewers emptying into a main conduit running to the Ayrshire coast, and the employment of the sewage for purposes of irrigation. They propose, where practicable, availing themselves of gravitation, and when that is impossible resorting to pumping. The time they estimate as necessary for the completion of the works is six years, and the gross cost, including preliminary and Parliamentary expenses, and the accumulation of interest during the construction of the works, they set down as £1,253,256; the annual charges they state at £3,550 for pumping, and £1,320 for the maintenance of the main conduit, &c. Besides this, the interest on the works at 4 per cent. will amount to £50,000, so that the annual charges, including interest, will be equal to a rate of 5½d. in the pound on the present rental, or 4½d. in the pound on the probable assessable value of property in the city by the time of the completion of the works. On the other hand, they estimate that at the very lowest the sewage ought to be worth £58,524 per annum for irrigational purposes, and are of opinion that, though this sum will scarcely be realised for it for some years, until agriculturists have learned the value of the fertiliser placed at their command, yet, "if a sufficient area of said land adjoining the coast be secured by the promoters, and the sewage applied for irrigation, a very considerable margin of profit will be left after paying interest on money invested in the farm and all working expenses."

Building Intelligence.

CHURCHES AND CHAPELS.

All Saints' Church, Falsgrave, Yorkshire, will shortly be consecrated. The edifice comprises nave, aisle, and chancel, and a tower and spire are to be added to the north-west front, and a chancel, aisle, and vestry at the south-east angle. When completed, the church will accommodate between 900 and 1,000 persons. The cost will be about £5,400. Mr. G. F. Bodley is the architect, and Mr. Barry, of Scarborough, the builder.

On Wednesday week a new Congregational Church at West Cliff was opened. The style is Early Geometric Gothic, and the cost is £4,000. Seats are provided for 950 persons. A tower and spire rise to a height of 120ft. Mr J. P. Pritchett, of Darlington, is the architect; Mr. Dongill, the clerk of works; and Mr. R. Robinson, of Whitby, the builder.

St. Andrew's Church, Montpellier, near Bristol, after having been closed for some time for the purpose of undergoing renovation, was reopened on Sunday last. In the interval a large sum has been expended in improving the interior of the edifice. The walls have been painted, and in prominent places a number of scriptural texts have been placed. The panels of the reredos are illuminated alternately with the Greek cross and the fleur-de-lis, the three centre panels being reserved for especial adornment. In the centre one is a large Greek cross, and on either side scriptural sentences, in brilliantly illuminated characters.

St. Andrew's Episcopal Chapel, Perth, was opened on Sunday. The chapel, which is in the Early English style of architecture, is of an oblong form, with the roof supported by open rafters, and contains sittings for about 400 persons. The interior of the chapel is plain.

The foundation stone of a place of worship has been laid in Dewsbury for the use of a body of revivalists who have no other name than the Dewsbury Glory Band.

The parish church of Oundle took fire early on Sunday morning, apparently spontaneously; and the fire was not got under until four of the bells in its fine peal were cracked.

On Saturday, the 15th instant, the new church of St Katherine, Stuttgardt, was consecrated by the Bishop of Honolulu, who has been the last week preaching for his mission at several places in Germany, and holding confirmations under a commission from the Bishop of London. The building itself is in Decorated Gothic, cruciform, with a spire rich in gilt ornamentation; it is 90 ft. in length from the west end to the vertex of the apse which forms the eastern end of the chancel. In the southern transept is placed the organ, while the northern one is used as a small chapel for daily service, and furnished accordingly. The reredos consists of three Gothic arches, each enclosing in sculpture a sacred subject—the northern one the Birth, the southern one the Baptism, and the central the Crucifixion. The floor of the chancel is paved with encaustic tiles, tastefully arranged, and the whole of its windows are stained glass.

Church building and restoration are progressing well in Worcestershire. At Hallow, two miles and a half from the city, a new church is being built, and may perhaps be ready for consecration by Christmas. The style is Decorated; the roof is steep-pitched, and stone-arched ribbed, and a handsome reredos is promised by Earl Beauchamp, the lay rector of the parish. There will be 450 sittings. About £4,000 has been raised for the new church which is being built near the railway station at Droitwich, but more money is wanted before the building can be consecrated. It is in the Decorated style and has about 300 free sittings. The Baroness Windsor generously defrays the cost of a chapel of ease at Webheath, in the parish of Tardebigge, near Bromsgrove. The chapel is in the Early English style, will have 200 free sittings, and consists of nave, chancel, vestry, and bell turret. September will see the opening of the new parish church at Churchill, near Kidderminster, erected by Mr. Hopkins, in place of the dilapidated old building of thirteenth century architecture. A district church is in course of erection at Blackheath, near Rowley, for the contiguous parts of Rowley, Hales Owen, and the Quinton. The style is Early English; there will be 847 free sittings; and the total cost of the building (which is to be endowed by the Ecclesiastical Commissioners) will be more than £6,000. Mr. Wilson, of Birmingham, is the builder. At Castle Morton, a chapelry to Longdon, near Tewksbury, a chapel of ease, in the Early English style, is to be begun next spring. It will be a plain parallelogram, with bell-cot at the west end and south-west porch, and 90 sittings. It is to cost £500; the present deficiency is only £150. Iccomb church (in a parish on the eastern borders of Worcestershire, now transferred to the diocese of Gloucester) is to be restored by Mr. Worcester. St. Andrew's Church, Worcester, is to be restored at a cost of £2,000. The cathedral restoration proceeds but slowly.

BUILDINGS.

New Roman Catholic schools are being erected at Wadhams Hill, Wolverhampton, from designs by Mr. E. Welby Pugin. The material used in the exterior is brick, with stone facings and string-courses. Mr. Heveningham is the builder. The cost is estimated at £1,215.

A new dock was opened at Boulogne, on Tuesday week. The dock was commenced in 1859. The basin for shipping is 17 acres in extent, with a quay wall frontage of 3,600ft. and a quay space of over 240,000 square feet. The cost has been £300,000.

The rector of West Toft (Rev. Mr. Sutton) has met the recent scarcity of water by digging a well in the village, and presenting it to his parishioners. Over the well a pretty pump-house is being built. It will be 20ft. high, and is to be surmounted by a cross. Three large Gothic windows will be the chief features of the structure, which is to be flint, with stone and white brick dressings.

New premises for the National Provincial Bank of England have just been completed at Southampton. The materials used are Corsham Down and Portland stone. Mr. J. Gibson, F.R.I.B.A., of Westminster, is the architect, and Messrs. Bull and Co., of Southampton, the contractors.

At Hurstpierpoint, Sussex, on the 14th inst., the foundation stone of new parish schools was laid by the Lord Bishop of the diocese. The schools comprise boys' and girls' school, class rooms, and infant school, with master's house attached. The contract price is £1,867. Mr. F. Hollands, of Hurstpierpoint, is the builder, and Messrs. Goulty and Gibbins, of London and Brighton, the architects.

Extensive and long-wanted alterations are shortly to be made in the Southwark Police-court, Blackman-street, Borough. The cells will be reconstructed the interior of the court altered considerably, and a new and commodious police station erected.

A new theatre will be opened at Croydon to-morrow (Saturday) evening. The plan is similar to that of the Holborn Amphitheatre, the stage being so arranged that it can be used for either operatic, dramatic, or hippodramatic entertainment.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—C. B. A.—W. S.—I. N.—I. M.—R. P. S.—A Student.—M. and T.—W. Brothers.—W. H. C.—R. and G.—A. and C.—B.—T. Dewsou.

Maxwell and Tuke, Bury.—Your letter and plans for workmen's cottages, will appear in a future number of the Building News.

Correspondence.

NATIONAL COMPETITION—SOUTH KENSINGTON.

To the Editor of the Building News.

Sir,—You have devoted considerable space to the description of the architectural designs submitted in competition for the Queen's medal, and now being exhibited at South Kensington; and I therefore think you will not be unwilling to publish a suggestion from one of the students who furnished a design. Would it not be much better and more satisfactory to competitors generally if the adjudicators were architects by profession, instead of being artists only who know little or nothing about architecture? As regards myself I have made up my mind never again to waste time in this competition, without some alteration is made in the persons selected as judges. My reasons for doing so are as follows:—I am an architect of good experience, and have gained some competitions, and for the South Kensington competition I prepared what I still believe to be a good design, and I am supported in this opinion by several other architects. In the same school of art in which I am a student, another design was prepared by a youth who has no knowledge of architecture, and his design was in every sense impracticable. Wooden gables were shown without any means of support; arches were numerous which had no means of abutment; and disproportion and eccentricity were the most noticeable characteristics of the design. However, to make it go down, I suppose, with the sagacious artists who were the judges, the design was filled in with all sorts of fiddle-de-de woodwork, as small as the chasing on the back of a watch, and generally speaking as impracticable as useless; and, to cap all, the angle of the building was shown supported on a light wooden roof. This latter design was honoured with a medal. My own has been returned without even receiving the honour of being exhibited at South Kensington. It will be obvious to all that, as an architect, I felt bound to be governed by the necessities of good construction, architectural appropriateness, convenience of arrangement, &c., and I could not (even if I would) have indulged in the unarchitectural nonsense with which my fellow competitor's design was filled. I would add that I am not urged by any ill-feeling in thus writing, but by a desire that these competitions should be conducted in such a way as shall ensure the best design receiving the greatest honours, which I am convinced will never be the case whilst artists with little or no architectural knowledge occupy the position of judges.—I am, &c.,

A Competitor.

BUILDING SOCIETIES.

Sir,—"Why pay rent?" "Why not pay a *little* more for a *few* years and the house becomes your own property?" We have all heard these questions pretty frequently, and an article on the subject in a recent number of the Building News induces me to ask for space for a few remarks.

Building societies, as a rule, profess to lend money at 5 per cent., and they do, in reality, nothing of the kind. I have had occasion to use them for and at the request of clients, and I know their methods pretty well.—You want (say) £1,000 for ten years—very well, 5 per cent. on £1,000 is £50, which multiplied by 10 is £500 interest, and this added to the principal, £1,000, is equal to £1,500. Now the societies are so kind as to allow you to pay off this £1,500 by annual instalments of £150. But £150 per annum for ten years is worth at the end of that period £1,886, and over. Hence you really pay 8½ per cent. instead of 5, or, assuming that the business of the society is large, and that these instalments are reinvested in the same manner, the rate of interest becomes usurious. I have now before me the prospectus of a company which has powers of borrowing from Government the amount of the subscribed capital at 4 per cent. interest; yet they adopt the same scale of repayment charges as the rest of the fraternity. They *could*, with the aid of entrance fees, fines, charges of 1s. for a two penny pass-book, &c., afford to lend at 5 per cent. as they propose. How is it they do not? The reason is plain—the last dividend was declared at the rate of 7½ per cent. Small chance, I think, of borrowing at 5 per cent. under these circumstances.

The public ought to be able to borrow on the security of houses and lands two-thirds of their market value for stated terms of years not exceeding (say) twelve, at 5 per cent. interest on the annual balances of the principal; and it is, I think, a fair question whether the Government could not safely and profitably employ the deposits in the Post Office Savings Banks to this very desirable end. Thousands would be benefited by the adoption of the system, and as the lending public are now content with 3½ for their deposits, there would be no risk in satisfying the borrowing public, who are willing to give good security and 5 per cent.

As matters at present stand it is really wiser to continue to pay rent to a landlord instead of half as much again for ten or twelve years to a society, for if you invest the annual difference it will accumulate to a sum sufficient to buy your house two or three years sooner than you could have done by the "aid" of the society.—I am, &c.,

E. Ingress Bell.

WALWORTH COMMON COMPETITION.

Sir,—As one of the unsuccessful competitors, and finding the guardians look with indifference at the reasonable request of the majority of competitors, I would beg your kind permission to put a few questions, to which I may possibly get a reply.

I am not going to enter upon the merits or demerits of either of the premiated plans (for here, I think, ample has already been said), but simply to join issue in condemnation of the choice made by the guardians (entirely stultifying their own printed instructions); and here let me inquire if it is correct that a large number of plans were thrown out, the competitors not complying with the instructions; also, whether the three best plans of the remaining portion, according to the guardians' opinion and judgment, and complying with their instructions, were made choice of, and in juxtaposition with other plans not in accordance to those instructions, but yet made choice of by the guardians. I am at a loss to know how a majority of the guardians should set aside and ignore their own instructions, and perform such an act of unfairness to those competitors who had so justly succeeded, had the guardians acted up to the spirit of their instructions. In confiding to their honour, the majority of the competitors had placed implicit confidence for an impartial decision, and spent nearly two months of their time. Would not the proper course have been, when so divided, to have considered the request of the competitors, and called to their aid a gentleman of standing in the profession, or have awarded the premiums to those who had complied with their instructions, and have refused others for noncompliance?

Trusting the guardians may yet see a way to do justice, or state the reason of adopting such a course.—I am, &c.,

Thos. Jewell,
Author of No. 9 plan.

WALTON AND WEST DERBY SEWERAGE—LIVERPOOL.

Sir,—Your notice of our examination of Mr. Rawlinson's report on the sewerage of Walton has called forth a letter, in which he says, "I am not going to argue the whole case over in public, but simply to state a few facts." Most of these facts—fictions, we think, would have been a more appropriate term—he neglects to mention, have already been placed by him before the Liverpool public. His statements we have shown to be quite fallacious, and it is clear to us that he has written a report which, among other shortcomings, displays, to take the most charitable view, great carelessness in dealing with the subject, combined with most serious topographical inaccuracies. Mr. Rawlinson may not believe this, but the weakness of his case is evident from the fact that he has not fairly met any one of the statements we have challenged him to disprove, except by reiterated assertions, which only confirm us in our suspicion that the views expressed by him were taken up hastily under influences not favourable to the delivery of an impartial verdict.

This is our view of the case, but we shall not ask your readers to believe it until we deal with the facts themselves, and then they can form their own opinion. We would gladly have confined our remarks solely to the engineering merits of the two schemes, but, as Mr. Rawlinson in one letter accuses us of "self interest dulling our perceptions," and imputes other motives in equally choice phrases, we cannot help this allusion to the whole transaction as it appears not only to us but to the members of the Walton Board.

We shall not attempt to vindicate our right to subject his report to legitimate criticism. Such would be absurd; though we can quite understand that one who has had all his own way for so long a time, as Mr. Rawlinson has, should, from his own point of view, consider any questioning of his infallibility extreme presumption—though how it can be construed into treating him with more than disrespect we know not. If Mr. Rawlinson had not written a letter to the *Liverpool Mercury*, in which, though it recoiled upon himself, the intention of crushing us once for all with abuse and sneers was not transparently evident, he would have had a better claim to consideration, though we cannot help, at the same time, congratulating him on the improved tone and temper of his later letters. We have no wish to trespass further on your space with mere personal matters, so are quite willing to let the subject drop.

Let us examine the first of his facts; indeed, it contains the theory upon which he bases his recommendation to waste sewage:—In his report he says, "A few places situate on large tidal rivers, such as the Mersey, or on the sea, where there is a deep water shore, may harmlessly waste sewage by draining direct to such waters."

This at once suggests the question whether the wasting of sewage by the Rimrose outlet will be of a harmless nature, and for an answer we have only to read a little further on that, "Bootle, Waterloo, Seaforth, Southport, and other places dependent on summer visitors, and situate on a flat shore left dry at low water, which shore is used for bathing, must consider their own specialities and prevent shore pollution."

The majority of your readers will perhaps be as ignorant of the situation of those places as Mr. Rawlinson evidently was of the outlet he recommended. Will it be believed that this very outlet will discharge at the boundary line dividing two of those places, viz., Bootle and Seaforth? He gives us the poison and suggests the antidote. The Waterloo and Seaforth Board have decided to act on his advice; they dislike "Cloaca Maximas" discharging on their shore, and have instructed their law clerk to oppose its construction. Under these circumstances, perhaps, it may be in the nature of a crime to waste sewage.

As Mr. Rawlinson has admitted in a letter to the *Liverpool Daily Post* that "if there had been no safe means for constructing a permanent relief outlet for surplus sewage when not wanted, I should have recommended tanks, engines, and irrigation, as designed by Messrs. Reade and Goodison," it will be unnecessary to support our plans as a scheme for sewage utilisation, and we may confine ourselves to the question of cost, to which the controversy is now narrowed. In his letter he says "I have recommended the Rimrose Bridge outlet as cheapest in first cost." Let us see how this agrees with his original report, where it is stated:—"This sewer may be comparatively costly to construct in the first instance, but it will give a permanent outlet for sewage," and also it will, "like the Cloaca Maxima at Rome, endure. Costly, comparatively, to what? There is but one answer, for of the four sea outlets brought under his notice by the chairman of the West Derby Board, we have Mr. Rawlinson's authority for saying it is the cheapest; therefore, as our outlet is the only other left for comparison, can he seriously say "that he recommended the Rimrose outlet as cheapest in first cost?"

This is a very fair specimen of the forgetfulness of former language which appears so characteristic of him. If Mr. Rawlinson will only do us the favour to read our report, which we have before frequently recommended him to do, he will there find that, as estimated by the chairman of the West Derby Board, whom Mr. Rawlinson is quite right in describing as an eminent contractor, the combined sea outlet will cost £35,000, while our outlet, tanks, engines, and laying out 150 acres as a sewage farm, will cost but £16,120 11s. 6d., thus showing a saving of £18,579 8s. 6d. in first cost in favour of utilisation. We have before challenged Mr. Rawlinson to prove our estimates fallacious; we repeat the challenge, and if he requires it will go to the expense of getting a competent surveyor to check the estimates. In the face of these facts, his assertion is injudicious, not to say foolish.

In describing our plans his letter says: "Part of the area of Walton is to be sewered by pumping, and the entire sewage is to be dealt with partly in depositing tanks and partly in irrigation." Though we have his authority for saying that our plans would have been recommended by him had not the tidal River Mersey been so convenient, and its populous shores so close at hand, we are afraid that the above quotation shows such a confusion of mind as to what our plans really are that he would have recommended them from a false conception of their nature. None of the area of Walton is to be sewered by pumping, and all the sewage, except during storms, when it will partly flow into the River Alt, at a time when no damage can be done, will be dealt with by irrigation. Walton, we may inform him, does not, as Butler describes Holland, "draw 50ft. of water," and its drainage will flow by our route down the natural valley line without the aid of pumping. The pumps are merely for lifting the sewage on to the land for utilisation purposes.

Regarding the choice of land the letter says: "Liverpool is growing at so rapid a rate that no man can predict how far the suburbs may extend, or the prices land may rise to

for villa purposes, and sewage farming beyond a township boundary will not in most cases be desirable." True, no man can predict what may take place, nor can he predict of any place in England that a town may not spring up in the middle of what is now a rural district, but are we to be debarred from carrying out sanitary works on that account? If so, the whole of the transactions of this changeable world ought to be stopped until we are assured that all is permanent. Let him, however, make his mind easy on this score. We have known Liverpool for six and thirty years, and we can assure him that villa building at Kirkby, in the neighbourhood of the proposed pumping station, is, in the language of brother Sam, "a contingency not at present on the cards," and below the pumping station and between it and the sea there are thousands of acres of suitable agricultural land available. Perhaps he will inform us more clearly why "sewage farming beyond a township boundary will not in most cases be desirable." A little light thrown upon that point would be valuable.

If we show a little levity we must be excused; we find it difficult to look at such statements seriously. Perhaps, after all, he is only joking.

Mr. Rawlinson is very fond of the interrogative form of composition. Taking his cue, we ask him, as a business man, who was to treat for a sewage farm before either board had decided upon adopting utilisation? In former times Mr. Rawlinson had pronounced strongly in favour of utilisation as a principle, now he puts it on more mercenary grounds. He says: "The value of a thing is just whatever it will bring," and solemnly, "if it saves money to waste sewage, then, according to the laws of political economy, wasted it must be."

It appears to us most incomprehensible that any man of knowledge should recommend the wasting of sewage on to the shores of a thickly populated neighbourhood, and yet be so tender about the slightest overflow under any circumstances into the River Alt, along whose course, from the proposed outlet to the sea, there is scarcely a single habitation, whose waters are not used for drinking purposes, and are at present dreadfully polluted with sewage; yet below Walton no complaints are heard of. It has been proved over and over again that if the dry weather flow of sewage is provided for, the stream may safely be left to take care of itself. No injunctions need be apprehended under such circumstances, and still less if the dry weather flow, diluted with twice its volume of water, is provided for by pumping on to lower land, as in our scheme.

In another part of his letter he informs us, "Messrs. Reade and Goodison have so read up this sewage utilisation question (and it has simply been reading) that they will take no other view." It is not pleasant to deal so in repetition, but if Mr. Rawlinson will only read our report he will find that the information has been gained principally by inspection of some of the principal sewage works and inquiry on the spot, and our knowledge of main sewers has not been gained in a back parlour, but by the carrying out of actual works. In addition, we have had the advice of practical authorities on sewage farming,—agricultural advice which Mr. Rawlinson expressly states in his evidence before the Commission on the Sewage of the Metropolis he is incapable of giving.

There are many other minor statements contained in his letter which cannot boast of greater accuracy than attaches to these already mentioned, but we need not notice them. A great point is, however, made of there having been three engineers to the West Derby scheme, viz., the local surveyor, the chairman of the West Derby Board, and the late Mr. William Stubbs—"Nil nisi bonum de mortuis." None have a greater regard for his memory than ourselves, but, as a matter of fact, having at his death purchased all his plans and added his business to our own, we have made diligent search for the evidences of his having made "main sewerage a study;" we can find no plans or documents bearing on the subject, so that if he did make it a study it was done at home. One of us was his fellow pupil; he was a versatile genius, and we have the highest admiration of his talents, but the evidence of the study of main sewerage is wanting.

If the chairman of the local board was so intimately connected with the engineering of the sea outlet no wonder he clings so to his own scheme, and, perhaps, Mr. Rawlinson's faith in him may have had some influence on Mr. Rawlinson's mind. Mark, we do not say it had (perhaps it had), but is it kind to bring up a man, as poor Stubbs is brought up, as witness on his own behalf that the scheme he prepared four years ago is cheaper than one the plans of which were not made until two years after his death?

There may be a difference of opinion with regard to the advisability of having a railway contractor who also dabbles in engineering as chairman of a board; we express no opinion ourselves, but have heard others say that it is likely to lead to many evils, for we all know how men on a local board, or elsewhere, especially if they possess energy and determination, with a smattering of special knowlege, are the great stumbling blocks to professional men, such as Mr. Rawlinson, carrying out an enlightened policy; they are surrounded with a dense armour which none can penetrate. We are sure all professional readers will appreciate that fact, "Ne sutor ultra crepidam." Let not Mr. Rawlinson grow indignant over these remarks; we merely state well known truths, of course knowing that there are always exceptions to them, and let us hope his friend is one.

We have now done until Mr. Rawlinson reappears in some other paper (he has been in three already), and we leave your readers to judge whether we have been justified in calling Mr. Rawlinson's report in question. Anyone who wants further information on the subject may have a printed copy of his report on application to us. We wish to do Mr. Rawlinson justice, both in text and context, for beforetimes he has complained that we have confined ourselves to the text. Let us assure him, however, that we are not at all disappointed at his report. We have been in business long enough to be prepared for such contingencies.

But one more correction requires to be made. It was the Walton Board that submitted our plans to him for very excellent reasons, which we quite approve of; firstly, because they, as most boards do under similar circumstances, required another professional opinion, and Mr. Rawlinson appeared to be one of the foremost men to whom they could apply, and, secondly, knowing his intimate relationship with the West Derby Board, they were aware that under any circumstances their plans would come before him. They thought they might as well come before him first as last, for without his approval there was little chance of an amicable arrangement being made with the West Derby Board. We are extremely sorry to make these remarks, but, unfortunately, the Walton Board does not, any more than ourselves, feel confidence in his opinion, and we may be pardoned if we think for this he has, through his erratic conduct, principally himself to blame.

We apologise for so trespassing on your space, but assertions made in a line may take a column to refute them, and, in order to give you an opportunity of judging who it is that deals in abuse, we enclose copies of the former correspondence, which you are at liberty to make any use of you may think proper.—We are, &c.,

READE AND GOODISON.

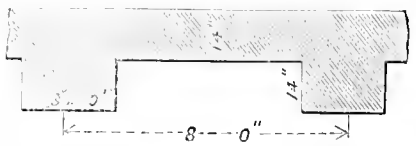
August 18.

Intercommunication.

QUESTIONS.

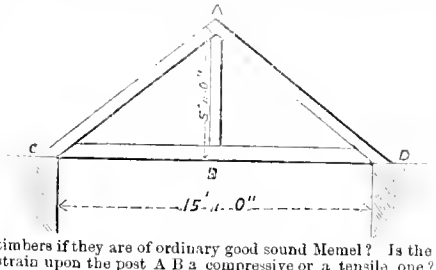
[985.]—PUDDLING ARCHES.—Could any of your numerous correspondents tell me the reason of the puddle lining laid on arches getting cracked and becoming quite full of fissures? What is the remedy for it, as in this state it lets the water through very readily?—T. P.

[986.]—WALL BUILDING.—I have a contract for building 400ft. of wall up a steep incline of about 1 in 10. The wall is to be in plan as shown in the figure. What is the cheapest way to build it so as to have a constant height above ground, and the least amount of material? Would



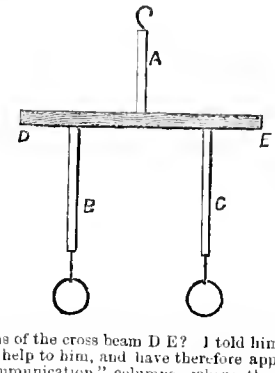
it not be the best plan to bind it in the line of the slope, and have the top nearly parallel with surface of the ground? or would it be better to build it with steps? I should like to get an elevation from some of your correspondents before starting the job.—CONTRACTOR.

[987.]—TRUSS.—In the truss shown in the annexed cut, what is the strain upon each of the timbers supposing the total weight distributed over each of the rafters A C, A D, to be one ton? and what ought to be the scantlings of the



timbers if they are of ordinary good sound Memel? Is the strain upon the post A B a compressive or a tensile one? as I cannot come to a satisfactory decision myself about it.—A BEGINNER.

[988.]—GYMNASTIC ARRANGEMENT.—A friend of mine is putting up a gymnastic arrangement of the description shown in the drawing. The cross beam D E is of wood, and the rods of iron. He wishes to know what ought to be the diameter of the rods A, B, and C; and the



dimensions of the cross beam D E? I told him I could not be of any help to him, and have therefore applied to your "Intercommunication" columns, where these questions are generally discussed and practically answered.—A COUNTRY SUBSCRIBER.

[989.]—MAGNETISM.—Allow me to ask, through the medium of "Intercommunication," which is the best way of imparting temporary magnetism to soft iron without having recourse to electricity? As I have no electrical machine or galvanic battery I could not avail myself of those means which are sometimes used, I believe.—GALVANISM.

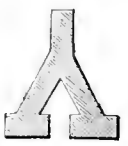
[990.]—PRESERVING TIMBER.—What is the best way of preserving timber from rot in wet situations; and is it possible to buy any ready prepared for such purposes; or must it be sent, by the load or otherwise, to a manufacturer to properly prepare it?—S. T. L.

[991.]—STEAM POWER FOR SAWMILL.—I have a carpenter's shop, which is contiguous to a mill, from which I am about to have power to run a circular saw. Can any of your readers give me any information as to the proper price to be paid for the accommodation? Is there a scale of charges according to size of saw, or any other rule?—SAWDUST.

[992.]—HIGH PITCHED ROOF TRUSS.—Would "Provincial" kindly inform me where I can procure Mr R. Norman Shaw's Book Views, &c.; also the price? And would some correspondent kindly tell me the proper way to brace a high pitched roof truss, say as per sketch?—YORKSHIRE STUDENT.

[993.]—STUDENT'S GUIDE.—In an answer to 466 in your impression of August 16, 1867, an "Apprentice" recommends a book—"Student's Guide for Measuring and Estimating Artificer's Work." I should be very glad to know where it is published, and the cost of it.—G. N., Brixton.

[994.]—LOAD ON CAST-IRON SKEWBACK GIRDERS.—Can any of your readers furnish me with a for-



mula for ascertaining the safe load on cast-iron skewback girders of this section; and what is the most favourable mode of disposing the metal?—URGENT.

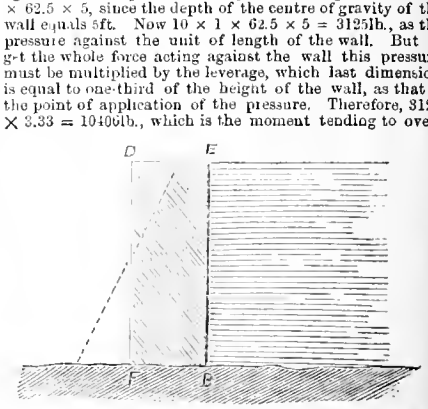
[995.]—THE LONDON ARCHITECTURAL ASSOCIATION.—How is it that the London Architectural Association is idle during the summer months? Meanwhile, I am constantly reading of the doings of provincial associations.—LOOKER ON.

[996.]—COMPLETE SET OF BUILDING NEWS WANTED.—Can any subscriber sell me a complete set of BUILDING NEWS from issue? If so, will they name the price?—B. J. A.

[997.]—IRON IN IRON ORE.—May I trouble you, or any of your readers, to inform me in detail how to ascertain the amount of iron in iron ore?—IRON.

REPLIES.

[961.]—RETAINING WALLS.—As X + Y expressed himself indebted to me for the solution I gave him respecting his problem of finding the centre of gravity of a semi arch, I will endeavour to satisfy him regarding the thickness necessary for retaining walls. The simplest way to proceed will be to assume the wall to be rectangular, find its thickness upon that assumption, and then give it the ordinary batter. In the figure, let D E B F be a rectangular retaining wall 10ft. in height; let the weight of a cubic foot of water be taken equal to 62·5lb; then the pressure against the wall per foot in length will be equal to $10 \times 1 \times 62.5 \times 5$, since the depth of the centre of gravity of the wall equals 5ft. Now $10 \times 1 \times 62.5 \times 5 = 3125$lb., as the pressure against the unit of length of the wall. But to get the whole force acting against the wall this pressure must be multiplied by the leverage, which last dimension is equal to one-third of the height of the wall, as that is the point of application of the pressure. Therefore, $3125 \times 3.33 = 10406$lb., which is the moment tending to over-



turn the wall. To resist this force, a certain weight of wall must be necessary, and since the length and height are known all that is wanted is the thickness. The wall is supposed to turn about the point F, and the leverage with which it will resist the overturning is the distance from this point to the centre of gravity of the wall, equal in this case to half the thickness. Putting W for the weight of a cubic foot of water, W^1 for that of the wall, H for the height, and T for the thickness, we have

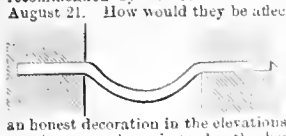
$W^1 \times H \times T \times \frac{T}{2} = W \times H \times \frac{H}{2} \times \frac{H}{3}$, and reducing for T

we obtain $\frac{W^1 \times H \times T^2}{2} = \frac{W \times H^3}{6}$, and solving for T

we finally find $T = \sqrt{\frac{W \times H^2}{3\,W^1}}$. Substituting the values given in the example, and making $W^1 = 112$lb., the average weight of a cube foot of wall, the value of T is 4.33ft., or 4ft. 4in. This may be regarded as a mean thickness, so that if the wall be battered at the usual batter of 1 in 8 or 1 in 10 the thickness at top and bottom will be determined, as shown in the figure, by the strong dotted line. I omit all consideration of such a case when the *back* of the walls batter, as I never heard, saw, or read of such an instance.—Q. E. F.

[973.]—MEASURING GARDEN WALLS.—There does not appear to be any difficulty in arriving at the true contents of the wall described by your correspondent G. S. E. Let him take the footings first, and the neat work afterwards, and reduce the quantities to the standard rod measurement. There would be no extra for simply striking the joints, as it is done while the work is being carried up. In every case the true contents should always be ascertained, and there can be no impartiality to either party. If it is necessary or politic to make any "allowance" to the builder, let it be always done as an extra, and not under the idea that there is more work done than what is really accomplished.—ARBITRATOR.

[978.]—HOLLOW WALLS.—I see that hollow walls are recommended by "J. M. W." in the BUILDING NEWS of August 21. How would they be affected by the Metropolitan Building Act?



Some glazed headers are sold, I believe, for such walls, and are of extra length. Might not these form an honest decoration in the elevations? The common custom in some places is to dip the headers in coal tar. A more usual plan is that of using little wrought iron cramps, about 4in. long, with a slight curvature in the centre, to prevent the transmission of damp from wall to wall. Whatever these may be in execution, they appear miserably inefficient as bonders.—COTTAGE BUILDER.

[978.]—My advice to "W. B. T." would be, as he cannot use iron ties or cramps, to employ stone headers if his walls are more than 9in. in thickness, and he could not use brick bond. Or he might put in some ties of odd chocks of creosoted timber, which would bond the walls very well. As cheapness is his great requisite, he might get one or two old creosoted sleepers and cut them up.—L. P.

[984.]—FISH PONDS.—"Francis R. Capon" is recommended to read Article 3 on the Use of Asphalte in Construction in BUILDING NEWS of June 12 last. Fig. 1 in section would seem to meet his case.—E.

BUILDING AND LAND SOCIETIES.

THE accounts of the Kidderminster Permanent Benefit Building and Investment Society for the year ending July 31 last have just been issued. The present value of shares is stated to be £5,131 12s. 5d., and the profits of the year £490 12s. 4d. The working expenses are very moderate. The value of mortgages is stated at £5,383 14s.; subscriptions, fines, &c., due, £28 3s. 8d.; balance in banker's hands, £713 11s. 2d.

The seventeenth annual meeting of the Wellington, Dawley, Ketley, and Shropshire Building Society was recently held. From the report it appeared that business had largely increased during the past year. The share subscriptions received amount to £1,490 15s.; repayments and mortgage redemption moneys from borrowing members, £2,156 10s. 10d.; deposits with the society, £2,034 1s. 6d.; and the sum of £3,415 2s. 10d. has been advanced to members on approved mortgage securities. The whole receipts during the year have been £7,247 2s. 6d., and, during the seventeen years of the society's operations, £55,478 11s. The report and financial statement were unanimously adopted, and the officers for the ensuing year elected.

Some conferences have recently been held in Bradford of working men and others, to consider the feasibility of enabling cottage occupiers to acquire possession by co-operation of their dwellings, and thus to become their own landlords. At a meeting held on the 29th of July, it was resolved "That it is desirable to provide to workmen of limited means facilities for the acquisition of dwelling-houses, and to accomplish this object by means of a joint-stock association." On Monday evening an adjourned meeting was held in the lecture room of the Working Men's Club, to consider a scheme that had been drawn up by a provisional committee. The gist of the scheme was that a society should be formed, which should buy blocks of eligible cottage property and sell the houses separately to working men on easy terms; requiring not more than 10 per cent. of the purchase money to be paid down at the time of purchase, and the rest to be paid weekly instead of rent during a term of twelve or four years, at the end of which term the house would become the absolute property of the occupant. Mr. Nichols, secretary *pro tem.*, pointed out the disadvantages under which the occupiers of the lower classes of houses laboured as compared with the tenants of better class dwellings, and entered at considerable length into detail as to the working of the proposed society. A discussion ensued, and, finally, a fresh committee of nine persons was appointed to consider the question, examine the rules of societies similar to the one proposed, and report to a future meeting.

The report of the Improved Industrial Dwellings Company (Limited) to be submitted to the shareholders at the meeting on Friday (to day) states:—In addition to the £50,000 in £100 shares already allotted, £43,250 has been subscribed in 1,25 shares, making the total subscribed capital £ 3,250. The rental received during the half year has been about the usual average in the cases of all the properties except at Wapping, where there have been a few more empty tenements than formerly; and at Greenwich, where, owing mainly to the depressing stagnation of almost every branch of industry during the last two years, there has been a very large deficiency in the amount of rental received. With the revival of trade, however, the dwellings are steadily being tenanted, and the directors have undiminished confidence in the ultimate profit to be derived from the investment. The dwellings have been named "Nelson Buildings." The whole of the buildings at the Britannia street estate are now completed and occupied. They have been named "Derby Buildings." The estate at Bethnal Green has been in the company's possession since Lady day. At present the directors propose to confine their operations here to the erection of a comparatively few houses on plans which have been drawn up to meet the requirements of such a neighbourhood, where there is little or no call for lofty structures. Negociations are pending with the Marquis of Westminster for a lease of a valuable site in Ebury street, Pimlico, upon which five blocks of buildings are to be erected. The directors will be glad to be able to congratulate the shareholders upon the placing of some of the company's property in so good a situation at the West end of London. A further sum of about £40,500 will be required to complete the purchases and contracts to which the company is committed at this date. The second advance of £3,000 towards a loan of £6,000 by the Public Works Loan Commissioners has been received by the company, and the payments of principal and interest have been commenced in accordance with the terms of the Act of Parliament. The charges incidental to obtaining the loan, however, have amounted to £135 19s. 5d., and if the costs of raising future loans are to be proportionately high, the value of the process will be seriously impaired. It is hoped, however, that upon loans of larger amount the costs may be comparatively reduced. The directors propose to debit these costs to a suspense account to be gradually worked off by crediting thereto the first profits arising from the investment of the loans. The directors propose that the usual dividend, at the rate of 5 per cent per annum, shall be declared payable out of this sum, which will amount to about £1,824 1s. 5d., and that the balance of £526 10s. 9d be carried forward. The properties belonging to the company at present completed and occupied are as follows:—Cobden buildings, King's Cross road, 20 tenements; Nelson buildings, Bridge street, Greenwich, 40 tenements; Tower buildings, Brewhouse lane, High-street, Wapping, 60 tenements; Stanley-buildings, Old St Pancras-road, King's Cross, 104 tenements; Palmerston-buildings, City Garden row, City road, 72 tenements; Cromwell buildings, Red Cross-street, Southwark, 24 tenements; Derby-buildings, Britannia street and Wicklow street, King's Cross road, 168 tenements total, 488 tenements in occupation. Buildings in course of erection at Willow street, and at the Bethnal Green Estate, to be completed this year, 190 tenements—total, 678 tenements. The Ebury street site will accommodate about 100 more families, so that the total number of tenements built and projected by the company at this date is about 778. These will afford decent comfortable homes to about as many separate families, or to 3,890 persons, reckoning five to each family.

WAGES MOVEMENT.

THE bricklayers' labourers at Leeds, who struck work about three weeks since in resistance to an attempt made by the masters to reduce their wages from 4½d. to 4¼d. per hour, have agreed to accept the services of Mr S. James Wheelhouse, barrister. Mr. Wheelhouse directed that, pending his final decision, the men should resume work on Monday morning last at the rate of 4½d per hour.

The strike in the wrought nail trade of East Worcestershire continues with considerable determination, neither men nor masters showing the slightest disposition to yield. The number of men on strike is scarcely so great as estimated a fortnight since, owing to the fact that in the neighbourhood of Lye Waste several factors have contracts to complete under a penalty within a given time, and in these cases they have been obliged to employ men at the advanced rate. On the completion of these contracts, however, it is understood that the reduced scale will be adopted in these as in other establishments.

The strike in the joiner trade at Dumfries has been satisfactorily got over by a compromise between the masters and men, it having been agreed that the latter should receive an advance of ¼d. per hour from now till March, when a further advance of ¼d. would take place. The strike has only lasted a week.

STATUES, MEMORIALS, ETC.

THE statue of the Duke of Cumberland, in Cavendish-square, which is in a dilapidated condition, is about to be re cast at the cost of the Duke of Portland.

A memorial portrait has been presented by the working men of Durham to Dr. Waddington, the Dean of that town, principally in acknowledgment of his great liberality to the funds of the County Hospital. The artist was Mr. Clement Burlison, of Durham, and the large frame was carved by Mr. Peter Gradon, of the same place.

On Saturday afternoon a meeting was held at Carlisle of the subscribers to the Earl of Carlisle testimonial fund, for the purpose of determining what form the testimonial should take. The following resolution was adopted:—"That a statue be erected to the memory of the late Earl of Carlisle, that Mr. Foley, R.A., be engaged as sculptor, and that the said statue should be erected on the Mont at Brompton." The statue will be either in bronze on a stone pedestal, or of Sicilian stone. The cost, independent of the pedestal, will be £650; and the committee have now £700 in hand.

The Leigh Hunt Memorial, projected by Mr. S. C. Hall, about three years ago, to the *Art Journal*, is now in a fair road to completion. Mr. Joseph Durham, A.R.A., is the sculptor, and the memorial will be a bust and pedestal over Leigh Hunt's grave at Kensal-green Cemetery. The hon. secretaries are Messrs S. C. Hall and Edmund Oliver, and the hon. treasurer is Mr. R. Townshend Mayer, of 25 Norfork-street, Strand, W.C., by whom subscriptions will be thankfully received.

LEGAL INTELLIGENCE.

ON Friday last, at the Portsmouth Police Court, Mr. Thomas Backhurst, builder, Church-street, Landport, was summoned for having commenced building fifteen houses without complying with the byelaws of the Local Board. A fine of £5 and costs was inflicted. Mr Edward Farminer was summoned for a like offence, and the same fine was inflicted.

NUISANCE BY A BOARD OF HEALTH.—SCARISBRICK *v.* THE ORMSKIRK LOCAL BOARD OF HEALTH.—In this case, tried at the Nisi Prius Court, Liverpool, which was an action brought by Lady Ann Scarisbrick, the owner of extensive estates in the neighbourhood of Orm-kirk, to recover damages from the defendants for causing a nuisance by polluting a stream running through a portion of the plaintiff's property, and communicating with the lake in Scarisbrick Park, a verdict was taken by consent for the plaintiff, damages £1,000, to be reduced to 40s. on the abatement of the nuisance complained of. Mr. Manisty, Q.C., Mr. Holker, Q.C., and Mr. Charles Russell were counsel for the plaintiff, and Mr. Quain, Q.C., Mr Pope, and Mr. Wheeler had been instructed for the defence.

TRADE UNIONISM.—At the Salford sessions, Sylvester Greenhalgh, bricklayers' labourer, was indicted for stealing a spade, the property of Charles Lawrence. The prisoner had been employed upon a building at Oldham, and when he left he took with him a spade belonging to the prosecutor. It transpired that the prisoner was a non society man, and that he was driven from his work because he did not join the society. He sold the spade to a person named Partington, and when he was arrested said he should never deny having taken it, but that he would not have done so if the other men had not smashed his hod. One of the witnesses said it was true that the prisoner was compelled to leave the job because he would not join the society.—The Chairman: True liberty! I suppose if a man is not a member of your society, and comes to work with you, you don't treat him well? Witness: We give him every chance.—The Chairman: But you make it so hot for him if he does not join that he has to go and seek his living as he can? Witness: Of course.—The Chairman: And in addition to that, do you sometimes break his tools and injure him in that way? Witness: No; there were no tools broken in this case.—Mr. Watson in defending the prisoner, said the case seemed to have been pressed against him by the union men.—The jury acquitted the prisoner.

Our Office Table.

A prize of £25 is offered by Mr. W. R. Lloyd for a paper containing the best and most feasible plan for the temporary employment of operatives in casual distress. The paper is to be read at the forthcoming Social Science Congres at Birmingham. The prize will be adjudged by the council of the Social Science Association. Competitors must send in their papers to the secretary of the association, 1, Adam-street, Adelphi, on or before September 21.

M. Lameire's drawings, which formed a portion of the Architectural Exhibition this season, and which attracted so much attention, are now on view at the South Kensington Museum, in the Educational Department.

There are twenty-two alabaster quarries at and near Volterra, which yield annually about 500 tons of alabaster.

It has been decided that there shall be an exhibition next year of the industries peculiar to South Staffordshire and the East Worcestershire districts and of the works of art and *vertu* to be found therein. The exhibition is to be held at Wolverhampton, and is to be open from May to September.

On Saturday afternoon Mr. Clabrough, manager of the Bristol City Hotel Works, was presented by the men under him, as a mark of esteem, with a silver watch and gold chain, and a purse containing ten guineas. A dinner was held at the St. John's Porter-house, Stonebridge, at which a large number of the men attended. Mr. Ponsford, who presided, in proposing the health of Mr. Clabrough, expressed his pleasure that the feeling of antagonism which at one time existed between employers and employed was dying out, and that a new state of things was fast coming into existence.

A terrible fire has raged for some days in the forests near St. Aymer, Canada, and has finally reached the town, consuming the station and other buildings of the Northern Railway, and eleven dwelling-houses. The losses to the Dominion by fires in the woods this year have been enormous. All of the heavy timber lands have suffered in greater or less degree.

Shortly after seven o'clock on Tuesday morning the party walls of a house in Golden-square, London, fell with a heavy crash, leaving the interiors of the whole of the rooms and the inmates, some of whom were in bed, exposed. Fortunately the occupants of the different rooms sustained no bodily injury.

It is stated that the origin of Messrs. Sillar and Wagner's patent for purifying town sewage is very peculiar. One of the partners had been studying the Book of Leviticus, and came to the conclusion that "the ashes of an heifer"—that is animal charcoal—"and blood poured out upon the ground" (blood and clay mixed with other ingredients) would make a good purifier. This originated a series of experiments, which culminated in the late public trials at Tottenham and Leicester.

The Amsterdam exhibition of the works of art of all nations is announced to open on the 27th of September, and the works to be exhibited are to be sent in before the end of the present month. All communications to be made to the Commission of the Exhibition, at the Academy of the Beaux Arts, Amsterdam. There is one clause in the regulations which deserves notice; it is to the effect that no work can be received except from the producer, or accompanied by his consent in writing.

The British Association, which has met this year at Norwich, has chosen Exeter for its place of meeting for 1869.

Mr. Robert Platt, cotton spinner, Stalybridge, has undertaken to erect public baths for Stalybridge, at his own cost. They will involve a cost of several thousand pounds.

The Metropolitan Board of Works have offered to bear half the expense of widening King-court, Borough.

Specifications and drawings have been prepared for the erection of new fire engine stations in the following localities:—Peckham-road, Camberwell; South Parade, Chelsea; West India Dock road, Poplar; Essex-road, Islington; Adelaide-road, St. John's-wood; Bow-road; Charlotte-street, Marylebone; Evelyn-street, Deptford; Clapham Common; Driffield-street, Bow-road; Southwark-street; Bushey-green; Lewisham; St. Thomas-road, Old Kent-road; and Percy-cross, Fulham.

A contemporary states that for some reason best known to themselves the gas company have refused to light the lamps on the handsome new obelisk, erected on the site of Middle-row, Holborn, unless the gas be paid for by meter, and a special fee be paid for lighting and cleaning. The Holborn Board of Works had therefore to go to the expense of a meter, and to employ a man at 5s. a week or £13 per annum—no trifling item.

The "Musical Standard" comments severely on the rumoured removal of the organ of St. Stephen's Church, Walbrook, from its present position in the apsidal recess over the western entrance, downstairs. Our contemporary believes that, if this be effected, the beautiful case of the organ must be sacrificed, and the beautiful interior of St. Stephen's Church will materially suffer.

"All those valuable panoramas, pictures, works of art, and fittings" which once formed the stock-in-trade of the Colosseum, are for sale. "London by day," "Paris by night," "The real waterfall," "The Stalactite cave," and "The Earthquake of Lisbon" are all ticketed in lots, and will shortly pass away (if a purchaser be found) from the rather sensational exhibition which delighted the childhood of the present generation.

Considerable progress has recently been made (owing to renewed energy having been manifested in the prosecution of the works) in the construction of the Holborn Valley viaduct, and it is now thought that the whole will be completed and opened early in the spring. On Wednesday, several spacious houses, warehouses, and other premises, situated in Snow-hill and Farringdon-street, were disposed of by auction in order that the ground may be promptly cleared for the purposes of this great improvement.

The tension or strain of a fiddle string, or the proper tone of a piano, is ascertained with a piece of steel, called a tuning-fork. Mr. W. Airy, son of the well-known mathematician, has inversed this fact to the application of ascertaining the tension of a steel or iron rod by a musical note struck upon a string. In this way he has shown that he can define the strength or bearing power of rods used in the construction of bridges.

The Birmingham Architectural Society having determined upon an annual visit to some place of interest to the profession, made on Tuesday week its first excursion, the place chosen being Oxford. Several architects of the latter city made arrangements to receive their Birmingham brethren, and, accompanying the party, greatly assisted by able and interesting descriptions of the buildings visited.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3430.—J. H. Wilson. Improvements applicable to water-closets and pumps connected therewith, which latter improvements are applicable to lift pumps generally. Dated December 3, 1867.

The patentee claims, first, constructing closet pans or basins of glass. Second, forming the same at the lower end with a shank or hollow faucet, having a lateral opening or aperture therein for discharging the contents thereof, substantially for the purpose and in the manner described and set forth. Third, turning the closet pan on its vertical axis for discharging its contents, substantially for the purpose and in the manner described and set forth. Fourth, constructing closet pans so that they may be removed or lifted from their seats, substantially for the purpose and in the manner described and set forth. Fifth, forming the rotating pan neck or seat of the rotating pan with recesses to receive tallow or other lubricating material. Lastly, the general arrangement and combination of the several parts described and set forth as applied to ships and other water closets.—Patent completed.

3457. W. A. Herring. Improvements in apparatus for warming buildings in which high pressure steam engines are employed. Dated December 4, 1867.

Here the patentee causes the exhaust steam from the engine to pass a coil of pipe of such diameter that the back pressure on the engine may be insignificant. This coil he encloses in a cistern or close tank with which pipes for warming the building are connected. The outlet pipe passes away from the top of the cistern or tank, then circulates through the rooms or buildings to be warmed, in the ordinary way of a hot water apparatus, and afterwards the pipe returns the same water in a comparatively cold state to the bottom of the cistern or tank. This water remains in the cistern or tank until it again becomes hot, and then it again circulates through the pipes of the hot water apparatus. In this way the rooms or buildings are warmed without other fuel than that necessary to keep the high pressure steam engine at work, and at the same time an economy of water is effected, which sometimes is of importance, the exhaust steam from the engine being condensed into a pure water which is returned into the boiler.—Patent completed

3487 J. Partington. Certain improvements in the method of heating buildings, and in the apparatus connected therewith. Dated December 7, 1867.

This invention consists in the use and application of an air chamber or vessel or vessels situated behind the fire, so as to form the back of the grate in cellars, kitchens, or other suitable positions. The chamber may be of any convenient form and made of metal, brick, fireclay, or combinations thereof, and from below it is supplied with cold air by means of a pipe and regulating valve, and on the air becoming heated by the action of the fire it ascends up a pipe applied to the upper part of the chamber, which extends up the chimney, and is carried into the various rooms at different heights by branch pipes, which may be opened to allow the hot air to escape into the room, or the heat may be obtained by radiation only.—Patent abandoned.

3486 W. H. Cooke. Certain improvements in springs to be applied to doors, and for similar purposes. Dated December 9, 1867.

This invention consists in applying to one end of the ordinary rod or wire a small wheel, the periphery being slotted, drilled, or ratchet toothed, into which slots, holes, or teeth, a sliding plate or bolt is introduced, to retain and prevent the wheel yielding to the torsion of the spring and turning, the fitting supporting the end of the wire and wheel being so arranged that the retaining plate or bolt enters into or passes through it, so as to form a strong support for the end of the plate or bolt. Thus, by forming the extremity of the wire square, and applying a key, having previously removed the plate or bolt, the wire may be twisted to an extra degree than when originally fitted, and by replacing the plate the extra torsion remains; or the direction of the torsion may be reversed; or by removing the plate or bolt the wheel wire turns in the fitting without any torsion.—Patent abandoned.

3500 W. R. Lake. Improvements in excavating machines, more especially designed for making ditches and drains. (A communication.) Dated December 9, 1867.

This invention consists, first, in so arranging the driver's seat that his weight shall counterbalance that of the plough whereby the earth is loosened. Second, in combining with a flanged wheel two revolving belts between which the earth is elevated when loosened by the plough. Third, in a mode of regulating the depth of the cut, and at the same time changing the seat of the plough point. Fourth, in the substitution of guides for the land sides in common use. Fifth, in a mode of regulating the delivery of the earth excavated. Sixth, in a device for raising the machinery in turning; and also in that for raising the entire machine except the wheels. Seventh, in the use of an adjustable shoe for finishing the ditch to receive drain tiles. Eighth, in so constructing the frame that, by folding the same, the distance between the wheels may be made wider or narrower. Ninth, in a mode of suspending the ploughs and frames so as to permit the said ploughs to work at a constantly increasing depth below the surface of the earth. Tenth, in the attachment of the draught at whatever depth the plough may be working. Eleventh, in arranging the plough and the parts connected therewith, so as to loosen the earth and throw it between the elevating belts. The machine is more expressly designed for making ditches and drains. Reference to the drawings is essential to a full description of the invention.—Patent completed.

Trade News.

TENDERS.

Blackheath.—For erecting a new lodge to Congregational church. Mr. J. E. Saunders, architect:—

Little	£578
Larke	576
Colls and Sons	575
Jerrard	564
Staines and Son	548
Perry	488

Croydon.—For completing a pair of villas at Croydon for Miss Banks. Mr. Edgar Aldous, architect. Quantities by the architect:—

Dennis, Coleman-street, Camberwell (accepted) ..£480

Dulwich.—For completing four houses in Northfield-road, Dulwich, for Mr. Manning. Mr. Edgar Aldous, architect. Quantities not supplied:—

King (accepted)	£375

Greenwich.—For pulling down Upper Circus Lodge, Royal Hill, and building a new house and shop, for Edwin Shalless, Esq. Henry Roberts, architect and surveyor. Quantities not supplied:—

	Including old materials
Messrs. Hoare and Postlethwaite	£950
Ware	865
Fenn (accepted)	650

New Cross.—For building cowshed, for Mr. Josiah Crutcher, Pomeroy street, New Cross. Mr. Edgar Aldous, architect. Quantities by the architect:—

Vaughan	£308	0	0
Dennis	242	0	0
Snelling and Derby (accepted)	208	12	3

Kingston-on-Thames.—For enlargement of workhouse. Messrs. F. H. Rushforth and C. L. Luck, architects. Quantities by Mr. H. T. Northcroft:—

Simpson	£6744
Mann	6621
Thomas	6523
Nightingale	6372
Higgs	6325
Collings	6312
Gammon	6182
Manley and Rogers	5941

Leytonstone.—For lodge and receiving wards for the Guardians of Bethnal-green. Mr. William Mundy, architect. Quantities supplied:—

Read	2397
Cook	2313
Read and Son	2267
Forest	2215
Dyer	2169
F. and F. J. Wood	2155
Arber	2142
Hill and Co.	2105
Emor	2075
Mundy and Hutchinson	2050
Perry and Co.	2000
Rivett	1990
Hodson	1963
King and Sons (accepted)	1960

London.—For building two shops and three houses in Queen's-road, Montpelier-road, Peckham. Mr. Edgar Aldous, architect. Quantities by the architect:—

Messrs. Snelling and Derby (accepted)...£2100

Potter's Bar.—For erecting a new Baptist chapel at Potter's Bar. W. Allen Dixon, architect:—

J. Garrud (accepted)	£717

Stow Maries (Essex).—For additions and repairs to rectory-house, buildings, and chancel of parish church. Mr. Frederick P. Walters, architect:—

Killby	£1170
Saunders	1100

Totnes.—For restoring the church at Totnes:—

Samual Reeve (accepted)	£1095

Tottenham.—For two villa residences, Green-lanes, for Mr. Jenkins. Mr. C. H. Sharp, architect:—

Casey	£1428
Carter	1250
Wright	1230
Henshaw	1195
Fowler	925

Twyford.—For erecting a house and conservatory for W. H. Toomer, Esq., Twyford. W. Allen Dixon, architect. Quantities supplied:—

Staines	£3380
Laurance	3174
Manley and Rogers	3157
Mann	3145
Eaton and Chapman (accepted)	3050

Wandsworth Common.—For house and offices for Mr. Robert Neal, Mr. Neal furnishing bricks, sand, and gravel. Mr. Charles Bowes, architect:—

Atkinson	£714
Lathey Brothers	640
Thornton	630
Easton Brothers	607
Gates	593
Strong	543
Wheeler	537

COMPETITIONS.

India.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Halifax.—Extension of time.—For proposed new infirmaries, fever hospital, &c., at the Halifax Workhouse. C. Barstow, Clerk to the Guardians.

Herefordshire County and City Asylum.—September 14.—For the erection of the above named building R. Griffiths, architect, 3, Martin-street, Stafford.

Aldershot.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

Metropolitan Board of Works.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring gardens.

Chesham, Bucks.—September 2.—For the restoration of the parish church. Rev. A. F. Aylward, Chesham, Bucks.

Oxford-road, Manchester.—For the erection of a new catholic church. J. A. Hansom, architect.

Burton-on-Tre t.—September 12.—For alterations and additions to police station. R. Griffiths, architect, 3, Martin street, Stafford.

Highgate.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

Leavesden Woodside (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

St. Pancras.—September 3.—For the erection of a mortuary house and other works on the burial ground adjoining the workhouse. J. Moore, clerk, vestry hall, St. Pancras.

Teignmouth, Devon.—For the erection of a coast guard station. Drawings, &c., at coast guard watch room. Tenders to the Admiralty coast guard office.

Board of Works, Limehouse District.—September 14.—For watering, scavenging, and removal of dust. T. W. Ratcliffe, clerk to the board.

Islington.—September 8.—For the erection of six houses near the Barnsbury road. Mr. J. T. Barlow, 7, Belle Vue villas, Seven Sisters'-road, N.

West Ham Union.—September 23.—For the erection of an apparatus capable of cooking for 800 inmates. F. E. Hilliary, clerk to the guardians, Leytonstone.

CHERTSEY (Surrey).—September 7.—For the erection of a villa residence. T. Wormiacott, architect, Faroham.

LUTON, NEAR CHATHAM.—September 12.—For sinking wells or shafts, and for excavating galleries or headings, in the chalk. S. M. Heckford, secretary, Brompton Water works Company, 3, Military road, Chatham

METROPOLITAN BOARD OF WORKS.—September 29.—For the erection of fire brigade stations at Amhurst road Hackney, and Upper Tooting. J. Pollard, clerk to the board, Spring Gardens.

COLOGNE WATER WORKS.—September 18.—For the supply and erection of high service reservoir, two Cornish steam engines, steam boilers, likewise for cast-iron pipe, cocks, &c. At the office of the Chief Burgomaster.

MANCHESTER.—For erecting a new Catholic church, Oxford-road. T. A. Hansom, 25, Alfred place, Thurloe square, London, S.W.

HANLEY.—September 7.—for the erection of coach houses to Hanley Hotel. Messrs. Scrivener and Son, architects, Hanley.

HULL.—September 5.—For the whole or any portion of the works required in the erection of St. Matthew's Church, Anlaby-road. Adams and Kelley, architects, 18, Park-row, Leeds.

PROPERTY SALES.

AUGUST 19.

AT THE MART.—By Messrs. Fuller and Marr.—Leasehold house and shop, No. 3, Langton terrace, Shooter's hill road, Blackheath, let at £60 per annum, term 85 years unexpired, at £4 per annum sold for £700.

Leasehold house and shop, No. 4, Langton terrace, let at £65 per annum, term and ground rent similar to above—£760.

Freehold villa, No. 1, Richmond villas, Norbiton—£240.

Freehold villa, No. 2, Richmond villas, Norbiton—£240.

Freehold three houses, Nos. 1 to 3, St. George's place, Norbiton—£400.

Leasehold house, situate in Providence road, Malden, let at £16 per annum, term 99 years from 1861, at £4 10s. per annum—£100.

Leasehold three houses, situate in Providence road, Malden, producing £35 2s. per annum, term 98 years from 1858, at £3 15s. per annum—£190.

AUGUST 20.

At the Mart.—By Messrs. Beadel.—Freehold and copyhold farm, known as Clarke and Beadle's, situate in the parishes of Tollesbury and Tolleshunt D'Arcy, Essex, comprising a farmhouse, homestead, buddings, and 104a. 0r. 30p. of land—£2,520.

Freehold two residences, with stables, cottage, farm buildings, and 40a. 1r. 19p. of arable and meadow land, in the parish of Frostenden, Suffolk—£2,565

Freehold property, known as Fidler's Hall, Romford, Essex, comprising two cottages, homestead, and 1sa. 1r. 9p. of arable land—£1,710

By Mr. Newbon.—Leasehold four houses, Nos. 5, 6, 7, and 8, Walbrook street, New North road, Hoxton, let at £25 and £26 each per annum, term 61 years from 1813, at £3 each per annum—£220 and £225 each.

Leasehold two houses, Nos. 54 and 55, Bemerton street, Copenhagen street, Islington, let at £28 each per annum, term 96 years from 1844, at £12 per annum—£470.

Leasehold two houses, Nos. 15 and 16, Charles place, Hertford place, Kingsland, producing, £60 per annum, term 34½ years unexpired, at £8 per annum—£305.

Leasehold house and shop, No. 62, Prebend street, New North road, Islington, let at £30 per annum, term 75¼ years from 1851, at £6 6s. per annum—£290.

No. 63, Prebend street, let at £30 per annum, term and ground rent same as above—£275.

No. 64, Prebend street, let at £32 per annum, term and ground rent same as above—£285.

No. 65, Prebend street, let at £26 per annum, term and ground rent same as above—£280.

No. 66, Prebend street, let at £26 per annum, term and ground rent same as above—£270.

No. 67, Prebend street, let at £30 per annum, term and ground rent same as above—£275.

No. 68, Prebend street, let at £28 per annum, term and ground rent same as above—£265.

No. 69, Prebend street, let at £30 per annum, term and ground rent same as above—£265.

No. 70, Prebend street, let at £32 per annum, term and ground rent same as above—£265.

No. 71, Prebend street, let at £32 per annum, term and ground rent same as above—£265.

Nos. 1 and 2, South street, New North road, producing £40 10s. per annum, term 75¼ years from 1851, at £12 12s. per annum—£320.

Leasehold house, No. 14, South street, let at £27 10s. per annum, term and ground rent similar to above—£290.

Leasehold house, No. 12, Modbury terrace, Queen's crescent, Haverstock hill, let at £28 per annum, term 99 years from 1850, at £6 per annum—£230.

At Garraway's.—By Messrs. Stuckey and Winstanley.—Freehold, 7a. 2r. 2p. of arable land, called Bathfield, Sussex—£375.

Freehold, 1a. 3r. 2p. of meadow land, called Brook Meadow, Sussex—£100.

Gregory's and Button's Farm, Sussex, comprising farmhouse, buddings, and 56a. 2r. 34p. of land—£4,500.

AUGUST 21.

At the Mart.—By Messrs. Gadsden, Ellis, and Scorer.—Freehold residence, known as Park House, Walton on-Thames, let at £50 per annum—£850.

AUGUST 24.

At the Mart.—By Mr. Whittingham.—Freehold building land situate at Acton, in 41 lots—lot 261, £50; 262, £99 18s.

Freehold building land, situate at Norwood, in 41 lots—lot 258, £135; lot 259, £60; lot 260, £60; lot 285, £80; lot 286, £36; lot 287, £40; lot 289, £35; lot 290, £38 6s. 8d.; lot 296, £35; lot 297, £38 18s. 9d.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Day, Kingsland road, builder, September 3, at 12.—John Hoar, Smith street, King's road, Chelsea, carpenter, September 4, at 1.—John Howell, Portobello road, Notting hill, carpenter, September 3, at 12.—Levi Lee, Kentish town road, stonemason, September 2, at 12.—William Sexton, sen., York-place, Barnsbury, joiner, September 3, at 11.—William John Baker Jubilee street, painter September 10, at 12.—Robert Henry Clement, Sussex street, Brixton, carpenter, September 10, at 12.—Reuben Watkins, New Kent road, plumber, September 4, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Ducross, Bellbroughton, Worcestershire, painter, September 5, at 10.—Henry Edwards, Cardiff, builder, September 2, at 11.—Henry Millward, Delph, builder, September 4, at 10.—Thomas Patton, Middlesborough, stone mason, September 7, at 11.—John Rosesby, Appleby, Lincolnshire, mining engineer, September 9, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION

October 3, T. Collins, Grove road, Fulham, builder.—November 20, E. Taylor, East Dulwich, builder. October 2, J. W. and W. A. Sanders, Guildford street, Gray's Inn road, builders.—October 5, H. Green, Cardiff, builder.—September 29, J. Amess, Bristol, timber merchant.

BANKRUPTCY ANNULLED.

William Henry Baker, Cottesmore, Rutland, Ilmeburner, August 19.

DECLARATION OF DIVIDEND.

C Fisher, Henley on-Thames, builder, div. 3s. 5½d.—J. Cotes, Marlock Bath, painter, div 4d.—G. Gale, Sherborne, builder, div. 1s. 2½d.—F. W. Vigus, Exeter, timber dealer, div. 2s. 6d.

PARTNERSHIPS DISSOLVED.

Newsome and Rhodes, Shipley, masons.—Laver and Hewson, Maude road, Camberwell, builders.—Johnson and Bromley, Liverpool, plumbers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£11	10	12 10	Archangel, yellow	£11	0	£12 0
Quebec, red pine		3	5	4 15	St. Petersburg, yel.	10	0	12 0
,, yellow pine		2	18	4 5	Finland	7	0	8 0
St. John N.B. yellow		0	0	0 0	Memel	0	0	0 0
Quebec Oak, white		5	0	5 10	Gothenburg, yellow	8	0	9 10
,, birch		4	0	5 0	,, white	8	0	9 0
,, elm		4	0	5 10	Gefle, yellow	9	0	10 10
Dantzic oak		4	0	6 0	Soderham	9	0	10 10
,, fir		2	5	3 5	Christiania, per C., 12 ft. by 3 by 9 in. yellow	11	0	13 0
Memel fir		3	0	4 5				
Riga		3	0	3 3				
Swedish		2	0	2 8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1 1
Masts, Quebec red pine		4	10	6 10				
,, yellow pine		4	10	6 0	Pumice Stone per ton	6	0	8 0
Lathwood, Dantzic, fm		6	10	7 10	Oils, &c.			
,, St. Petersburg		8	0	9 10	Seal, pale	per ton	26	0 0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body		90	0 0 0
					Cod		38	0 0 0
					Whale, Sth. Sea, pale		35	0 0 0
Quebec, white spruce		13	0	20 0	Olive, Gallipoli		48	0 73 0
St. John, white spruce		13	10	15 10	Cocoanut, Cochin, ton		53	0 55 0
Yellow pine, per reduced C.					Palm, fine		40	0 40 0
					Linseed		30	15 34 0
Canada, 1st quality.		17	0	18 10	Rapeseed, Eng. pale		34	0 0 0
2nd do		11	11	12 10	Cottonseed		29	10 38 0

METALS.

IRON:—								
Welsh Bars in London	per ton	6	5	0	6	5	0	3
Nail Rod	do	7	10	0	7	12	6	
Hoops	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bar, in Wales	do	5	10	0	6	0	0	3
Railroads	do	7	10	0	7	15	0	2½
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	17	6	net.
Swedish Bars	do	9	17	6	10	10	0	2½
STEEL:—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
COPPER:—								
Sheet & Sheathing, & Bolt	per ton	79		0	2		0	
Hammered Bottoms	do	97	0	0	0	0	0	
Flat Bottoms, not Hammered	do	83	0	0	0	0	0	
Cake and Tough Ingot	do	1	0	0	3	0	0	3
Best Selected	do	77	0	0	85	0	0	
Australian	do	77	10	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	3	0	0	7½	
LEAD —								
Pig, English	per ton	21	5	0	0	0	0	
,, Spanish Soft	do	18	10	0	0	0	0	2½
Shot, Patent	do	22	10	0	22	15	0	
Sheet	do	20	0	0	20	15	0	5
White	do	27	0	0	30	0	0	
REGULUS OF ANTIMONY								
French	ton	43	0	0	0			
ZINC:—								
English Sheet	per ton	25	10	0	26	10	0	2½
Devaux's V. M. Roofing Zinc	do	25	0	0	0	0		

* And 6 per cent. discount if laid upon the new system

SPELTER:—								
On the Spot	per ton	20	0	0	0	0	0	
QUICKSILVER	per lb	0	17	0	0	0	0	
TIN:—								
English Block	per ton	95	0	0	0	0	0	
do Bar	do	89	0	0	99	0	0	2½
do Refined	do	97	0	0	0	0	0	
Banca	do	99	10	0	0	0	0	
Straits	do	92	10	0	93	0	0	net

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 4, 1868.

ORNAMENTAL CONSTRUCTION.

IT is indisputable that nothing presents a more unsatisfactory and incongruous appearance than a building in which the ornament is too palpable, and in which the decorations resemble a series of patchwork. The highest æsthetical effect and the general beauty of the *coup d'œil* depend, in great measure, upon the ornamental portions of the building forming an integral part of those upon which its strength and stability are founded. This remark, of course, does not allude to statues placed either upon pedestals or in niches, and which are removable at pleasure. They may, it is true, greatly enhance the general appearance of a structure, but their absence, at the same time, ought not seriously to mar its beauty. An edifice that is dependent for its architectural merit solely upon the statues surrounding it is but a very poor specimen of art. Manifestly, to obtain the maximum degree of æsthetical excellence the principle to be adopted would be to build altogether the whole structure with the same material that was employed for the ornamental purposes. This is what has been carried out in continental cities, where cathedrals and churches have been erected entirely of marble ; but the only example we have to show is that miserable flat-topped abortion called the "Marble Arch." As a constructive and not merely ornamental material the marble tribe is far superior in strength and durability to many of the granites and limestones used, and it may ultimately prove that it would have been wiser, in an economical point of view, to have employed that material in the erection of the Palace of St. Stephen's.

From the limited use made of ornamental marbles among ourselves there are not many experimental results extant respecting their absolute powers of resistance to a crushing or a transverse strain, and we are, therefore, not so well acquainted with their constructive merits as we should be had they been tested to the same extent as their companions—timber, iron, and stone. Captain Fowke was apparently not satisfied with what had been done previously to his time in the way of experimenting upon timber, for he tested upwards of 2,500 various specimens of different woods. Some of these came from the forests of Hungary, Austria, and Russia, others from the English colonies of India, Guinea, Tasmania, and Australia, and others from the West Indian islands of Trinidad and Jamaica. He deduced from the results of his experiments the specific gravity, the breaking weight, and the amount of deflection due to a transverse strain of all the woods, together with their resistance to a crushing force, both in the direction of and across the grain, and, finally, their relative degrees of elasticity. It would appear that the erection of any large structure is necessarily attended with a certain number of experiments upon the materials selected for its construction, for we find that upon the occasion of the building of the new Opera House, at Paris, some very valuable results were obtained by M. Michelot, chief engineer of "les ponts et chaussées." He directed his inquiries principally towards ascertaining the crushing strength of the various stones and marbles used in that splendid edifice. Most of the columns are of jaspar, from St. Gervais, and, together with the porphyrites, evinced a strength superior to that of granites and syenites. This last is a peculiar description of the granite tribe, and named after the granite found at Syene, in Egypt, which has hornblende in the place of mica, one of the constituents of common granite. The porphyritic rocks, as the Greek name implies, are the results of either volcanic or subterranean igneous origin, and it is not surprising that they should be endowed with superior powers of resistance, owing to the double action of heat and pressure they are subjected to in their formation. It is a significant fact, of which our London architects may take cognisance, that their Parisian brethren are gradually abandoning the use of the coarser descriptions of building stones, which are of only an inferior quality, and which resist very inefficiently the action of the weather, and, availing themselves of the resources of the new suburban lines, are introducing a superior and handsomer kind of stone in their works. The principal stones used in Paris for architectural purposes are the syenites, granites, and porphyries of the Vosges, the green melaphyre of Ternuany, and the granites of Mont Blanc. All these are classed by Humboldt, in his "Cosmos," as indigenous rocks, by the early geologists as plutonic, and by Sir Charles Lyell as hypogene. The protogenes of Mont Blanc are geologically so termed to distinguish them from ordinary granites ; they have, instead of mica, in their composition, talc or steatite.

Polished granites from Peterhead and the Duchy of Cornwall are familiar to all of us, and we shall soon witness some magnificent examples in the massive columns intended to grace the piers of the new Blackfriars Bridge. A very beautitul marble is used in Bavaria, belonging to the Dioritic porphyries, having a deep sea-green tint, and approaching in some instances to the well-known serpentine. Russia, usually supposed to be very much in the background so far as the liberal arts and sciences are concerned, can produce from her imperial marble works specimens which, for beauty of design and fidelity of execution, can compare with those of any other nation. Her artisans work to great perfection in all the varieties of porphyritic rocks, including the unrivalled jaspars of the Ural mountains, and the rhodonite, a peculiar and rare stone constituting a silicate of manganese. Let us now inquire a little into the advantages that these materials offer for ornamental and constructive purposes, and we will begin with the jaspar. It will be at once understood that there is a great difference between the large rough-quarried jaspar and that forming the variety which is recognised as an inferior description of precious stone. They may have the same chemical composition, but, nevertheless, that does not establish an identity. Charcoal has precisely the same chemical composition as the diamond, and so has plumbago, but notwithstanding, a lump of charcoal or plumbago is not a diamond. The appearance of a quarry of jaspar is very remarkable ; the colours appear to be continually changing, like the fabled tints of the chameleon, among which predominate a blood red, a pink, and a green, mingled at intervals with the peculiar opaque whitish grey of pure quartz. The red variety is exceedingly hard and takes a splendid polish, although these advantages are not by any means common to all the specimens. As a rule, the presence of carbonate and sulphate of baryta interferes with the working and polishing of the stones, and moreover renders them susceptible to the influences of the weather. Upon the whole, it is advisable not to employ them for external work, but to confine their services, like the celebrated Caen stone, to the purposes of internal ornament and decoration. Practical experience has shown the folly of employing jaspars in external work. Monuments have been built of them which have disintegrated with great rapidity.

It is certainly true that a marble is a limestone, but every limestone is not a marble, but only becomes so when it is possessed of certain properties. A marble may be defined as a limestone which is, in the first place, capable of receiving a certain amount of polish; in the second, endowed with a distinct tint and uniformity of colour; and, in the third, able to be quarried in masses which are free from cracks and shakes. As may be expected, marbles varying in purity, and in the degree in which they possess these qualifications, are to be found in nearly every country, particularly in those exhibiting a hilly contour, and where the geological nature of the ground is of a metamorphic character. Undoubtedly, the difficulty of procuring in sufficient abundance marbles suitable for construction has delayed the more general introduction of that beautiful and durable material as a building agent, but now that increased facilities are afforded, it ought to take that prominent position to which its antecedents most unquestionably entitle it. Another reason, increasing the difficulty of procuring it, is that the quarries are rarely situated in accessible localities, and seldom or never near the sea coast, or where a main route of intercommunication would be likely to run. As an example, although there is abundance of white limestones, yet the quarries of Carrara are the only source of white statuary marble, and ever since the time of the Romans have supplied the whole world with that particularly esteemed artistic material. It is probably this circumstance that rendered the Italian sculptors so famous in the art, although it must be confessed that the same material is still available for similar purposes. Greece is rich in marbles, and ever was, as the ruins of her temples abundantly testify. In Laconia the celebrated red marble of antiquity has been rediscovered, but the discoverers have rested content with recording the fact, and the quarries remain unopened and unworked. In Portugal, Prussia, and Belgium, marble is employed as a constructive material upon a much more extensive scale than in our own country. The French, not content with their own supplies, import largely from the last-named country. Austria possesses a peculiar marble of a bright chestnut red, not met with anywhere else, and, moreover, endowed with the advantage of being quarried of very large size. The New World has not been forgotten by nature in the distribution of this particular gift. New York can show numerous examples of marble ornamental construction, all of American or Canadian production. Although we are still far from approaching to anything like real architectural merit in our public buildings and erections, yet no one will deny that the taste of the age is improving. There is a general tendency to adopt tasteful, elegant, and ornamental designs for great works, which only needs encouragement to develope more fully. We trust that the time will come when we shall build not in stone but in marble.

HIGH AND LOW ART ACTION.

IN these hasty and imperfect notices of great subjects, I should wish it to be understood that I do not dwell on them for the mere sake of talking about art details and differences of opinion and taste existing among modern artists, but I wish, if possible, to develope a new plan and system of art action and practice, more just to the great body of working artists and workmen than that now in vogue and so universal. These slight papers, therefore, have a connection with each other, and all aim at a definite and well defined end—a new system of art education, and consequent art *practice*, and a more universal and fairer system of exhibiting those artistic and individual results to the public. I hope, in a futnre paper, to be able to give a general and intelligible synopsis of this. Meanwhile, I go on with the well-nigh forgotten art of Phidias, for which it is to be feared there is but small interest, so that extreme brevity is necessary, and, for more than one reason, politic.

Poor Phidias ! one wonders whether he ever dreamed, like Leonardo, of *railways* or art manufacture, or what he would have done

had he had any idea of the ultimate fall of his magnificent work, put away in a big, awkward room, after well-nigh total destruction, and transportation to a place he never heard of, and fated to be looked at by here and there one about once in a month, and even that falsely! Fortunate is it for us that he knew nothing of high art or the "ideal spiritual;" fortunate, indeed, is it that his mind was of a more commonplace and practical turn, and that he was, consequent on it, modest enough and satisfied to do common work and a little mere natural copying; and this thought it is that brings us to another nameless workman of great capacity, and whose work will, if carefully thought over, help to show how false that idea is which divides art into high and low, and accepts the one order of workmen while it rejects the other.

Most people have heard of Dr. Barth, but few, probably, know much of where he went and what he did. His African travels took him into regions altogether out of the ordinary course of the traveller and tourist, and so brought him into contact with objects not seen by any but himself. There would seem to be scattered over considerable tracts of North Africa remains of buildings and rock sculptures by a people before the Roman occupation, or, at least, beyond its influence, and the particular sculpture to which reference is now made is one of these rock carvings. It is on a large block, about 12ft. long and 5ft. high. "The surface is quite smooth, and bears testimony to a state of life very different from that which we are accustomed," says Dr. Barth, "to see now in these regions, and illustrates and confirms St. Augustine's statement that the ancient inhabitants of this country used cattle for their conveyance and not camels, as at present time." The sculpture represents (there is in his book a small, badly executed woodcut to show what it is like) a dense group of oxen in a great variety of positions, all moving in one direction; on the end of the stone, which is now broken off, the pond or well was represented from which the cattle were to be watered. "Some of these bulls are most admirably executed, and with a fidelity which can scarcely be accounted for, unless we suppose that the artist had before his eyes the animals he chiselled." Dr. Barth's sketch is very slight, and, of course, nearly everything has been lost in the wood-cutting, but still there is quite enough to show how finely and admirably these animals have been sculptured and drawn by the nameless workman who executed them. My special object in calling attention to them and to work of this kind is to show how we may travel in a moment from low art to high art, from these rude though so living sculptures on mere and bare rock surfaces to the perfect and finished work of the Athenian temple. Let this be considered, if it please anyone to do so, the rudest of low art (for the Academy certainly would not so much as look at it), and the "cattle" panels of the Parthenon the highest art by the very greatest of sculptors; then I can only say that this rough workman had that within him enabling him to do such work as the representing living and moving animals, which Phidias himself might well have envied. There is no more instructive lesson to be learnt in these days, if we were prepared for it, than this of the possibility of finding in rude work and in rude uncultured men the elements of that art, and art capacity, which is now supposed to be the exclusive prerogative of the highest art and the highest refinement of artistic power. We are *not* fit for it, because all the lower men, as they are called, are working as manufacturers, and not as individual artists or art-workmen.

There are other fragments of sculpture from these rock surfaces which might have been referred to, but it will, for the present purpose, be unnecessary, for those who have carefully looked at the rudest of the Romanesque work will know how much has been done by men to whose works the term high art has never yet been for a moment applied, and to do so would be considered, in the present low state of art knowledge, as simply ridiculous; yet there can be no doubt that very many of those have left behind them specimens of work, in the very rudest and roughest manner, which, so far from being equalled in more learned days and by more refined men, have not been approached in artistic, mental, and manual power. It is a very long distance from central north Africa to the new Cattle Market, and some time has elapsed since the centuries B.C. and the present highly civilised and most enlightened century, but has any gentle or simple reader ever seen in process of execution, or in a completed state, any one or more specimens of the *cattle drawing* to be found occasionally going on there, *i.e.*, in the new Cattle Market, when a very favourite bull, or very fine ox, comes to market, and an order is given by some art-loving farmer or salesman for his portrait in oil colours? We ask has anybody with an eye ever seen such a production? if not, he has something yet to see and learn. If he has seen one I am certain he cannot have forgotten it. We simply ask him most respectfully to mentally compare the results of the present advanced system of art education, as visible in it, and the past rude plan of doing things, when there certainly were no art schools or royal academies in existence either to help or to hinder. We are, or at least ought to be, never too old to learn. Or, to pursue the thought a little further, will anyone compare the portrait of some noble lord's "favourite breeding bull," enclosed in a paddock, with a whisp of straw in his mouth, and exhibited on the walls of the Royal Academy, and in a good place too, with the Phidian bulls or the African rock work! And yet, be it recollected that the modern London Cattle Market can exhibit to the eye of the artist workman animal life as fine and as worthy of living and moving portraiture as anything Phidias ever saw. But we are educated and he was not!

But the special lesson to be learnt from this, that is, if we will try to learn it, is, as hinted in my former paper, that the real secret of power in art in the production of a result is to be sought, not in the imaginative powers of the executive artist, but in nature and natural forms and accidental occurrences, and that to get at this, in whatever material it be sought for, *the hand of the individual artist and workman is needed*. The terms high and low art have, in truth, no such meaning as is now attributed to them by our schools and academies; thus degrading one set of artists while another set is almost deified, for we here see the greatest of sculptors employing himself in the simple copying of the mere natural forms and actions of common cattle, at the same time that his capacity and genius were such as to give him power over the human form in its most graceful postures and movements, and that in a way which has never been in any age of the world or anywhere equalled. Perhaps there is no other such instructive lesson as this in the whole history of art practice. Why, we may ask, are there no such sculptors as Phidias nowadays? what had he, so far, at least, as animal life is concerned, *more* than the modern sculptor of to-day to work upon and with? And then, too, another question starts up here of great significance. Would Phidias be considered in these days, and by our modern authorities, or by Mr. Ruskin, as an artist of *high* art powers and standing, had he sculptured *nothing but cattle?* Supposing it could be proved that none of the "figures" were by him, but only the victims of sacrifice, would such work, magnificent as it undoubtedly is, entitle the man who executed it to the rank of an artist producing *high* art? No, certainly not, most people will doubtless say. But why not? for it is to the very utmost as difficult to draw and paint or chisel a bull as a man—in some respects more difficult, for is not that most mysterious of all things, the life in them, to be made visible and evident in both? The mere *form* is as hard to do in the one as in the other, and as easy, if it can be done at all. But, unhappily, we have no means of judging of all this. There is, as I before said, no trial or student's work anywhere visible; no Academician condescends to draw or carve animal life in its simplicity or in its native state of living action. Landseer draws animals, deer, and dogs, but they are all harmless domesticated brutes that will quietly stand for their portraits, or lie down on hearthrugs by the hour; in short, civilised creatures are nearly or quite useless for artistic purposes, for all the life natural to them seems to be gone, and to have been fairly groomed out of them, leaving little else but their skins. C. B. A.

A MEDIÆVAL ARTIST'S SKETCH BOOK.

THERE are in MSS. in the British Museum some rare and very beautiful architectural backgrounds, in rich colours, as of Paris, with Notre Dame, in Harl. MS. 4,379; an illustration of a scene in Froissart; and in the royal MS. XVI. F. 2, containing the poems of Charles, Duke of Orleans, is a pictorial view of London from the Tower, with an interesting portraiture of old London Bridge and its exquisite apsidal chapel at the south or Surrey side. But these are not so curious or valuable as the unique illustrations found in the margins of a copy of Geoffrey of Monmouth, made in the fourteenth century (Royal MS. XIII. A. 3.), which I lay before your readers as eminently suggestive to the modern architect, and affording, probably, the only known instance of an English mediæval artist's sketch book, although not so strictly professional as that of Willars de Honecourt. I owe the knowledge of their existence to the kindness of Mr. Frederick Thompson, and with special permission made careful traceries of them.

The engraving of a central lantern with a leaded spirelet in the Monasticon, taken from a Cottonian MS., and representing St. Benet's, Hulme, offers a distant resemblance to some of the elevations of similar structures; but the latter are peculiar in being raised on a lower stage, as if, in many instances, doubled. There is apparently a lingering recollection of foreign taste discernible, as though the unknown artist had been a traveller beyond seas. Perhaps the seals of the period and those of an earlier date, as in the instance of Battle Abbey, make the nearest approach of similarity to these drawings, which are sketched in pencil delicately, and with a fine, point, and afterwards have been tinted by a brownish-lilac tint of colour. The draughtsman, as far as we can judge, in most cases produces buildings no longer extant; but again there are instances in which we can trace a likeness to churches either still in being, familiar to us by description, or changed by subsequent additions. The proportions are graceful, the character of style and tracery is distinct, and it requires but the practised hand and eye of the modern architect to recognise germs of beauty and suggestions of fine forms grouping, and outline, from which his own genius and knowledge would soon construct buildings capable of reproduction and adding fresh reputation to his name. Simplicity and dignity, quiet force and grandeur, are blended; there is no frittering of ornament, no straining after exotic decoration or fanciful and capricious novelties, which now pass current for originality; and in all there is a genuine hearty English feeling perceptible in every line. The castles and houses in many cases I have omitted, as they only confused the main features of the central object of interest, and, if introduced, must necessarily have crowded out some of the drawings now comprehended in a single page, whilst those actually given present a very fair sample of the rest.

I proceed to notice the designs in detail.

1. Canterbury.—The western elevation of a town church, with a three-light Decorated window. In the spandrels are quatrefoils, on

either side is a small turret with a leaded spirelet, which terminates in a cross. Below the window is a double doorway, with a spandrel included under a comprising arch. The aisles have lean-to roofs, with a two-light window in each face having a circle in the head; at the angle is a turret pinnacled, with arcading in the upper portion, and bold mouldings at the base; above the great west window rises the arcaded stage of a tower which has angle-pinnacles, and a central spire of moderate height.

2. Leicester.—A minster. The west front presents a gable, with three round-headed windows below it, arranged pyramidally, two and one; it is flanked by tall turrets, with a single window in each face, and terminating in a thin spirelet. The transept represents two round-headed windows in the clerestory of each arm, and angle turrets. Over the crossing rises a small low tower, in two stages, crowned with a little spire.

3. A design for a gable, reminding the reader of Exeter Cathedral. The sides are crocketted, and the finial takes the form of a *fleur-de-lis*; in front of it runs a battlement with trefoils in the merlons. Below this is a beautiful canopy, crocketted and richly foliated, having a delicate quatrefoil or rose on each side. A triangular shield, like a shortened "heater," *semée* of crosses, and surmounted by a ducal coronet, completes the design.

4. Colchester.—A noble west front with angle towers in two stories and tall spires projecting beyond the aisles, as at Wells; five doorways, beautiful canopied four-light windows to the aisles, and a grand western window with rich tracery of quatrefoils and circles in the head. The crocketted gable contains a rich trefoiled window; the central tower has trefoiled windows in the lower stage, which has a leaded roof, above which, and from an arcaded base, rises a low spire.

5. A western tower, with a spire in two stages, flanked with lean-to aisles.

6. London.—The superb canopied Decorated window of four lights, flanked with turrets, the beautiful tower in two stages, each containing a pair of windows, and graceful spire, no doubt represent old St. Paul's in its integrity before Inigo Jones added his monstrous addition at the west end. Amongst a forest of spires, we may recognise St. Mary Overye, with its steeple now showing only as a tower, and the west front of Westminster Abbey, possibly an ideal, with arcaded turrets and spirelets, and two beautiful Decorated windows; and, beyond, a low central tower and flèche, which would, if carried out, indeed give an outer glory to a building deformed by the detestable additions of Wren.

6*. A west front, with gabled ends to the aisles, and turrets, to be compared with No. 2.

7. Winchester.—A design enlarged from No. 4, with the addition of a fine two-light of remarkable design, having a pierced lozenge-shaped transom.

8. A corbel head, probably of Edward II.

9. A two-storied west front, with round-headed windows, angle-turrets, battlements, and a broad central spire; the lower story is arcaded.

10. Gloucester.—1. A west front, with a west window having interlacing tracery, arcaded angle turrets with very thin spires, and a central tower, like that of Winchester Cathedral, carrying a very lofty spire flanked by pinnacles. 2. A very remarkable elevation—a tall gable, with its cross; above, a beautiful triplet without a comprising arch, of admirable proportions, and flanked by two fine towers with angle-turrets (like St. Nicholas, Ghent), lofty windows, and low spirelets. 3. A gable with angle-turrets, and a broad band of quatrefoils and a central rose; behind it is a central tower and flèche.

11. Caerleon.—A west front, somewhat similar to 4 and 7, combining features in each. Above the window rises the upper part of an arcaded tower, which has a broad band of quatrefoils, angle-turrets, and low spire. The portal is double, and each doorway is cinquefoiled. The windows of the aisles are of two lights, canopied, and with foliated tracery in the head. The angle turrets have windows in stages.

12. A beautiful wayside cross. A shaft raised on three steps, very delicate in design, and apparently carrying a cross of metal, most graceful and simple, and perhaps jewelled.

13. York.—A west front, with a triplet within a comprising arch. A gable and flanking turrets, a central steeple, arcaded, with spire-lights of diamond shape, complete the design. Besides these is a range of noble canopied two-light windows, a tall tower with a flying buttress, foliated underneath; steeples and turrets fill the background.

14. City of Rome.—1. A superb tower, with lateral turrets and pinnacles, and windows in three stages, above a central door, full of character and dignity. 2. A magnificent west front, with lateral towers projecting beyond the aisles, and, like them, filled with two-light windows. Five cinquefoiled portals admit to the interior; the central bay, like the aisle, is flanked by pinnacled turrets, and below the steep gable there is a grand window in two stages. The central tower is battlemented. The whole composition is full of inventive power.

I can only hope, in conclusion, that these drawings may recommend themselves to architects in general, and that some may be induced to vary the wearisome sameness of modern churches—wearisome from eccentricity and trick, or from the tameness of feeble imitation—by hints gathered from the tracing of a hand that has lain still for five hundred years. There are in this MS. some good heraldic designs and some vigorous battle scenes.

MACKENZIE E. C. WALCOTT, B.D., F.S.A.

ARCHITECTURAL FOLIAGE.*

THIS is a work published in parts at five shillings a part, containing six plates. The plates are lithographed. Now lithography has done a good deal for art; but, in the opinion of many well qualified to speak *ex cathedra*, the old school of copper-plate engraving did, in its day, even more. The lithograph lends itself with what is called "fatal facility" to careless design, from the ease with which, by a *tour de main*, gross faults may be glossed over. The work before us has many faults, the principal of which is the absence of truth and earnestness. In a lithographed representation of an architectural object, as in a woodcut, some endeavour should be made to convey to the spectator a fair idea of the subject. Black outlines and forced shadows are but poor substitutes for delicate forms and truthful treatment. A book is a book, and should not be put forth without good reason, and, at all events, should be heralded in becoming terms. When we find such remarks as are contained in the circular accompanying the work we must be permitted to exercise our discretion and estimate its value by our own lights. "The above work will be found of great service to architects, sculptors, carvers, and others, in furnishing them with a series of choice examples for architectural purposes." To all this we cannot subscribe. The designs are too realistic, are forced in the representation, and deficient in vigour. The foxglove, the fern, the convolvulus, the geranium, the passion-flower, and the snapdragon, are depicted in various forms. In 1865, Mr. James K. Colling, F.R.I.B.A., published a work on "Art Foliage for Sculpture and Decoration," nearly all of his designs having been previously and by special arrangement illustrated in the BUILDING NEWS. The work before us is no improvement on that of Mr. Colling. Mr. Robinson also publishes a series of designs for "carved panels suitable for headstones, crosses, tombs, &c." The circular accompanying this work states that "the designs in the above work are very chaste and beautiful, being adapted from natural foliage, with scrolls, passages of Scripture, monograms, &c., and are designed to supersede the many tasteless broken columns, urns, weeping willows, &c., which so frequently disfigure an otherwise passable memorial. In publishing this work at a low price, Mr. Robinson hopes the designs may be generally adopted, and thus make another great improvement in the memorials placed in our cemeteries and churchyards." In the whole range of art nothing is more difficult of production than a suitable memorial. From Captain Noah down to Captain Cook, from Prince Lee Boo to the Prince Consort, memorials have been a failure, and we do not find, even in this work, any indication of "another great improvement." On the contrary, the memorial designs are much below the average, and the terms in which they are introduced to the public are not calculated to disarm criticism.

* "Architectural Foliage adapted from Nature." By JOSEPH BARLOW ROBINSON. London: Bemrose and Sons, 21, Paternoster-row.

THE TANK SYSTEM OF SEWAGE.

THE *Engineer*, in an article on this question, says, the local board of Hastings have recently completed works for discharging their town sewage into the sea, which carries it away from the town. There are two or three points in connection with this scheme to be particularly considered. One is whether experience—for nothing else will decide the question conclusively—will demonstrate that by these means the sewage, with all its noxious and disagreeable accompaniments, will be really got rid of; the other embraces the policy, economical and otherwise, of allowing so enormous a waste to be made of valuable manure; and the third has reference to the ultimate disposal of the solid residue which accumulates on the shore. We have already expressed our opinion, supported by facts, respecting the mistake of converting the ocean into a cesspool; but, upon the other hand, it may be four or five years before any serious annoyance results from the error, and certainly anything was to be preferred to the state of drainage existing at the fashionable watering-place in question. It appears that some years ago nearly £20,000 were expended in what was called the drainage of Hastings, which consisted, as is usual upon all coast towns, in running the sewage by a number of outlets into the sea. These pipes and culverts discharged at all times of the tide, sometimes flowing pretty full, at others merely dribbling, to the great disgust and annoyance of bathers, who, however, continued their marine ablutions notwithstanding. It was not until the appearance of fever in the town that the ventilation of the sewers was attended to, but, although this in some measure mitigated the evil, it did not remove it, and the authorities determined to adopt a totally different principle of drainage. According to the present system all the old outlets are abolished, new main and branch sewers constructed which convey the sewage into a large tank holding about a million and a half gallons. It is here stored up until the proper turn of the tide takes place, which sweeps it away, or, at least, a large portion of it, east of the town. The tank is supposed to be filled and emptied once in every twenty-four hours, or nearly so. Assuming this to be practically the case, and putting the value of the sewage at the lowest figure, the sea at Hastings engulfs annually £10,000, and to accomplish this suicidal result the board has spent £30,000.

Having investigated the fallacy of the principle, and demonstrated the reckless disregard of the true value of sewage and its proper utilisation and application to land, evinced by the scheme in question, let us now direct attention to the disposal of the solid residue in the tank. The hope of converting this into a marketable manure, and inducing agriculturists to purchase it, is the wildest idea of all. There is, of course, nothing new in the tank system of sewage. It has been used at Birmingham, Coventry, Uxbridge, Leicester, and numerous other towns, partially for the purposes of storage, and also for obtaining a residue from which to manufacture a saleable artificial manure. Every instance where it has been attempted to sell artificially manufactured

sewage manure has resulted in a miserable failure. It was calculated at one place that £4 per ton would be given by farmers for the manure, and the price obtained with a great deal of difficulty was 4s. After an elaborate process of deodorisation and evaporation scarcely sixpence per ton could be realised at Birmingham for the solid residue, which, it is needless to observe, would not pay for the cartage of it. In face of these facts, as clear as unquestionable, it is not easy to comprehend upon what foundation the expectations of those can rest who hope to achieve a result that both theory and practice have proved to be impracticable. Theory has demonstrated that the various precipitating chemical re-agents hitherto employed do not fix the ammonia, the most valuable constituent in sewage for agricultural purposes; and even if they did, practice has shown that the compound cannot be disposed of at a price that will even repay the cost of production, much less yield any remunerative return. Farmers and agriculturists, whatever faith they may put in guano, superphosphates, and other artificial manures, have none in sewage compounds, and will hardly cart it away when they may do so gratis. We must not be supposed to assert that no chemical means exist by which a manure possessing fertilising ingredients could be manufactured from the solids extracted out of the fluid sewage; but we maintain that, in the first place, the process is tedious; and that, secondly, the sale of the compound would never repay the cost of its production, thus proving every such scheme, commercially speaking, a failure. At the same time no process of precipitation or artificial manufacture will produce a manure at all approaching in powers of fertilisation to the unadulterated sewage, which is allowed to irrigate the land in the manner so conclusively successful at Barking and Croydon. There is but one solution to the great national sewage problem, and although it will take years yet before the truth is universally acknowledged and recognised, nevertheless it will be finally established. All schemes of deodorisation and disinfection, all projects for getting rid of our town refuse into rivers and seas, will sooner or later prove so many mistakes; and those who have committed themselves to such undertakings will discover the fallacy of their proceedings. The proper disposal of sewage is the utilisation and application of it to the land, that it may return to the soil that which was taken from it, fertilise the ground that is barren, and refertilise that which is exhausted. Any other plan of disposing of it is simply an evasion of responsibility, a dereliction of duty, and a flagrant and unjustifiable waste of that which no money can replace.

WOODS USED IN CABINET-MAKING.

MR. THOMAS PATERSON was one of the working men who visited the Paris Exhibition last year, and ably reported on what he saw there. His report is one of the twelve which compose the little work under the title of "Modern Industries," issued under the auspices of the Paris Excursion Committee. In looking through the magnificent collections of woods from Brazil, Canada, and New South Wales, and the smaller but not less interesting exhibits of Algiers, Natal, Guinea, &c., it is impossible not to be struck, says Mr. Paterson, with the small number of these woods which are in actual use in the manufacture of furniture. Some of the woods are shown to be of large size, and are exceedingly beautiful in colour and figure, and many of them would contrast admirably with some of those at present in use.

There was a contribution to the Exposition of specimens of timber, collected by the late Captain Fowke, in which several hundreds of different kinds of wood are arranged in a kind of revolving screen. Each specimen is labelled with its specific gravity, and the amount of weight necessary to break it. Each piece was of the same size—viz., 2in. square, and has been actually broken by the weight marked on it, thus giving anyone accustomed to work in wood a very good idea of the use it may be put to. Collections of this kind would be of the greatest use. They might be accompanied with a book composed of leaves of the woods, prepared and polished, to show their texture and colour, with labels giving the average size of which boards could be cut, the average price, and the market, &c. At present neither artist nor workman is aware of the resources which are at their disposal, and much meretricious ornament would be avoided if this mine of decorative riches were fully explored. In the French Colonies department there were some articles of furniture which have been made from the woods of Cayenne, cut by the convicts sent to that settlement.

That a wide and systematic acquaintance with the resources of any country is the first requisite to the development of its trade may be considered an obvious truism; yet in this country, eminently trading and manufacturing, and dependent for its greatness upon the growth of its trade and manufactures, no means are taken to make the traders and workers acquainted with the materials which are being wasted in our vast colonies, but which, if known, would be sources of wealth which we can scarcely over-estimate. The staghorn sumac may be mentioned as an example of a very finely veined wood, which seems to be plentiful, and which, though it does not grow to any great size, would be useful in manufacture. The butternut, a kind of walnut wood, grows to a large size, and seems to be very cheap. The kauru (or New Zealand pine), also, as a wood to veneer upon, would, I think, be of the greatest value; as well as the heron pine (which is sufficiently handsome to be used without any veneers), the red beech, and many others.

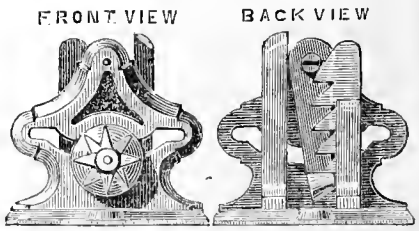
As a new application, or, rather, the extension of an old process in the treatment of wood, the chairs and settees in the Austrian department, made by bending long slips, may be instanced. Some of these chairs were exhibited in 1862. The manufacture has, however, greatly improved since that time. One chair in the Exposition (purchased by the Prince of Wales) was all that could be wished, both as regards strength and beauty. Though no one would wish to see this system of bending wood applied to all articles of furniture so exclusively as it is applied in the manufacture of these chairs, yet the capabilities of the process are well shown, and much might be learned from them. I noticed a method of producing a very good kind of decoration on polished surfaces of wood by stamping with what is called by chasers a mutt tool, which produces a slightly roughened but regular surface, the pattern being left polished. I observed, also, in passing round the Historical Gallery, a mode of decoration which had an extremely good effect. This was an application of tortoiseshell. The under surface or side applied to the piece of furniture had been polished and gilded, the outside surface of the shell being then carefully smoothed and polished, the gold showing through the semi-transparent shell, and giving all its markings, while the shell protected the gilding, so that, though it had been made for more than twenty years, it was still beautiful and effective. It seems to me much to be regretted that some method cannot be devised which would place all such methods of decoration so completely before all our workmen and designers that they might have them, so to speak, at their fingerends.

CURIOUS MONUMENTS IN BENGAL.

THERE exists, within 300 miles of the British capital of India, a tribe of semi-savages, who habitually erect dolmens, menhirs, cysts, and cromlechs, almost as gigantic in their proportions, and very similar in appearance and construction, to the so-called Druidical remains of Western Europe: and, what is still more curious, though described and figured nearly a quarter of a century ago by Colonel Yule, the eminent Oriental geographer, except by Sir J. Lubbock, they are scarcely alluded to in the modern literature of prehistoric monuments. In the Bengal *Asiatic Journal* for 1844 you will find Colonel Yule's description of the Khasia people of East Bengal, an Indo-Chinese race. Dr. Thomson and I dwelt for some months among the Khasia people, now eighteen years ago, and found Colonel Yule's account correct in all particulars. The undulatory eminences of the country, some 4,000ft. to 6,000ft. above the level of the sea, are dotted with groups of huge unpolished squared pillars and tabular slabs, supported on three or four rude piers. In one spot, buried in a sand grove, we found a nearly complete circle of menhirs, the tallest of which was 30ft. out of the ground, 6ft. broad, and 2ft. 8in. thick; and in front of each was a dolmen or cromlech of proportionately gigantic pieces of rock, while the largest slab hitherto measured is 32ft. high, 15ft. broad, and 2ft. thick. Several that we saw had been very recently erected, and we were informed that every year some are put up, but not in the rainy season, which we spent in the country. The method of removing the blocks is by cutting grooves, along which fires are lighted, and into which, when heated, cold water is run, which causes the rock to fissure along the groove; the lever and rope are the only mechanical aids used in transporting and erecting the blocks. The objects of their erection are various—sepulture, marking spots where public events had occurred, &c. It is a curious fact that the Khasian word for a stone, "man," as commonly occurs in the names of their villages and places, as that of man, maen, and men does in those of Brittany, Wales, Cornwall, &c.; thus Mansmai signifies in Khasia the stone of oath; Mamloo, the stone of salt; Manflong, the grassy stone, &c., just as in Wales Penmaen Mawr signifies the hill of the big stone, and in Brittany a menhyr is a standing stone, and a dolmen a table-stone, &c.—*From Dr. Hooker's Presidential Address at the British Association Meeting.*

TEMPLAR'S PATENT SASH FASTENER.

IT is a general subject of complaint that the ordinary fastenings of our windows are easily opened from the outside by means of a knife, and that if it is desired to have the window partially open—for the sake of ventilation for instance—it cannot be secured; and so we have to run the



risk attendant upon an open window, or forego the benefits of ventilation and pure air. The little contrivance illustrated by the accompanying woodcut is intended to obviate all these inconveniences, and we believe does so in a most

efficient manner. Its action will, we think, be readily understood by a reference to the engraving. It is self fastening: a servant closing the window fastens it at the same time without any extra effort or thought. The window can be partially opened and still secured by means of the toothed catch, and the overlapping of the bases of the two parts effectually prevents the introduction of a knife. Moreover, the dropping of the top sash does not interfere with the action of this fastener, as it does with that of the ordinary ones, and it is claimed for it that it effectually prevents rattling by the wind.

THEATRE BUILDING.

CASE UNDER THE METROPOLITAN BUILDING ACT.

AT the Marylebone Police-court, on Thursday week, Mr. D'Eyncourt was engaged for several hours in hearing a case of the most difficult and important character, the decision affecting no less than three theatres now erecting in London. The case was also of public interest, inasmuch as it concerned the safety of the audiences in theatres during the panic that would result in case of a sudden outbreak of fire. The Marylebone Theatre, in New Church-street, Edgware-road, is now undergoing alterations prior to its being shortly reopened to the public as the "Royal Alfred" Theatre. Mr. Alexander Peebles, the district surveyor of the northern division of Marylebone, acting under the provisions of the Metropolitan Building Act, visited the premises, and noticing that the builder, Mr. Samuel Simpson, of Tottenham Court-road, did not carry out the works in accordance with the rules laid

down in the Act, he gave him notice of the alterations and additions which he required to be done. The builder took no notice of this communication, nor did he appeal to the Metropolitan Board, then sitting, but, according to the district surveyor's evidence, he proceeded with the work with extra speed. Under these circumstances, the district surveyor took out a summons against the builder, under the Metropolitan Building Act, for that he "did do certain things contrary to certain rules of the said Act, to wit, did construct the floors of corridors leading to the boxes upon the first gallery, and also the floor at back of side gallery, with combustible materials, and did omit to do certain things required to be done by the said Act, to wit, to construct the side floor with stone or other fireproof material, and carried by supports of a fireproof material, as required by section 22." After a long discussion as to what was meant by the term "corridor," during which references were made to Johnson's, the "Imperial," and other dictionaries on the subject, the case was simplified by the defendant stating that he had not obeyed the notice from the district surveyor for several reasons, among which were the following:—1. The theatre was not essentially different from what it had been before the alteration, except that new material was used, the old having become so rotten that it was unlikely that the Lord Chamberlain would re-license the theatre unless it were removed. The interior arrangements of the former theatre having been approved by the Chamberlain, all that was necessary was to get the Chamberlain's license again.—[In cross-examination the builder stated that the stage had been shortened, and the auditorium thereby enlarged, holding, under the new arrangement, 200 more persons. The magistrate said he was strongly of opinion that the Lord Chamberlain's license did not apply to the question as to the materials to be used in the construction of a theatre. Defendant said it did; for instance, if he deposited plans approved of by the district surveyor, but which did not meet with the approval of the Chamberlain, he (the builder) would have to alter those plans before he could get the license. Mr. D'Eyncourt asked to be shown any section which exempted theatres from the operations of the Metropolitan Building Act. Plaintiff said there was no exemption for theatres.]—2. Defendant said he had built the Queen's and Holborn Theatres, and there were surveyors in those districts, but they had not objected to the mode in which those buildings had been constructed, though it was precisely the same as in the present case. He was also building the Gaiety Theatre, and no difficulty was made by the district surveyor there.—[Mr. D'Eyncourt observed one object contemplated by the act was the safety of the public during fire, and to say that Mr. Peebles ought not to take action because two other district surveyors had not thought proper to do so was no proof that Mr. Peebles was wrong.]—3. The defendant said the plans were approved of by the official at the Metropolitan Board who acted on behalf of the superintending architect.—[It was contended by the plaintiff that this was not the approval of the Metropolitan Board.]—Mr. D'Eyncourt, in giving his decision, said that he considered this to be a new building, and came under the operations of the Building Act. He was, therefore, bound to say that he believed the plaintiff had made out his case, and the necessary alterations must be made in accordance with the district surveyor's notice.—[As the defendant seemed dissatisfied with the decision, the magistrate intimated his intention on that day week (yesterday) to give fully his reasons for the decision arrived at.]

UTILISATION OF STORM WATERS IN FRANCE.

THE great point of difference between the sewerage of London and that of Paris is that the sewers in the latter city do not convey any solid matter, but their contents consist of the rainfall and storm waters, the refuse of street drainage, of the urinals, and the waste waters from houses and industrial premises. Compared with the perfect system of our metropolitan drainage, that of Paris is very incomplete, and by no means up to what we should regard as a proper standard for so fine a city. The important question of purifying the contents of their sewers, and utilising them as a manure, has for some time engaged the attention of many of the *savants* and engineers in Paris. During the last two years the municipal authorities have granted divers sums for the purpose of defraying the cost of some reliable experiments in connection with the subject. A double object was to be obtained by the execution of any project that embraced the desired end. One was to put an end to the evil resulting from the discharge into the Seine of the contents of the sewers, and the other to utilise them when intercepted, and distribute them over land to produce a fertilising effect as a valuable manure. Not only would the advantage, viewed in this light, be of a twofold nature, but the public health and agricultural prosperity would be likewise benefited by it. Bearing in mind what had been done in England with respect to utilisation of sewage, and the great value of the irrigation system carried on in Italy and Spain, the Parisians commenced their operations upon a single piece of ground near to the discharging main sewer at Asnières. In order to give the matter a perfectly fair trial, it was determined to separate the mode of proceeding into two distinct sections; in the one, the water was treated with chemical reagents, and thus partially purified; in the other, the irrigation was carried on direct from the discharging outlet, without any preliminary purification. The latter plan will unquestionably be found the preferable, as all the expense and uncertainty of the clarifying process will be saved. At the same time, it is frequently necessary to provide settling tanks, for the water to deposit some of the heavier particles held in solution before it is permitted to flow over the land.

The chemical process adopted at Asnières consists in the treatment of the sewer water with sulphate of alumina, fourteen grains per gallon being sufficient to precipitate the suspended ingredients, and effect the purification of the liquid. The purifying tanks have been for some time in regular operation, and their success has been most satisfactory. Financially the results have been as follows:—The manure sells at 15s. the ton, and the cost of its production varies from one-fifth to one-third. Several acres have been planted with Indian corn and beet-root, and have yielded excellent crops. Possibly some of our readers may recollect seeing at the Champ de Mars some very fine specimens of pumpions, remarkable both for their size and weight. These were grown at Clichy, upon irrigated land, and the system adopted was that of open carriers, very similar to what is termed among us "the pane and gutter system." Experiment has demonstrated that at Clichy the quantity absorbed by the soil was at the rate of 7,000 gallons per acre per diem, for a continuous period of twenty-one days, which is equivalent to a rainfall of 1½in. in the twenty-four hours. The merit of having successfully carried out these irrigating sewage works is due to a French engineer, M. Mille, and the municipal authorities are so well satisfied with the results of his exertions that they have granted a large sum of money for the further development of similar works upon a more extended scale. These are to be carried out upon the plans of Gennevilliers, where tanks, reservoirs, and all necessary appliances and machinery will be provided for the purpose. It will not, therefore, be surprising if the people of Paris actually utilise their waste and refuse water before ourselves.—*Mechanics' Magazine.*

SUGGESTIONS FOR THE CONSTRUCTION OF MUSEUMS.

DR. HOOKER'S inaugural address at the meeting of the British Association at Norwich contained some excellent remarks under this head. He said:—Much of the utility of museums depends on two conditions often strangely overlooked—their situation and their lighting and interior arrangements. The provincial museum is too often huddled away, almost out of sight, in a dark, crowded, and dirty thoroughfare. Such localities are frequented by the townspeople only when on business, and when they consequently have no time for sight seeing. In the evening, or on holidays, when they could visit the museum, they naturally prefer the outskirts of the town to its centre. The museum should be in an open grassed square or park, planted with trees, in or on the outskirts of the town, a main object being to secure cleanliness, a cheerful aspect, and space for extension. Now vegetation is the best interceptor of dust, which is injurious to the specimen as well as unsightly, while a cheerful aspect and grass and trees will attract visitors, and especially families and schools. If the external accessories of provincial museums are bad, the internal are often worse; the rooms are usually lighted by windows on one side only, so that the cases between the walls are dark, and those opposite the windows reflect the light when viewed obliquely, and when viewed in front the visitor stands in his own light. For provincial museums, when space is an object, there is no better plan than rectangular long rooms, with opposite windows on each side, and buttress cases projecting into the room between each pair of windows. This arrangement combines economy of space with perfect illumination, and affords facilities for classification. Upon this plan the large museum at Kew is built, where the three principal rooms are 70ft. long by 25ft. wide, and each accommodates 1,000 square feet of admirably lighted cases, 6,700ft. of wall room for pictures and for portraits of naturalists, besides two fireplaces, four entrances, and a well staircase 11ft. each way. A circular building with cases radiating from the wall between the windows, would probably be the best arrangement of all. A light spiral staircase in the centre would lead to the upper stories. Two or more of the bays might be converted into private rooms without disturbing the symmetry of the interior or interception the lighting of the cases. The proportions of the basement and first-floor might be such as to admit of additional stories being added, and the roof be so constructed as to be removable without difficulty when an additional story was required; furthermore, rectangular galleries might be built, radiating from the central building, and lighted by opposite windows with buttress cases between each pair of windows.

NEW THEATRE, CROYDON.

THIS building, just opened, comprises a market and hotel, in addition to the theatre, and stands on the site of the old Lecture Hall. The market is open to the front, and well ventilated. The central entrance opens to a wide corridor, leading to the gallery and pit entrance to the theatre, and, on the right, to the Royal Hotel. On the extreme right, past the hotel, is the box office, up a broad flight of stairs. The large space above the ground floor in front has been made into a spacious assembly room. The theatre proper is 54ft. deep by 100ft. wide, the proscenium being almost midway between the walls. The stage is so constructed that when the theatre is required for equestrian performances it may be entirely removed. In addition to the pit and gallery the auditorium comprises fifteen private boxes, 100 box seats, and fifty balcony or dress-circle seats. The front of the balcony tier is rather a novelty, rising but half the usual height. The decorations, which have been executed by Mr. Dillon, from designs by the architect, are Greek. The theatre has been built by Mr. Hutchinson, from the designs and under the superintendence of Mr. T. T. Smith, Bloomsbury-square, the architect of the Holborn Amphitheatre.

COMPETITIONS.

THE trustees for the erection of a new Wesleyan chapel and schools at Burton-on-Trent have selected the designs of Mr. Edward Holmes. The buildings will be erected at the corner of Station and Union-streets, and will cost about £4,000. The designs were submitted in a limited competition.

The commissioners for the erection of the Abergavenny townhall and markets met on Friday last, and finally decided to give the first premium, of £50, to Messrs. Wilson and Willcox, of Bath, the second, £20, to Mr. Haddon, of Hertford, and the third, £10, to the local man, Mr. Neville. There were sixteen competitors, but the commissioners were almost unanimous in finally declaring in favour of the successful competitors. It was a most fair competition, and future committees will do well to emulate the example of the commissioners, each one of whom was furnished with a tabular paper upon which were arranged the various requirements of the particulars of the competition, and as each competitor fulfilled or failed in the particular requirements under consideration was accorded or not a mark against his name. Although the commissioners worked hard at the plans considerable time was thus occupied before any decision was arrived at. Messrs. Wilson and Willcox are entrusted with the contract. Plans and specifications of the work will be commenced at once.

EARLY CLASSIC ORNAMENT.

IN the present day Classic architecture in this country carries very little enthusiasm with it. It is cold and spiritless, and provided it is "according to Chambers," both the architect and his master, the public, are satisfied. Why should the most perfect architecture be dragged through so narrow a channel? What would Gothic architecture become if sketching and measuring were almost ignored, and Pugin taken as an infallible standard? I am confident that Classic architecture can never be great unless we measure, draw, and think for ourselves among the ancient examples. The early Italian artists could have only obtained their knowledge by those means, and why should not we have recourse to the same expedient, and go to the fountain head at once?

I have selected a few examples of early ornament to show that Classic art is not always the tame workmanship it is represented to be. Nos. 1 and 3 of the lithographic illustration are from an ivory-cased box of Græco-Egyptian work in the British Museum. The subjects are vigorously incised, and filled in with red, green, and black cement. There is an air of quaintness about the figures which one does not very often find in the works of those stern old artists. Nos. 2, 5, and 7, drawn principally from examples in the Louvre, are Egyptian renderings of the lotus flower in its various stages of growth, from the incipient bud to the full-blown flower.

The lotus is constantly repeated in Egyptian architecture and decoration, drawn on fixed conventional principles, but one would not identify it by its natural type. No. 6 is a rather unusual hieroglyphic, taken from a black granite sarcophagus preserved in the British Museum. It is a cross form, with palm-like foliage depending from it.

A cross, very similar to that used in early Gothic decoration, may be found in Egyptian, Rhodian, Etruscan, and other work executed long before the Christian era. No. 4 is a very spirited sprig of foliage, from an Etruscan vase in the British Museum. The artists of this per od were so facile with the brush that nothing short of a careful tracing will represent the studied freedom of their touch.

O. W. D.

THE PRESERVATION OF COMMONS.

CASES are now pending in our courts of law upon which the future of our commons and open spaces depends. Sir Thomas Maryon Wilson, Earl Spencer, Lord Brownlow, and others are contesting, as lords of manors, the claims of the public. Hampstead Heath, Wimbledon and Berkhampstead Commons are all representative cases. Some two years ago Lord Brownlow had a large portion of Berkhampstead Common enclosed by a substantial and somewhat costly railing. Mr. Augustus Smith, a landed proprietor with extensive common rights, deemed this an illegal proceeding, so he determined to "return to an old constitutional form." A special train, filled with some hundreds of labourers, started from London by night, and arriving at Berkhampstead, uprooted the railings in a few hours. This proceeding, of course, was the subject of much comment; but to this day the railings have never been restored, and the portion of the common once enclosed is now as open as it has been from time immemorial. Earl Spencer's proposal to convert a portion of Wimbledon Common into a park for presentation to the public was stoutly resisted, for, argued the public, they could not be presented with what was already theirs. That portion of the scheme which provided for "the outlying parts of the common" being sold for building purposes was loudly condemned. The result is that the Wimbledon residents and the lord of the manor are "in Chancery." The half-finished house in the neighbourhood of "Jack Straw's Castle," Hampstead Heath, affords ocular demonstration of the frustration of Sir Thomas Wilson's claims. An injunction in Chancery has alone preserved the magnificent view across the heath to Harrow. The right of the lord of the manor to build on the heath at all is warmly disputed by Sir Gurney Hoare and the inhabitants of Hampstead, and the legal decision is expected at the end of the long vacation. These are only three out of many instances in which the vagueness of the rights of lords of manors is causing great public inconvenience. The question is too important, says the *Express*, to be left to the chances of local patriotism, and will, it is hoped, be dealt with effectually by the new Parliament. The Right Hon. W. Cowper, Mr. J. S. Mill, Mr. Shaw Lefevre, Mr. Locke, Mr. Thomas Hughes, and Mr. Charles Buxton are amongst the members who are on the committee of the Commons Preservation Society, and are thus pledged to seek a satisfactory settlement of the law. Another notable case requiring settlement is Epping Forest, "with an indigent cottager on the one side, and the rector, the justices of the peace, and the county families banded together on the other."

For years past the green sward of Blackheath has been gradually destroyed, partly by legalised stealth. Local authority, though aided by the recent Commons Enclosure Act, has been powerless in the matter. It is therefore gratifying to know that the Metropolitan Board of Works has taken this "lung" of London under its charge. Portions of the heath will be planted with trees, and others will be set apart for recreation and equestrian exercise.

DRAINAGE AND DRY SOIL *VERSUS* CONSUMPTION.

PHTHISIS, or, as it is popularly styled, "consumption," is to be found amongst the inhabitants of all climates. That the extraordinary prevalence of the malady in some latitudes is largely dependent on certain atmospherical variations is a circumstance long since recognised by medical men, but until lately, says Dr. Henry Day, in a letter to the *Staffordshire Advertiser*, the difficulty has been very great to point out, confidently, the one special condition which seems to invariably foster the complaint; but at length it has been established that dampness of the soil has a most potent influence for evil in developing this curse of our species. The tenth report of the Medical Officer of the Privy Council, recently issued, affords interesting and valuable information on this point. The diminution in the prevalence of consumption effected by means of well-devised drainage schemes is conclusively shown by the statistics given in the report respecting the following fifteen towns, where the fallen death rates for consumption (per centum) after improved land drainage are as follows:—Salisbury, 49; Ely, 47; Rugby, 43; Banbury, 41; Worthing, 36; Leicester, 32; Macclesfield, 31; Newport, 32; Cheltenham, 26; Bristol, 22; Dover, 20; Warwick, 19; Croydon, 17; Cardiff, 17; Merthyr, 11. Mr. Simon, the medical officer of the Privy Council, being determined to investigate as fully as possible the œtiological relation foreshadowed by the facts ascertained in connection with the drainage of the towns named, commissioned Dr. Buchan to carry out still further researches on a plan both extensive and elaborate. Dr. Buchan's report has now been issued, and from his "Summary of Conclusions" we quote the following:—

> The connection between soil and phthisis has been established in this inquiry by the existence of general agreement in phthisis mortality between districts that have common geological and topographical features of a nature to affect the water-holding quality of the soil; of general disagreement between districts that are differently thus circumstanced; and of pretty regular concomitancy in the fluctuation of the two conditions, from much phthisis with much wetness of soil to little phthisis with little wetness of soil. The connection between wet soil and phthisis came out last year, as above described, in another way—by the observation that phthisis had been greatly reduced in towns where the water of the soil had been artificially removed, and that it had not been reduced in other towns where the soil had not been dried. The whole of the foregoing conclusions combine into one—which may now be affirmed generally, and not only of particular districts—that wetness of soil is a cause of phthisis to the population living upon it.

Mr. Simon, in some eminently practical remarks on the matter, observes:—

> Phthisis, so far as it depends on wholesome circumstances of indoor industry, has since my last report been made preventible under law; and phthisis, so far as it depends on wetness of soil, may easily, in great part, be made similarly preventible. . . . An undrained state of soil, in any place where population is aggregated, answers to the legal intention of the word "nuisance," and I apprehend that even in the present state of the law the local sewer authority is bound to provide that such a state shall not continue through want of proper constructions for drainage. . . . But, at least, the law might unequivocally condemn, so far as detrimental to health, all damming of natural drainage, and for river conservancies it would be a function scarcely if at all less important than that of preventing the pollution of rivers, that they should also, as far as possible, prevent or remedy all such artificial and natural obstructions of water-flow as keep tracts of land sodden with stagnant wetness.

The facts thus brought forward by these eminent medical men are irrefutable, and claim the most serious consideration by those whose special province it is to consider such matters. We hope that in all places where defective drainage exists the authorities will bestir themselves, and thus reduce to a minimum the ravages of so dire a malady as consumption. Dr. Day, in the letter we have referred to, intimates that the drainage of Stafford is far from being perfect.

GUARDIANS' IDEAS OF ARCHITECTS' REMUNERATION.

THE Sunderland Board of Guardians recently commissioned Mr. Greener, an architect, to prepare plans for a new hospital. The guardians, in thus acting, would seem to have been oblivious of the regulations of the Poor Law Board as to new works for purposes of poor relief. These instructions should have been furnished to Mr. Greener, but it seems that they were not sent down by the Poor Law Board until after Mr. Greener had prepared his plans. The plans had to be submitted to the Poor Law Board for approval, and, not being in accordance with the requirements of that body, they were rejected. This made the Sunderland guardians open their eyes, and the matter was discussed at a meeting of the board held yesterday week, when a long discussion arose as to the architect's commission. Mr. Greener had charged according to the regular professional scale—viz., 2½ per cent. on the estimated cost of the building on the plans he had prepared. Some of the guardians were under the impression that Mr. Greener ought to make a totally new set of plans, embracing all the requirements of the Poor Law Board, for one commission—*i.e.*, that he should only be paid for the plans ultimately adopted. But Mr. Greener, having been positively commissioned and definitely instructed as to the preparation of the first plans, maintained that, having executed the plans in the manner stipulated, he was entitled to the commission. It was not his fault that the plans were not in accordance with the Poor Law Board's regulations, and he ought not to be made to suffer. At the same time, he was willing to so modify his plans as to meet the views of the Poor Law Board, and would endeavour to get them passed. Now, from this it will be seen that while Mr. Greener made a determined stand against injustice, he was not unreasonable; but his claims were sought to be ignored, and, from a report in the *Sunderland Times*, it seems that something near akin to bullying was resorted to by some of the guardians. But one of this body, who seems to have had a notion of fair play, spoke up for Mr. Greener, and at length the guardians unwillingly admitted the justice of Mr. Greener's claims, although a doleful lament was heard as to the hardship of the ratepayers having to pay £91 5s. (the amount of the work to be done being £3,000) for plans that might not be used. But these guardians were quite conscious that the ratepayers would know on whom to settle the blame.

AN ARTIST'S MEDIÆVAL SKETCH BOOK.

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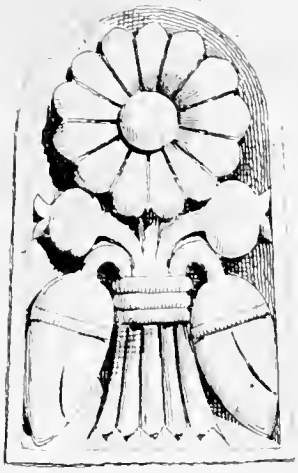

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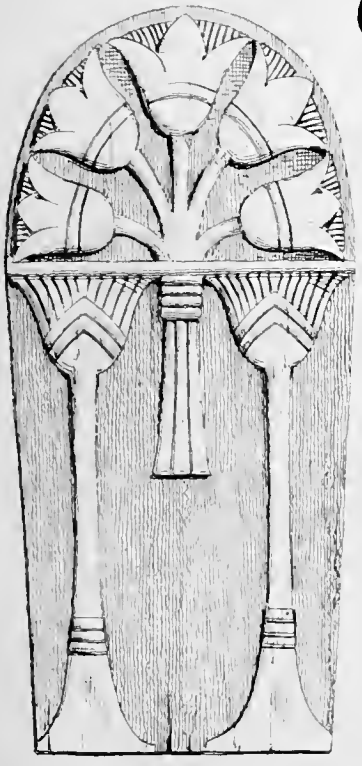

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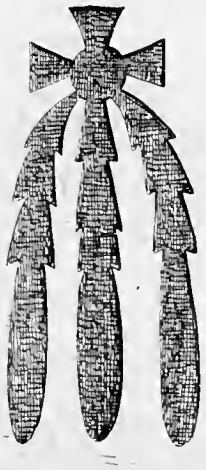

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Wm. W. Lewis del. et sc.

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EARLY CLASSIC ORNAMENT.

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.—V.

THE third method of gallery arrangement, and the most promising one, is what we have called the "transept system." Its distinctive feature is that of placing the galleries in recesses formed for the purpose, such, for instance, as shallow transepts. This system evidently interferes far less with the structural lines of the building than either of the preceding ones. In the "theatre system" the gallery front and its adjuncts are the most prominent features of the interior; in the "balcony system" they still form an overpowering horizontal mass; in the "transept system" they are no more than a series of short horizontal lines stopped by the vertical ones. On the first arrangement a number of columns are inevitable. On this there need not be one in the whole interior. Height and dignity of proportion are everywhere gained, and there is an end to that bane of chapel architecture—the wide single span roof. With such advantages it is strange that the system has not found more favour; but the unwise use which has been made of it partly explains the fact.

The commonest shape in which it has been tried has been that of a plan nearly in the shape of the letter T. The vertical arm is long and narrow; the cross arms receive the galleries, and the pulpit stands at or about their junction. Now, a place of this kind will evidently be a bad one for speaking in. The preacher's voice is lost in the transepts, and fails to reach the end of the building. The people in the galleries, too, find themselves almost hidden from the rest of the congregation. The galleries, therefore, become unpopular; it is not thought "respectable" to sit there, and so many "sittings" are thrown away. Considerations like this last one have a weight which architects may contend against in vain, and it is, therefore, best to take them into account at first starting. But the plan just described is far from being a fair instance of the system. No. 7, in our last illustration, shows it turned to much better account. This is taken from Messrs. Lanyon and Lynn's design for Trinity College Church, Edinburgh. Here there is a central octagon of 50ft. diameter, with four radiating arms. One of them forms a short chancel, the rest are adapted for galleries. There is nothing to obstruct the view of the pulpit, there is ample space and air, the congregation are grouped around the speaker, and every line of the building proclaims its purpose. Externally it is equally effective, with far more genuine ecclesiastical character than the would-be churches noticed in our first paper. The idea is capable of further development. A grand central space, like that seen here, might become a most impressive and even magnificent feature, rather enhanced in effect than otherwise by the surrounding galleries. As to the external treatment, many ways will present themselves, all free from the shapeless awkwardness of the stereotyped Nonconformist church. Why is it, then, that such a form has not been more studied as a basis for design? Is the fault on the part of chapel-designers or on that of committees? Have that small clique who, to Nonconformists, represent the architectural profession, worked themselves into so deep a rut that they cannot get out of it? While their clients remain contented, they are scarcely likely to try. They have too much reason to perpetuate a state of things which, for them, economises both time and labour and brains. The mystery is that there is so much satisfaction on the other side, that no one longs to strike out a new path, and to introduce a type of building with some nobleness and fitness of character.

The remaining plans, in our last page of illustrations, are inserted as suggestive of particular ways in which advance is possible. No. 8 (the plan of St. George's Church, Tufnell Park), designed by Mr. Truefitt, shows an attempt to group the congregation closely around the speaker. We commend the idea to those Nonconformists who prefer churches which, like this, are destitute of galleries. If they wish, so far, to evade one great difficulty in design, it does not follow that they must introduce the long nave and aisles still absurdly repeated by many of their Episcopalian neighbours. There is still less reason why they should crowd their buildings with such a multitude of pillars as they sometimes do. This folly is becoming a thing of the past even in the Church of England. Such an example as that of St. James the Less (No. 10), designed by Mr. Street, will show that excellent effect can be obtained with no more than two columns on each side of the nave. It is curious, however, that even in imitating Church of England designs, Nonconformists are so far from imitating the best of them. Instead of keeping up with the latest advance in art, which generally coincides with the least amount of unfitness for their own purposes, they appear to have seen nothing of later date than twenty or thirty years ago. It may, perhaps, be useless to tell them that the work they copy is weak and inferior; that the first efforts of the Gothic revival contained many follies and puerilities now abandoned. But there is one argument that cannot fail—they are decking themselves out in a style that is no longer fashionable.

A row of large columns is undoubtedly one of the most inappropriate things which can mar the design of a Nonconformist church, and the majority of chapel promoters are wise enough to object to it; but to reject a feature when it becomes practically inconvenient is one thing; to forbid its use under all conceivable circumstances is quite another. Numbers of persons of the class just referred to show the same aversion for a stone column which a bull does for a red rag, and with an equal amount of intelligence. No matter where it is placed, whether it obstructs the view or not, it is an abomination to them. It is just such irrational prejudices as this which make half an architect's troubles. The natural difficulties to be conquered in designing a good Nonconformist church would give him work enough; but when to these are added all the unreasonable fancies of the people he is working for, the problem set him becomes fairly insoluble. Now to introduce (say) only two or three substantial columns in a design would often give immense advantages. They could be placed where not a single seat would be hidden by them, and where, from the modifications they would admit of in the roofing, they would greatly improve the acoustic properties of the building. Yet to attempt it would in many cases be hopeless, and in a chapel competition ruinous. Supposing, however, the prejudice to be overcome, a great source of variety would at once be gained. Up to this point we have had to do with buildings destitute of any columns, unless it were iron ones, which, by the way, spoil a good many sittings in the aggregate, without the least complaint being made about them. It is one of the commonest things to find a chapel with twenty iron columns, ten below the galleries and ten above. At least twenty, and probably forty or fifty persons are inconvenienced by them, and yet everyone thinks this quite a natural and proper state of things. But should an architect be adventurous enough to insert a couple of stone columns, which at worst could not deprive a dozen people of their view, the outcry is really astonishing. In this, as in other points, a little common sense is the first requisite to improvement. It is quite right to condemn obstructions, but let the principle be carried out fairly and uniformly. Such plans as No. 7 would then plainly have the preference. Next to them would be those with a few columns judiciously placed, and last of all, those which now form the great mass of designs, such as No. 1 in our first plate.

Of the system now suggested, that in which a very limited use is made of stone shafts, few existing instances can be given. The first fact that presents itself in searching for examples bearing on the difficulties of Nonconformist church design is the scarcity of buildings of a monumental class free from internal columns. However else they may differ, temples, mosques, basilicas, and churches all agree in this respect. But there are great variations, arising from the special conditions of each case, in the *amount* of columniation. We have shown a few of the types in which it is smallest, not that any of them are fit for literal repetition, but because even rudimentary ideas are worth having in a case like the present one. No. 11 is a church of the fifth or sixth century, that at Galb Louzeh, from M. de Vogue's very interesting work on the architecture of Central Syria. With its small number of piers, its short chancel, and its large narthex or porch it comes nearer, at any rate, to the form we are in quest of than do most churches of a later date. No. 12 is the plan of St. Sophia, Trebizond, in which four shafts, less in size than the last, produce a very picturesque effect both externally and within. No. 13, from Revoil's "Architecture Romane," is the Abbey Church of Thoronet; and No. 15, from the same work, the Church of St. Martin de Londres, Herault. No. 14 shows the very early but magnificent church of St. George, at Thessalonica, as given in Messrs. Texier and Pullan's work on "Byzantine Architecture"; suggestive, even here, of some thoughts about the path which has been travelled from the almost indestructible grandeur of ancient work down to the transitory shams of to-day. It is comforting, after all, to remember that nineteenth century "chapel Gothic" is not likely to be sketched and measured twelve hundred years after its erection. But without any risk of this kind it would bear to have a considerable addition of solidity. Strength and massiveness of construction are far more telling qualities than mere ornament, and anything which would do away with thin walls, weak carpentry, and lath and plaster, would make a valuable revolution indeed. It is partly with this aim that the less frequent use of iron columns is to be desired, and the introduction of more durable substitutes. How to effect this without interfering with the convenience of the congregation is a problem to be answered differently, it may be, in each separate case. No. 16 is a plan slightly altered from that of St. Martin's, Haverstock-hill, lately built by Mr. E. B. Lamb, in which the four piers used to aid the internal and external design are nearly unobjectionable in position. The rest of our plans may be worth noticing for particular points. No. 17 is adapted for three galleries on the "transept system," which might be carried by girders without any other support. No. 9 is the plan of the Sinclair Seaman's Church, Belfast, by Messrs. Lanyon and Lynn, an L-shaped building, with the pulpit at the angle. No. 18 shows the plan of a Congregational church, built by Mr. Waterhouse, at Manchester, and adapted to a wedge-shaped site. The gallery is indicated by the dotted line.

In concluding this series it is proposed to notice some minor features of Nonconformist churches, as well as that general ideal which it would seem most desirable to aim at in their design.

THE NATIONAL ART LIBRARY AT SOUTH KENSINGTON.

YEAR by year the number of students who use the art library at South Kensington increases, notwithstanding that the "arrangement which can scarcely be called accommodation"—we use the words of the keeper of the library—becomes yearly worse and worse. At present the table space available is barely 2ft. to each reader; in the British Museum 5ft. is allowed to every person. The library, moreover, is badly lighted and very inconvenient. As the keeper says, the completion of a building not merely utilised as a library, but constructed for one, will prove the only effectual re-

medy. The sooner this is accomplished the better. Elbow room is absolutely necessary to art study. The books are often of much larger dimensions than ordinary, and valuable drawings, lithographs, &c., are very liable to damage from the want of a proper amount of space whereon to inspect them. With all its disadvantages the collection of literature it contains is so valuable to students that its use has considerably increased; with increased facilities its value might be trebled.

ARCHÆOLOGY.

A FEW days ago the Rev. Edmund Kell and Mr. Charles Lockhart found the relics of a Roman building in Castleford on Andover Downs Farm, belonging to Mr. Joseph Turner, where one had been discovered by them last year, of which an account was printed in the "Journal of the British Archæological Association" of last September. The relics now discovered, situated 256ft. westward of the former building, are far inferior in quality, and in a very dilapidated condition. Being situated higher up the slopes of the hill, where the mould was comparatively thin, they were constantly exposed to the action of the plough, and of course the farmer would remove the dislocated stones. There was the same description of pottery, Samian ware, nails and other iron articles, bones of edible animals, oyster shells, &c., as in the relics of the first building exhumed. The discovery of these Roman relics is valuable to the antiquary as establishing the position of the Roman station Vindonum, the neighbourhood of which near the intersection of the Roman road from Silchester to Salisbury with that from Winchester to Cirencester had been conjectured, but not proved, by Sir Cecil Colt Hoare in his "History of Wiltshire." The relics of the building discovered last year were oblong, 66ft. 6in. long by 41ft. 2in. broad, with a portico 2.ft. long by 14ft. broad. The walls, 2ft. thick, were composed of flints embedded in mortar. The direction of the building was N.N.W. The roof, which had been composed of hexagonal stone tiles, had been supported by fourteen pillars at regular intervals, opposite to each other, the foundations of which remained. There were the remains of six fireplaces and three furnaces, but no hypocausts or baths. The building was pitched with stone, and is conjectured to have been a diversorium or inn, and not what is usually called a Roman villa. On the site were found abundance of crockery, Samian ware, coins, nails, and iron articles of various kinds; ox, sheep, hare, horse, and other bones; and oyster and mussel shells.

Referring to the recent meetings of archæologists at Cirencester and elsewhere, the *Herts Guardian* says that it is most desirable to extend the taste for archæological inquiry generally, and this can best be achieved by means of county societies. There is ample field for the exertions of a local society throughout Herts. The only society at present existing in Herts has St. Albans for its head quarters, but this society limits its researches to West Herts, and regards neither the east nor northern portions of the county. And yet there is much to inquire into in these parts of Herts; for though the county altogether is lamentably poor in ecclesiastical antiquities, yet there are remains of old castles, sites of old Roman roads, and other objects which would well repay research and examination. If the archæologists of those portions of the county which are not embraced by the St. Albans Society would communicate with the Rev. R. Gee and the Rev. W. O. Davy, the usefulness of the society might be extended to the whole of Hertfordshire.

The general meeting of the Leicestershire Architectural and Archæological Society was held on Wednesday and Thursday week at Kegworth. On Wednesday, after service, Mr M. H. Bloxam, F.S.A., pointed out the architectural features of the church. The party then proceeded to the schoolroom, where a temporary collection had been made of antiquities belonging to the neighbourhood. Walking parties were then formed for visiting Kingston Church, Ratcliffe-on-the-Soar, and "Tom Moore's stile" on Broad Hill. Returning to Kegworth dinner was partaken of at a local inn, and in the evening a meeting was held in the Mechanics' Institute under the presidency of the Rev. J. Clarke, the rector of Kegworth. Papers were read on "Memorials of Kegworth," by the president; on "Some Discoveries made in the Progress of the Restoration of Lutterworth Church," by Mr. Bloxam; and on "Richard Fowke's Journey to Freestone shore, illustrative of Social Life amongst the Middle Classes at the Commencement of this Century," by the Rev. E. Towers. The usual votes of thanks terminated the meeting. On Thursday the society visited Gotham, Bunny, Wysall, Willoughby, Wymeswold, Rempstone, Cortlingstock, East Leak, and West Leak.

On Tuesday week the North Oxfordshire Archæological Society had a field day at Witney and the neighbourhood. Their first visit was to Eynsham, to inspect the church; from thence to the little church at Cogges. They then proceeded to Witney Church, lately restored by Mr. Street. On Tuesday they visited Minster Lovell, where the church is undergoing renovation; it has a central tower on remarkably solid columns, each with a stone seat round its base, and a tall narrow arch by its side. There are remains of a screen and a rood-loft gallery, and in the vestry north of the chancel the unique feature of a double lagioscope, so that the holy services of the altar may be seen by a person either inside or outside the vestry room. The monument to Henry Heylyn was absent for repairs. The remains of the ancient mansion of the Lovells excited admiration from their elegance of design, loftiness of build, and solidity of masonry. The proceedings concluded with a visit to the museum at Witney, over which the visitors were conducted by Mr. Thomas Purdue.

WATER SUPPLY AND SANITARY MATTERS.

THE disposal of the sewage is now exciting a large share of attention in Merthyr Tydvil. A system of main drainage has lately been completed, and the sewage matter, after being deodorised, has been discharged into the River Taff, about four miles below the town. The Local Board of Health have, within the last fortnight, been threatened with an injunction to discontinue this practice, in consequence of the nuisance which it is alleged it occasions. This has placed them in a position surrounded by many difficulties, the chief of which is what to do with the sewage matter if an injunction be obtained. The nature of the district—a narrow valley, on each side of which rise steep hills—precludes irrigation, and the only other means of utilising sewage appears to be by converting it into manure, on the same principle as at the Stroud works. This the town surveyor recommends, and it is a plan that is likely to be adopted, as many of the members of the Board are themselves in favour of it.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new aisle to St. Pancras Church, Chichester, was laid on Monday week.

On Wednesday week the foundation stone of a new Wesleyan Chapel was laid at St. Lawrence, Kent. Sittings will be provided for 200 persons.

St. Michael's Church, Stinsford, Dorsetshire, has been restored, under the direction of Mr. Hicks, architect, of Dorchester; Messrs. Wellspring and Son being the builders.

On Thursday week the Bishop of Ripon consecrated the new church of St. Anthony, Newcastle-on-Tyne. The edifice consists of a chancel 30ft. by 22ft., and nave 63ft. by 24ft. 6in., south aisle 10ft. wide, and an organ chamber and vestry. The style is Early Pointed, and the materials are red brick, with bands of dark-coloured bricks introduced in the interior. Messrs Austin and Johnson, of Newcastle, were the architects.

On Saturday the memorial stone of a new Methodist Chapel was laid at Ilkley, Yorkshire. The style of the building is twelfth century Gothic, and it will seat 650 persons, at a cost of £3 500. Messrs. Andrews, Son, and Pepper, of Bradford, were the architects.

A new Wesleyan Chapel at Ceprinion, in the Knighton circuit, was opened on the 19th ult. It is in the Norman style, and was built from the designs of Mr. Pugh, of Bishop Castle.

On Wednesday week a new Unitarian Chapel was opened at Hunslet, Yorkshire. The building is of Potternewton delphstone, with Meanwood sandstone dressings, designed in Early English Gothic, and is 52ft. long by 30ft. wide. The total cost, including the land, is about £1,700. Mr. Alexander Crawford, of Leeds, is the architect.

The annual general meeting of the Carlisle Diocesan Church and Parsonage Building Society was held on Thursday week at Penrith. From the report it appeared that £713 had been granted towards the erection of churches and parsonages.

The foundation stone of a new Primitive Methodist Chapel was laid at Theale, near Reading, on Monday week. Mr. May, of Ufton, is the contractor.

The new church of St. Patrick, at Jordanstown, has been consecrated by the Lord Bishop of Down and Connor and Dromore. The general style of the building is Mediæval—that of the tenth century. The material used is white sandstone, relieved with red brick for the exterior; while red and black brick, with sandstone dressings, were used for the interior. The chancel is 24ft. long by 18ft. wide, with semicircular end. The pulpit is of stone. The cost was about £3,000.

A new Presbyterian Church has been opened in the town of Killarney. The style is Gothic. Sittings are provided for about 120 persons. The total cost was about £1,000. Mr. Francis Norman was the contractor.

The church of St. John the Baptist, Hey, is at present undergoing repair and enlargement, at a cost of £2,000.

Emmanuel Church, Brighton, was recently opened. The edifice has a frontage of 104ft. in Norfolk-terrace, and of 72ft. in Belvedere-terrace. The walls of the interior are polychromatically decorated. The stained glass windows have been supplied by Mr. Bell, of Camden Town. The sittings (1,500 in number) are of stained deal. The roof is of iron, and covered with iron externally, and the stairs leading to galleries are also of iron. The cost has been £5,000. Messrs. S. C. Hemming and Co., of London, were the contractors.

BUILDINGS.

A new railway station was recently opened at Taunton. The length of platform under roof is 250ft.; width of roof, 88ft.; height of apex of roof, 42ft. Messrs. W. Brock and Co., of Bristol, were the contractors.

The foundation stone of a new industrial school was laid at Mossbank, near Glasgow, on Wednesday week. It will be built of red, black, and white bricks, and will be 240ft. in length, and three stories in height. It will contain 1,000 children, at a cost of £900.

The bullion court of the Bank of England is being cleaned and repaired.

Shepherd's Hotel, at Cairo, has been destroyed by fire. This may lead to a building operation. The adjoining hotel of the Oriental Hotels Company, by Mr. Tompson, cost £120,000. Shepherd's had been a palace of Mehemet Ali Pacha, and now belongs to H. H. Kiamil Pacha. It is on the site of General Bonaparte's head-quarters and of Kleber's assassination.

St. Hubert's Hall, Great Harwood, Lancashire, was opened on Monday week. It has been built for the use of the Roman Catholics in the town, as a place in which to hold social meetings, &c., at a cost of £950.

The foundation stone of six almshouses was laid at Stilton the other day. Mr. Hutchinson is the architect, and Messrs. Tyres, Ireson, and Richardson are the contractors. The cost will be £450.

The old hospital building in Little Park-street, Coventry, has recently been purchased, and has undergone extensive alterations and improvements adapting it for a county reformatory for girls. Mr. Steane, of Coventry, was the architect.

By the liberality of a resident a new village hall is to be built at Cheriton, in Kent, to accommodate 100 persons. The style will be Gothic, and it will be built of Bath and Kentish rag stone, faced internally with coloured bricks, at a cost of about £1,200. Mr. J. Gardener, of Folkestone, is the architect.

A new bank has just been erected for the Midland Bank at Oundle, Northamptonshire, from the design of Mr. Browning, architect, of Stamford. The carving of the capitals, of polished serpentine, which ornament the front, is by Mr. William Hilliam, of Stamford.

Messrs. George Angus and Co.'s new warehouse and office, &c, in Grainger-street West, Newcastle-on-Tyne, was opened a few days ago. The general plan of the building is somewhat of the L form, measuring about 140ft. in the longer and 90ft. in the shorter arm, by an average width of 45ft. The front building consists of large shops, with a spacious cart entrance in the centre, leading to the cellars, large warehouses, and workshops behind. Over the shops are two stories of offices and attics. The style of architecture is Italian Gothic, successfully adapted to commercial purposes. The building was formally opened on the 26th ult. by the Mayor of Newcastle, Henry Angus, Esq., at a luncheon, held in the warehouse. The architect is Mr. Gibson Kyle, of Newcastle. The contractors are Mr. R. Robson, mason; Messrs. J. and W. Lowry, joiners, &c.; Mr. R. Richardson, painter, &c.; Mr. H. Watson, plumber; Mr. Curry, carver; Mr. Beck, slater; Mr. J. Charlton, plasterer.

The buildings and site of the old city gaol at Worcester have been purchased by a gentleman, and a portion of the edifice has been converted into almshouses. The foundation stone of a new church on part of the site was laid last week.

The china and earthenware manufacturers of the Staffordshire Potteries, as represented by the local Chamber of Commerce, have concluded a convention with their workmen for the settlement of trade disputes by arbitration. The board to whom future differences are to be referred is composed of ten manufacturers, nominated by the chamber, and ten workmen appointed at a large public meeting held last week at Hanley. It is a noteworthy fact that one of the first questions addressed to the Liberal candidates for the representation of the Potteries was, "Will you vote for a legislative enactment making the decision of boards of arbitration binding on the parties appealing to them?" The affirmative answers given were loudly applauded.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—S. W.—W. M. jun.—I. M. S.—I. C.—I. B. R.—T. G.—I. A. D.—T. O.—C. B. A.—I. P. S.—W. H. B.—W. B.—B and Son.—S. S.—J. Redford.—W. E.—J. M. S.—S. K. M.—A. S. P.

Correspondence.

BUILDING SOCIETIES.

To the Editor of the BUILDING NEWS.

SIR,—Your correspondent, Mr. E. Ingress Bell, has drawn attention to a most important question in relation to building societies, but has he not fallen into a misapprehension as to their scope and object, and been thus led to undervalue their utility?

A building society is really a deposit bank and loan fund—nothing more. It receives the deposits of its members, allowing interest upon them, and lending the money to such of the members as may wish to borrow. The interest paid to the depositors is paid out of the profits made by the higher rate of interest paid by the borrowers. It is obvious that the depositors could not receive 5 per cent. if the borrowers only paid that rate. The error is not in charging a higher rate of interest to the borrower than they pay to the depositor, but in professing to charge only 5 per cent. when the rate is really 7, 7½, or 8 per cent. Some of the best societies, as, for example, the National Freehold Land Society, which works in alliance with the British Land Company, adopt a clear and unexceptionable principle of action in this respect. That society advances money to purchasers of lots upon the estates of the British Land Company at 5 per cent., but it is 5 per cent. upon the balances remaining unpaid; and to all borrowers for building purposes they charge 7 per cent., but that is upon the balances due, so that a man who has paid off £700 out of a loan of £1,000 is paying 7 per cent. upon £300 only, while, in the case censured by your correspondent, 5 per cent. is paid upon the £1,000 until the whole is paid up. I agree with him that it is an unbusinesslike proceeding, and one that calls for correction. I do not agree with him, however, that the rate of interest is too high, nor do I subscribe to the opinion that it is better for a man to continue to pay rent. The great advantage is overlooked by him of a man becoming by these payments the owner of his own house. He may, it is true, rent a house for fifteen years on easier terms than by buying one through a building society, but this is not always the case; but at the end of the fifteen years he is just where he began, while, after his money is paid to the building society, the house is his own. I am sure that if he looks at the whole case he will not in future discourage building societies, but endeavour to make them more efficient by correcting the errors in practice, one of which he has pointed out.—I am, &c.,

Masbro', August 31. S. S.

SIR,—I think the letter in your journal of last week from Mr. Ingress Bell will induce many persons to entertain doubts as to the benefits derivable from the operations of land and building societies; will you therefore permit me to offer a few observations in reply?

I may at once state that I am not officially connected with any society, but have watched the progress and working of several for many years past.

Your correspondent expresses an opinion that an exorbitant rate of interest is exacted by these societies, and that it would be much better to continue the payment of rent for a few years and invest an amount for the purchase of a house without the aid of a society. Let us see what the result would be, and for illustration one case will be as good as a hundred.

Say for the villa in which I reside the landlord receives £36 a year rent, and I could obtain the lease of the property for £300. I borrow that sum from a building society and purchase the house, repaying the amount by 120 monthly instalments of £3 10s., including principal and interest, or £42 per annum, to which add £8 for ground rent, insurance, &c., making the yearly charge £50, or a total outlay in ten years of £500. The present rent being £36 I shall have to provide an additional sum of £14 a year to meet these payments for ten years, and at the end of that period shall have paid to the society £420, being the £300 borrowed, plus £120 as interest, or about 8 per cent. per annum.

The building societies of course are not all conducted upon exactly the same principles, but the chief of them do not differ materially in their general results.

Now if instead of obtaining the house through the assistance of a society I invest the £14 a year at 4 per cent. interest (and where can it be safely placed at a higher rate?) until it accumulates to £300 with the view of buying a house of that value, I must wait fifteen years and pay rent in the meantime amounting to £540 (£36 × 15), which being added to the total sum invested, viz., £210 (£14 × 15), makes the outlay £750, or, £250 more than would be incurred by purchasing the house with the aid of a building society.—I am, &c., S. S.

London, September 2.

ANOMALIES UNDER THE METROPOLITAN BUILDING ACT.

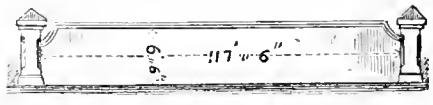
SIR,—The Metropolitan Building Act, though, on the whole, its existence and enforcement have had a wholesome effect, would appear to be by no means an unmixed good. The endless disputes that have arisen, and the conflicting decisions arrived at by magistrates before whom the summonses have been heard, convey anything but a salutary impression of the dignity of the law. When the law ceases to be certain in its operation it loses its dignity. The greater the number of interpretations that can be placed upon a statute the greater is the blame attaching to those who placed it on the Statute Book, and, accepting this dictum as sound, the framers of the Metropolitan Building Act have, by all accounts, much to answer for. At least, we may reasonably come to such a conclusion when we find so much disputation as to the meaning of this or that clause. But the obscurity of meaning of some of the clauses is not what I wish to draw attention to now. From reading the report of a case recently heard before Mr. D'Eyncourt at the Marylebone Police Court, I have been struck with the thought that there must be something radically defective about the act. Under its provisions, as is now pretty generally known, every district of London is under the surveillance of a surveyor, whose duty it is to see that the requirements of the act are complied with in all erections within their respective districts. Now, from the case I have referred to, it would appear either that the provisions of the act are so ambiguous as not to be alike comprehensible by those appointed to carry them out, or that those so appointed, from motives best known to themselves, or from no motives at all, are capricious in their rendering of the act. In the case mentioned Mr. Samuel Simpson, builder, of Tottenham Court-road, was summoned by Mr. Alexander Peebles, district surveyor for the northern division of St. Marylebone, on account of not having complied with the provisions of the act in executing certain portions of the works required in the alterations now being carried out at the Marylebone Theatre in fireproof materials. The builder's defence was that he had built the new Queen's and the Holborn Theatres, and that they were built on precisely the same principles as the works now condemned by Mr. Peebles; and that, moreover, the plans for both those structures met with the approval of the district surveyors in those localities. Mr. Simpson said that he was also the contractor for the new Gaiety Theatre, in the Strand, and the plans for that edifice, though similar to those of the Marylebone Theatre (so far as the point at issue was concerned) had met with the approval of the surveyor in that district. Furthermore, the plans now condemned by the Marylebone district surveyor had been "passed" as satisfactory by an official at Spring Gardens, acting on behalf of the superintending architect of the Metropolitan Board. Taking the accuracy of the builder's statements for granted (and none of them were impugned) it really does seem a gross anomaly that, with all these precedents on his side, judgment should be given against him. I do not call in question the justice of the condemnation. Mr. D'Eyncourt is one of the most experienced of metropolitan magistrates. There is every probability that his decision is right. But, whether right or wrong, the uncontradicted statements made by the builder give no flattering picture of the working of the act. Are the duties of district surveyors so loosely defined that some act in direct opposition to others? And when plans are "passed" at head-quarters, does it savour of sound management when subordinate officials reject such plans? And if, in the future the Queen's, the Holborn, or the Gaiety Theatres are destroyed through not being erected on the fireproof, or supposed fireproof, principles enjoined by the act, will the Metropolitan Board or its officers, the district surveyors, be liable to an action for damages? We certainly cannot but marvel when we read of public officers being so widely divergent in opinion as to the path of public duty. If it arises from ambiguity of expression in the act, why does not (if the act cannot be intelligibly amended) the Board issue an authoritative manual or handbook explanatory of the act? Certainly those who administer the law should understand the law. I don't know how the district surveyors are off for work, but I think they ought to keep a sharper eye on the bad materials and workmanship that seem to be so common now in some of the suburbs. At least, that is the opinion of one who is

NOT A PROFESSIONAL.

THE ART OF BUILDING IN CONCRETE.

SIR,—Having read with much interest your articles I., II., and III. on the different modes of concrete building in your last numbers, I trust you will not think it out of place my sending you the result of my experience. After having completed the concrete work for the house at East Sheen satisfactorily with Mr. Tall's patent apparatus, containing thirty rooms with passages, all with fireproof floors in the same material, I now give the result of my experience at this place, under Mr. W. F. Hooper, surveyor, with the same apparatus.

I started on Wednesday morning, the 19th inst., at nine o'clock, on a house 41ft. by 38ft. 6in., and by the 21st inst., it was 6ft. 4in. high all round the building, all the external walls being 12in. thick, and two internal walls, containing the flues, 15in. thick, the number of hands employed being four only. I have also on the same grounds erected two boundary walls 117ft. 6in. long, each 6ft. 6in. high, and 6in. in thickness, with a pier at each end only, thus—



These walls are admired by all who call to see them, and I would ask any practical man with a knowledge of concrete if he can name another system, with blocks or otherwise, that can produce the same result?

With reference to the cost of the apparatus, I am given to understand that the patentee is willing to take it back after the completion of these works, and allow one-half the value paid for it, which arrangement, combined with the inexpensive system of building as compared with the ordinary mode of building, will show a considerable saving; and it further strengthens my opinion that, with these arrangements, anyone desirous of building two or even one cottage, would find it exceed their most sanguine expectations as regards the great saving between building in concrete and ordinary brickwork, with the addition of all the advantages connected with concrete building, such as a more substantial house and a much warmer house in winter, the walls being quite impervious to damp and vermin, and the system providing a sure cure for a smoky chimney, with minor advantages. I shall be glad to show the works here to any gentleman interested in this system of building.—I am, &c.,

H. R., Clerk of the Works.

Ailsa Park, Twickenham, August 26.

ST. ANDREW'S CHURCH, MONTPELIER.

SIR,—I notice in your paper for last week a short account of the "improvements" in the church of St. Andrew's, Montpelier; but, in the cause of art, religion, and good manners, will you allow me to ask if costly gifts are to be set aside at any time incumbents may see fit? If so, there is

not much encouragement given. Would it not have been much better if the centre panel of the said reredos had so been coloured as to throw out in bold relief the symbol of our redemption that has for some time past stood upon the super altar of this church, instead of casting it aside, to the insult of its donor—yes, and of Him whose sign it is, as well as to the deepest regret of many devout communicants at that altar?—I am, &c.,

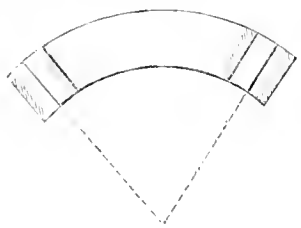
AN ARCHITECT.

Intercommunication.

QUESTIONS.

[998.]—GOTHIC ARCHES.—Will any of your readers kindly inform me what book (if there is any) will give me examples of the four periods of Gothic architecture, viz., Lancet, Geometrical, Curvilinear, and Rectilinear, and where it may be got; also the price?—W. E., Salford.

[999.]—GOTHIC ARCHES CIRCULAR ON PLAN.—Allow me to thank "S. Lewis" for his attention to my query—"Gothic Arches Circular on Plan;" but his answer does not suit my purpose. The method he proposes is for an arch cutting square into a circular wall. I want to construct mine with the sides of soffit radiating



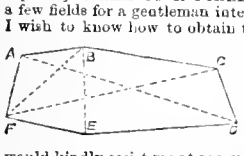
nearly to the centre, as per sketch. It will be observed that the sides of soffit are drawn parallel to the radiating line, and on that plan I am bound to work. I shall feel obliged to "S. Lewis" for working lines for the above; also his opinion as to whether it would be better to have the beds twisted or fair?—CLERK OF WORKS.

[1000.]—CLIPSHAM STONE.—Will you kindly, through your paper, inform me if Clipsham stone is a stone that would be likely to stand the London smoke, as I should like to see some of it used in town, as there is so much decay in some of the stone used in good buildings; and, knowing that Clipsham stone is one of the best weather free-tones in England for all external purposes, I should like the opinions of some of our practical men on the subject.—A SUBSCRIBER AND BUILDER.

[1001.]—PLAN DRAWING AND ARCHITECTURE.—Could any of your numerous correspondents be so kind as to give me the following information?—What is the best course of study necessary to obtain a thorough knowledge of plan drawing and architecture in general, and the works necessary for the same; and is there such a work that treats on Gothic architecture, both theoretically and practically; also for all kinds of church architecture, domestic architecture, &c.; and a good work giving a complete system of lines for stone cutting?—STONEMASON.

[1002.]—HORSE POWER FOR A GENERAL JOINER.—Will any of your readers kindly inform me if they know of a general joiner that is worked with one or more horses; and if so, where it can be seen, and who made it?—I. J.

[1003.]—AREA OF A FIELD.—Having lately surveyed a few fields for a gentleman intending to build upon them, I wish to know how to obtain the total area. I saw in your valuable columns of "Intercommunication" for August 21, a reply about a triangle, and I should be exceedingly obliged to any of the gentlemen who answered the question if they would kindly assist me at present. The line A D is 1,170ft. long; F C, 1,370ft.; B C, 730ft.; B E, 320ft.; B F, 210ft.; F E, 165ft.; E D, 540ft.; C D, 85ft., and A F and A B each equal to 90ft. How am I to proceed to calculate the area of the whole figure A B C D E F?—YOUNG SURVEYOR.



[1004.]—TELESCOPE GLASSES.—Can any of your readers inform me of the reason why the telescopes belonging to engineers' levels and theodolites always view the objects upside down? Is there any real necessity for such an arrangement, or is it merely to bewilder the uninitiated?—QUERY.

[1005.]—FREEZING MIXTURES.—I should be much obliged to any one of your valuable contributors who could explain to me the theory of freezing mixtures, so very much used during the late hot summer, and what chemical ingredients would be the cheapest to employ for the purpose.—S. P.

[1006.]—MOIST WATER COLOURS.—Could any reader inform me how and where I could obtain either porcelain or gutta percha pans for moist water colours, also lead tubes for oil colours?—H. K.

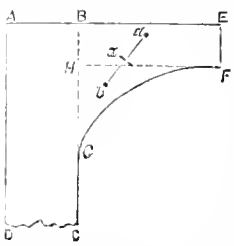
[1007.]—CEMENT FOR GAS AND WATER PIPES.—I want a formula for a cement for gas and water pipes, really impermeable to gas and steam. Perhaps some reader will oblige.—MACHINIST.

[1008.]—RETAINING WALLS.—I am obliged to "Q. E. F." for the trouble he has taken, but if he examines my question (No. 961) he will see that it was not the case of a retaining wall with the earth or water level with the top, but for one with a surcharged embankment. I suppose there is some general rule sufficiently accurate for all practical purposes. Rankine gives one, but long and complex, as he takes into account the pressure of the earth on the top of the wall. To obviate this, in my figure I showed the foot of the slope of the embankment resting against the edge of the back of the wall. With regard to the form of the wall, the back is often built parallel to the face, and very seldom vertical. I have built several on railways abroad, but I think sometimes there has been a useless excess of strength given to them; and in cases where a wall is 30ft. or 40ft. high, with 80ft. of bank above it, it is difficult to judge what is the best form of wall to be used, and of what dimensions it should be built; and some clear, simple rule such as I ask for would, I think, be serviceable to many.—X + Y.

REPLIES.

[962.]—ST. PETERSBURG STANDARD DEALS.—I find in "Intercommunication," No. 962, in my answer to "Builder's" question in No. 710, St. Petersburg Standard, there is a slight error, probably mine. It reads: "A St. Petersburg standard C is 120 planks 12ft. 11in. by 11in., or 60 planks 12ft. 3in. by 11in., equal to 880ft. run of 3ft. by 9in.," which should be "880ft. run of 3in. by 9in., or 73 deals 12ft. 3in. by 9in., and one piece 4ft. over."—W. L—D.

[979.]—CENTRE OF GRAVITY OF ARCH.—The second question proposed by your algebraical correspondent X + Y is a little more complicated than his first, but still admits of an easy solution. In the first place, the part A B C D may be regarded as the pier, and as having nothing to do with the semi-arch. We then have the irregularly shaped piece B E F G, of which it is required to find the centre of gravity. Draw the horizontal line F H, and find the centre of gravity of the semi arch H F G by the method previously given by "Q. E. F." in a former number. Let it be at the point *b*. Next find the centre of gravity of the rectangularly shaped figure B E F H, which will obviously beat its centre at *a*. Having determined these points, draw the line *a b*, joining them, and cut it at the point *x* in the inverse ratio of the weights of the pieces B E F H and H F G, so that *a x* : *x* : : *b* : : weight of H F G : weight of B E F H. The centre of gravity of the whole figure B E F G will be situated at the point *x*.—Q. E. F.



[982.]—STRENGTH OF BRICKS.—Having seen "Hydraulic's" question in your "Intercommunication" columns, I wanted to see the replies. Finding there was no answer inserted in your last issue, I beg to hand you the calculations, thinking it is an important question, which should interest every young architect and engineer:—3in. × 1in. × 1in. : 800lb. : : $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$, which = $\frac{1 \times 800 \times 3 \times 3 \times 3}{3 \times 1 \times 2 \times 2 \times 2}$ = 900lb. crushing weight for 1in. cube. As there are 36 of these cubes in the size of the brick given, it would require 36 times 900lb. to crush the brick: 900lb. × 36 = 32,400lb., the crushing weight for a brick 9in. × 4½in. × 3in. —ENGINEER.

[982.]—"Hydraulics" does not state his question very clearly. By $1\frac{1}{2}$ cube does he mean a cube containing $1\frac{1}{2}$ square inches, or a cube of which the side is 1½in. in length. Upon the latter supposition, the number of square inches in the surface of the cube would be $1\frac{1}{2} \times 1\frac{1}{2} = 1.5 \times 1.5 = 2.25$, and the calculation is $2.25 \times 800 = 1800$lb. The crushing weight of a brick will manifestly depend upon the manner in which it is laid. If laid in the ordinary way, as in walls, the strength in pounds would be equal to $9 \times 2 \times 800 = 21600$lb. But if it be laid flat, as in paving, the calculation would be $9 \times 4\frac{1}{2} \times 800 = 32,400$lb.—H. B.

[983.]—PARTY WALLS.—Allow me to inform "H. R. T." that anything overhanging a wall has nothing whatever to do with the boundaries of land. The boundary line will depend upon the plan, and not the elevation of a wall. I cannot understand what "H. R. T." means by a cellar 4ft. square, and therefore am unable to answer the remainder of his question.—CLERK

[987.]—TRUSS.—The strains upon each member of the truss can be solved by the following simple formulæ:—W = the gross weight on the truss; c = the half span; k = its rise; H = the tension along the tie beam; T = the thrust along each of the rafters.

$$H = \frac{W \times c}{4 \times k} \qquad T = \sqrt{H^2 + \frac{W^2}{16}}$$

Substituting the dimensions given in the example—

$$H = \frac{2 \times 7.5}{4 \times 5} = .75 \text{ tons.}$$

$$T = \sqrt{.75} \times .75 + \frac{2 \times 2}{16} = .8125 \text{ tons.}$$

The scantlings should be for the rafters 3in. by 4in.; tie beam, 8in. by 3in.; and kingpost, 3in by 4in. The strain on the kingpost is a tensile one, and in this instance equals one ton.—GEO. E. WALTERS, 25, Englefield-road, De Beauvoir Town, N.

[985.]—PUDDLING ARCHES.—The reason puddle cracks not only when laid over arches, but in any other situation, is that it has not been properly made. A great deal of care and patience is necessary in making puddle, and unless it be thoroughly well beaten up and amalgamated, it will always crack and let in water. The chief thing to attend to in the making of puddle is to mix it well and lay it on in thin layers, one after the other. The only remedy that "T. P." has is to remove a portion of the puddle in the neighbourhood of the cracks and put in fresh, taking care to make the joints good by well punning the material.—M. S. M.

BUILDING AND LAND SOCIETIES.

THE annual general meeting of the Staffordshire Land Building, and Improvement Company was held at Stafford on Monday week. The report and accounts were approved and passed. The retiring directors were re-elected, as were also the retiring auditors, and the usual votes of thanks were passed.

The first annual report of the Monarch Permanent Land, Building, and Investment Society states the total income of the undertaking for the year at £84 946; the sum advanced on mortgage at £83,736; and the balance of profit at £4,750. Interest at the rate of 5 per cent. has been paid upon the fully paid-up shares.

WAGES MOVEMENT.

THE manufacturers and operatives of the Staffordshire Potteries have just formed a Court of Conciliation and Arbitration for the settlement of disputes in the pottery trade, consisting of ten employers and ten workmen. The operative members of the court were appointed on Wednesday week evening at a large and enthusiastic meeting of potters at the Townhall, Hanley, at which Mr. J. Ayshford Wise, formerly M.P. for Stafford, presided.

The strike of the bricklayers in New York continues unabated. The attempt at compromise on the part of the masters and men has failed, and both sides seem determined to remain firm. In view of this, the bricklayers have resolved to form a co operative railway company, with a capital of 20,000 dollars.

STAINED GLASS.

A MEMORIAL window for the chancel of Peel Chapel, Hulton, has just been completed by Messrs. R. B. Edmundson and Son, of Manchester. The window is in three divisions, and is composed of four large panes of plate glass; upon these are depicted the "Ascension of our Saviour" and figures of St. Peter and St. John, to whom the chapel is dedicated; the subordinate parts are embellished with appropriate symbols and inscriptions, and enclosed within borders of Classic design; the cartoons were prepared by Mr. S. Le Resche.

Three stained glass windows have just been placed in Tur Langton Church, Leicestershire, from the works of Messrs. Heaton, Butler, and Bayne.

A new stained glass window has just been placed in St. Peter's Church, Droitwich, by Messrs. A. and W. H. O Connor, of Berners street, London.

One of the windows in the north aisle of Westminster Abbey has just been filled with stained glass, manufactured by Messrs. Heaton, Bayne and Butler, from the designs of Mr. Henry Holiday. It is placed there as a memorial to the late Isambard Kingdom Brunel, who died in 1859. The architectural framework consists of two tall and graceful lancet arches, surmounted by a quatrefoil opening in the head of the principal arch. The artist has filled the quatrefoil head with a Christ in glory, surrounded by hovering angels with censers. Each of the lower lights contains three subjects from the history of the Jewish Temple, and the lowest portion of each is occupied by two allegorical figures, those on the western side representing Fortitude and Justice, those towards the east Faith and Charity. Among the incidents from the history of the Jewish Temple are the Presentation, Solomon Praying at the Dedication, and the Child Christ among the Doctors.

STATUES, MEMORIALS, ETC.

THE Albert Memorial, standing exactly opposite to the Central Hall of Arts and Sciences, has now reached its greatest height. The cross which forms the apex is in its place. The broad flights of granite steps cover a large space, and have a good effect. From the centre of these rise the pedestal and canopy to support and cover the statue of the late Prince Consort.

A tablet, Celtic cross, or cairn, is to be erected to the memory of Alexander III., on the King's Rock, between Burntisland and Kinghorn, being the spot to which the body and horse of the king are believed to have rolled after falling over the cliffs above.

The Birmingham Town Council has just granted a site for the erection of a statue to James Watt. The site is at the junction of Ratcliff-place with Paradise-street.

LEGAL INTELLIGENCE.

ON Tuesday last a new provision in the new Inland Revenue Act took effect, by which, in the stamp duty, the mortgage duties on leaseholds may be omitted in the amount chargeable.

INJUNCTION AGAINST THE BRADFORD CORPORATION.—A bill has been filed in Chancery by Mr. W. R. C. Stansfield, of Esholt Hall, against the Corporation of Bradford, to restrain them from causing or permitting to pass into the River Aire any sewage, filth, or other offensive matter either solid or liquid, from the Bradford beck, in such a manner that the same may pass therefrom into the said River Aire to the injury of the plaintiff, and from in any manner polluting the said river in its course past the Esholt Hall estate. And from allowing any sewage, filth, or other offensive matter to pass from the Bradford beck into the said River Aire. And upon special affidavits filed before the Master of the Rolls, and without notice to the Corporation, his Lordship has made an order, on *ex parte* statements, restraining the Corporation until further order from opening or permitting to be opened any additional main or branch sewer, or any house drain, or sewer, into the outfall sewer, or into Bradford beck, or any sewer communicating therewith, or emptying itself therein. And notice has also been given of an intended application for an extended injunction to the whole of the sewage on the first seal day next Michaelmas term. The bill was filed on the 28th ult., the application for the interim injunction was made on Monday, and a copy of the bill and notice of injunction were served yesterday on the Town Clerk of Bradford.

Our Office Table.

The cost of watering the streets of London during the past season is stated at £100,000.

Mr. W. F. Laurence, contractor for the Lynn Dock Works, has undertaken the contract for the Bristol Port and Channel Docks. The amount of the contract is £600,000.

The Local Board of Health of Farnham has just awarded to Mr. Richard Hasard and Mr. John Anstie, of Devizes, the first premium of 100 guineas for their plans for the drainage and the utilisation of the sewage of the town. There were twelve or thirteen other competitors.

Paris is about to have the accommodation of an underground railway—more, however, for bringing in market produce from the suburbs than for passenger traffic. It will start from the Halles Centrales at the end of the Rue St. Honore, and take the line of quays as far as St. Cloud, whence it will proceed to La Marche, where a large station will be built, forming the starting point of a new circular railway, passing entirely round Paris at several miles distance. The works are to be commenced in the Champs Elysee, between the Palais de l'Industrie and the Place de la Concorde.

The portraits of the Sovereigns of France, and of the architects and artists who had co-operated in erecting and adorning the Louvre, in number twenty-five or thirty, and executed in Gobelins tapestry, have been removed from their frames and sent back to the manufactory to be, if possible, repaired, as they have been greatly moth-eaten. They cost originally 200,000 francs, and have been fixed on panels in the Apollo Gallery for the last two or three years.

St. Joseph, the reputed father of our Saviour, is generally described as a carpenter. During the late visit of the British Archæological Association to the picture gallery at Charlton House Mr. Black pointed out that the original term used signified architect, builder, or mason. He stated that the designation carpenter was a complete misnomer, no wooden buildings having been erected in the Holy Land, where St. Joseph lived, stone only being used in the construction of the houses.

At the recent meeting of the British Association at Norwich, Professor Leone Levi read a paper in Section F (Economic Sciences and Statistics), "On the Progress of Learned Societies illustrative of the Advancement of Science in the United Kingdom during the last thirty years." The Professor had divided the different arts and sciences into eight distinct groups. Group *d*, comprising geological, antiquarian, archæological, historic, and architectural science, shows an advance in membership of 373 per cent. during the past thirty years; and group *e*, "Applied Science—Society of Arts, Engineers, Architects, Pharmaceutical, Medical, Actuaries, United Service," shows an advance of 453 per cent.

Notice has been given by the India Office that forty appointments in the Engineer establishment of the Public Works Department in India will shortly be open to public competition, and that a competitive examination will be held in December.

The Boston Town Council contemplate the formation of a public park in that town. The piece of land proposed to be devoted to this purpose adjoins Bath Gardens, and is the property of the Council.

A meeting of the Lexden and Winstree Highway Board was held on Friday last. The first business proceeded to was the election of a surveyor. There were forty-seven candidates. After reading the testimonials, five candidates were chosen from this number, for the purpose of making the final selection. These five candidates were:—Mr. John A. Blenkarne, of 181, High-street, Camden Town; Mr. William Adney, The Grove, Wellington, Shropshire; Mr. Francis Green, C.E., Bridge-street, Hereford; Mr. Robert Wrightson, of Westminster; and Mr. John Richards, of Derby. The voting of the members of the Board was then taken, with the following results:—Richards, 30; Blenkarne, 2; none of the other candidates receiving any votes. Mr. Richards was therefore declared duly elected.

On Wednesday, at the meeting of the Liverpool Town Council, it was resolved that an additional sum of £150,000, as provided by the Act of 1865, should be borrowed, for the purpose of improving the public parks of Liverpool.

From early times the Americans have had nicknames for their chief cities. New York is called Gotham; Boston, the Modern Athens—though it is now oftener called by a name Dr. Holmes gave it, "The Hub," *i.e.*, of Creation); Philadelphia is the Quaker City; Baltimore, the Monumental City; Cincinnati, the Queen City; New Orleans, the Crescent City; Washington, the City of Magnificent Distances; New Haven, the Elm City. The fashion is kept up with the new cities that are built in the West. Chicago is now called the Garden City; Detroit, the City of the Straits; Cleveland, the Forest City; Pittsburgh, the Smoky City; Indianapolis, the Railroad City; St. Louis, the Mound City; Keokuk, the Gate City; Louisville, the Falls City; Nashville, the City of Rocks; Hannibal, the Bluff City; Quincy, the Model City; Alexandria, the Delta City.

In St. Louis there is an establishment for making mantels, &c., from silicate and sand. Flint (silicic acid) and soda are melted together in such proportion as to make a viscid substance. This, mixed with sand, is ground in a mill and becomes plaster-like putty. It is then pressed into moulds by hand. In a few hours it becomes perfectly hard, and is said to be as perfect as the carver's work of months. It is Ransome's process imperfectly carried out.

The Poplar Board of Works have completed the purchase of the new recreation ground in the East India Dock-road from the Secretary of State for India. The purchase money was £10,150. The Poplar District Board of Works had paid £5,418 13s. 10d. on account, and the Metropolitan Board of Works have now come forward with a contribution of £6,000.

Dr. Wagner has made known a simple plan for the manufacture of bricks almost entirely of ashes and coke. The coke, after being broken into very small pieces, is mixed with the ashes, and then with one-tenth their weight of slaked lime and enough water to work them well together into a plastic mass. After standing a day the mixture is moulded into the required shapes. They are set on planks to harden, which they must not be allowed to do too rapidly. They are generally ready for use in about fourteen days.

A swarm of bees lately settled in the roof of a church in Norfolk, where they remained undisturbed till Thursday week, when the parish clerk removed from the roof no less than a hundredweight of honey.

The Committee of the Birmingham School of Design have availed themselves of an offer made some time since by Mr. Cole, C.B., to send a selection of art manufactures from the South Kensington Museum, and the exhibition will open on Monday next in the Fine Art Gallery, Ratcliff-place.

"St. Pauls" of this month speaks rather dogmatically of English architecture, as follows:—"There never has been any style with a just claim to be called English. Architecture, in middle-aged and modern Europe, has been a thing of periods, not of nations. There has undoubtedly been in each country a smack of the soil, giving to the buildings of each a character more or less distinctive; in the most widely differing examples in various countries showing difference enough to constitute (say) a variety, not a species; and in the most nearly alike showing little or none. And this holds quite as good with so-called Classic as with so-called Gothic. If nationality is to be the ground of choice, the Elizabethan style has as strong a claim as any other; but it may be taken for granted that its claim will find no supporters. Though, vicious as this style is, it is doubtful whether its adoption would not, on grounds which will presently appear, involve a less absurdity than would that of any one of the lately exhibited designs. To try to beg the question by speaking of Gothic as English is either ignorant or disingenuous; and, indeed, the attempt is particularly out of place, seeing that most of the designs have a good deal of continental character."

For a single house in the Rue Richelieu, Paris, at the corner of the Rue Ménars, about to be demolished for one of the new streets leading from the Grand Opera, a jury has awarded 2,600,000f., or £104,000. In 1816, the same house was sold for 20,000f.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3580 J. STANFIELD. IMPROVEMENTS IN THE APPLICATION OF HYDROGEN GAS TO THE FURNACES OF STEAM ENGINES, BOILERS, AND KILNS FOR THE MANUFACTURE OF LIME AND BRICKS. Dated December 16, 1867.

This invention consists in the means of and apparatus for obtaining and applying hydrogen gas to the furnaces of steam engines, boilers, and kilns for the manufacture of bricks and lime, and to this end the patentee constructs the said furnaces with a suitable chamber of any convenient shape, and placed in any convenient position, through which chambers he passes steam, causing it thereby to be decomposed, and thus supply hydrogen gas to the furnaces. —Patent completed.

3591 W. E. NEWTON. AN IMPROVED METHOD OF, AND APPARATUS FOR, THE MANUFACTURE OF TINNED LEAD PIPES. (A communication.) Dated December 17, 1867.

Here a cylindrical casting of lead is first prepared of the requisite size and thickness; a mandril is then placed in the centre of this casting in such a way that there shall be left an annular space round the mandril and between the mandril and the inner side of the leaden cylinder. Into this annular space molten tin is run to form the internal coating. The cylinder or tube thus prepared is then submitted to the action of a hydraulic press, which forces the metal out in the form of a lead pipe lined with tin and rolls it up in a coil in the manner that ordinary leaden pipes are coiled when manufactured by hydraulic pressure. —Patent completed.

3583 T. V. MACKINTOSH. IMPROVEMENTS IN MACHINES FOR MAKING DRAINS OR TRENCHES. Dated December 17, 1867.

This invention consists, principally, in combining a series of digging lines or blades for loosening the earth with an endless chain of dredging scoops which elevate the loosened earth upon a shoot arranged to deliver it either to one or to both sides of the trench or upon a waggon.—Patent completed.

3501 H. BESSEMER. IMPROVEMENTS IN THE MANUFACTURE OF FIRE-BRICKS, TILES, ETC. Dated December 9, 1867.

The patentee claims, first, the manufacture of fire bricks, tiles, and solid or hollow fire lumps, retorts, pipes, crucibles, and other hollow vessels or moulds required to resist heat, by moulding or forming such articles in granulated burned clay, or in a mixture of clay and other materials that have been previously subjected to a red heat, and causing such granulated materials to cohere by the employment of a soluble silicate acted on by chloride of calcium, in the manner described. Second, the manufacture of ornamental bricks, tiles, quarries, trusses, bases, vases, busts, figures, columns, capitals, bases, cornices, copings, tablets, finials, and other articles of a similar character employed in building and architectural decorations, by moulding or forming such articles in granulated burned clay, or in a mixture of clay and other materials that have previously been subjected to a red heat, and causing such granulated materials to cohere by the employment of a soluble silicate acted on by chloride of calcium in the manner described.—Patent completed.

3636 J. CAPPER. IMPROVEMENTS IN THE CONSTRUCTION OF CHIMNEY TOPS OR CAPS. Dated December 28, 1867.

Here the inventor fits within and attaches to a chimney top or cap of cylindrical or other desired form a hollow, conical, or other tapering piece or passage called a "draught jet." This draught jet is open at bottom and top, the end of the smallest area being uppermost, and situated below the upper termination of the cylindrical or other part. The smoke is thereby caused to issue from the said draught jet in a protected position at an increased velocity. He surrounds the upper part of a cylindrical or other chimney top or cap by another or outer cylindrical or other top piece of larger size, thereby leaving a space between the two. The outer piece rises higher than the inner. To the inner cylindrical or other piece below the lower end of the outer one he affixes a projecting ring or flange, and to and between the said ring or flange and outer cylinder or piece he attaches dividing pieces, so that a circle of openings at a short distance from each other is left, through which, and up through the space between the inner and outer pieces, a current of air rises and assists egress of the smoke from the inner piece into the atmosphere. He also constructs chimney tops or caps of a combination of the improvements described under the above first and second heads; and, further, he uses in combination the improvement described under the first head with the outer piece described under the second head, but without the projecting ring or flange and circle of openings therein described.—Patent abandoned.

Trade News.

TENDERS.

ERRATUM.—In the list of tenders of August 21, Mr. D. Cubitt Nicholls is described as architect for "building Foundry Wharf, Wapping for Messrs Innes, Brothers, and Co." This is not correct. Mr. R. B. Marsh is the architect; Mr. Nicholls only prepared the quantities.

LONDON.—For rebuilding No. 5, Fashion-street, Spitalfields. Mr. H. H. Collins, architect:—

A. Cohen.....£320

BRIGHTON.—For building stables, &c., at Wellington villas, for H. Tester, Esq. Goulty and Gibbins, architects, London and Brighton. Quantities supplied by J. C. Lansdown and Co:—

Cheeseman	£504
Hall	497
Nash	471
Lockyer (accepted)	410

BURSLEM.—For repairing damage caused by fire at Messrs. Cork, Edge, and Malkin's manufactory:—

		Additional if fireproof floors.
Blackhurst	£523 15 0 ...	£212 4 0
Barlow	500 0 0 ...	200 0 0
Bowden	495 0 0 ...	206 10 0
Woolrich	493 0 0 ...	320 0 0
Watkin	478 0 0 ...	210 0 0
Bennett and Cooke	475 0 0 ...	249 0 0
Brindley and Critchlow (accepted)	460 0 0 ...	210 0 0

CARDIFF.—To pulling down and rebuilding of shop and warerooms for J. B. Hopkins, Angel-street, Cardiff. J. Hartland, architect. Quantities supplied:—

Price	£960
Michelmore	949
Shepton	940
Jones Brothers	890
Lock	889
Seager	800

HAMPSTEAD.—For making roads and sewers on the estate of the Land Company of London (Limited), at Shoot-up-hill lane, Hampstead. Mr. H. G. Haywood, surveyor. Quantities supplied:—

Ennor	£3915
Mowlem and Co.	3714
Hill, Keddell, and Waldram	3707
Nicholson	3470
Pound	3410
Bloomfield	3145
J. Clark	3097
Porter (accepted)	2700

LONDON.—For first portion of new buildings and alterations to Paddington Workhouse. Mr. Thomas R. Parker, architect. Quantities supplied:—

Adamson	4386
Lovett	4280
Wigmore	4130
Temple and Forster	4100
Nutt and Co.	4100
Butt and Son	4090
Crockett	4036
Till	3947
Lee and Gregory	3842
Ellis and Son	3892
Wicks and Banga	3847
Mann	3795
Higgs	3774
Cooper and Cullum	3590
Merrit and Ashby	3535
Palmer	3500
Foale	3400

LONDON.—For rebuilding warehouse, Bury-street, St. Mary Axe. Mr. H. H. Collins, architect:—

King and Sons	£1015
Henshaw	942
Dawes	880
Wall and Russell	822
Stuart and Bennett	670

LONDON.—For erecting additional factories in Lower Kennington-lane for the Patent Silvering Company (Limited). Mr A. Nickerson, architect:—

Ellis	£1800
Clemence	1644
Henshaw	1618
Newman and Mann	1550
Macey (accepted)	1477

WOLSTANTON.—For the erection of new Wesleyan Schools. Mr. Roberts, architect, Trentham:—

Bradbury	£1375
Brindley and Critchlow	1060
Blackhurst	970
Grosvenor	926
Sutton (accepted)	915

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HEREFORDSHIRE COUNTY AND CITY ASYLUM.—September 14.—For the erection of the above named building R. Griffiths, architect, 3, Martin-street, Stafford.

ALDERSHOT.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

METROPOLITAN BOARD OF WORKS.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring-gardens.

OXFORD-ROAD, MANCHESTER.—For the erection of a new catholic church. J. A. Hansom, architect.

BURTON-ON-TRENT.—September 12.—For alterations and additions to police station. R. Griffiths, architect, 3, Martin street, Stafford.

HIGHGATE.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

LEAVESDEN WOODSIDE (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

TEIGNMOUTH, DEVON.—For the erection of a coast guard station. Drawings, &c., at coast guard watch room. Tenders to the Admiralty coast guard office.

BOARD OF WORKS, LIMEHOUSE DISTRICT.—September 14.—For watering, scavenging, and removal of dust. T. W. Ratcliffe, clerk to the board.

WEST HAM UNION.—September 23.—For the erection of an apparatus capable of cooking for 800 inmates. F. E. Hilliary, clerk to the guardians, Leytonstone.

LUTON, NEAR CHATHAM.—September 12.—For sinking wells or shafts, and for excavating galleries or headings, in the chalk. S. M. Heckford, secretary, Brompton Waterworks Company, 3, Military-road, Chatham.

METROPOLITAN BOARD OF WORKS.—September 29.—For the erection of fire brigade stations at Amhurst-road, Hackney, and Upper Tooting. J. Pollard, clerk to the board, Spring Gardens.

COLOGNE WATER WORKS.—September 18.—For the supply and erection of high service reservoir, two Cornish steam engines, steam boilers, likewise for cast-iron pipes, cocks, &c. At the office of the Chief Burgomaster.

MANCHESTER.—For erecting a new Catholic church, Oxford-road. T. A. Hansom, 25, Alfred-place, Thurloe square, London, S.W.

STRATFORD.—September 23.—For the erection of a store in Maryland-street. H. Ough, architect, 29, Charing Cross.

SOUTHWARK.—September 14.—For the erection of five houses in St. George's-road. Mr. H. S. Legg, architect, 32, Bedford-row.

PETERCHURCH (Herefordshire).—September 12.—For the reparation of the chancel of Peterchurch Church. T. E. Williams, architect, 67, Victoria-street, London, S.W.

PHŒNIX GAS COMPANY, BANKSIDE.—September 9.—For constructing certain timber and tile roofing. J. A. Crookenden, secretary, 70, Bankside, S. E.

PETERBOROUGH.—September 26.—For the erection of a new Baptist Chapel. J. W. Chapman, architect, 14, Great Western-terrace, Westbourne Park, London W.

EASTBOURNE (Sussex).—September 16.—For the erection of Christchurch district schools. H. E. Rumbles, architect.

BROMPTON, &c.—September 12.—For sinking wells or shafts, and excavating galleries or headings, in the chalk, near Chatham. S. A Heckford, secretary, the Brompton, &c., Waterworks Offices, 3, Military-road, Chatham.

PROPERTY SALES.

AUGUST. 25.

AT THE MART.—By Messrs. Gadsden, Ellis, and Scorer.—One half of a moiety of freehold premises, No. 31, Oxenham street, Coventry street, Piccadilly—sold for £200.

One half of a moiety of freehold premises, No. 32, Oxenham street, aforesaid—£180.

One half of a moiety of freehold premises, No. 27, Coventry street—£520.

One half of a moiety of freehold premises, Nos. 28 and 29, Coventry street—£820.

One half of a moiety of freehold premises, Nos. 30 and 30½, Coventry street—£1,050.

One half of a moiety of freehold premises, No. 31, Coventry street—£450.

One half of a moiety of freehold premises, No. 32, Coventry street—£1,000.

One half of a moiety of freehold premises, No. 65, Princes street, Coventry street—£330.

One half of a moiety of freehold premises, No. 66, Princes street, Coventry street—£340.

One half of a moiety of freehold premises, No. 67, Princes street, Coventry street—£420.

One half of a moiety of freehold premises, No. 68, Princes street, Coventry street—£300.

By Mr. T. J. Tobin.—Freehold residence and nine acres of land in the parish of Hewetsfield, Gloucester—£690.

Freehold residence and six acres of land situate as above—£295.

By Mr. E. White.—Leasehold six residences, Nos. 1 to 6, Albert villas, The Drive, Enmore Park, South Norwood, term 71 years unexpired, at £5 5s. each per annum—£190 and £200 each.

By Mr. Ward.—Freehold two houses, Nos. 59, Hyde road, and 1, Harvey street, Hoxton, annual value £70—£780.

At the London Tavern.—By Messrs. F. R. and F. Vigers.—Freehold house and shop, No. 231, Blackfriars road—£1,180.

Freehold house and shop, with land in the rear, No. 232, Blackfriars road—£1,040.

Freehold house and plot of land in the rear, No. 236, Blackfriars road—£1,080.

Freehold plot of building land, situate in Surrey row—£1,160.

Freehold plot of land, fronting the Camberwell New road—£270.

Freehold plot of land, fronting the Knatchbull road, Camberwell—£320.

Freehold house and shop, with yard and buildings in the rear, No. 4, Lothian terrace, Cold Harbour lane, Brixton, and a lease for 1,000 years of two half and one whole arches—£1,000.

Freehold messuage and shop, No. 26, New Kent road, let at £37 per annum—£920.

Freehold residence, No. 28, New Kent road, let on lease at £13 per annum—£840.

Freehold residence, No. 30, New Kent road—£920.

Freehold residence, No. 32, New Kent road—£820.

Freehold house, No. 38, New Kent road, let on lease at £8 8s. per annum—£1,060.

Freehold residence, with stabling, No. 128, Walworth-road, and a lease for 1,000 years of three arches—£2,050.

Freehold residences, with stabling and buildings, No. 126, Walworth road, and lease for 1,000 years of three arches—£2,400.

Freehold land and buildings, with frontages in New Kent road and Nile place, area about 13,150 superficial feet, and lease for 1,000 years of six arches—£1,770.

Freehold house and premises, No. 1, Nile place, Wentworth street, New Kent road, let at £39 per annum—£820.

Freehold two messuages, one with shop, Nos. 2 and 3, Wentworth street, New Kent road, let on lease at £4 per annum—£800.

Freehold two messuages, Nos. 4 and 5, Wentworth street, New Kent road, let on lease at £7 per annum—£620.

Freehold messuage, shop, and cottage, No. 6, Weymouth street, and 23, Baker street—£400.

Freehold plot of land, fronting the Elephant and Castle Station—£280.

Freehold two plots of land, fronting the Walworth road, and a lease for 1,000 years of an arch—£960.

Freehold plot of land, cottage, and buildings in Hampton street, Walworth, and a lease for 1,000 years of one arch—£570.

Freehold plot of land, fronting Hampton street, and a lease for 1,000 years of one arch—£300.

Freehold two plots of land, fronting Hampton street, and a lease for 1,000 years of one arch—£360.

Freehold house, No. 3, Hanover street, Walworth, let at £19 4s. per annum—£340.

Freehold plot of land, fronting Hanover street, Walworth—£340.

Freehold house, No. 30, Hanover street, Walworth, let at £19 4s. per annum—£370.

AUGUST 26.

At the Mart.—By Messrs E. Fox and Bousfield. Freehold and copyhold estate, situate at Field heath, Hillingdon, Middlesex, consisting of a residence, with stabling, cottage buildings, and ten acres of meadow land—£2,370.

Leasehold three residences, Nos. 1, 2, and 4, Oakley crescent, City road, producing £157 10s. per annum, term 74 years unexpired, at £26 5s. per annum—£1,500.

Leasehold six houses, with shops, Nos. 1 to 6, Market place, Silchester road, Notting hill, producing £255 per annum, term 99 years from 1866, at £38 12s. per annum—£1,900.

By Mr. G. B. Hilliard.—Copyhold estate, known as "Walden House," Great Tatham, Essex, comprising a house, with stabling, farm buildings, and yards, and about 48a. 0r. 11p. of land—£2,700.

AUGUST 27.

At the Mart.—By Messrs. H. Brown and T. A Roberts.—Leasehold 76a. 3r. 19p. of marsh land in the parish of East Guldeford, Sussex, term 500 years unexpired, at a peppercorn rent—£6,820.

Freehold ground rents of £80 per annum, arising from Nos. 134, 136, 138, and 140, St. Paul's road, Canonbury—£1,685.

By Mr. Newbon.—Leasehold residence, No. 42, Compton road, Canonbury, annual value £65 per annum, term 95 years from 1850, at a peppercorn rent—£725.

Freehold residence, fronting the main road, Hornsey—£700.

Leasehold residence No. 1, Archway villas, Archway road, Upper Holloway, annual value £38, term 93 years unexpired, at £7 per annum—£525.

Leasehold residence, No. 2, Archway villas, Archway road, let at £36 per annum, term and ground rent similar to above—£505.

Leasehold residence, No. 12, Cloudesley street, Islington, let at £50 per annum, term 80 years from 1836, at £8 per annum—£515.

By Mr. Saffell.—Freehold estate, situate in the parish of Upchurch, Kent, comprising about 13¾ acres of land, with residence and buildings—£2,510

Freehold 4a 3r. 2p. of land situate as above—£760.

AUGUST 28.

At the Mart.—By Messrs. Rushworth, Abbott, and Co.—Life interest on a Baronet, age 30 years, in freehold estates in the Borough Fen and in the parishes of Newborough, Crowland, and Deeping St. James, in the counties of Northampton and Lincoln, comprising upwards of 3,110 acres, with farm houses, buildings, and six cottages, the whole producing nearly £7,200 per annum—£9,200.

Leasehold four houses, Nos. 23 to 26, Edward street, Blackfriars road, producing £111 16s. per annum, term 16 years unexpired, at £8 8s. per annum—£385.

Leasehold three houses, Nos. 69 to 71, New street, Princes road, Lambeth, producing £46 16s. per annum, term 11½ years unexpired, at £9 9s. per annum—£95.

By Mr. J Apps.—Freehold 8a. 0r. 39p. of hop and arable land, in the parish of Gondhurst, Kent—£700.

Freehold 4a. 1r. 22p. of meadow land, situate as above—£710.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

John William Crook, Langley, Bucks, carpenter, September 16, at 12.—Thomas Lane, Watford, builder, September 11, at 1.—William Joseph Bowen, Tottenham, builder, September 11, at 1—James Cobden, Pooles Park, Seven Sisters road, builder, September 11, at 11.—Thomas Fergusson, Amberly road, Paddington, contractor, September 10, at 11.

TO SURRENDER IN THE COUNTRY.

Miles Ogg, Flaxley, Gloucestershire, carpenter, September 14, at 11—Charles Noble, Bramham, Yorksbire, builder, September 14, at 10.—Benjamin Horsfield Sykes, Altofts, Yorkshire, bricklayer, September 12, at 11.—Gabriel Baker, Bristol, painter, September 11, at 12.—Thomas Hughes, Pontblyddyn, Flintshire, builder, September 16, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 1, J. George, Orleton, Herefordshire, carpenter.—October 17, J. Knott, Coombe, Cornwall, mason.—November 27, H. Cridland, York road, Battersea, plasterer.—September 16, G. B. and G. Capes, Burton-upon-Trent, engineers.

DIVIDEND.

September 11, D. G. F. Macdonald, Brighton, surveyor.

SCOTCH SEQUESTRATION.

John M'Gregor, Dunoon, joiner, September 1, at 12.

PARTNERSHIPS DISSOLVED.

Hedley and Sutherland, Tench street, Wapping, carpenters—Walker and Co., Rugby, and South Wharf, Paddington, lime and cement merchants.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 11, 1868.

PUBLICATIONS ON ENGLISH ARCHITECTURAL ANTIQUITIES.

SINCE the days of Augustus Pugin the character of architectural publications having reference to ancient buildings has not improved, nor has the example worthily set by that excellent and industrious draughtsman been followed with equal zeal. The fact is, that the work to him was a profession, whereas at the present time it is looked upon rather as a pastime to occupy the vacation hours of established architects, or a stepping-stone to reputation by younger men just entering professional life; and it is laid aside as soon as their time becomes more profitably engaged. It is lamentably true that to architecture and all that appertains to it the public may be considered as profoundly indifferent, and that publishers find no sale for such works except among the fraternity of architects themselves. Under these circumstances we must accept the situation and seek only such ameliorations of the system as can be wrought within it. We think, however, that those architects and students who do approach the task do not sufficiently realise what the real need is in the matter.

In the early days of the revival of the taste for mediæval architecture, such a work as Pugin's "Specimens of Gothic Architecture" (1823) was undoubtedly well-conceived and likely to be useful. Yet the later works by that author, in which he was assisted by his son A. W. Pugin, were preferable in many respects. Their "Examples of Gothic Architecture" (1831, &c.) treated of less fragmentary portions of buildings, and dealt with structures of an earlier and better type, many of which were set forth therein with a commendable completeness.

The Brothers Raphael and J. Arthur Brandon, in 1860, published their admirable "Analysis of Gothic Architecture," while "Details of Gothic Architecture," by James K. Colling, equally excellent, had been commenced in 1852; and these careful works supplied the profession with an ample store of precedents, of which it may be said, without any detriment to the authors or their purpose, that it may be questioned whether the use that has been made of them has been productive of more good than harm. Unthinking copyists have taken advantage of them, and brought ridicule not only on themselves but upon the whole school of the revival by the manner in which they have malappropriated instead of studied the various details which are given in them.

"The Examples of Ancient Domestic Architecture," by F. T. Dollman and J. R. Jobbins (1858, &c.), is a work of a different and we think a far more useful character. It transmits a thorough and faithful record of most of the interesting old buildings selected for illustration, and though, of course, it is open to misuse and piracy, as we might term the wholesale importation of any feature from the work of a past age into modern building, it in no way lends itself to such a practice.

The magnificent work on the principal English abbeys, entitled "Architectural Parallels," by Edmund Sharpe (1845), had a higher aim than any which preceded it, nor did the manner of its execution fall far short of its aim; but, for completeness in the manner in which the fine examples of English ecclesiastical architecture selected are represented we know few works to equal that on "The Churches of the Middle Ages," by Messrs. Bowman and Crowther. The somewhat scarce works on Wenlock, Buildwas, and Tintern Abbeys, by Joseph Potter, also merit very high praise.

In the production of such works as these, and some few others of the same class, the list of which our limits prevent us from pretending to make exhaustive, there seems of late years to have been a comparative cessation.

Another style of architectural publication has since come into vogue; it is that fitly described by their authors as consisting of *sketches*. They are results of tours undertaken by architectural students, and are interesting and valuable enough in their way, but from their very attractiveness are liable to lead away the younger professional men from the class of study which would be more beneficial to them. In these we have few if any measured drawings, the making of which is the staple food upon which young architects should be brought up, and picturesque pretty drawings are their object throughout.

It is true that in noticing these we are somewhat straying from our subject of *English* rather than *foreign* architectural publications, but their authors, the foremost among the professional students of their day, chose the continent instead of their native land as the theatre of their studies, so that we are forced, as it were, to follow in their steps, protesting meanwhile that their choice is not the one we would wish accepted as a desirable precedent.

The first, and by no means the least able, was that by Mr. R. Norman Shaw, entitled "Architectural Sketches from the Continent" (1858). They are dedicated to the members of the Royal Academy, having been taken in his capacity as travelling student of that institution—in itself an ample reason for the transpontine localities from which his subjects are taken. Through France, Lower Germany, and Italy the succession of his pages hurries us, giving us glimpses—glorious glimpses—of the noble buildings he met with in his route, just as a literary bee might of the scents of the various flowers she rifles with scarce greater rapidity. Of this work we notice that the author says in his preface that he hopes its chief utility may be found in its *suggestive tendency*. We know not what hard fate drove him at such a pace on his travels, and can, therefore, only pity him as we should the mad dog whose last fatal course was urged to unwonted speed by the kettle tied to his caudal appendage. But if it were from exigencies imposed by the Academy we should have much to say on the subject, being of opinion that it would be far better for its students to bring home thoroughly well-studied drawings of one good building than even able sketches only of the whole in Christendom. We assume, however, that the *suggestive tendency* coveted by Mr. Shaw for his sketches was not exactly that others should go and do likewise.

We find, however, in 1862, another equally able and equally discursive set of "Specimens of Mediæval Architecture, chiefly selected from examples of the twelfth and thirteenth centuries in France and Italy, and drawn by W. Eden Nesfield," in which measured drawings to scale form a still smaller proportion. Of this work, as of the last, conceding the aim to be one of the bee order, highly to be desired that it should be taken by some, it would be difficult to surpass them in the excellence and spirited manner of their execution.

We have now, however, before us, just completed, another volume of "Detail Drawings and Sketches in England and France," by F. Rogers, which is not quite so able, while it is even far more discursive than either of its predecessors. In its license of choice the butterfly rather than the bee would appear to have been the type followed. Cathedrals, churches, houses, cottages, and chests are wandered among with a sweet free will. Now, were a sculptor to publish a parallel work we should be danced from ancient Egypt and classic Greece to the France of Francois I. and Louis XIV., be presented in successive pages with the Apollo Belvedere and a Nineveite bull, with the Venus di Medici and an Attic steed, the nose of a Hercules and leg of a Satyr, and we should close its pages with very much the same impression left by an afternoon's walk through the Crystal Palace.

Lest we should seem to exaggerate, let us suppose an architectural student, of the non-roaming order, seeking in the three works referred to for some information as to Chartres Cathedral. From Mr. Shaw he would only get, in plate sixteen, the elevation and details of a miserable little doorway, on the north side of the clock turret, of which the only speciality is the introduction into the jambs of two columns for their own sake and nothing else, as they have nothing whatever to support the head—a simply chamfered lintel—so that they are dragged in, neck and shoulders, into conversation, as Sampson was. In Mr. Nesfield's book we get the two west spires, but disconnected. The tympanum of one west doorway, two capitals, and a base, and two scraps of friezes from the celebrated north porch; while, in Mr. Rogers's book we get a lop-sided view of the north-west angle of the north portal, and such a miscellaneous number of scraps, from various parts, that they look as if they were studies in an old curiosity shop.

Now with hearty and sincere thanks for the many objects of interest these authors have given to us, we would say, to future students, that of such fragmentary sketches we have had quite if not more than enough. Our head aches with the difficulties of searching in these volumes for what we happen to have wanted, and our powers of memory would fail us if the number of this sketching band were much further enlarged.

Far different is the work since published by Mr. R. J. Johnson, upon "Early French Architecture." This is one of which it is impossible to speak in terms of too high praise. It is nearly exhaustive of what it proposes to treat, and its style of execution is first-rate.

We wish, however, that our architects and architectural students would look more at home. French architecture, by French architects and Government aid, has been, on the whole, very fairly and fully represented, and we may well leave the completion of that task in their hands. But English architecture has been but fragmentarily and indifferently put before the world, and its reputation has suffered accordingly.

Where are any monographs of our Cathedrals? Where are any details of them given on an intelligible scale and in a reliable manner? What is there to give a foreigner a clear idea of any of the masterpieces of our special insular styles—the Early English or Perpendicular? Where are our countless admirable parish churches and noble towers and spires reliably set forth? Sketchily, and in a picturesque manner, many may be seen in the "Reliques of Ancient English Architecture," by John Johnson, and others in Brandon's "Parish Churches;" but these works only serve to indicate a mine of wealth, of which they do not more than pretend to skim the surface.

In the meantime the rage for the restoration of these buildings is proceeding at such a rate that more than ever is the work of properly delineating our ancient monuments imperatively needed. We hail, therefore, with pleasure, the establishment of the Pugin Studentship, the express purpose of which is to induce young English architects to study and draw the mediæval remains of our own country, and as the first fruit of the movement, and earnest of what we may expect to reap through it, we welcome "Illustrations of the Mediæval Antiquities of the County of Durham," by John Tavenor Perry and Chas. Henman, jun., the former a past Pugin Student, and the latter the present

one. Still we trust that the good work will not merely be left to the junior members of the profession, and venture to suggest, as one method of obtaining the end we have in view, that architects who are engaged professionally in the work of restoration might do good service in publishing the drawings which it is incumbent upon them to have made of the present condition of such buildings of interest as they are called upon to restore.

TOMBS AND TOMBSTONES.

THE word tomb, which strictly means a mass of stonework raised over a grave, is in common use applied to any sepulchral structure. From the earliest ages man has devised some monument to his departed fellow. In the historic ages the most ancient is the rock-hewn tomb, but the *tumulus* is undoubtedly of much higher antiquity, as the rudest people, without implements, could accumulate a large heap of stones and cover it with earth. We are not going into a disquisition as to the comparative antiquity of the subterraneous or Hypogæan, and the above-ground or Hypergæan systems of burying and commemorating the dead. We will pass by the stupendous monuments of remote antiquity, the mausoleum built by Artemesia, that of Hadrian, and the smaller one of Cæcilia Metella, which, however, is 90ft. in diameter and about 130ft. in height, and come at once to a phase of the subject which more nearly concerns ourselves. There are few who would wish to pass away without leaving some sign behind them, and among the very poor this feeling is stronger than among the very rich. The names of the latter cannot well perish. If not matter of history they are matters of record, and however obscure may be the place of burial their memory cannot lightly die; but with the poor it is different—their annals are short and simple, and they look upon some sort of head-stone as a thing of great importance. It might therefore be supposed that in every country a considerable degree of skill had been attained in the production of memorials, but this is far from being the case, and, leaving foreign countries out of the question, let us look at Kensal Green. We take Kensal Green to be a representative cemetery—the burying place of the illustrious, the rich, and the middle classes, the type of public taste in monumental architecture in the middle of the nineteenth century. If anything were wanting to check the notion that we are near the millennium of art, or that we have made any perceptible advance in national taste—in the monumental line, at least—a visit to Kensal Green Cemetery would suffice. It is little to the purpose to say that the French exhibit no more, or the Americans less, taste in this particular; the question is why, with all our vaunted revival, our hosts of ardent spirits—earnest students they call themselves—do we, with the best intentions, put up such vile memorials to the dead? The subject is a delicate one, and we have no desire to wound the feelings of anyone, but private considerations must give way to public welfare, and if anything in these columns should awaken people to the absolute duty of providing memorials of a better character than now prevails, if those who have been respected during their lives should not be made ridiculous in death, we shall be satisfied.

It is not desirable to go deeply into the question of the good taste or propriety of epitaphs. "The heart knoweth its own bitterness," and so long as the epitaph shows feeling and is free from overweening confidence, or, as sometimes happens, a defiant spirit, the passer-by has no reason to complain. When, however, after the address, *siste viator*, we are told that the lady of John Smith was "the best of wives," it is impossible to overlook the fact that the majority of married men in the world might be unwilling to acquiesce in John Smith's complacent view of his good fortune. With exceptions such as these, epitaphs should not be criticised, but the mere monument, as the work of an artist or worker in stone, is legitimate subject for comment. The public by no means oblige relatives to erect memorials to the deceased, but they have a right to expect them to be inoffensive to the eye, and unopposed to the general fitness of things. It can never be maintained that stone scrolls and draped urns are elegant, or that sarcophagi like cellarets, columns wreathed with roses, obelisks terminating in heaven-pointing hands, or broken lilies symbolising the decease of a middle-aged person, are appropriate; but in the span-new monuments we see less negative beauty and more positive pretension. The lavish employment of polished granite, particularly red granite, of marble called Sicilian, serpentine, Irish green, and Derby marbles, encaustic tiles, orbs of coloured glass, and, above all, the use of gilding, is destructive of repose and the modest simplicity of what the Italians call a Holy Field, and the Germans God's Acre. Equally out of place is the excessive use of bright-coloured flowers. A cemetery is not a tea garden, and, although there is no need for us to "enhance the gloomy horrors of the tomb" by excluding all the grace that flowers and foliage afford, still such plants and trees should be chosen as are "fitt to adorne the dead and deck the drery toombe." Any white, blue, neutral-coloured, or purple flower is appropriate, but yellow, red, or any mixtures of the two last colours are unsuitable. In the choice of trees and shrubs there are few that must be excluded. Forest trees scarcely find a place in most cemeteries on account of the space they require, and it would, therefore, be better to leave the horse chestnut out of the list and to be sparing of weeping willows. Deodar cedars are very well as long as they are young, but when full grown they require as much room as others. It is rather to shrubs, large and small, that the gardener should look for the embellishment of a cemetery, and of these so many are fit that it is needless to name them. Of all places in a cemetery a grave is the last on which flowers or shrubs should be planted. The common practice of turning the grave itself into a little garden is most objectionable. A flat or a coped tombstone, or *dos d'ane* as it is called, or turf, is the only proper covering for a grave. With a monument the case is different, as it by no means implies that the body is buried beneath; but a mere head and foot stone, with a raised curb, enclosing a few geraniums, or, perhaps, two or three dwarf arbor vitæ, is open to objections that are more than sentimental. The profuse use of flowers of brilliant colours is much to be regretted. Round one grave, a large one, are set no less than twenty-four geraniums in pots. In contradistinction to this monument may be seen one erected about twenty years ago to Mr. H. Webb, of great simplicity and grace. The style is Pagan, but it is not paltry, like too many of its neighbours erected within a year or two. One of these consists of four square legs of serpentine marble, supporting a slab of the same material covered by a slab of white marble. The whole looks like a small but heavily-mounted billiard table with the white cloth over it. A monument of more than ordinary pretensions—that to Captain Rickets—is in every respect a remarkable work, and has only recently been completed. It is a sort of shrine, supported by eight external columns of red granite and twelve dwarf columns of Irish green marble, the latter supporting a stone cist. A canopy, with crockets, gargoyles, and finials, crowns all. The style is French Gothic of the thirteenth century, and the monument is well worth seeing. The mortuary chapel, if it can so be termed, of General Perry, merits attention on account of its beautiful metal doors, but it is not elegant in general form. The vault of Mr. A. Blumbery, of white marble and polished grey granite, in the form of a Grecian temple, about 15ft. square, is just finished. It will look better when the polish has gone off. Here will be seen what we believe to be the only terra cotta monument in the cemetery. It is erected to Mulready, the genial, well-beloved painter. The effigy of the deceased is recumbent under a canopy supported by six columns, the whole in terra cotta. In panels in the sides of the dado, rough sketches of some of his principal works are incised. This monument is worthy the attention of the student, from its original treatment, but it is very questionable whether such a treatment is suited to the open air. In a church it would be proper, no doubt. The large granite tomb of Sir W. Molesworth is remarkable for the injudicious manner in which the descending steps are contrived, but it is simple, and so far meritorious. Of very opposite character is an ambitious octagonal structure of white marble and red granite, of enormous size, in memory of Mr. H. Molyneux. We question whether in modern times any private individual in any country has so large and costly a memorial. There is nothing to compare with it in the cemetery in this respect, but it is in indifferent taste, and is not an improvement on the memorial art of thirty years ago. The plain grey granite vault of General Duncan Sim is in better taste and far handsomer, great judgment being shown in polishing certain of the surfaces only. The monument of the Ducrow family is too well known to need comment. Passing by the monument of J. St. John Long, by that almost universal genius Sievier, the gigantic granite slab which covers the vault of the Rashleigh family is conspicuous, as also the metal plate whereon are engraved the names of the deceased. The student will see that this treatment is massive, but by no means elegant, but far better than the glittering white marble, incised with patterns, tile-bedecked, and jewelled, which is in abundance on every hand. The memorial of J. Meadows Kendel, of unpolished red granite, and the wrought-iron one of Mr. T. Walford, are the next objects of interest. The latter is a decided failure. The pretty little Doric temple which contains the remains of Dr. Valpy will be noticed for its classic elegance, and the monuments of the Princess Sophia and the Duke of Sussex for any merit the student may suppose them to possess. The monument to the former, though consisting principally of a sarcophagus raised high in the air, is not inelegant. There are few persons at present living who could design a better in the same style. The recently-erected tomb of Sir de Lacy Evans is no improvement on the work of the commencement of this century. In this portion of the cemetery there is little more that is worthy of notice. The usual amount of uninteresting headstones, broken columns, weeping willows, and lachrymatory urns will be found, and perhaps a few Gothic crosses and slabs in no way remarkable. The stranger returning to the entrance will wonder what palm branches and wreaths of bay have to do with Sarah, the beloved wife of Mr. Green, as he never heard of her as a poetess or even a martyr. But he will feel that on Robert Lindley's humble tomb the violin unstrung and broken is neither ill conceived nor badly executed.

Ascending the hill the Catholic cemetery is reached, and from the well-known mediæval predilections of that religious body it might be expected that some tasteful crosses or mortuary chapels would be found. This is not the case. Of the former there is scarcely one, and of the latter none whatever. A small unfinished building roofed with gaudy red, green, and black glazed tiles glittering in the sun, and a still smaller building of no pretensions, are all that meet the eye.

Now it is well known that there are some excellent architects of this persuasion, men admirably qualified to supply the very thing

which is wanting, a monument of a religious rather than sentimental character, but of their existence this cemetery presents small traces. The plain coped stone, surmounted by a foliated cross, in low relief, with the inscription on the bevelled plinth, is almost unknown, and yet it is the most appropriate covering for a single grave. The headstone, usually in the form of a foliated cross, seems to be the favourite; but we noticed no monument that seemed worthy of the present state of Gothic art. We, however, saw more than one that showed the affection in which the dead are held. In the southern portion of the cemetery the poorest of the poor find their resting place. Here there are hundreds of graves, distinguished by little plaster casts of devotional subjects, beloved perhaps in life by the sleeper below the earth, for sod it cannot be called at present. In one case about twenty white stones, weighing nearly three pounds each, were placed side by side, from the head to the foot of a grave, that had nothing else to mark it. In another case, the only sign was a flint stone about 6in. square, placed at the head. This mourner was poor, but offered all he had, and his offering, rude as it might be, was not in bad taste; but how with the others of ample means? The subject is depressing. It is humiliating to find that country or creed makes little difference in the bad taste and low art prevailing in monumental works, and in this country our shortcomings are the more to be deplored from the high state of civilisation to which we are always assuring ourselves we have attained. The remedy lies in our own hands. If the architect, artist, and sculptor are employed more and the cemetery mason less, there is no reason to doubt that in ten years as great an improvement will be made as has been effected in a like period in any branch of art. But we repeat, the art must be in higher hands than it is at present, and money should be spent in obtaining a pure design, and not in florid and often absurd decoration.

WESTMINSTER ABBEY AND ITS ORGAN.

IT has often been said by the leading journal that if we English people are not remarkable for "commerce and business" activity, we are assuredly remarkable for nothing else, and no one will, I presume, be at all likely to dissent from this somewhat severe dictum, though it does not say much for us. It is not *fine art*, certainly, that we are now in this present age remarkable for; there are no great and enduring paintings nowadays, and in this country, in process of execution; no work of sculpture other than manufactured; and the great work of the future, says the same world-wide authority, must be the "rebuilding of this hideous metropolis"—mighty London; so that there is nothing, it would seem, but business and business only.

Mr. Disraeli, who has achieved so much in so very many ways, is even more severe than this, and once declared that the whole modern world, generally, and everywhere, could not consider itself famous for anything whatever in these modern times but *music*—*i.e.*, musical composition and musical performance. Indeed, he says, what sculpture was to the Greek, and architecture to the Egyptian, *music* is to us—not, perhaps, to England, but generally to the modern world. And to cite another great authority, Mr. Hullah, nothing has made such progress as modern musical instrument-making. But volumes of poetry, says he, have been written about the antique lyre, but who ever saw a line on the subject of the infinitely finer but common-named fiddle? In spite of the *Times* dictum, therefore, we are improving, fiddles are improving—at least they say so—and so are *organs*, church and cathedral organs.

Westminster itself, as everybody knows, is all of it in a rapid and truly cheering course of systematic improvement—streets, drainage, houses, and all; and the venerable Abbey itself could hardly be expected to fall behind in such a race of progress on to ultimate perfection, and a very great deal might be said about it and its old and its new arrangements, so suitable to modern wants and requirements, and ritual! But our immediate and pressing object now is the Abbey organ, which is under a thorough course of cleaning and repairs and "additions," and we would therefore most respectfully ask a little attention to it, so that it may be seen what it is possible to do in these days of universal improvement and educational excitement.

It is first necessary that the reader should at least roughly understand what an organ is. It is not a simple instrument, like a pianoforte, all before you at a glance; but a large organ like that at the Abbey is a very complicated instrument indeed, and is in reality not one simple instrument, but several—*i.e.*, a quoir organ, the great organ, a swell organ, and so on, each consisting of some hundreds of pipes, and many *ranges* of pipes or stops, and working apparatus. Of course it is impossible to describe all this, but anyone will be able to understand, without lengthened description in detail, what a very complicated piece of apparatus it is. It must, however, be understood that though the whole instrument is made up of many parts, it is in fact *one* instrument. It is necessary to be studious of brevity, but without a little particular commonplace description it is not possible to make clear what it is needful to say. I cannot refer at present to the only book likely to give it (Hopkins and Rimbault on the Organ), who I dare say have found out; but it does happen sometimes that a wonderful flash of genius comes across some perhaps humble man engaged in the manufacture of a common piece of mechanism, and this never happened more happily than when the *swell organ*, as it is so well called, was thought of. It is quite an obvious thought, like the way to America, when you have once seen it and know it; it simply consists in shutting the pipes up in a box, with a portion of it so made as to open by louvre boards, so that the sound is shut up or deadened, and let out or *swells*, at the will of the performer, who shuts or opens them at pleasure. Nothing can be simpler or more obvious than this, but it is a splendid triumph of genius both mechanically and musically, and creates, when judiciously managed—which is not always the case, for you can work the best of ideas to death—the most beautiful effect of which music is capable, comparable to nothing but the sound of a sweet-toned bell under the influence of the wind, the purest of sounds. I say that this happy and beautiful thought can be worked to death, but Mr. Turle, the organist of the Abbey, fortunately, is as skilful and happy in the use of the swell organ as it is in itself a skilful and happy thought. It could not be better done, because there is not too much of it—the truest of all tests of the good and proper use of anything. But this is not all. The pipes of an organ nearly all of them stand upright, so that the sound, coming out at the top, goes upward towards the roof, and is reflected down again from the roof and walls. It is important to bear this in mind, and also the fact that the purest of all sound or sounds from a pipe or pipes is *after* the pipe or pipes are closed and have ceased to speak, and the sound is in the air.

Another point to note, and it is quite as important, if not more so, to keep it in mind, is, that it is not the instrument only, but the position it occupies in a building, that determines the quantity and quality of the sound effect it produces; and in our cathedrals, through a series of ages, it must have been a problem where best to put the organ; and the rood screen or organ screen was found to be, as it most surely is, the very best place—the result of the wisdom of our ancestors, for the organ is clear of everything, with plenty of room for the air vibrations, so that the whole organ is as a trumpet in the open air, and there is as much difference between an instrument in such a position and in one shut up in a box (as at the Temple Church) as there is between a trumpet in the open air and one tied up in a coal-sack. Again, a great deal depends upon what the organ stands upon, its solidity, firmness, and so on, and still more on the nature of the material of which the *walls* of the building in which it is are composed, whether of stone or of plaster, and whether *painted* or not. Now there were only three buildings in London wherein might be found all these precious and rare requirements—the Abbey, St. Paul's, and the Temple Church; and it is hardly to be credited that in all three of them all these rare and happy advantages have been ruthlessly sacrificed and thrown away. To confine ourselves for the present to the Abbey. In a truly unfortunate moment it was determined, I presume by the Chapter, under the advice of the Abbey architect, Mr. Scott, that this organ should be *cut in two* or rather three, a large organ on one side, another large organ on the other side, both almost touching the top of the aisle arches, and a small organ, or rather a few pipes, in the middle—I suppose, to hide the performer, and thus in a moment to destroy at one blow the whole strength of the instrument, for now the organist sits in the middle of it, with one half of it behind him, instead of the whole of it before him, giving him thus a certain command over it, which is now lost, to say nothing of the fact of his being entirely hidden from the choir, and they from him. But the final and fatal blunder is this, that the swell organ, so happy in effect, will not act, and this is very curious and well worthy of a little thought. As I tried to explain, the *swell* is produced by the opening and shutting of louvre boards, and in the old arrangement, when the whole organ stood in the middle of the loft, the louvres so opened as to throw the sound into the nave, and there it found space and air to vibrate in, and (so charming was sometimes the effect) to return after reflection, producing a sort of echo from the west wall. It is impossible to over-estimate the value of this beautiful accident, but it has been all thoughtlessly thrown away, no man understanding it or having the courage to say nay to its destruction.

But even this is not all, for it will hardly be credited that the motive given for this stupid blunder—for what else can it be called?—is, that it—the putting the organ out of sight—"opened out the Abbey, and exhibited to greater advantage its Gothic proportions!" Now, I think that every Gothic man may be confidently appealed to for this—that if there be one thing more than another which may be called a "fixed principle" in Gothic architectural plan inventing, it is this, that in a Gothic interior like the Abbey, the screens, altar rails, and "furniture" generally, *add* to the Gothic effect of it, and increase its architectural nobleness. A sort of confusion and mystery is created by your not seeing the whole building at once, like its plan on paper, but yet being clearly conscious of its size and extent. "Opening out," for that is the term, is simply Gothic destroyed. And Professor Willis (description of Canterbury Cathedral) especially notes the miserable mistake that was made when some restoring architect went down there and destroyed all the screens, and fairly gutted the church. Who does not agree with Professor Willis? This, therefore, in addition to the musical destruction, has been repeated in Westminster Abbey, when its organ was cut in two and put out of sight, that you might "see the Abbey!"

Is it too late to amend all this? for that is now the question and the reason of this notice; for, as I have already said, the organ is all to pieces, cleaning and mending, and, what is more, a new "trumpet stop" of very great power (*tuba mirabilis*) is to be added to increase the effect of the organ accompaniment in f. f. passages. Wonderful! Has it ever occurred to anybody connected with this place that the *quoir* is a necessary and very constituent element in the "music" of Westminster? But let us be thankful for all things particularly, and more especially for this *tuba*; and, also, to come down from the sublime to the very ridiculous, for a little attention to the *bellows*, for, truth ought to be told, they make nearly as much noise as the organ itself, in the act of blowing. But, I say, let us be thankful for what we can get, whether much or little; and so now, having got the new trumpet, and well rid of the old one, which some may remember with dismay, let us ask, as the choir boys say, for more—*i.e.*, let us ask Mr. Scott and Dean Stanley to kindly take it into their thoughtful consideration whether or no it would not now be a capital opportunity, after so much mischief, to commence the real and *bonâ fide restoration* of the Abbey Church of Westminster by simply putting back in its proper place "the organ," so that you may both hear it and see it; for what possible, even miraculous, additions can be made to this organ which can possibly make up for the previous total breaking up of the whole instrument into bits, cases, pipes, sound, music, and all—putting all the said bits where they cannot possibly act, destroying the organist's power over the instrument, and so deadening and destroying the quality of the sound from it that I do not hesitate to say that the putting the whole thing out in the Broadway would have been less of an evil?

C. B. A.

GOSSIP FROM GLASGOW.

(FROM OUR CORRESPONDENT.)

AFTER a tedious delay the statue of Lord Clyde has been placed upon its pedestal. From not only the reputation of its sculptor, Foley, of London, but from evidence of his genius, as seen in a model of Burke, lately shown in our Fine Art Exhibition, something great was expected. It is a statue that may "please the million," but I am not sure that it will altogether satisfy the fit few who are versed in not only the canons but the associations of art. The treatment is eminently realistic, and there is a melodramatic, not to say "bumptious," air about it, which is as alien to the highest class of art as it was to the character of the modest-minded soldier whose services it seeks to commemorate. This may perhaps arise in some degree from a slight anachronism. The accessories all indicate the brief but brilliant career in India, while the face and the whole bearing of the statue point to a period fully twenty years earlier. In especially artistic repose Foley's Lord Clyde cannot for a moment be compared with the statue which it has displaced, the Sir John Moore, of Flaxman. However, whatever its defects, I must say this of it, that it is a vast relief from the many Marochettis to which Glasgow has so long been almost invariably doomed.

I had lately an opportunity of seeing a cast of the head of Foley's statue of Lord Clyde. It is (in an art sense) broad, simple, and heroic, and wholly dwarfs the rival busts by Adams and Ewing.

Operations are commenced in converting part of the corporation property in Sauchiehall-street from dwelling houses into premises for the School of Art and several of the scientific and learned societies. It is likely that the Architectural Society will find here a congenial home.

The "Eastern Difficulty" is about as chronic in the deliberations of the Glasgow Town Council as in the politics of the courts of Europe. Whenceever arises the general Oriental grumbling and dissatisfaction, in at least one instance the wise men of the East have long had a real grievance, the inadequacy of their police-office accommodation. Far be it from me to say that there has been a disproportionate increase of crime in the meridian of the Calton. It is more pleasant to find a sufficient and satisfactory reason in the obvious facts that the present prison is wholly unsuited to its purpose, and that it is desirable to have the several departments—now scattered—such as lighting, cleansing, and watching, under one roof, as they are under one administration. Another reason is, that justice, which in such matters is too often blind, required that magisterial dignity should not in the east be "cabined, cribbed, confined" in a dingy den, while in the west it luxuriates in a spacious palace. Within these few years new police offices have been built in the west, north-west, and north-east districts of the city, and now the east in turn has its claims recognised. The western police-office is an exceedingly elaborate building, ornamented with carving and embellished with sculpture; and, had not the east got shortly something decent as a *quid pro quo*, the local jealousy would likely have become incensed, indignation meetings have been held in the City Hall and on the Green, and about half of the town councillors been made to shake in their shoes in which they were to "walk their chalks" at the impending municipal election. The eastern police-office is a much plainer building than is its sister in the west, and depends less for its effect upon elaborate ornamentation than upon breadth of composition and simplicity of detail. It consists of a centre of two stories and two wings of one. The centre is about 80ft. long, and each wing about 40ft. The wings and the basement of centre are rusticated. Above the rustic work is a dado course, and upon this in the centre compartment are set windows having architraves, frieze, and cornice. The centre building is crowned with a noble cornice, unbroken from end to end, and enriched with dentils and modillions The doorpiece, although simple, is effective, and is composed of architraves, frieze, consoles, and cornice. On the frieze is carved the city arms. The architect (also of the western), is Mr. Carrick, the city's master of works.

A new broom sweeps clean, and the new lord of the manure is making a clean sweep of the streets by brushing them by machinery.

Messrs. Bateman and Bazalgette have issued their report upon the sewage of the city. Their proposal is nothing new—to carry it in covered aqueducts to the sterile sands of Ayrshire, and dispose of it as manure.

Whatever a reformed Parliament may do or may not do about education, Glasgow, always forward in this good work—bear witness its normal schools and its printing for the blind!—has been, meanwhile, doing a little in the way of helping itself. In Elgin-street a large building is almost completed for the Gorbals youths' school, and at Mossbank, the other day, the foundation stone was laid of the Glasgow schools of industry. The design for the Gorbals youths' school is by Mr. Honeyman, and, as it is Italian, he seems to be forsaking that first love to which I thought he had been irrevocably wedded—the Gothic. The basement is rusticated, with arched windows, and has a Doric doorpiece of coupled three-quarter columns. The upper storey is somewhat plain, but character is given to it by a bold cantilever cornice of iron and timber. Adjoining there is being erected an ordinary tenement, of a Greeky character, by Mr. Gildard. The architects for the Glasgow industrial schools are Messrs. Douglas and Stevenson, and the style is the Domestic Gothic. This building is to be of red, black, and white brick, will be 240ft. in length, three stories in height, have a spire and dormers breaking the sky-line, and will furnish accommodation for about 1,000 children. These schools are considered of so much social importance that their foundation stone was laid by the Grand Master-Mason of Scotland, the Earl of Dalhousie.

Subscriptions for the Wallace Monument are "never ending, still beginning." Begging circulars having once more been issued, surely the £5,000 which it was to cost will be now speedily raised, and the monument along with it, or else we may ask with Macduff, in *Macbeth*, "Stands Scotland where it did?"

In a recent review of a Glasgow book on architecture you twitted us Scots a little on our partiality for the Greek. We may be right or wrong in our partiality, but we have some reason to be proud our achievements. The High School, the Royal Institution, Surgeons' Hall, and the several monuments on the Calton Hill, in Edinburgh, and the gaol, by Stark, and the later and more original works by Thomson in Glasgow, argue not a little, I think, for a just taste in the north; and in the battle of the styles Greek has just accomplished another rather considerable triumph. I mentioned some time ago a competition for designs for a church, the style being strictly limited to Greek and Gothic. Messrs. Thomson entered Greek, and, notwithstanding all the eloquence that has been expended in enforcing again and again that Gothic is your only style for churches, the Classic conquered. Another competition has been decided since I last wrote to you, that for the Reformed Presbyterian congregation in Cumberland-street. In this case there was no limitation of styles, and the successful design is Gothic, by Mr. Barbour, of Dumfries. This small body of Presbyterians seems to be prospering, if I may judge from it being about to build also in Laundressy-street. This building will be likewise Gothic, and the architect is Mr. Thomas Binnie, a new and hitherto unknown aspirant towards fame and fortune in designing broach spires and pointed arches.

The chief event of the season is likely to be the new offices for the Scottish Widows' Fund Assurance Society, the architects being Mr. Bryce, of Edinburgh, and Mr. Burnet, of Glasgow. The site, a most valuable and imposing one, is being presently cleared out.

Very rapid progress has been made with the building of the University. The eastern wing is already being roofed.

Glasgow, that "flourishes by the preaching of the Word," boasts once more of one of the largest provincial theatres, the Colosseum. The proscenium, although not so wide as is that of Drury-lane or Covent Garden, is said to be deeper than any in London, and this depth is being added to. Beneath the stage is a place 30ft. high, into which scenery descends, and part of which is bridged over for the building of set-scenes, &c. If the Union Railway gets dragged along, the Theatre Royal will shortly require to be rebuilt.

Of country work, a large mansion is being built in the Upper Ward of Lanarkshire, by Mr. Finlay, merchant, from designs by Mr. Leiper (late Melvin and Leiper), a clever young Gothic architect, whose talents have almost all at once given to him a high place in the profession; and in the classic Vale of Leven, overlooking the birthplace of Roderick Random, Mr. Aiken, spirit dealer, is erecting a mansion from designs by Mr. Watt.

Having now probably shown that my long (and enforced) silence was of no great consequence, I lay down my pen, hoping that no such interval may occur until I resume it.

BUILDERS' AND GENERAL HARDWARE.

(FROM A BIRMINGHAM CORRESPONDENT.)

AFTER a depression almost unexampled in its duration and severity, the hardware trades of Birmingham and the great Midland district are beginning to show signs of recovery, and the numberless factories and workshops are once again in tolerably steady operation. Builders' and contractors' ironmongery is in better demand than for two years past, but it is noticeable that the builders in Australia and other colonial markets who used to outbid English builders in regard to the superior quality of their fixtures, are now beginning to prefer cheaper and commoner articles. A good business is being done in the Scotch trade for all kinds of hardware, and the West Indian orders are improving. The East India market is taking a much greater quantity of railway and engineering ironwork than for some months past, but, of course, a large proportion of the present demand is on account of Government contracts. The home trade is steadily improving in all the principal departments, and the factors' travellers predict a fair winter demand, especially for builders' tools and furnishing ironmongery.

In Birmingham, the cut-nail works are in steadier operation, and the demand for wood screws—a trade which is in the hands of two or three firms—is gradually recovering. In the gun trade, the manufacturers still complain of depressed prices, although during the past fortnight the demand for sporting guns has been more favourable. The Birmingham Small Arms Company have just declared a dividend for the past half-year at the rate of 20 per cent. per annum, after carrying the large sum of £6,000 to the reserve fund. Mr. Joseph March has been appointed proofmaster, under the

"Gun-barrel Proof Act, 1868." The salary attached to the office is £600 per annum. Steel pens, buttons, and fancy wares are only in moderate demand. Edge tools and steel toys command a somewhat better inquiry, and some of the metallic bedstead makers have a fuller employment for their workpeople. A well-informed correspondent of the *Builder's Weekly Reporter* states that "the hammer makers still suffer to a considerable extent from the competition of rival manufacturers in the Northern States of America, whose productions are increasing in favour among the builders in this country." A tolerable home trade, however, still remains to the English hammermakers, who will doubtless be stimulated to greater enterprise by the influence of a little wholesome rivalry.

At Wolverhampton, the makers of galvanised ironware are a shade busier, notwithstanding the great increase in the production of such ware in this locality during the past few years. The lock trade is tolerably brisk, especially in the secure rim and night latch branches. The japanners and tin plate workers have a more favourable inquiry this week, on account of the Colonial and South American markets. The home demand for coal vases is quite buoyant. In agricultural implements and ironwork rather more is being done throughout the district, and other descriptions of heavy hardware are in better demand. The dispute between the fine plate locksmiths and their employers on the question of wages is not yet terminated, and there is every reason to believe that the discontented workpeople will join the Co-operative Association of Fineplate Locksmiths, already established with much success in Wolverhampton.

At Willenhall, the lock trade is steadily improving, but the curry-comb makers have not full employment for their workpeople. The Bilston japanners and tin plate workers have a fair demand for goods adapted to this season of the year. At Wednesbury and Darlaston the engineering ironwork makers are doing an improved business, especially on account of the East India market. The Walsall saddlers' ironmongers have a much better home demand for bits, stirrups, and other malleable ware. At Westbromwich the ironfounders are doing more business in the kitchen ware department, and the mill and forge castings branch is reported better. Chilled rolls command a fair inquiry. At Tipton the chain, cable, and anchor makers are fairly employed on Admiralty contracts, but the general merchant's trade is scarcely so favourable. The nail-makers' "strike" continues without any prospect of immediate settlement. Large numbers of them, with their wives and families, have left the district for Kent, on a hop-picking tour. Over 1,000 of them, bent on this enterprise, left Stourbridge a few days ago by special train.

STATE OF THE TOWER BARRACKS.

THE *Lancet* Sanitary Commission on the state of the barracks of the Foot Guards has made public a condition of things with regard to the Tower of London not at all creditable to the War Office authorities. Soldiers, storekeepers, warders, policemen, and women and children, to the number of 1,062 persons, are confined within a space which is taken up principally by stores, workshops, ramparts, &c. Overcrowding presents one of the chief obstacles to the sanitary improvement of the fortress. The principal barrack is a modern structure, having a castellated appearance, internal comfort being sacrificed to external effect. The rooms are dark and prison-like, the windows are small, and there is no perfect ventilation. There are no ablution rooms, latrines, or urioals, under the barrack roof. The principal ablution room occupies the basement of one of the ancient towers, and is approached by a narrow staircase. It is dark, and the floor is perpetually wet. Over this is the cooking kitchen, and over this again is the library. It should be an imperative rule that kitchens should have nothing above them, so that a louvre opening may be made in the roof for ventilation: the heat, as here, is otherwise intolerable. The basement of another ancient tower is occupied by latrines, and is a most disgusting place. There is practically no ventilation, and the stench is overpowering. It is said that they have been condemned, and that new plans have been prepared; but no money has yet been voted for the purpose. Some of the married sergeants reside in the casemates, which have been constructed with a view of restoring the fortifications to their original state. These rooms, though large and lofty, are dark and ill-ventilated. More of these unhealthy and cell-like dwellings are about to be built, and it is to be hoped that the engineer officer entrusted with the designs will strive to make them a little more comfortable. The casemates are more adapted for ornament than for present use. They would not resist a single modern shell, and they are not likely to be tested. Small openings might be made in front for light and ventilation.

MEASURING WORK.

THE Islington Board of Guardians held a special meeting on Tuesday week, for the purpose of investigating the charge made against the contractors for the new workhouse of having used "improper" materials—*i.e.*, materials not in accordance with those specified in the contract—in the construction of the new building. In the course of the investigation, Mr. Burden, the architect, was examined, and in reply to a question he said that he depended upon the Clerk of the Works (Mr. Lewis) for the accuracy of the measurement on which he certified. He could not say it was the duty of the clerk of the works to make the measurements; he could only speak as to custom. It was customary for contractors on the one side, and the clerk of the works on the other, to send a statement as to the measurements to the architect, and if these tallied the architect gave a certificate.—A Guardian here observed that with such a system Mr. Burden would place himself in an awkward position should there be collusion between the clerk of works and the contractor.—The architect replied that either the clerk of works must do the work or he must do it himself. He was able to check the measurements by his plans.—A Guardian adverted to the fact that the measurement of the work took up the whole of the time of the clerk of works.—Mr. Lewis, in reply to a question, said that on all works where he had been engaged it was the custom for either the architect or his clerk to go over the work with the clerk of the works.—The architect said that the clerk of the works was supposed to work on the part of the architect and the persons who employed him. A part of his duty was to measure up the work for the architect, and this did not relieve the latter from responsibility.—Mr. Hillman said he had questioned a celebrated architect on the subject, and he had said that the duty of a clerk of the works was not to measure up work.—The discussion on this topic then dropped, and after some further conversation it was carried unanimously—"That the architect be requested to write an imperative letter to the contractors, requiring them to remove from the ground the whole of the defective materials within two days."—The Clerk of the Works suggested that for the future all materials brought on the ground should enter by one gateway, and that a gatekeeper should be appointed to inspect the loads.

SEPULCHRAL REMAINS IN SOUTHERN INDIA.

SIR WALTER ELLIOTT, in a paper read before the Ethnological and Geographical Section of the recent British Association meeting at Norwich, stated that some five-and-twenty or thirty years ago he examined a number of ancient cairns and tumuli on the Neilgherry Hills, which proved to be the burial-places of an extinct race The most common are simple circles, from 3ft. to 6ft. in diameter, formed by a few rude stones placed side by side, and sometimes enclosed within a larger circle or square of similar stones. A few that were opened contained only one or two earthen vessels, incinerated bones, and sometimes a few beads. These are occasionally deposited just without the circle, at a spot on the east side, where one stone projects beyond the curve. An extensive collection of these circles occurs at the Red Hills, near Madras, which had been the burial-place of an extinct race called Curumbars. None of the present inhabitants of the plain now deposit the remains of their dead in this fashion. A second kind of tomb is composed of a few large slabs of stone, generally four, placed upright, so as to form a square, and surmounted by a slab serving as a cover or lid. They are termed *pandis kulis*, and occur in all parts of the country, in great numbers on the banks of the River Noyel, in the province of Combatore. In some places, as at Chittore, there is a circular opening in the end stone, apparently intended for the introductory offerings to the dead, but which the natives consider to be an entrance or doorway, and say they were the habitations of a race of pigmies or troglodytes, whence the place goes by the name of the City of the Dwarfs. In a *pandukí* of this class were found, in three earthen vessels buried in the north-east corner, a necklace of gilded beads on clay or lac, a small string of hexagonal cornelian beads marked with white lines, four oblong beads and two smaller ones of crystal or quartz, a small armlet of thin gold plate, two gold bbuke or buttons, and some fragments of gold. Remains of iron implements, much oxidised, were also found. A third description of tomb is of frequent occurrence in the province of Malabar, called *Kodi Kals*, generally found on eminences or open slopes. They may be described as chambers excavated in the soil, with a descent of a few steps and covered with a convex slab, whence their name, from their resemblance to a *kodi* or umbrella. The chamber has a shelf on one side, and a conical cavity, in which a coarse earthenware vessel 4ft. or 5ft. high and 3ft. or 4ft. in diameter, like an amphora without handles, is deposited, its wide mouth covered by a stone lid. In one of these, on removing the cover, other smaller vessels were discovered, of various shapes, all containing burnt bones and a little fine shining powder or sand, which was also strewed about the bottom, on which also rested a saucer-shaped vase of fine glazed pottery, containing a string of crystal cup shaped beads. Other beads, and some oxidised pieces of iron, were found on the shelf. In the vicinity of these umbrella tombs are often seen other edifices in which the convex lid is supported on upright stones; but in none of these that have been examined have any remains been found indicatiog their purpose, whether monumental, sepulchral, or religious. They are called *Topi-Kals*, or "cap stones," and have much the appearance of gigantic mushrooms. The structures in the Neilgherries, like the umbrella and hat tombs of Malabar, generally occupy the tops of hills or gentle slopes surrounded by woods. The most common form of these cairns is that of a circular wall of uncemented rough stones, four or five feet high, three feet thick, and six to eight feet diameter inside, exactly like a draw well. Others are formed of tall, unhewn stones, set on end in a circle. Instances also occur, though more rarely, of conical earthen tumuli, and of circular cavities lined with stones, from which the earth slopes down on every side. Diversified as they are in form, the interior arrangement is nearly alike in all. On removing the upper soil, one or more long narrow slabs of unhewn stone are discovered lying horizontally, and, where there are several, parallel to each other, all invariably in the same direction—from north-west to south-west. On digging deeper the space between the slabs and between these and the wall is found to be filled with pottery, almost invariably broken, as if carelessly cast in. The vessels are for the most part empty, of a cylindrical form, with many rings, as if turned, and having rounded bottoms, but no handles. Most of them have lids, surmounted by rude figures of buffaloes, deer, elephants, tigers, bears, birds, snakes, or men. Sometimes the fancy of the potter has produced monstrous shapes of birds with two heads, or beasts ending in snakes. On clearing out this broken pottery and removing the stone slabs, one or more flatter vessels are found with or without covers, sometimes entire, sometimes crushed by the weight of the superincumbent stone, and containing a few burnt bones, and fine black or brown mould, together with gold or metal, jewels, beads, rings, &c. Others contain cups or vases of bronze or mixed metals, together with utensils which may have been used by the deceased, as spears, knives, sickles, razors, tweezers, all of iron, much oxidised. Traces of charcoal, resin, and other matters which may have been left among the ashes of the funeral pile also occur. The remainder of the paper contained a description of one or two cairns which Sir Walter Elliott had examined.

The once famous City Theatre, in Norton Folgate, known latterly as the City of London Theatre, will soon be numbered with the things that were, it having been purchased for railway purposes.

SOME INCONGRUITIES OF "REALISM" IN THE DRAMA.

THE new drama produced at the Surrey Theatre, on Saturday last, "Land Rats and Water Rats," by Watts Phillips, is decidedly Boucicaultish in character, a weak, improbable, and indistinct plot being made subservient to the prowess of the scene-painter and the property room. A real horse and cab are driven on to the stage, and a locomotive and train improvised by the scene-painter and (theatrical) machinist pass across. But while "realism" seems to be so fashionable with some authors, why do they not see that their scene-painters and machinists fulfil their portions of the work with fidelity? Old Blackfriars Bridge is the great *piece de resistance* in the new drama, but why is it a counterpart of Waterloo Bridge as regards the open balustrading? Within our memory Blackfriars Bridge was never flanked with anything but plain stone walls, except on such portions of the structure as were unable to sustain the weight of stone, where a wooden palisading was substituted. Again, the plot may reasonably be presumed to be laid at the present time, as the interior of the Langham Hotel is one of the scenes. Here we must blame the playwright. Old Blackfriars Bridge was closed before the Langham Hotel was completed, and before the old bridge was closed the London, Chatham, and Dover Railway bridge had been erected, and so effectually shut out the fine view of London as seen from the bridge formerly, and as depicted by the Surrey scene-painters. Again, the driving wheel (not wheels, for the train and locomotive only consist of a long painted partition with wheels underneath) of the locomotive must have made many a mechanic smile as he saw it on Saturday night, containing, as it did, only four spokes, formed by two bars crossing each other at right angles within a hoop, to say nothing of the absence of the driving crank. Surely if "realism" as to scenic effects and properties now constitutes the playwright's principal stock in trade, it is worth the bestowal of a little more attention. The representation of the Langham Hotel as contemporaneous with old Blackfriars Bridge and an uninterrupted view of London cityward from the latter, are matters that should not, for the sake of "realism," be unnoticed, and they are matters, moreover, at which the lover of the unsophisticated drama and the admirers of art will indulge a hearty laugh. The artist, in transferring the open balustrade of Waterloo Bridge to old Blackfriars Bridge, however, would seem to have a predilection for æsthetics rather than for "realism," and is, therefore, to be commended. Much as is talked about the prospects of the drama, it seems to us that the production of such pieces as "After Dark," "Land Rats and Water Rats," (depending as they do on "realism" in connection with things that should be of subsidiary interest) is anything but a favourable sign.

PUBLIC WORKS IN PARIS.

THERE are manifestly only two methods of executing any project or undertaking. One is to do it yourself, and the other to get somebody to do it for you. Under the latter method may be included every possible phase and branch of contracting, which is the favourite principle of carrying out work in this country. It is not to be understood that works of construction, both architectural and engineering, have not been executed by private parties in some instances; but in the main the preference is given, and justly too, to the contracting system. Owing to the advent of certain circumstances it has not unfrequently occurred that a railway company has relieved its contractor from his engagements when it became obvious that he was unable to duly fulfil them. A case in point happened in India, upon one of the great arterial lines, where, after the contractor had done a certain portion of the work, he being unable to complete the whole, the company took the contract off his hands, and finished the line not only in a most efficient manner but with great advantage upon the side of economy—a fact reflecting the highest credit upon its engineers and managers. The principle of contracting, although in the abstract implying merely the substitution of one party for another, yet comprises an almost infinite number and variety of ramifications, depending upon the obligations entered into under the contract.

Contemporaneously with the remodelling of our own metropolis, that of Paris is proceeding *pari passu*, and it is impossible to predict which will benefit most by its partial transformation. From various causes one uniform system of obtaining the execution of the magnificent works at present in different stages of progress in the French capital has not been adhered to. The magnitude, the uncertainty, and other features inseparably connected with their construction has prevented this desirable result. This is the less surprising when it is borne in mind that the transformation of Paris has been commenced and steadily and persistently carried out for the last fourteen years. Strictly speaking, there is no system on the continent answering exactly to our contracting. Both the methods of "adjudication" and "concession" have many points in common with it, but yet do not realise the precise signification we attach to it. The works connected with the improvements of Paris have been accomplished partly by "direct execution," a phrase self-explanatory, and partly by "concession." A glance at what has been effected in the French metropolis will suffice to indicate that the municipal authorities do not intend to be behind ourselves in providing for the health and comfort of the inhabitants of their chief city. With a few exceptions our main thoroughfares are by no means very ample in their dimensions, but those of Paris are, or we should say were, still more contracted and limited in their accommodation for traffic. Naturally, therefore, the attention and energies of the legislative authorities were in the first instance directed to the widening, straightening, and general amelioration of their public routes, and in pursuance thereof three principal plans were laid down. Of these the first was commenced seventeen years ago, and is now completely finished. It embraced a total course of six miles, and cost eleven millions sterling, but the benefits it conferred more than compensated for the expenditure it entailed. Air and light were by its means distributed over a district in which the narrow and tortuous alleys and lanes forbade the slightest circulation of the vitiated atmosphere, and swift demolition befell the old obscure and dilapidated localities and purlieus in the vicinity of the Tuileries, the Louvre, the Palais Royal, the Hotel de Ville, and la Cité. The extent of the second projected system of streets, commenced just ten years ago, is thirteen miles, and consists chiefly of routes rendered necessary by the enormous development that modern times, together with the introduction of railways, have produced upon all metropolitan cities. It constitutes the principal means of intercommunication between the railway, telegraph stations, and most of the foci of official importance, and affords a convincing proof of the uncertainty attending the cost of all works of a corresponding magnitude. The original estimate was nearly three millions and a quarter, and it is calculated that when the system is completed the expenditure will reach nearly seven millions. No doubt additional works and extensions have been made which were not contemplated in the original estimate, but they could not have been sufficiently extensive to cause an increase exceeding by 120 per cent. the total sum first allowed for. The third system, both in cost and extent, is about equal to the first, and, although decidedly a great improvement to the city, is nevertheless not characterised by that amount of utility unquestionably belonging to the two former. It is rather a work of expediency than one of absolute necessity, although some portions of it may be said to have been rendered imperative by the extensions already accomplished in the other two. No such anomalies as *cul-de-sacs* could be permitted in the transformation of an imperial metropolis.

The experience gained by the carrying out of the Parisian improvements, in which, as we have already stated, the principles of direct execution and that of concession were both employed, resulted in the recognition of the latter as the preferable method economically considered. One great advantage of this plan was found to consist in the personal interest it gave to those responsible for the accomplishment of the task, and the superior activity, energy, zeal, and ability exhibited in the pushing on and rapid completion of the works. The results would have been probably still more satisfactory had it been possible to employ the method of adjudication, which has been most successfully adopted in the construction of the railways. The peculiar manner in which the financial arrangements were effected precluded the practicability of employing the method of adjudication. Where the "concession" plan is employed the means of arriving at its cost is thus determined. So soon as a certain work—suppose the opening up of a new route—is determined upon, a preliminary estimate of the expense is made by the municipal officers, who base their calculations upon the results of similar works already accomplished. This valuation is submitted to a committee appointed especially to examine into such matters, and the fiat of the members ultimately fixes the price of the concession. No concession is ever granted without this check upon the estimate being performed, and the lodgment of a proportionate amount of caution money, as a guarantee for the fidelity of his intentions, is the only condition imposed upon the contractor. Referring to a report lately published, relative to what may be termed the inner working of the French systems of contracting, it is manifest that they are free from the great majority of the blemishes which attend our own, which, in fact, disgrace many of the parties connected with the execution of large public works, and cast a shade of distrust and suspicion upon those who ought in no manner whatever to be concerned with the financial part of the undertaking. When £10,000 is added to an estimate to ensure the fulfilment of the contract, it is time for our municipal authorities to seriously consider whether the principle of direct execution would not be preferable to the system of contracting.

WALTON SEWERAGE, LIVERPOOL.

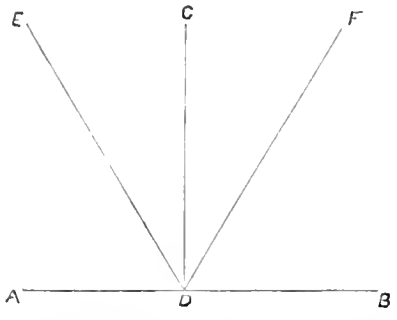
IT appears that the Walton Board do not intend adopting Mr. Rawlinson's advice to join the township of West Derby in a joint outlet for wasting the sewage into the River Mersey. They have instructed their engineers, Messrs. Reade and Goodison, to modify their utilisation scheme so as to adapt it to the disposal of the sewage of Walton alone. The following resolution was adopted unanimously at the last meeting of the Board:—That as there does not appear any probability of an agreement being come to between the West Derby Board and that of this township for a joint outlet sewer for the disposal of the sewage of both townships by utilisation, the engineers be instructed to modify the plans so far as to make the outlet sewers applicable for the township of Walton only, due provision being made in such altered plans for prospective increase of population.

The congress of German architects, which has been sitting at Hamburg, was closed on Friday last.

THE THEORY OF SHADOWS.*

EVERY one who regards himself as a finished draughtsman ought to be thoroughly *au fait* at the various descriptions of perspective, including lineal, parallel, geometric, and aërial, and at any rate acquainted with the science of shadow drawing. We have known many first-rate draughtsmen who knew absolutely nothing about sciography and the correct projection of shadows. They were literally unaware that shadows could be defined with the same degree of accuracy and fidelity with which the contours of substance can be delineated. In addition to ignorance upon the point it was not considered as a matter of much importance. The eye was assumed to be quite a sufficient guide, and provided the outlines of the objects were correctly ascertained, the shadows might be simply sketched in without any effort to define their proper limits with that mathematical accuracy of which they are capable. Yet there is very little doubt but that the just delineation of shadows, not only of their outline, but also of their relative tone and depth, is a subject of the greatest importance in either architectural or artistic productions. It is in the former of these that the deficiency of an unpractised eye and an ignorance of theory would be most apparent, since the character of the drawing being of a rectilineal kind would betray an error sooner than the latter. The theory of shadows is usually treated of in text books relating to descriptive geometry, and it must be confessed that the subject is not a very attractive one, except to those possessing a strong taste for geometrical analysis.

Mr. Puckett, in the work to which we refer, has treated the subject of the projection of shadows in a series of lectures illustrated by accompanying diagrams. Perhaps this gentleman would allow us to point out one fact to him, of which, by the arrangement he has adopted in his volume, he does not appear cognisant. However admirable a series of lectures may be when delivered orally, it by no means follows that they will read equally well. It is the same with all speaking, and in nothing more manifest than in pulpit preaching. A sermon that is perfect when well delivered will often be found to read but very indifferently, and one that can be read with pleasure would be completely spoilt by public declamation. In compiling a book of a number of lectures there is a dissimilarity and a want of sequence which become very unsatisfactory. This is not noticed in the lecture and class room, where the one lecture succeeds the other in its proper time, and the whole system of education is based upon this recognised foundation. But to gather together the information that has been spread over a certain period, and publish it in exactly the same unconnected form in which it first appeared, is a complete mistake in the art of "book-making." It is easy to perceive that the author is master of his subject, and thoroughly understands the principles of tuition. He commences by the case of a simple block, and proceeds to the more intricate and complicated examples in subsequent lectures. Every step in the working out of a diagram is clearly demonstrated, and all the necessary points, lines, and projections truly and correctly defined. This care is the more necessary in the solution of all problems depending upon geometrical reasoning for their accurate determination. It must be borne in mind that the successive steps are not only dependent upon one another, but combine to make up the whole figure. They constitute so many links, whereof if one be broken the whole of the problem become obscure and unintelligible. If the student is unable to determine the position of one of the lines, or ascertain the necessary projection, he can go no further with the problem, as it is very rarely that he can supply the missing link in the process. The case is otherwise with analytical reasoning or calculation, where if a step in the operation be omitted the pupil can generally supply it if it be not of a very complicated nature. The subject of sciography includes three descriptions of the projection of shadows—one where the cause is natural light, the other where the shadows are generated by artificial light, and the third where they are due to the medium of reflection. In the two first the theory is nearly identical, and there is only one position for the source of light, which is assumed to be in front of the observers. A few examples are all that is required to elucidate the projection of shadows by artificial light. Reflected light, and the projections of the shadows due to its agency, are founded upon the well-known physical law that the angle of incidence is equal to the angle of reflexion, and that when one is given or is a known quantity, the other is also known. As this is a very important law, we will explain it a little in detail. Let A B be the surface of a mirror or of any reflecting substance, such as a sheet of water or quicksilver, and



let C D be a perpendicular to it at the point D. If E D represent the incidental ray falling upon the surface at the point D, then E D C will be the angle of incidence, and E D A its complement. Similarly F D C will be the angle of reflexion, and F D B its complement. Bearing in mind that C D A is a right angle and calling the angle of incidence θ, and that of reflection ϕ, we shall always have the following equalities, $\theta = \phi$: angle E D A = angle F B D = $(90° - \theta) = (90° - \phi)$. The plates in this little volume are distinctly and clearly lithographed, and the lettering, a most important point, has been carefully attended to. Anyone who uses the treatise must do so with the full intention of becoming thoroughly acquainted with the contents, as there is no other way open to him but to take his drawing board and squares and work out to a good large scale the various diagrams explanatory of the problems. It is essentially a practical book, and imparts a knowledge of sciography by the only methods by which it can be adequately acquired.

* "Sciography or Radial Projection of Shadows." By R. CAMPBELL PUCKETT, Ph. D., Head Master of the Bath School of Art. London: Chapman and Hall, 193, Piccadilly. 1868.

BUILDING IN SAUCHIEHALL STREET, GLASGOW.

OWING to the rapid and steady westward extension of Glasgow, Sauchiehall-street has, in the memory of those still comparatively young, passed from being a quiet country road to be a busy thoroughfare, so that where but a few years ago the suburban villa was seen nestling snugly among shrubbery and trees, with green lawn and flower plots interspersed, are now to be seen long continuous ranges of tall buildings, the upper stories of which are divided off into commodious dwelling houses, after the Scotch method, and the street floor occupied as first-class shops, containing all conceivable commodities requisite for the comforts of those residing in the still rapidly extending west end. Hitherto, however, these remarks were true only of the south side of Sauchiehall-street, the north side, west of the Corporation Gallery Buildings, still remaining in the same condition in which it was forty or fifty years ago. The circumstance of one side of this street being occupied by detached villas and gardens has rendered it a favourite and pleasant thoroughfare; but it has been evident for years that the north side of the street was doomed to a change also; there being an increasing demand for shops in this locality, there were not wanting those who saw the profit that would accrue from erecting buildings to supply this demand. Fortunately for the amenity of the street, the building an illustration of which is given in our present number has been restricted by the proprietor to three stories in height, an example which it is to be hoped will be followed in the case of such buildings as may afterwards be erected in the same line of street.

This building has been erected with the view of being occupied as shops and warehouses, the ground having become too valuable for dwellings. The frontage to Sauchiehall street measures about 126ft. and to Scott-street about 60ft. The building was described pretty fully by "our Glasgow correspondent," on the 24th of April last (No. 694). Messrs. A. and G. Thompson are the architects.

A NEW "ROAD STEAMER."

GREAT efforts have been made within the last few years to apply steam power to the draught of loads on common roads, but two difficulties have hitherto hindered these efforts. The first difficulty was the jar caused to the machinery by travelling over a rough road, if the locomotive was lightly built; and the second obstacle was that if the locomotive was made heavy and large, in order to obviate this first difficulty, it was only done at the expense of the roads which would suffer greatly. Mr. Thomson, a civil engineer of Edinburgh, has, however, overcome these difficulties in a manner which appears to be highly satisfactory, although by very simple means—viz., by fixing stout india-rubber tires to the engine wheels. The various trials of these engines appear to have demonstrated the success of Mr. Thomson's expedient. One engine, weighing 8 tons, was recently tried in Edinburgh. It drew a train of four waggons, each weighing 2 tons 15 cwt., and each loaded with 5½ tons of coals, making, with the engine, a weight of 40 tons, from a colliery twelve miles from Edinburgh, to the latter city, although built to draw only 15 tons. The train (90ft. long without engine) travelled with perfect ease along a road having inclines of 1 in 16. Reaching Edinburgh, it deftly threaded its course amid the streams of ordinary traffic, over beds of broken stones, dodging through barriers for the protection of the road-menders, turning sharp corners, and descending steep streets, describing serpent-like sinuosities as the exigencies of the steering demanded. The whole trial was very complete as a demonstration of the tractive power of the engine, and of the perfect control over it possessed by its driver. Professor Archer, in a paper read before the British Association, compares the india-rubber tires to the cushioned feet of the elephant and camel, than which it is probable that the tires will be hardly more destructible.

DRAINAGE OF THE FENS.

AT the recent meeting of the British Association at Norwich, Mr. G. W. Harding read a paper on this subject. He confined himself to the Bedford level, comprising 300,000 acres of land in the counties of Cambridge, Norfolk, Suffolk, and Huntingdon. Having remarked upon the scanty materials left by history as to the period at which attempts were first made to reclaim this important tract of country from the water, and glanced at a tradition that this attempt was to be attributed to John of Gaunt, at the latter end of the fourteenth century, he passed on through the reigns of several sovereigns to that of Elizabeth, in which a commission of sewers was issued, with the object of draining what was known as the North Level. Nothing, however, was done for twenty-three years, when, through the exertions of Sir William Cecil (afterwards Lord Burghley), the first statute was passed proposing a general plan for draining the whole great level. A multiplicity of commissions were issued during the reign of James I., and so many disputes and difficulties arose that the king himself eventually became the undertaker of this great work, for which he was to receive 120,000 acres. An engineer and workmen were obtained from Holland, but the work did not proceed satisfactorily, and was eventually given up. Nothing more was attempted until the fifth year of the reign of Charles I., when a tax of 6s. per acre on the

land in question was imposed for carrying out the work, but no part of the tax was paid, nor was anything done. Mr. Harding thus advanced by easy stages to the present times.

THE DRAINAGE OF PARIS.

DURING the last few days one of the bridges, the Pont de l'Alma, near the Champ de Mars, has been crowded with people overlooking an exciting mechanical operation—the laying down at the bottom of the Seine of two enormous water pipes, to complete the system of Parisian sewers, which are themselves almost a city, having main avenues, thoroughfares, passages, and cross-roads. In consequence of the Seine running through Paris, and dividing the town into two distinct portions, the drainage on each bank has been hitherto independent, one branch being carried off to Asnières, and the other coming out at the Pont de l'Alma. But it was deemed necessary to avoid infecting the water at this spot, and so the engineers decided upon joining the two branches together. They began by constructing a kind of underground canal from the Pont de l'Alma to the right bank main sewer. This was dug at the depth of 105ft., and took three years to complete, without any other display of works on the surface than a few wells and engines here and there. All that then remained to be done was to join the two branches by means of an enormous iron siphon, for ensuring the regular circulation of the sewage from one side of the river to the other. It consists of two tubes, one metre wide, two centimetres thick, and 124 metres long, made of two sheets of iron one over the other. A bed of concrete has been made across the river: it is to receive these tubes, which are now being laid—a gigantic operation, wherein no fewer than 150 workmen are employed. So great are the difficulties encountered in laying down the tubes, from the strength of the current and other causes, that several attempts have been unsuccessful as yet, and the mode of working has been changed in consequence. Divers go down continually to watch the proceedings. A day or two ago a jerk in the machinery threw over one of the chief contractors, M. Gonin, who, however, escaped unhurt. No similar work has ever been undertaken before, so that the excitement caused by this one is not to be wondered at. But it stops all navigation on the Seine at present, and the river is encumbered with boats awaiting the accomplishment of the work. This is expected to be effected in a very few days.—*Paris letter.*

THE CONSUMPTION OF SMOKE.

THE first inquiry by a Government inspector, under the 49th section of the Sanitary Act, 1866, was held by Mr. Rawlinson, at Hanley, on Tuesday and Wednesday of last week. Under this section, where a local government fails to enforce the act on a complaint of a number of the inhabitants, the Home Secretary is empowered to call upon the defaulters to do their duty, and, if necessary, appoint an inspector to put the act in force. When the Sanitary Act was passed, the town council of Hanley adopted its other provisions, but neglected to enforce the clauses requiring the consumption of smoke created by manufacturing processes. The nuisance arising from this cause in Hanley has been very great, and some three months back about 200 inhabitants of the town memorialised the Secretary of State to send down an inspector to enforce the smoke clauses. This being the first application under the 49th clause the Home Secretary instituted a preliminary inquiry, which was held as above stated. Evidence was given of the neglect of the town council to put the smoke clauses in force until after the memorial had been got up, of the serious nature of the nuisance arising from the large quantity of smoke emitted from the chimneys of the town, and, on the other hand, to show that of late the nuisance had been to some extent abated. Mr. Rawlinson intimated that as the town council had at last taken steps to enforce the act they would be allowed to proceed; but if they relaxed in their duty the Home Secretary would consider it necessary to take the matter out of their hands. He also hinted as extremely probable that if local authorities neglected to put the act in force the whole of the manufacturing districts would be placed under Government supervision in regard to the smoke clauses.

ARCHÆOLOGY.

A VERY fine sepulchral urn was discovered last week in a barrow on the top of Tredinny hill, near the Land's End. It was found to a Kist-vaen, formed by eight stones in layers of four. It was resting on a granite rock and was covered by a flat stone. The measurement is about 8in. by 13in. The urn is perfect except the bottom. It has four handles and is ornamented by a rude chevron pattern. It was filled with human bones. A few flints were found on the removal of the earth, and a considerable quantity of ashes lay around a large rock in the centre of the mound, on which it is believed the body was burnt.

An interesting archæological discovery has been made in a railway cutting at Pont de Pierre, not far from Châlons-sur-Saone. At 3ft. below the surface of the ground, a group of thirteen skeletons was found in a narrow space, and wonderfully preserved. They seem to be the bones of full grown men who had died in battle. The skeleton of a woman has been discovered among the others. Between the jaws of one of the dead was found an obolus, which the friend of the defunct had perhaps slipped in to enable the departed to pay his fare to Charon. A coin very much defaced, but still seen to bear the effigy of the Emperor Gordian was also picked up among these remains, which leads to the conclusion that 1,700 years have elapsed since they were interred.

At a meeting of the Newcastle Antiquarian Society on Wednesday week, a letter was read from Mr. "W. J. Rose," London, offering to the society a collection of prehistoric flint implements which he had collected in Denmark. He asked £2,000 for the collection. The secretary replied, stating that they were not in a position for making such a purchase. Mr. Rose answered that he would abate something of the price. The secretary replied that they had not funds for the purpose. The secretary said he questioned the value and genuineness of the implements offered.

At a special council of the British Archæological Association on Thursday week the following were appointed a committee for insuring the illustration and preservation of the Fairford windows:—Earl Bathurst (president of the association), the vice presidents, officers, and council of the association; the Rev. T. D. Rice, M.A., vicar of Fairford; the Ven. T. Thorpe, Archdeacon of Bristol; the Rev. Canon Powell, vicar of Cirencester; the Rev. Canon Howman, Mr. Tom Taylor, Mr. B. B. Woodward, F.S.A., librarian to the Queen at Windsor; Mr. T. W. Reid, Print Department, British Museum; and Mr. J. D. T. Niblett, M.A., F.S.A., all of whom have consented to act. It was resolved to invite other persons distinguished in art to join the committee, including the presidents of the Royal Academy, Society of Antiquaries, Institute of Architects, and the Archæological Institute. A "Fairford window account" has been opened at the National Bank, Charing Cross, and some subscriptions are already paid. The hon. secretaries of the association, Messrs E. Levien, M.A., F.S.A., and G. E. Roberts, F.S.A., act as honorary secretaries to the committee.

A correspondent to the *Cork Examiner*, writing from Dingle, says:—The Earl of Dunraven and Dr. Stokes, of Dublin, have been here on an antiquarian excursion. Yesterday they visited the crumbling ruins of Minard Castle, which was blown up by Cromwell's soldiers. In the course of his visit Lord Dunraven was afforded a specimen of the way the precious antiquities of the country are being swept away. This is his lordship's third visit, and, acquainted as he was with the district, he naturally looked for Kilmurry church, or rather oratory, above the castle. To his astonishment it had disappeared. A farmer explained to his lordship that about ten years since a proprietor had thrown it down to employ the materials in building his own house.

WATER SUPPLY AND SANITARY MATTERS.

THE sewage experiments lately tried at Clichy on the Seine, and favourably reported on by a jury appointed to taste the fruits, vegetables, &c., produced, are about to be pursued on a much larger scale on the plain of Gennevilliers.

New drainage and water works have just been completed at Bedford. The water reservoir is a subterranean brick built tank, capable of holding 400,000 gallons.

Building Intelligence.

CHURCHES AND CHAPELS.

Kingsland Church, Herefordshire, was reopened yesterday week, after restoration. The church, which is dedicated to St. Michael, was built in the reign of Edward I., and is a very interesting specimen of Early Fourteenth Century work. The restoration embraces the removal of the old pews, and the erection in their place of new oak benches, the chancel being fitted with stalls of the same material. The nave roof, previously ceiled, has been opened out and restored, the chancel roof painted decoratively, and the windows in this portion of the church filled with stained glass, which has been made to harmonise with some ancient figments that remain. The altar has a rich frontal, and is duly furnished with cross and candlesticks. The stonework in the interior of the building has been repointed, as also have the exterior walls, the tower excepted. Mr. Smith, of Tenbury, is the contractor by whom the work has been carried out. The cost of the restoration is estimated at about £1,400. Mr. G. F. Bodley, of Harley-street, London, was the architect.

Three of the oldest churches in the county of Lincoln are now undergoing a thorough restoration, viz., Barrow-on-Humber, Habrough, and Horkstow. Barrow, the ancient church of St. Michael and All Angels, is a fine specimen of Perpendicular Gothic, and contains many mural monuments. The architects employed are Messrs. Kirk and Parry, of Sleaford, and the builder, Mr. A. Stump, of Barton. The cost of the entire work will be about £700. The same architects and builders are also employed at Horkstow, where the old church of St. Maurice, a fine specimen of the mixed style of Saxon and Norman architecture, stands.

The new church of St. Paul's, St. Leonards-on-Sea, was opened on Thursday, the 27th ult., and has been built at the sole expense of the late William Gilliat, Esq., of East Hoathly, from the designs of Mr. John Newton, architect, Salisbury-street, Adelphi. It consists on plan of nave and two side aisles. East of the nave is the chancel and a horseshoe-shaped apse. On the north of the chancel is the tower, and on the south a chancel aisle. There is a north and south porch. The church is built externally of rough blue local stone, with Bath stone dressings, and is lined internally with red brick and tile, the masons' work being executed in Caen stone. The chancel and apse are groined throughout, and the ashlar is constructed of red brick and incised stone bands alternately, the ribs being carried by wide antique shafts. The tile pavements in the apse and chancel are most elaborate, of marble and Minton's tiles; the altar space, containing incised marble slabs, displays the emblems of the sufferings of our Lord. Beneath this, and east of the altar rail, are five very beautiful medallions in incised marble, illustrating the martyrdom of St. Paul, St. Stephen, St. James, St. Peter, and the Slaying of the Innocents. The spire is as yet not completed, but will be shortly finished. The church has already cost about £12,000. The contractors are Messrs. Jackson and Shaw, of Earl-street, Westminster. Messrs. Farmer and Brindley have executed the carving, and Mr. Robinson, of Holborn, the stalls. The building has been carried out under the immediate supervision of Mr. J. Walters, the clerk of works.

The following city churches are at present closed for repairs or cleansing purposes:—St. Margaret's, Lothbury; St. Mary, Woolnoth, Lombard-street; St. Michael Bassishaw, Basinghall-street; St. Michael, Wood-street; St. Matthew, Friday-street; St. Peter-le-Poer, Old Broad-street; St. Giles's, Cripplegate; St. Swithin, Cannon-street; St. Mildred, Poultry; St. Michael, Cornhill; and St. Ethelburga, Bishopsgate.

Whitfield's Tabernacle, Tabernacle-walk, City-road, is to be re-erected. The foundation stone of the new structure will be laid this (Friday) afternoon by Mr. J. Remington Mills, M.P.

On Thursday week, a new church, dedicated to St. Peter, was consecrated at Sidford, Devon. The edifice is in the Early English style, and consists of a nave, two side aisles, a chancel, with its aisle, and a vestry. Red brick is the material used, with dressings of Bath stone. Messrs. Gosling and Selway, of Ottery St. Mary, were the builders.

The parish church of Wembdon, near Bridgwater, destroyed by fire last spring, is to be rebuilt from plans prepared by Mr. J. M. Hay, architect, Bath.

BUILDINGS.

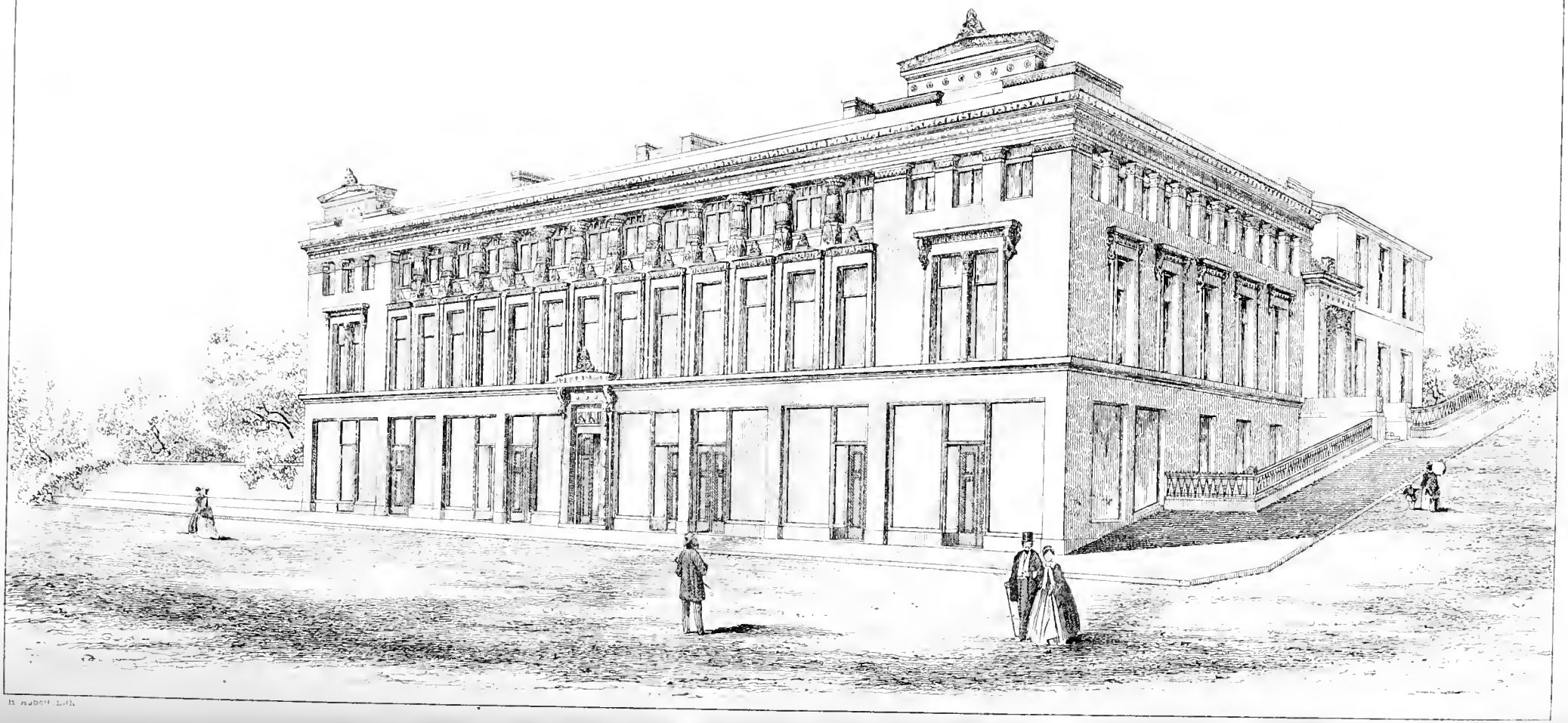
New Wesleyan Schools have been opened at Bolton this week. They are L-shaped, and contain an area of 2,850ft. The style is Gothic, the exterior being of brick, with stone dressings. The cost is £2,000. Messrs. Cunliffe and Freeman, of Bolton, were the architects, and Mr. John Merrick, of the same place, the contractor.

A new mechanics' institute was inaugurated on Tuesday evening, at Crook, near Durham. The building is of stone, with ornamental window dressings, and contains a lecture hall, 50ft. by 30ft. The total cost was about £1,200. Mr. J. D. Thompson, of Bishop Auckland, was the architect, and Mr. John Thompson, of the same place, the principal contractor.

The schools in connection with the Baptist Chapel at New Swindon are now being greatly enlarged and altered, at a cost of £1,400, from plans prepared by Mr. T. S. Lansdown, Mr. Thomas Barrett being the contractor.

Building, Sauchiehall St. Glasgow.

A & G. THOMSON, ARCHTS.

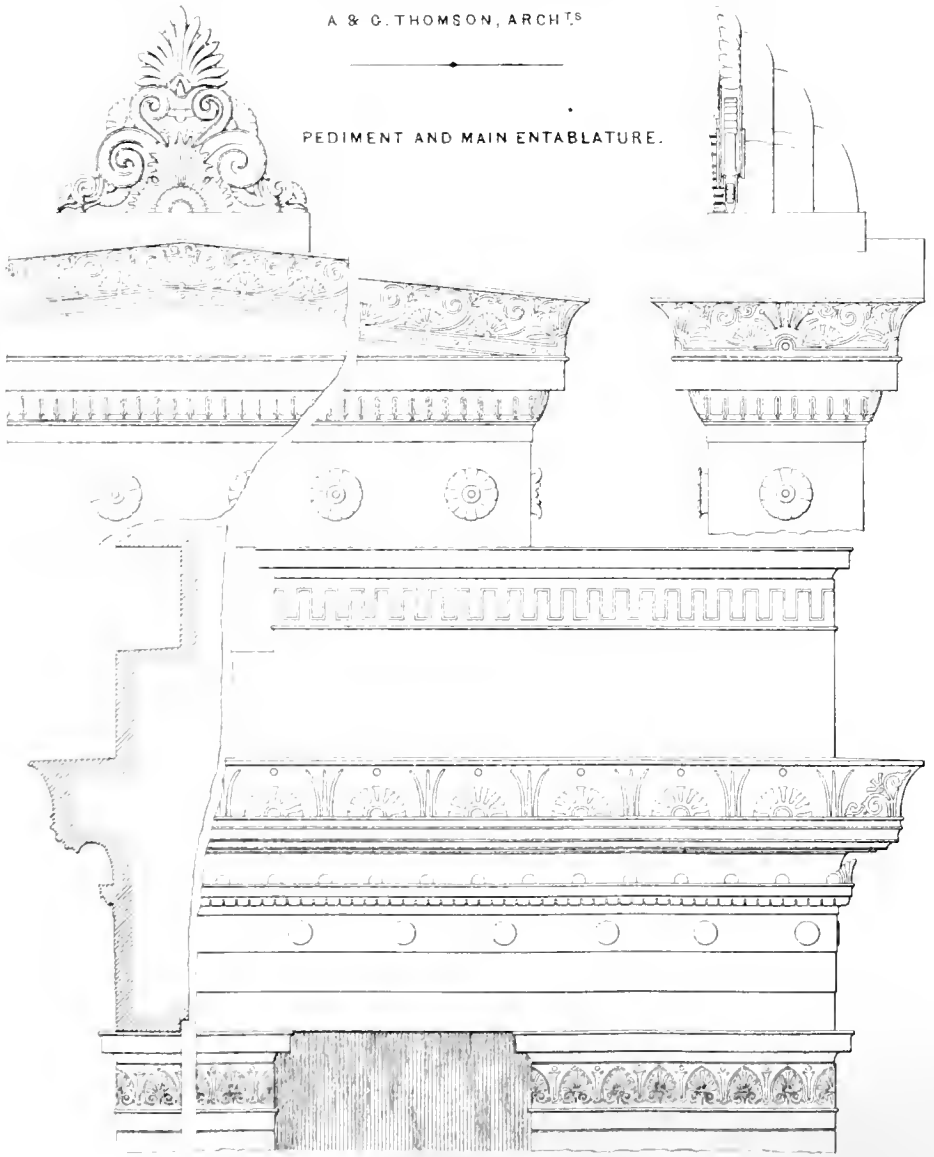


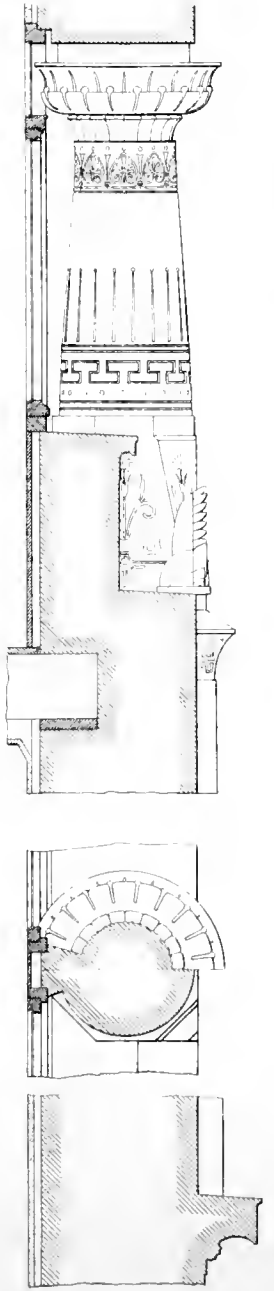
Printed by Whitehead

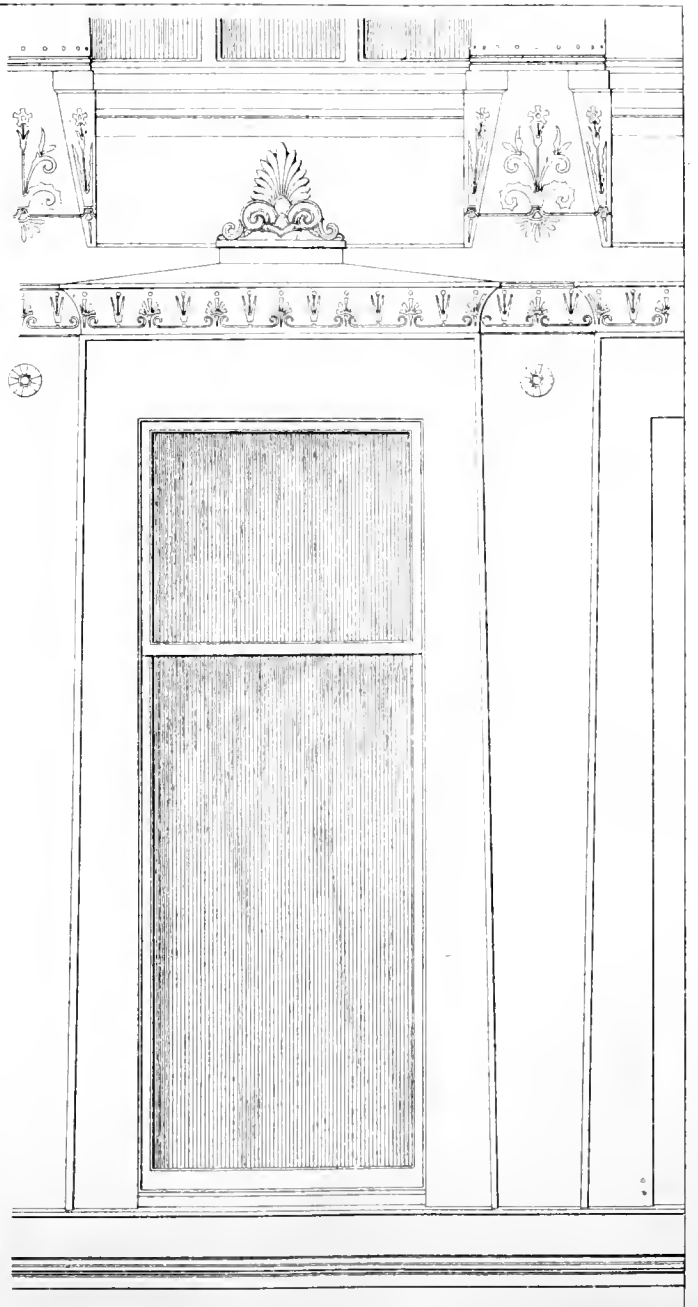
Details of Building, Sauchiehall Street, Glasgow.

A & G. THOMSON, ARCHTS

PEDIMENT AND MAIN ENTABLATURE.







WINDOWS OF UPPER FLOORS.

12 9 6 3 0 1 2 3 4 5 6 7 FEET

The members of the Granby Lodge of Freemasons, No. 24, Durham, intend to erect a new Masonic hall in Old Elvet, Durham, and the plans of the building were passed by the Board of Health on Wednesday, the 2nd inst. The building will be erected from designs by Mr. T. C. Ebdy, architect, Durham.

A new small-pox hospital is about to be erected at Calcutta. There are to be four wards, 92ft. by 42ft., capable of receiving from 30 to 40 patients, with 1,738 cubic and 90 superficial feet for each person. Four small wards for infectious cases, 10ft. by 8ft. each, will be attached. The entire cost, which is to be borne by Government, will be 35,000 rupees.

A new pauper hospital is to be erected at Rotherhithe. Accommodation will be provided for 500 patients, and the cost will be £30,000.

The Town Council of Blackburn have just decided upon the erection of a new fish market, at a cost of £3,950.

The Bolton Gas Company have formally opened their new offices. The structure has been erected from designs of George Woodhouse, Esq., and under the superintendence of Mr. John Handford, clerk of the works. The style of architecture adopted is Venetian Gothic. The block covers an area of 518 superficial yards, and has a frontage on three sides. The principal entrance is in Hotel-street, and has a richly-moulded archway supported by four red granite columns, with carved caps, with cusped tympanum. Over this doorway rises a tower, square on plan, and slated roof spirelet, the roof having small gablet dormers on each of the four sides, with finials, and the summit of the roof being surmounted with a wrought-iron cresting and flagstaff. The interior of the building is elaborately fitted up. The floor of the vestibule or principal entrance is laid with encaustic tiles. From the vestibule a stone staircase rises which leads to the show room, manager's room, board room, and the upper story of the building, the minor offices and store rooms being approached by a back staircase of stone. The contractor for the shell of the building was Mr. John Thompson, of Manchester; for the internal oak fittings, Mr. James Morris, of Deansgate, Bolton; and the pine fittings, Messrs. Day and Raby, of Bolton. The painting and decorating are by Messrs. Lomas, Manchester and Bolton.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—J. C. T.—P. and S.—R. and G.—G. C. H.—J. P. S.—Drake B others and Co.—C. R. R R.—E. I. B.—C. T. P.—I. W.—I. H.—I. O.—H. W. B.—A. and G. T.—I. H. T.—S. G. and Sons.—W. S.—"A Young Architect."—C. B. A.

ERRATUM.—In our report of the result of the Abergavenny Townhall and Markets it was stated that the second prize of £20 had been awarded to Mr. G. C. Haddon, of *Hereford*, instead of Hereford, in which town that gentleman practises.

TOLERATION.—We pay no attention to anonymous letters. Your "master" is evidently a born flatterer.

Correspondence.

BUILDING SOCIETIES.

To the Editor of the BUILDING NEWS.

SIR,—I foresee that you will do good service by kindly allowing the ventilation of this subject in your columns, and I ask for space for one or two remarks with reference to the courteous letters, both signed "S. S," from your correspondents in Masbro' and London. As it will simplify matters in this case the "last shall be first." "S. S," assumes (*a*) that a house worth £36 per annum can ordinarily be bought for £300, and (*b*) that the whole of the purchase money can be borrowed from a building society. These two assumptions are, I think, so erroneous as to be fatal to his argument. As a rule, houses are not purchased to pay the buyer 12 per cent. or 9 per cent. nett, after providing for all the annual charges and risks, and it would not be safe to generalise from exceptional instances.

I think I shall be borne out in saying, first, that a house *worth* £36 per annum, and worth buying at all, would not ordinarily be bought for less than £400; and secondly, that few building societies lend more than three-quarters of the purchase money.

Now let us re-consider his illustration, in the first case assuming that I purchase the house by borrowing £300 from a building society and paying down £100; and in the second case, that I continue to pay £36 per annum as rent and invest my annual surplus at interest.

First case.

Annual repayments on loan of £300	£42	0	0
Loss of interest on £100 paid down	5	0	0
Ground rent, insurance, repairs, and contingencies...	10	0	0
Annual outgoings	£57	0	0
Deduct rent	36	0	0
Annual excess	£21	0	0

Second case.

£21 per annum invested for ten years	£298	0	0
£100 capital	162	0	0
Money in hand at expiration of ten years, having all that time paid rent.	£460	0	0

So that I am in a position to buy a similar house, which shall be just entering on its lease, instead of having run out ten years of it, and shall, besides, have £60 to the good. Your Masbro' correspondent, in admitting that I can rent a house on easier terms than I can buy one through a building society, yet tells me that at the end of so many years I should, in one case, have a house of my own, and in the other "be where I began" What, then, has become of the annual surplus due to the comparative "easiness" of the terms? I have shown above that I should be very far from 'where I began;" I should have *more* than a set-off against the house in hard cash, thus justifying my former assertion, that, as matters now stand, it is really wiser to continue to pay rent to a landlord than to buy a house through the *aid* of a building society.—I am, &c.,

E. INGRESS BELL.

30, Regent-street, Waterloo-place, S.W.

SIR,—Your correspondent, "E. Ingress Bell," notwithstanding his experience, seems to have very confused notions of the nature and character of building societies. He must have been most unfortunate while acting for and on behalf of his clients in transacting business with building societies so badly constituted or improvidently employed as for it to be *wiser* to continue to pay rent to a landlord, instead of seeking the aid of a properly constituted building society to purchase the property so rented.

One fact is worth many figures, as figures, if not correctly placed, invariably delude and deceive; I may, therefore, state, in opposition to the experience of your correspondent, that I know several working men now in the possession and enjoyment of their own freeholds, who have purchased them through the aid of a building society, whose subscriptions and interest to such society for fourteen years have amounted to less than they must have paid to the landlord for rent in the same time.

It is readily admitted that all property cannot be purchased so as to work out thus satisfactorily, but it is manifestly unfair to charge upon building societies the inconveniences arising from a reckless and improvident purchase. And that must be a most reckless purchase which would lead to the conclusion asserted by your correspondent, unless, indeed, the purchaser had sought aid from a building society established by money lenders for their own special benefit, without regard to the interests of those for whom such societies were originally established.

Almost every good thing has been counterfeited, and it is just possible that your correspondent's experience may have been confined to the counterfeits; if so, every honest man ought to join with him in denouncing such.

Every provident man who intends to become a borrower from a building society should take care to join a *mutual* one, that is, one so constituted that all the profits are mutually to be divided among the members. This was the original intention of their establishment, and it should ever be kept in view. Then provident men may with propriety be asked, "Why pay rent?" "Why not pay a little more for a few years, and the house becomes your own property?"—I am, &c., A COUNTRYMAN.

Thetford, Norfolk.

TEMPERANCE HALLS.

SIR,—Charles Dickens, in describing the premises which "The Brick-lane Branch of the Grand Junction Ebenezer Temperance Society" occupied in the neighbourhood of Spitalfields, describes the characteristics of a vast number of existing teetotal meeting places, which are, by courtesy, denominated Temperance "Halls." Those not situate in a loft or approached by an almost perpendicular stable ladder, will, for the most part, be found to be low ceiled, irregular shaped apartments, devoid of any efficient means of ventilation, lighting, or egress. In the majority of cases, also, the "hall" will consist of some old stable or dilapidated workshop, and, if neither of these, it will be improvised by opening the folding doors between two rooms in a small house. From these remarks the reader will correctly infer that the temperance "hall" is indigenous to the poorer streets of the metropolis. It eschews main thoroughfares, however, more from necessity than from inclination. Now I do not make these remarks with a view to disparage the temperance movement; on the contrary, they are dictated by a hearty concurrence with its objects, and by my firm conviction that nothing (public-houses alone excepted) retards the progress of temperance principles in London and other large towns so much as the want of greater publicity. Large numbers of people cannot at present be got together at frequent intervals to hear the claims of teetotalism set forth. The audiences at temperance meetings, with but few exceptions, contain the "public" or "outside" element (*i.e.*, non-teetotalers) only in the same proportion as Falstaff's bread bore to his sack. Most teetotalers like to attend their halls regularly, and so they themselves monopolise the bulk of the space. Now, in many provincial towns, the temperance hall is no misnomer, being one of the principal buildings in the place. Surely it is not creditable to London teetotallers that things are different here. The only place of any importance in which temperance meetings are held is Cambridge Hall, Newman street, Oxford street, but even that is somewhat out of the way. One large hall at least ought to exist in each of the metropolitan boroughs, and it should be located in the most public place possible. Some such ideas as these have long since occurred to some of the leading spirits amongst the 200,000 London teetotallers, and practical effect is about to be given to them by starting a joint stock company, having for its objects the erection and maintenance of temperance halls in London and the provinces. It will be managed by working men, and the shares (£1 each) will, it is expected, be speedily taken up.—I am, &c.,

A FRIEND OF PROGRESS.

THE ST. ANDREW'S CHURCH, HERTFORD, COMPETITION.

SIR,—In the early part of January last an advertisement appeared in your columns inviting architects to send in designs for the proposed new Church of St. Andrew, Hertford, which was to seat 600 persons, and the cost not to exceed £3,000. Competitors were advised to visit the site and make themselves acquainted with the prices of materials, &c., to enable them to make a design that could be carried out for the sum at the committee's disposal.

Various designs were submitted, from which the committee ultimately selected the plans prepared by Mr. Johnson, of Moorgate-street, who stated that his design could be carried out for £3,000, exclusive of the encaustic tile paving and some rich decoration he had introduced in his internal elevations. It appears, by a statement in the *Herts Mercury* of August 1, which I herewith forward you, that a meeting was convened to receive the tenders for the work, and that upon opening them the lowest tender was £4,360, and the highest £6,126, or more than double the architect's estimate.

The committee seem anxious to give Mr. Johnson every opportunity to carry out his plans if he can do so for the stipulated sum; but it is quite clear that the design cannot be carried out

for anything like the money, unless considerably altered or reduced.

Under these circumstances I think it most unfair to the other competitors that Mr. Johnson should be allowed six weeks to seek a builder (if possible) to carry out the works at the committee's price—viz., £3,000, after his utter failure to procure a public tender for a less sum than £4,360.

I have no personal interest in this matter, but as an architect I am anxious to see fair play in competitions, and so long as competitors are allowed to ignore instructions as to cost, &c., it is impossible that architects can compete fairly. It is much easier to design a costly building than it is to design a building at a limited cost with extensive requirements.—I am, &c., FAIRPLAY.

THE GAIETY THEATRE.

SIR,—By a report which appeared in your last impression of a case under the Metropolitan Building Act, relative to certain alterations now in progress at the Marylebone Theatre, Mr. Simpson, the builder, is reported to have said "That he was also the contractor for the new Gaiety Theatre, and the plans for that edifice, though similar to those of the Marylebone Theatre (so far as the point at issue was concerned), had met with the approval of the surveyor in that district." I am assured by Mr. Simpson that in this assertion he has been misreported; indeed, it is so contrary to fact that I feel bound to give such a report the most unqualified denial. I believe, with the exception of the Grand Opera and the new Vaudeville Theatre, at Paris, there is no theatre in Europe which has been constructed with such regard to prevention of fire—there will not be a wall or partition in the building of any other material than brick, no lintels in any of the walls, and, in addition to every corridor, passage, and staircase being of stone or concrete, the pit floor and the three tiers forming the balcony, upper boxes, and gallery will be all constructed of wrought iron and cement concrete, not a particle of wood being used, except only in the flooring boards. A double wire gauze curtain (on the principle of the Davy lamp) will close the opening between the stage and the auditory, so that if a fire were raging on the former not a spark and comparatively little heat could come through to the auditory.—I am, &c.,

CHARLES J. PHIPPS, F.S.A., Architect of the Queen's and Gaiety Theatres.

26, Mecklenburg square, W.C.

THE THAMES EMBANKMENT.

SIR,—I observe from a paragraph in "Engineering" of Friday last, that the engineer of the Thames Embankment Works is likely to receive a mark of royal favour upon the completion of these works. I presume that this means knighthood, and I have no doubt that it is for the architectural talent displayed in the arch at Temple-stairs, and the other works which you so pleasantly described in yours of August 28. Upon first reading your criticism I was somewhat astonished to find that you were not an admirer of the grand display of architectural talent to be seen on the Thames Embankment, and I could not make out why you should point out as absurdities so many things that the Spring Garden authorities think so very clever; but, of course, it was only a little pleasant banter, as you, of course, could not have any idea what was intended to be done to complete the arch which you have illustrated when you wrote. I will now enlighten you a little on this point. On the raised portion of the upper part it has been suggested that an equestrian statue of the Chairman of the Metropolitan Board of Works be placed; and the authorities having some doubts as to the strength of the arch to carry such a weight of taste, had the pier in the centre of the opening placed there, in case a shore should be required to shore up the keystone. I believe it has not yet been decided who is to have the honour of being represented on the lower part. I, therefore, suggest that the designer of the arch should be placed on one side in a suitable attitude, with a roll of drawings in his hand pointing to his mounted superior above; and on the other side—well, there will, perhaps, be room to accommodate all the admirers of this beautiful structure, so I would hoist them up to adorn it.—I am, &c., M. S. E.

Intercommunication.

QUESTIONS.

[1009.]—ADDRESS WANTED.—Could any of your readers inform me of the present address of Mr. H. J Austin, who gained the Pugin Travelling Studentship for either 1866 or 1867?—ALPHA

[1010.]—WALL FINISH FOR SMOKING ROOM.—I am erecting, in connection with an hotel, a room to be used as a smoking room, and occasionally as a public dining room. Its dimensions are 21ft. by 14ft. 6in., and 12ft. clear height. The walls I propose to matchboard "chair rail" high. Will one of your readers kindly give me the benefit of his experience, and suggest a moderately cheap and satisfactory manner of finishing the walls and ceiling, so that they may not become discoloured by smoke, and yet present a pleasing appearance? The usual way of treating such rooms about here is to cover the walls and ceiling with marble paper, varnished; but I should like, if possible, to do something different.—A COUNTRY BUILDER.

[1011.]—DURABILITY OF SLATES.—Can any of your readers give any information as to the durability of Port Madoc slates, and the actual difference between them and Bangor slates, and oblige?—A SUBSCRIBER.

[1012.]—CHIPPING CHISELS.—Will anyone tell me where to procure chisels of various lengths, such as a geologist would require for chipping off pieces of hard rock. They must be thoroughly well tempered.—S. W.

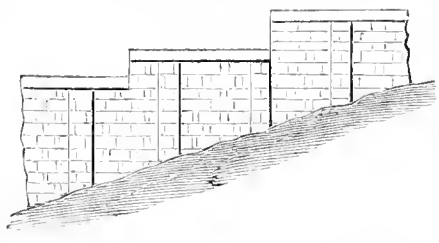
[1013.]—PARTY WALLS.—Allow me, through your "Intercommunication" column, to thank "Clerk" for his reply to my first question, and to express regret at not properly explaining the latter question, which should have read: A party wall having been pulled down, in which there was a small opening to give light to a cellar, has the proprietor, whilst reconstructing the wall, a right to place a much larger window in any other position he may choose? and having done away with the light to the cellar by the erection of the new wall, has he a right at any future time to reopen the light in its former position?—H. R. T., Hayling.

[1014.]—PORTLAND CEMENT FOR FIREPROOF FLOOR.—Will some of your subscribers kindly inform me, through the medium of your "Intercommunication" column, their experience in Portland cement as a finish to fireproof floors, and especially for warehouse purposes; and chiefly as to whether they are likely to cause condensation to any perceptible extent?—J. D. N.

REPLIES.

[984.]—FISH PONDS.—If carefully puddling the whole of the inside of the fish pond is not sufficient, "Francis R. Capon" can use asphalte, which would certainly make it watertight. I would advise him to carefully puddle it (i.e., work the clay up to the consistency of brick-making clay and line all the interior), and, if the sides are of too great a pitch, to work it carefully up, and make the sides in layers.—R.

[986.]—WALL BUILDING.—Allow me to inform "Contractor" that the elevation of his wall should be like what is shown in the accompanying cut. I have seen walls built



upon steep slopes falling to pieces owing to the fact of their having been built with the courses parallel to the slope of the ground. The courses should always be truly horizontal; and the wall has the better appearance for having the coping laid as shown. The top should be arranged in steps; although, if desired, the top course may have the bricks cut so as to be parallel to the surface of the ground. It is quite clear that if the whole of the courses be laid on the slope, the weight of the wall will be all thrown upon the lowest part, and must sooner or later burst it out.—T. M. S.

[987.]—TRUSS.—In the answer given by "Geo. H. Walters" in the BUILDING NEWS of the 4th inst., the square root sign in the formula is not put as it should be. Were it left unnoticed it might perhaps lead many into an erroneous calculation. It is put $T = \sqrt{H^2 + \frac{W^2}{16}}$, when it should be $T = \sqrt{H^2 + \frac{W^2}{16}}$. The figures .8125 are right, and bear the latter, which is the correct form. He is not correct in saying that the kingpost has a tensile strain equal to one ton. The only strain on a kingpost when the tie beam is horizontal is that which arises from the tendency of the beam to sag in the middle.—W., Tenby, South Wales.

[987.]—In the reply to this question, contained in your last impression, there seem to be some little mistakes that, for "A Beginner's" benefit, it is as well to set right. For instance, taking L = load on truss, T = half-length of tie beam, P = length of principal rafter, R = rise of roof, S = thrust at end of principal rafter, and F = strain at end of tie beam, I find—

$$S = \frac{20 \times 9}{5 \times 2} = 18\text{cwt.} = \text{thrust of rafter,}$$

$$F = \frac{20 \times 7.5}{5 \times 2} = 15\text{cwt.} = \text{tension of tie beam,}$$

while the strain on the kingpost, if framed as shown, would be one of tension; but the weight to be supported, simply by its own and that of half the tie beam, or (taking "G. E., Walters'" dimensions = say 3 cubic feet of fir at 40lb. $= \frac{120\text{lb.}}{2} = 60\text{lb.}$), a little more than half a cwt., instead of the ton he mentions; and the dimensions, if a kingpost be used at all in so small a span, might be—rafters, 3in. by 4in.; tie beams, 3in. by 5in.; and kingpost, below head, 3in by 3in. But, for the small span given, and to do away with an unnecessary amount of framing, I should feel more disposed to make the rafters 4½in by 2½in., with a collar 9in by 2½in. securely nailed to them about halfway up the rise of roof, and have no king at all. At all events, that portion of the frame is very slightly required; a ½in. iron rod would answer all the requirements as well. —A SUBSCRIBER.

[988.]—GYMNASTIC ARRANGEMENT.—From the question, the strain upon the rod A is twice that upon each of those B and C. We may proceed practically to work out the question, as follows:—Suppose a man to be swinging upon each of the ropes B and C, and we may put his weight at a hundredweight and a half. If we find the dimensions of B they will answer also for C, and doubling them will give us the size of the rod A. Bearing in mind that the rods are subjected to violent jerks and shocks, which are very difficult to calculate accurately, a liberal allowance must be made in the material. Let us assume the greatest weight that could come upon either of the rods B or C to be a couple of cwt., and if we make our working load to be one tenth of the breaking, we shall have to provide for a breaking strain of one ton upon each of the rods B and C, and two tons upon A. All these rods should be of wrought iron which material will bear safely five tons per every square inch of sectional area; and, therefore, the area of rods B and C should contain one-fifth of a square inch, and A two-fifths. Now, putting A^1 for the area, and D for the required diameter, we have, algebraically, $A^1 = \frac{\pi D^2}{4}$, but $\frac{\pi}{4} = 0.7854$, and $A^1 = \frac{1}{5}$, so that we have $\frac{1}{5} = 0.7854 \times D^2$. Solving for D, we obtain $D = \sqrt{\frac{1}{5 \times 0.7854}} = \frac{1}{\sqrt{5 \times 0.7854}} =$ practically $\frac{1}{2}$. The rods B and C may therefore be ½in., and the rod A 1in. in diameter. The crossbeam D E may be 4in. by 2½in.—W.

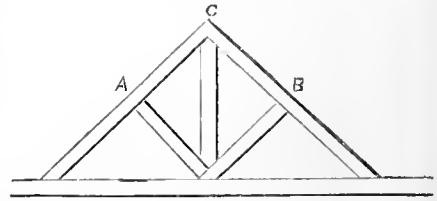
[989.]—MAGNETISM.—Soft iron may be converted into a temporary magnet very readily. One of the simplest means is to rub it longitudinally with another magnet, taking care to keep the friction always in the same direction. Another, but slower plan, is that of simple induction where the iron to be magnetised is held between two magnets, with their poles placed in opposite directions, as

shown in the drawing. A poker or pair of tongs can be rendered temporarily magnetic by simply holding them in the direction of the magnetic meridian, and striking them upon the other end with a hammer or stone. It should be borne in mind that soft iron is only rendered a temporary magnet by these means, but steel is rendered a permanent one; but it is a much more difficult task to effect, and cannot be satisfactorily accomplished without the aid of electricity.—STET.

[990.]—PRESERVING TIMBER.—"S. T. L." should purchase the timber he wants ready creosoted; or, if he prefers it, he can send balks to be prepared especially; but the former is the cheaper, and in every way the preferable plan. It is always better to buy any ordinary scantling that is used than to have any unusual size done, especially unless there be a great quantity of it.—AXEMAN.

[991.]—STEAM POWER FOR SAWMILL.—The power "Sawdust" would require is so limited that the charge could not be regulated upon the same principles that guide those made for portable or stationary steam power. He must make an arrangement with his neighbour.—S. N.

[992.]—HIGH-PITCHED ROOF TRUSS.—I have often braced roof trusses of the kind mentioned in "Intercommunication" by inserting a couple of strong struts, A and

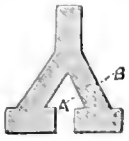


B, about 6in. by 4in., and a king rod, C D, of about the same scantling; or this last may be advantageously made of round iron, ¾in. in diameter.—CARPENTER.

[992.]—In reply to "Yorkshire Student," he can purchase the work "Norman Shaw's Sketches" if he will correspond with W. P., 13, Buckingham-row, Westminster, S.W.

[993.]—STUDENT'S GUIDE.—The cost of the book is 1s., and it can be procured from Weale, High Holborn. It is one of his excellent rudimentary series.—APPRENTICE.

[994.]—LOAD ON CAST-IRON SKEWBACK GIRDERS.—Will you allow me to ask "Urgent," in reply to his question what is the object of making a girder in so extraordinary a form? It does not appear to have any top or bottom flange, and is, in fact, the only specimen I ever saw of the kind. Taking it as it is, I should suppose that under a breaking load it would yield somewhere in the direction of the line A B. I should be inclined to take the sectional area of one of the sloping pieces, and work by Mr. Hodgkinson's formula. Putting W for the breaking weight in tons at the the centre, A for the area in square inches of the sloping flange, D for the depth in feet, and L for span also in feet,



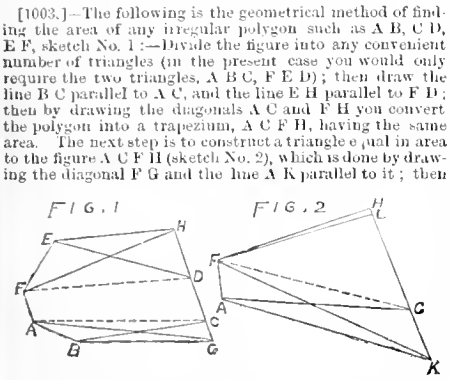
we have $W = \frac{A \times D \times 26}{L}$. The girder shown is about the worst form in which it would be possible to distribute the material.—CAST IRON.

[997.]—IRON IN IRON ORE.—Your correspondent should have given the name of the iron ore, as there are a great many varieties. There is the common ore or ironstone, which is mostly a carbonate; there are the red and brown hæmatites, the spathose iron ore, the specular, and the sulphide, or well known iron pyrites, and others of less notoriety and value, some of which are known only to the chemist. If "Iron" will let me know what particular ore he means, I will endeavour to tell him how to analyse it.—MINERALOGIST.

[1001.]—PLAN DRAWING AND ARCHITECTURE.—I would advise "Stonemason" to get "Gwilt's Encyclopædia of Architecture," published at £2 12s. 6d.; not that it contains a complete system of lines for stone cutting, but it does give you a knowledge of plan drawing and architecture.—R.

[1003.]—AREA OF A FIELD.—There is evidently some mistake either in the admeasurements or the figure. I see in the triangle B F C the side F C is greater than the other two together, which of course is an impossibility (Euc. i. 20); so, also, in the triangle A F B, the two sides A F, A B are together less than F B; while in the irregular figure C F E D the sum of the three sides F E, E D, D C is less than the one side F C; and equally wrong and for the same reason are the figures A F C B and A D C B. It is utterly impossible to construct a figure with the dimensions given; but if "Young Surveyor" will correct them I am willing to give the required information.—J. M'NAMARA

[1003.]—The following is the geometrical method of finding the area of any irregular polygon such as A B, C D, E F, sketch No. 1:—Divide the figure into any convenient number of triangles (in the present case you would only require the two triangles, A B C, F E D); then draw the line B C parallel to A C, and the line E H parallel to F D; then by drawing the diagonals A C and F H you convert the polygon into a trapezium, A C F H, having the same area. The next step is to construct a triangle equal in area to the figure A C F H (sketch No. 2), which is done by drawing the diagonal F G and the line A K parallel to it; then



draw the line F K, which gives the hypothenuse of triangle K H F, and this triangle is equal to the polygon A B C D E F. The formula for getting the area of any triangle is as follows:—Let K H = base, and L F = a line drawn from the vertex of the triangle perpendicular to K H, then $\frac{K H \times L F}{2}$ = area. If it is not convenient to convert the figure into one triangle, the only way is to divide it into a series of triangles, then get the area of each and sum them together. I would advise "Young Surveyor" to study "Binn's Elements of Geometrical Drawing," or any elementary work on that subject.—S. H.

[1003.]—"Young Surveyor" is either sadly in error or is asking for the solution of an imaginary problem. If he will take the trouble to look at the question he will at once see what an absurd calculation he requires; and before proceeding further, allow me to remind him that the editor, and we, the subscribers, require questions of practical difficulty. It is obvious that the two sides A F and A B, each 96ft., are less than the third side F B, 210, which is absurd; and again, F B and B C 210 and 730 = 940, less than F C 1370; and more than that, supposing the figures to be right, he wants the dimensions E G or D B to work it out by figures. When he has got the requisite dimensions, he can obtain the area by the following:—Divide the figure in triangles and parallelograms, and find the areas of each separately. To find the area of a triangle proceed as follows:—Take the triangle B F E in his figure; B F = 210, F E = 165, and E B = 320.

$\frac{1}{2}(210 + 165 + 320) = 347.5.$

$347.5 - 210 = 137.5 \qquad 347.5 - 165 = 182.5.$

$347.5 - 320 = 27.5.$

$\sqrt{(347.5 \times 137.5 \times 182.5 \times 27.5)}$ = area of triangle.

Or, to give the rule in words, "From half the sum of the three sides subtract each side severally; multiply the half sum and the three remainders continually together, and the square root of the last product will be the area."—R

[1003.]—It is very evident that "Young Surveyor" could not have measured such a piece of land as stated, for the simple reason that there never was and never could be a piece of land of such a form, and bearing such dimensions. To proceed: If "Young Surveyor" had but made himself acquainted with Euclid, book i., prop. 20, he could not possibly have fallen into so egregious a blunder; for since any two sides of a triangle are together greater than the third side, F E + E D are greater than F D. Again, for a similar reason, D F + F A are greater than D A; much more, then, are D E + E F + F A together greater than A D, which, according to "Young Surveyor's" proposition, they decidedly are not.—T. E. WOODHOUSE, Leicester.

[Other solutions of the problem have been received from "A Surveyor," "J. N. Crofts, Liverpool," and "R. L. B."]

[1007.]—CEMENT FOR GAS AND WATER PIPES.—The following is a cement, the formula for which I fell across lately, and which I find very good:—Mix six parts of finely powdered graphite, three parts of slaked lime, and eight parts of sulphur with seven parts of boiled oil. Knead well till the mixture of all the ingredients is perfect.—E. J. K

WAGES MOVEMENT.

THE working classes of America, who rejoiced with exceeding great, but as it turns out, with untimely joy over the passage of the recent law by Congress enacting that eight hours of labour should constitute a day's work in the Government dockyards, &c., have received a sad disappointment. They had imagined that the Government would continue to give the same wages for eight hours' work as had been paid for ten hours; but it appears that the Government does not see it "under those lamps," as Artemus Ward was wont to say. General Rodman, who commands the United States' Arsenal at Rock Island, having doubts as to the proper construction to be put upon the law, telegraphed for instructions to the Secretary for War, who replied that, in his opinion, the law did not provide that ten hours' pay should be given for eight hours' work, and that, until Congress directed to the contrary, he should order 20 per cent to be deducted from the wages which the men had been receiving. Under this ruling, the "boon" of the eight hour law is a curse, since the mechanics who were receiving 40dols. 50c. per day now get but 32dols. 60c.

Messrs. John Crossley and Sons, the great carpet manufacturers of Halifax, having contemplated the shortening of the hours of labour on Saturdays, but no wishing to do so without the approval of the men themselves, recently resorted to a somewhat novel expedient for settling such questions. Tickets were issued for a ballot, white tickets being for the proposed alterations, and blue for keeping things in *statu quo*. The votes recorded were as follows:—white tickets, 3,971; blue, 664; majority for the change, 2,307.

The fifty-eighth annual report of the Friendly Society of Ironfounders, a thick volume of 172 closely printed pages, records the proceedings of the society for 1867. Including a considerable amount of cash in hand, the income for the year was £72,798, and the expenditure £63,949, leaving a balance of £8,849. The financial position of the society at the commencement of the present year exhibits a decrease in its cash balance of about £20,000 when contrasted with the corresponding period of 1867. This large falling off arises from the great depression which has prevailed in the trade all through the past year. In consequence of this depression a large number of the members were thrown out of employment, and the sum expended in their relief was quite unparalleled in the history of the society. Upwards of £35,470 was paid away under this head in 1867, being an increase of £20,395 over the amount applied to the like purpose in 1866, and far in excess of any previous year's payments on a similar account. The total expenditure, which includes superannuation, accidents, funerals, and the promotion of emigration, was £15,838 for the direct benefit of the members of the society. There are 10,839 members.

At the general meeting of the Birmingham Trades Council held on Thursday week a deputation from the Liverpool bricklayers attended to lay a statement of their case before the council. The deputation alleged that the men were on strike for a set of rules which the masters were improperly attempting to force on them. It was resolved to give credentials to the deputation, and to recommend the case to the various societies for assistance and support.

The workmen in the bronze chasing and mounting establishments in Paris have struck work on account of insufficient pay.

The loss to the New York bricklayers in wages during the five weeks of their strike is estimated at 30,000 dollars. The strike still continues.

A movement is on foot amongst the ironworkers of the north of England to obtain an advance on the wages they have been receiving for the last year and a half. Following the long strike of 1866 was a great reduction of wages, amounting to 25 or 30 per cent. Even with this advantage in their favour masters have complained down to the present time that they cannot meet foreign competition, and the assertion has been partially borne out by the fact that only very partial employment has been afforded generally in the trade until a short time since. A meeting of delegates was held at Darlington on Saturday. The proceedings were private, but the resolution passed at the meeting has been published, which reveals that an attempt is to be made to obtain an advance of about 10 per cent. on puddling and mill work, and that deputations are to wait on masters to this end. Another meeting is to be held at Gateshead in a fortnight, to receive a report of what is the employers' answer. This attempt, which the union would wish to make national, is looked upon throughout the northern district as most rash and ill advised, and one to which the employers will under no circumstances yield.

STATUES, MEMORIALS, ETC.

THE group by M. Aimé Millet, intended to crown the new Opera house in Paris, has been cast. It represents Apollo erect and holding the lyre in outstretched hands. By his side are seated the muses of drama, music, and of dance.

The old Burgh Cross, which was fixed in the wall of a house on the south side of the High street, Dunfermline, and where it has been for many years, has been removed and erected on a substantial pedestal in front of the County Building. The decorations on the structure were finished on Saturday. The erection has been promoted chiefly by Dr. Henderson, Mr. Joseph Paton, and other antiquarians, and the expense defrayed by public subscription.

Subscriptions are now being asked in order to defray the expense of erecting a monument to Foxe, the "martyrologist," at Boston, Lincolnshire, his birthplace. Foxe is buried in Cripplegate church, and died in 1587.

A veteran French sculptor, M. J. Louis Gardie, who is upwards of seventy, and served under the first Napoleon, having settled at Brighton, is desirous of presenting to that town a large bas relief of the great Emperor, and a bust, in terra cotta, of Captain Speke. Curiously enough, though a Frenchman born, and one of Napoleon's guard, he was employed just fifty years ago by Messrs. Rundell and Bridge upon the celebrated "Wellington shield."

Mr. George Moore has offered to the inhabitants a memorial fountain to be erected in the Market-place. For above four years past Mr. Knowles has been working at the design. A drawing of it was exhibited at a recent meeting and was much admired. It is square, and stands on a base of little above 14ft. square. Its total height is 30ft., and it finishes with a massive bronze and gilt cross, surmounting a tapering spire. It is to be built of granite, rough hewn and polished, the upper part of it being boldly chiselled, with a floreated design. The principal feature will be the body, in the four sides of which four white marble basso relievi are to be placed. These relievi will be about 3ft. square, and are to be sculptured by Woolner. The drinking fountains are to be four in number, one on each side, and are to be placed about 3½ft. from the ground. There will be polished granite basins below each stream of water, and the surplus water will run by a pipe to receptacles below, so that basins may be kept filled with water for horses, dogs, &c.

STAINED GLASS.

THE west window of the parochial nave of St. Helen's, Bishopsgate, has this week been filled with stained glass, in memory of the late Mr. Alderman Copeland, at the cost of various friends and inhabitants of the ward of Bishopsgate.

A stained glass window has just been placed in St. Mary's Church, Bury St. Edmunds. The lights below the transom are occupied by one subject—The Last Supper, and the upper lights are filled with representations of SS. Mary and Joseph at the inn at Bethlehem; the Adoration of the Magi, and the Flight into Egypt. The window is from the works of Mr. H. Hughes, of London.

A new stained glass window is about to be inserted in the south window of the Parliament House, Edinburgh. The artists employed on this work are, we believe, the Chevalier Maximilian Ainmüller, inspector of the royal glass painting establishment at Munich, and Von Kaulbach, an artist of remarkable power. The subject illustrated is the inauguration of the Court of Session by James the Fifth, in the year 1532.

BUILDING AND LAND SOCIETIES.

THE annual meeting of the Chatham Building Society was held at its offices on Thursday last. The receipts for the year, inclusive of a balance of £2,601 from last year, have been £21,747. The advances were £14,245; realised shares, £1,290; withdrawals, £2,169, there being a balance of £2,210. The gross profits amounted to £3,091, leaving a balance of £2,224, after deducting £867 for expenses and interest paid. A dividend of 6 per cent. on unalletted shares was declared.

The eighth annual meeting of the Stafford Mutual Investment and Building Society was held in the Guildhall, Stafford, on Thursday week. The society now consists of 239 shareholders, holding 711 shares, 420 being original, and the remainder taken at various dates. Beyond these the society has £4,750 as investments, which will be repaid as the funds of the society came in. The secretary stated that during the eight years past the society had received over £56,000, which had been applied in advances and withdrawals. Mr. Austin and Mr. Anderson were re-elected directors, and Mr. Hilston, Mr. T. Hopper, Mr. W. Wynne, and Mr. J. Woodhouse were elected to supply extraordinary vacancies. Mr. E. Lloyd was re-elected auditor on behalf of the shareholders. Votes of thanks were unanimously accorded to the directors, the auditors, and the chairman for the services rendered.

The fourteenth half-yearly meeting of the London Labourers' Dwelling Society (Limited) was held on Monday last. The directors presented their report for the six months ending June 30, which was received and adopted, and the usual dividend at the rate of 5 per cent. per annum free of income tax was declared. The capital of the society now amounts to £33,400, the sinking fund (for the redemption of the leasehold property of the society) to £1,026, and the reserve fund (for the equalisation of dividends, or extraordinary expenses) to £3,995, of which sum £2,000 is deposited at interest in order to provide the means of purchasing temporarily at par any shares that a member may from unforeseen circumstances wish to realise.

LEGAL INTELLIGENCE.

IN our last impression we gave a report of some proceedings at the Marylebone Police court relative to the alterations now going on at the Marylebone Theatre. The magistrate, it will be remembered, decided in favour of the district surveyor, stating that he would give his reasons for such decision on a future day. Accordingly, on Thursday week, Mr. D'Eyncourt at some length stated the grounds upon which he had formed his opinion, and quoted various clauses in the Building Act in favour thereof. The first question was whether the alterations to be made would bring them within the cognizance of the district surveyor. The 10th section of the Act said "that whenever any old building has been taken down to an extent exceeding one-half of such building, such half to be measured in cubic feet, the rebuilding thereof shall be deemed to be the erection of a new building. [It was said the alterations would not amount to one-half.] Mr. D'Eyncourt was of opinion that the proposed alterations would bring it within the section of the Act he had quoted, as there appeared to be more being done than could be considered as necessary repairs. He, therefore, called upon the builder to comply with the orders of the district surveyor. Costs, to the amount of £5 7s. were allowed. A case for one of the superior courts was asked for, a request which the magistrate has under consideration.

At the Wakefield Courthouse on Wednesday week, Mr. Samuel Green, a member of the Town Council, was sum-

moned for a contravention of one of the building bye-laws of the borough. The town clerk, who conducted the case, said the proceedings were taken under the bye law of the Local Board relative to new buildings, which renders any person making any alterations in plans which have been approved of by the Local Board liable to a penalty of £5 In February last plans were sent in by Mr. Thomas Craven for the erection of four dwelling houses and shops, and were approved of by the board. In these plans provision was made for a kitchen containing slop stone and boiler in the back room on the ground floor, and a meat and coal cellar and pantry on the basement story, which was 6ft. 6in in height. On the borough surveyor making an examination of the premises, he found that the boiler and slop-stone had been removed into one of the low rooms, which had thereby become converted into a habitable room; and by the fifteenth bye-law all habitable rooms must be 8ft. in height.—Mr. Crutchley, the architect of the houses, here stepped forward and said that he was the real defendant, as Mr. Green had only worked to plans furnished by him (Mr. Crutchley), and, therefore, he absolved him from all responsibility. He submitted that whatever alterations had been made were quite beyond the province of the Local Board to regulate. A clerical error had crept into the plan, one of the low rooms being designated a meat-cellar instead of a scullery, but he contended that the scullery was not and was never intended to be a habitable room, never having been finished off as a habitable room would be.—Mr. Lynam, the borough surveyor, was now called, and stated that had a plan with the alterations been submitted to him he should have advised the committee not to approve of it, because, in his opinion, the room would have come under the definition of a habitable room, and, therefore, should have been 8ft. high. A fine of £2 and costs was inflicted on Mr. Green.

ARBITRATION CASE.—On Wednesday, the 18th ult., Mr. E. Waugh, of Cockermouth, heard (as arbitrator), at the Station Hotel, Holborn-hill, Cumberland, a case in which Messrs Bradley and Myers, builders, Newtown, Millom, are plaintiffs, and Messrs. M'Gowan, timber merchants, Whitehaven, are defendants. The case, which had been referred from the Court of Queen's Bench, was brought to recover the sum of £80 odd, the balance of an account alleged to be due plaintiffs by defendants. Mr. Thomas Postlethwaite, solicitor, Ulverston, appeared for the plaintiffs, and Mr. Mason, of Whitehaven, for the defendants. It was agreed that the £80 claimed by plaintiffs should be admitted, the question for the arbitrator being whether the defendants could substantiate a set-off equal to that amount. It appeared that plaintiff's claim was for £81 11s. 7½d., balance of account, which the defendants refused to pay, alleging that they had a claim of about the same amount for timber supplied to Mr. Thomas Sayers, a joiner and builder, either at the request of the plaintiffs, or under their guarantee, or otherwise, and of which plaintiffs said they knew nothing, at all events they denied getting the timber for which the defendants now charge them. Evidence was heard at great length, and the arbitrator has deferred his decision.

Our Office Table.

In connection with the widening of Wilderness-row, mentioned by us a few weeks since, the local authorities contemplate the purchase of a portion of the Charterhouse grounds for the purpose of forming a public recreation ground similar to that about to be provided at Poplar.

Howard's patent safety boilers are rapidly coming into use, and are spoken of very favourably. Many have already been fixed at Birmingham, and two others are about to be fixed at the Birmingham Waterworks.

At the last meeting of the Rotherhithe Vestry Mr. Kelsey was appointed as consulting surveyor, at a salary of £100 per annum, and it was decided to appoint a surveyor of pavements, at £200 a year.

The greater portion of the property required for the additional buildings for the General Post Office has been acquired by the Postmaster General. The new buildings will be situated at the corner of Newgate-street, and, therefore, on the opposite side of St. Martin's-le-Grand to that occupied by the General Post Office. The property required for the purposes of the new buildings is situate in St. Martin's-le-Grand, Bath street, Newgate-street, and Angel-street. No part of Newgate-street, Bath-street, or St. Martin's-le-Grand is to be stopped up. Bath-street is to be widened, and carried out so as to form a junction with Angel-street. This street is to be not less than 20ft. wide throughout. The work of clearing the site for the new buildings will be carried out as rapidly as possible. It is stated that a portion of the new premises will be devoted to the management of the new system of postal telegraphy.

On Monday, the thirty-eighth anniversary of the Operative Stonemasons' Society of England and Wales was held at Huddersfield. It was stated that the funds of the society were disbursed for trade and benevolent purposes. The balance in hand was £13,370. The total number of members was 18,628, of whom 2,356 were both sick and trade members. The members admitted during the year numbered 3,163; and the expenditure for the same period had been £24,807.

A new bridge across the Earn at Crieff has now been finished at a cost of several thousand pounds. It was built under the superintendence of Mr. Alexander Hair, of Edinburgh, and is a handsome and commodious structure compared with the old bridge, affording ample accommodation for all descriptions of vehicles, besides a broad footway on the east side for pedestrians. The bridge contains four arches extending to a span of 42ft. each, and the parapets are fully 100 yards in length.

A meeting promoted by the Council of the Midland Institute for the establishment of a trade school in Birmingham was held in that town yesterday week, Mr. William Kendrick in the chair. The Mayor, Mr. George Dixon, M.P., Mr. Arthur Ryland, and other gentlemen, spoke in favour of the project, and ultimately the following resolution was passed:—"That this meeting approves the scheme now submitted, and recommends that it be adopted by the Midland Institute, and that an appeal be made to the town for the necessary funds—namely, £250 for immediate expenses, and a subscription list of £400 per annum, and that upon these funds being provided a school shall be established." A liberal subscription was commenced.

Yesterday week workmen commenced operations in Dorset-street, Fleet-street, for the formation of an entrance to the intended volunteer ground, situate on the spot where Bridewell Prison and Hospital formerly stood.

The water has at length found its way once more into the Regent's Park lake, the bottom and sides of which have been cleansed and reconstructed, with a view to the prevention of loss of life in the "skating season." The sewage of the Theological College now finds its way into a sewer, and thus the water of the lake is able to maintain its pellucid appearance. Arrangements are made for emptying the lake, if necessary, in a very short time.

The *Edinburgh Courant*, referring to the death of George Mac Callum, a promising young sculptor, says:—"Several years ago young Mac Callum's very remarkable talents attracted the attention of Mr. David Bryce, Mr. John Steell, Dr. Burt, and other influential citizens, and during the intervening period his time was fully employed. In the sculpture room of our annual exhibition his works occupied a very prominent place. During the past few months he had completed a good many busts, which will probably be shown at the next exhibition of the Royal Academy. At the time of his death he was busily engaged on one of the groups for the Albert Memorial, and also on a model design for the contemplated statue of the late Sir David Brewster, for which he was one of the three selected competitors. His statues and medallions in the hall of the College of Physicians, Queen-street, executed last winter, have been greatly admired."

A piece of very "sharp practice" is said to have been recently achieved by a speculative builder, not a thousand miles from Wandsworth. He sold a batch of houses, one of their recommendations being that gas-pipes were fitted in in preparation for the mains being laid down in the front street. It subsequently turned out that a few inches of piping had been stuck through each of the ceilings.

An impudent theft has just been perpetrated at the Exhibition of the Society of British Artists, Suffolk-street, Pall Mall. A person called with a note purporting to be from Mr. J. Kennedy, of Kidderminster, requesting that a picture painted by the latter might be given up to him. The picture was handed over to the bearer of the note, which now turns out to have been a forgery.

The first annual meeting of the Wakefield Industrial and Fine Arts Institution was held on Friday week last, at the museum of the institution in Bell-street. From the report, read by Mr. Dixon, the secretary, it appeared that of the £1,356 16s. 10d. which was in the treasurer's hands, £21 had been received in subscriptions. Mr. H. Lee had promised a prize of £5 annually for excellence in drawing. Mr. Walter Smith (head master) considered that satisfactory progress had been made by the pupils. The report was adopted.

The Taunton Museum now contains—deposited there by Mr. E. Jeboult, surveyor, Taunton—original copies, in five volumes, of the surveys of the manor of Taunton Deane, made at the time of the Commonwealth.

On Saturday week the new iron bridge just erected at Wickham Market was formally inspected. The bridge is 36ft. in span, and is about 26ft. wide, and was designed by Mr. H. M. Eyton, architect. The contractors were Messrs. Whitmore and Binyon.

It has been suggested by a correspondent that swimming baths, similar to those in Sweden and Denmark, should be constructed. What is wanted, he says, is to have a large enough part of the water enclosed by wooden erections, which should be divided into separate rooms on all sides of the enclosure. He sees no reason why such baths should not be made in the waters of all the London parks, and he believes they would all pay well.

Mr. George Watson, of the firm of Watson and Baker, Southwark Bridge-road, and Shadwell, has undertaken to procure water at almost any depth by his newly patented "artesian well tube," and an experiment is about to be tried before a number of the most eminent scientific gentlemen connected with Her Majesty's Government, on the grounds attached to Richmond Villa, Upper Plaistow, when the principal residents in the district will be admitted by tickets, which can be procured on application to the proprietor.

The Congress of the International Association of Workmen, sitting this week at Brussels, has adopted resolutions, declaring that workmen cannot be completely emancipated by means of strikes; that it is necessary strikes should be regulated by a code of rules; that it is necessary to organise societies of resistance for all trades and in all countries where such do not yet exist, and to establish a connection of such associations with each other; and, further, that councils of arbitration should be instituted. Mr. Lucraft attended the Congress as the representative of English workmen.

Clement's Inn, one of the Inns of Chancery attached in name to the Inner Temple, and formerly the nursing-place of some of our best lawyers, is in course of demolition, the site being part of that required for the new Law Courts. Nothing very remarkable, from an art point of view, is attached to the place, if we except the sun-dial in the middle of the garden, which is supported by the kneeling figure of a naked Moor or African, of some merit. It was brought from Italy by Lord Clare, by whom it was presented to the society. The figure is worthy of preservation, and might be removed with advantage to some more public position.

Mr. Dewhurst, one of the borough magistrates of Bradford, is erecting an arcaded market for the benefit of a district where such a market is needed. Six successive plans were drawn by the architects, Messrs. Lockwood and Mawson, but each time the requirements were extended by the local board, as, for example, in regard to the breadth of the street and the arcading. One bye-law stated that "Every new street, not being a carriage road, shall be laid out and formed at least 24ft. wide, and there shall be one entrance at least to every such street, of the full width thereof, and open from the ground upwards." As to the breadth of the street, the local board, in the face of their own bye-law, insisted, successively, on 36ft., and even 42ft., to which the plans were actually altered. Mr. Dewhurst being advised that "open from the ground" in the bye-law as it stood referred to the entrance and not to the street, at last proceeded with his market in defiance of the corporation, who cited him before the local magistrates; but they have just dismissed the case, after full and repeated hearing.

An exhibition of articles lent from the National Museum at South Kensington was opened on Monday, at the Corporation Art Gallery, Ratcliff-place, Birmingham. During the day about eighteen hundred persons, many of them workmen, availed themselves of the opportunity of inspecting it. The collection includes a portion of the famous Castellani jewellery (bought at the Paris Exhibition), a quantity of other jewellery, and examples of ornamental art in silver, bronze, pewter, and iron. The whole is arranged in ten cases, in a manner adapted to the convenience of students, and each article bears an explanatory label, so that no catalogue is required. To the loan collection, by the courtesy of the Council of the Midland Institute, is added the collection of enamels given by the late Sir Francis Scott to the Institute.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3596 J. MURRAY. IMPROVEMENTS IN THE CONSTRUCTION OF ROADS OR STREETS. Dated December 18, 1867.

This invention consists in first preparing the under surface. The inventor then lays down upon this surface a series of longitudinal timbers, and, if necessary, these timbers may be bolted or otherwise fastened to one another. Upon these timbers he sets the usual granite or other paving, natural or artificial asphalte or other material being laid between the stones and the timber, and also between the stones themselves, so that the stones are covered on every side except the upper surface, or that surface exposed to traffic, by such asphaltic or other material.—Patent abandoned.

3687 W. FRYER. IMPROVEMENTS IN SELF-CLOSING TAPS. Dated December 28, 1867.

In making a self-closing tap according to this invention the inventor takes any kind of tap which can be opened and closed by the motion of its axis through about a quarter of a rotation, and he fixes the said tap in a box or chamber made, by preference, of cast iron, the ingress and egress pipes passing through the sides of the said box to the tap. To the axis of the tap he attaches an arm or lever, and connects to the end of the said arm or lever one end of a spring of vulcanised india-rubber, or a coiled steel spring, the other end of the spring being connected to the side of the box or chamber. The said spring tends to keep the tap in its closed position. To the end of the arm or lever, a rod, chain, or cord is attached, the said rod, chain, or cord, being in a line with the spring described, but on the opposite side of the arm or lever. The free end of the said rod, chain, or cord, passes through the side of the box or chamber, and terminates in a knob or handle. In using the tap, the knob or handle is pulled, when the axis of the tap is opened, and water or liquid allowed to flow. On loosing the knob or handle the spring pulls back the arm or lever and closes the tap.—Patent abandoned.

3695. E. T. BELLHOUSE. IMPROVEMENTS IN THE CONSTRUCTION OF FIREPROOF FLOORS FOR BUILDINGS. Dated December 19, 1867.

Here the beams, skewbacks and tie-rods are arranged in the same way as for the ordinary arched floors in mills and warehouses, the beams being either cast or wrought iron or other material. Instead of a segmental centering usually employed, the inventor makes use of a flat board or stage to support the bricks which are set obliquely from each bevelled side of the beam or skewback, or from specially made bevel bricks or blocks, the lowest angle of the bricks resting upon the wooden board or stage. When the bricks are set from each side nearly to the centre, the triangular space which is left between the bricks in the centre is filled up with triangular bricks or blocks. When the brickwork is sufficiently set, the stage is removed, and the ridges left on the upper surface of the oblique position of the bricks are covered with concrete, cement, asphalte, or other material, to make a level surface forming the floor. The rigid surface of the bricks below can be plastered over to make the ceiling.—Patent abandoned.

3620 B. MONSON. IMPROVED APPARATUS FOR SLIDING THE SASH FRAMES OF WINDOWS, AND FOR SLIDING SHUTTERS.—Dated December 19, 1867

Here the inventor lets into the side of the window case or frame an apparatus for governing the rate of movement of the sash to prevent its being moved with too great rapidity, and such an apparatus may consist of a frame containing a reel or barrel and spring fusee arrangement (or the mechanical equivalents thereof), winding and unwinding a cord or chain, the spindle of the reel or barrel being provided with a toothed wheel gearing with another toothed wheel which projects through an opening in the said frame and acts on a rack on the edge of the sash frame, a cast iron rack being let into each side of each sash, and the apparatus above described being inserted into each side of the window case or frame so that the toothed wheel which projects through the frame and acts on the rack in the sash frame shall be about half an inch lower than the top of the inside sash, the window being put in at the top and slidden downwards.—Patent abandoned.

3623 E. FIELD. AN IMPROVED CHIMNEY COWL FOR CHIMNEY TOPS.—Dated December 20, 1867.

Here the chimney top is provided with a loose cap, the lower edge of which extends somewhat below the upper edge of the chimney top, and this cap is supported by a shaft, spindle or arms, so that the effect of the wind blowing in any given directions against the side of the cap will be to force that side of the cap against the chimney top, and so protect the latter from any undue action of the wind, and thus permit the uninterrupted exit of the smoke at the other side between the upper edge of the chimney top and the lower edge of the cap.—Patent abandoned.

3689 W. E. NEWTON. IMPROVEMENTS IN BUTT HINGES. (A communication.) Dated December 28, 1867.

This invention relates to the peculiar manner of constructing butt hinges for doors which swing or open both ways. This improved construction of hinge folds into itself, it being a reversible rabetted hinge. This invention further consists in forming a butt in such a manner that it shall be a three leaf butt, folding into itself, two of which folds placed together will form a single butt, and will work alternately as the door swings back and forth from the centre. The invention further relates to the manner of attaching the butt to the door and casing, and in the device for muffling the sound and for rendering the door self-closing or automatic in its back movement towards the centre.—Patent completed.

3694 E. EVANS. IMPROVEMENTS IN THE CONSTRUCTION OF THE SASH FRAMES AND BOXINGS OF WINDOWS AND SHUTTERS, AND IN THE MODE OF HANGING THE SASHES OF WINDOWS. Dated December 28, 1867.

First, as regards sash frames, the inventor proposes to make the boxings thereof hinged or sliding, instead of fixed, as commonly practised, so that by simply turning such parts on their hinges, they may be opened and access had to the sash weights and lines for connecting them together when required; or the boxings may be slidden into grooves as panels and removed when required, or be otherwise attached to the sash frame so as not to be fixtures; and he proposes to connect the sashes of the window to the sash lines by affixing a hook to each sash line, which hook takes into a hole formed in a piece of metal let into the edge of the sash, so as to be flush therewith. He employs parting beads of the ordinary kind to keep the sashes separate.—Patent abandoned.

3666 C. CHURCHILL. AN IMPROVED GAS BURNER. (A communication.) Dated December 28, 1867.

This invention consists, chiefly, in a novel construction and arrangement of the parts of a gas burner, by which the gas and air are well heated before coming in contact with the flame, thereby securing the most perfect combustion; also in a peculiarly formed cock and an independent supply aperture, whereby a small flame is kept burning when the main flame is extinguished; thus, with trifling additional cost, avoiding the annoyance of relighting, and the danger arising from the escape of unconsumed gas.—Patent abandoned.

3708. M. A. F. MENNONS. AN IMPROVED MODE OF ACCELERATING THE INDURATION OF CERTAIN DESCRIPTIONS OF CONCRETE OR ARTIFICIAL STONE. (A communication.) Dated December 31, 1867.

This invention consists in the application of carbonic acid gas as a means of accelerating the induration of concrete or artificial stone composed of lime and sand or other siliceous matters.—Patent completed.

3713 V. I. DAGUZAN. IMPROVEMENTS IN THE CONSTRUCTION OF PAVING. Dated December 31, 1867.

These improvements consist in the construction of a level road or causeway, or horizontal across, as described. It is formed of flags or slabs composed of a grating or frame, made of wrought or cast iron, in the apertures of which pavings of a pyramidal or other shape are fixed with bitumen, asphalte, or other mastic. These pavings may be of wood, cut endwise, freestone, granite, prophyry, quartz, slag, or of different materials mixed together, affording a sufficiently resisting and durable surface.—Patent completed.

3717 N. SMITH. IMPROVEMENTS IN STOVES. Dated December 31, 1867.

In order to increase the heating power of open stoves or fireplaces, in addition to the ordinary communication with the chimney, which can when desired be closed by a register door or damper, the inventor employs two side flues or passages formed in the moulding around the fire-place or grate. This moulding is made to project forward into the room from the face of the chimney breast beyond the front plate of the stove. There are openings into these flues or passages in the cheeks of the stove, one on either side, and by and through these openings the draught from the fire enters. The flues or passages meet at the top, and the draught issues from them into the chimney, and passes by a valve which can be opened or closed at pleasure.—Patent abandoned.

10 W. J. FRASER. IMPROVEMENTS IN FURNACES OR FIREPLACES. Dated January 1, 1868.

This invention consists in the employment of rotating bars formed or provided with threads or projections arranged spirally, so that by the slow rotation of the bars upon their axes, the fuel in process of combustion is carried gradually along the furnace or fireplace. The fuel may be fed by means of hoppers, and the inventor communicates motion to the bars through suitable gearing, in connection with which a fan or fans, actuated by the draught of air, may in some cases be employed. The final specification of this patent is not at present filed, but it is probable that an extension of time will be petitioned for.

23 T. P. A. KEY. IMPROVEMENTS IN SCAFFOLDING TO BE USED FOR THE ERECTION OF HOUSES IN THE STREETS OF POPULOUS PLACES. Dated January 3, 1868.

In place of depositing building materials on the pavement, and erecting above a light scaffold of poles, ropes, and planks, the patentee places hollow wrought iron (preferably square, in horizontal section) on the footpath, and the ordinary wooden poles inside these columns. In some cases the poles (not the columns) descend into the ground, in others, to prevent slipping, he lets into the pavement stone a small stud affixed to the base of the column. The columns are connected at the top by cross girders, all but two of the girders being of the same length. The two above excepted are variable in length, and have their outer ends flush with the curb stone, forming a jetty, by which to bring the materials for building from carts, &c., to the platform thus formed by the girders when planked. Longitudinally, the iron columns may be connected by bracing of the wooden poles themselves, which will be found sufficient.—Patent completed.

3695 J. JOWETT. IMPROVEMENTS IN FIRESTOVES. Dated December 28, 1867.

This invention consists in forming that part of the roof above the firebars into an elevated hollow chamber or receptacle, with the front part sloping downwards towards the bridge, the space between the bridge and roof being contracted to smaller dimensions than usual. The effect of this arrangement will be obvious.—Patent abandoned.

Trade News.

TENDERS.

ESSEX.—For separate building for 248 female patients to the Essex County Lunatic Asylum. Mr. Henry Stock, county surveyor, architect. Quantities supplied by Mr. J. Marsland and Mr. F. G. Widdows:—

Brown	£20,400
Hammond	20,215
Hart	19,898
Adamson and Son	19,847
Perry and Co	19,595
Coleman and Son	19,358
Ashby and Sons	19,324
Wells	19,254
Browne and Robinson	19,150
Ennor	19,030
Webb and Sons	18,966
Hill, Keddell, and Waldram	18,580
Rider and Son (accepted)	18,569

DERBY.—Head-quarters and drill shed for Rifle Volunteers. Messrs. Stevens and Robinson, architects, Derby:—

Poxon, Lawley	£3334 17 0
J. W. Thompson, Derby	3040 0 0
J. and E. Wood	3000 0 0
Stoddard	2850 0 0
Desantoy	2789 0 0
R. Bridgart (accepted)	2785 0 0

EALING.—For the erection of a pair of villa residences, for Mr. Bowden. Mr. Marks, architect—

Keeble	£2179 0 0
Foxley	2160 0 0
Hyde	2085 10 0

FAVERSHAM.—For the erection of a detached residence for Mr. J. A. Anderson. Mr. B. Adkins, architect. Quantities not supplied:—

Whiting	£2180
Solitt (accepted)	2035
Shrubsole (withdrawn)	1998

HARROW.—For paving and burning for Irrigation Works, for the Local Board of Health. Mr. A. H. Jacob, engineer:—

	Per Acre.
Wright and Co.	£20 0 0
Mold	12 17
Aures	12 0 0
Reeves and Smith	9 0 0
Pearson	8 0 0
Lovett	6 15 0
Parker	6 14 8
Randall	6 5 0
Leach	6 0 0
Lawrence	5 18 0
Jewell and Co.	5 0 0
Hill	5 0 0
Sheer	4 17 6
Bean	4 15 0
Jarman	4 10 0
Barnes, Hassall, & Co. (accepted)	3 13 4

MARYLEBONE.—For mortuary for the parish of Maryle bone. Designed by T. Gane Browning, chief surveyor:—

Jennings	£425 18 0
J. Brown	375 0 0
E. Brown	349 0 0
Crabb and Vaughan	345 0 0
Scrivener and White	334 0 0
Stevens and Watson	325 0 0
Tavener	311 0 0
Crockett	299 0 0
Turner	277 0 0
Temple and Forster	265 0

NORWOOD.—For finishing fifteen houses at Enmore Park, near Norwood Junction, for Mr. Jones. Messrs. Mathews, architects:—

Shipley and Webster	£1396
Hurley	1340
Pearse	1229

TWICKENHAM PARK.—For the erection of dwarf boundary walls and entrance-gate piers, for William Budd, Esq. Mr. F. Warburton Stent, surveyor to the estate:—

Gascoyne	£316
Hill, Keddell, and Waldram	790
David Nicholson	710

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ALDERSHOT.—September 15.—For the erection of a billiard room at the Royal Artillery barracks. Royal Engineer office, Aldershot.

METROPOLITAN BOARD OF WORKS.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring gardens.

OXFORD-ROAD, MANCHESTER.—For the erection of a new catholic church. J. A. Hansom, architect.

HIGHGATE.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

LEAVESDEN WOODSIDE (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

WEST HAM UNION.—September 23.—For the erection of an apparatus capable of cooking for 800 inmates. F. E. Hillary, clerk to the guardians, Leytonstone.

METROPOLITAN BOARD OF WORKS.—September 29.—For the erection of fire brigade stations at Amhurst-road, Hackney, and Upper Tooting. J. Pollard, clerk to the board, Spring Gardens.

COLOGNE WATER WORKS.—September 18.—For the supply and erection of high service reservoir, two Cornish steam engines, steam boilers, likewise for cast-iron pipes, cocks, &c. At the office of the Chief Burgomaster.

MANCHESTER.—For erecting a new Catholic church, Oxford-road. T. A. Hansom, 25, Alfred-place, Thurloe square, London, S.W.

STRATFORD.—September 23.—For the erection of a store in Maryland street. H. Ough, architect, 29, Charing Cross.

PETERBOROUGH.—September 26.—For the erection of a new Baptist Chapel. J. W. Chapman, architect, 14, Great Western-terrace, Westbourne Park, London W.

EASTBOURNE (Sussex).—September 16.—For the erection of Christchurch district schools. H. E. Rumbles, architect.

PADDINGTON.—For refitting certain stoves to the new wing of St. Mary's Hospital. J. G. Wilkinson, secretary.

THORPE, NEAR NORWICH.—September 26.—For the erection of an additional wing to the Norfolk Lunatic Asylum. F. J. Blake, clerk to the visitors, Norwich.

MONKWELL-STREET, CITY.—For alterations to premises in Wind or court. Mr. W Smith, 12, Copthall court, City.

OLD-STREET, ST LUKE'S.—For new shop front to No 57. Mr. W. Smith, 12, Copthall court, City.

TAUNTON (Somerset).—September 30.—For building a shop, with house and offices. Messrs. Giles and Robinson, architects, 7, Furnival's Inn, W.C.

BUCKNELL.—September 18.—For enlarging, restoring, and reseating the parish church. T. Nicholson, architect, Hereford.

CHELMSFORD.—September 17.—For the supply of about 2,000 yards 7in. socket water pipes. A. Meggy, clerk.

HEMEL HEMPSTEAD UNION.—September 23.—For the erection of new infirmaries at the union workhouse. C. E. Grover, clerk, Hemel Hempstead.

LINCOLN.—September 23.—For the erection of the new church of St Swithin. J. Fowler, architect, Louth.

FINSBURY.—September 15.—For the supply of various articles used in omnibus building. A. G. Church, manager, London General Omnibus Company, 6, Finsbury.

BICESTER (Oxon).—September 24.—For restoring, refitting, and making certain additions, &c., to the Parish Church at Stoke Lyne, near Bicester. Rev. C. D. Marsham, the Rectory, Caversfield, near Bicester, Oxfordshire.

GLATTON (Hunts).—September 22.—For the restoration and reseating of Glatton Church, in the county of Huntingdon. James Ruddle, North street, Peterborough.

PROPERTY SALES.

AUGUST 31.

AT THE MART.—By Messrs. Jackson and Son.—Freehold water and steam mills, known as Dicker Oil Mills, situate adjoining the River Lea, Hertford, with house, offices, warehouses, &c., paddock and meadow land, comprising about 10 acres, annual value £1,000—sold for £8,600.

At the Guildhall Coffee-house.—By Mr. Whittingham.—Freehold building land, situate at Acton green, Middlesex, in 33 lots. Lots 1 to 41 comprised previous sales. Lot 44, £38; 45, £46; 46, £50; 47, £50; 48, £100; 56, £61; 57, £61; 58, £61.

SEPTEMBER 2.

At the Mart.—By Mr. Robins.—Freehold house, known as Bow Cottage, Finchley, also an enclosure of land, let at £20 per annum—£430.

Freehold residence, known as Chestnut House, adjoining above, and an enclosure of land, let at £32 per annum—£830.

By Mr. A. Savill.—Freehold house, situate at Mount Pleasant, Chigwell, let at £19 19s. per annum—£340.

SEPTEMBER 3.

At the Mart.—By Mr. W. H. Moore.—Leasehold house and stabling, No. 5, Latymer road mews, Manchester street, Notting hill, annual value £60, term 96 years from 1867, at £8 per annum—£355.

Leasehold residence, No. 62, Falkland road, Kentish Town, annual value £50, term 99 years from 1863, at £3 3s per annum—£510.

Leasehold house, No. 3, University street, Tottenham court road, annual value £60, term 98 years from 1804, at £7 10s. per annum—£595.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Edward Myers, Camden-road, engineer, September 24, at 1—Charles Reading, Caterham, carpenter, September 28, at 12—George Webb, Old Kent road, builder, September 24, at 1—James Niemann Champion, Baring-street, Islington, house decorator, September 23, at 11—Joseph Charles Morgan, Cambridge heath-road, builder, September 16, at 12—Charles Frederick Phelps, Russell-road, Kensington, builder, September 17, at 12.

TO SURRENDER IN THE COUNTRY.

William James Arnold, Tonbridge Wells, carpenter, September 21, at 3—Ralph Porter Newcastle upon-Tyne, builder, September 19, at 10 Thomas Edward Pritchard, Colchester, plumber, September 19, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

September 23, G. Johnson, Hull, joiner and builder—September 29, W. Smith, Hereford, painter—October 14, E. Swainston, Darlington, builder—September 29, H. Midward, Old Swinford, builder—October 16, A. J. and J. H. Hobson, Birmingham, gas fitting manufacturers—October 8, J. Rathbone, Sheffield, joiner October 21, J. W. Meatyard, Mere, Wilts, carpenter—September 28, W. Nightingale, West Bromwich, plumber.

DIVIDENDS.

October 15, T. D. Kirkham, Lower Broughton, painter—September 16, H. Spink, Swineshead, Lincolnshire, builder—September 21, R. Watts, Llanllwchaiarn, Montgomeryshire, carpenter.

PARTNERSHIPS DISSOLVED.

Allen and Co., railway contractors—Price and Knight, Norwich, coal proprietors and firebrick makers—Hargrave and Parkin, Leeds, bricklayers—W. and J. Horton, Wednesbury, timber merchants—Maddock and Son, Liverpool, slaters—Glover and Co., Ranelagh road, Pimlico, gas meter manufacturers—Weatherhead and Jackson, Eccleshill, joiners.

SCOTCH SEQUESTRATIONS.

David Muir, Glasgow, contractor, September 11, at 12—Neil Young, Glasgow, brick builder, September 15, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

TIN :—								
English Block	per ton	95	0	0	0	0	0	2½
do Bar	do	98	0	0	99	0	0	
do Refine	do	97	0	0	0	0	0	
Banca	do		10	0	97	0	0	nc
Straits	do	92	10	0	92	0	0	
IRON :—								
Welsh Bars in London	per ton	6	5	0	6	5	0	3
Nail Rod	do	7	10	0	7	12	6	2½
Hoops	do	8	5	0	9	0	0	
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	5	0	7	15	0	
Bar in Wales	do		10	0	6	0	0	3
Nailrods	do	7	10	0	7	15	0	2½
Foundry Pigs, at Olasg. No 1	do	2	12	3	2	17	6	ne t.
Swedish Bars	do	9	17	6	10	10	0	2½
STEEL :—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
COPPER :—								
Sheet & Sheathing, & Bolt	per ton	79		0	2		0	
Hammered Bottoms	do	97	0	0	0	0	0	
Flat Bottoms, not Hammered	do	83	0	0	0	0	0	3
Cake and Tough Ingot	do	1	0	0	3	0	0	
Best Selected	do	77	0	0	85	0	0	
Australian	do	77	10	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	3	0	0	7½	
LEAD —								
Pig, English	per ton	21	5	0	0	0	0	2½
,, Spanish Soft	do	18	10	0	0	0	0	
Shot, Patent	do	22	10	0	22	15	0	5
Sheet	do	20	0	0	20	15	0	
White	do	27	0	0	30	0	0	
REGULUS OF ANTIMONY								
French	ton	43	0	0	0			
ZINC :—								
English Sheet	per ton	25	10	0	26	10	0	2½
Devaux's V. M. Roofing Zinc	do	25	0	0	0	0		
* And 5 per cent. discount if laid upon the new system								
SPELTER :—								
On the Spot	per ton	20	0	0	0	0	0	
QUICKSILVER	per lb	6	17	0	0	0	0	

TIMBER, duty 1s per load, rawback, 1s.

Teak	load	£11	0	12	10			
Quebec, red pine		3	5	4	15			
,, yellow pine		3	0	4	5			
St. John N.B. yellow		0	0	0	0			
Quebec Oak, white		5	0	5	10			
,, birch		4	0	5	0			
,, elm		4	0	4	10			
Oantzic oak		4	0	6	0			
,, fir		2	15	3	15			
Memel fir		3	0	4	5			
Riga		3	0	3	3			
Swe fish		2	0	2	8			
Masts, Quebec red pine		4	10	6	10			
,, yellow pine		4	10	6	0			
Lathwood, Dantzic, fm		6	10	7	10			
,, St. Petersburg		8	0	9	10			
Deals, prC., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.								
Quebec, white spruce		13	0	20	0			
St. John, white spruce		13	10	15	10			
Yellow pine, per reduced C.								
Canada, 1st quality.		17	0	18	10			
2nd do		11	10	12	10			

Archangel, yellow		£11	0	£12	0			
St. Petersburg, yel.		10	0	12	0			
Finland		7	0	8	0			
Memel		0	0	0	0			
Gothenburg, yellow		8	0	9	10			
,, white		8	0	9	0			
Gefle, yellow		9	0	10	10			
Soderham		9	0	10	10			
Christiania, per C., 12 ft. by 3 by 9 in. yellow		11	0	13	0			
Oeck Plank, Dantzic, per 40 ft. 3 in.		0	12	1	0			
PUMICE STONE per ton		6	0	8	0			
OILS, &c.								
Seal, pale	per tun	36	0	0	0			
Sperm body		89	0	0	0			
Cod		38	0	0	0			
Whale, 8th. Sea, pale		37	10	0	0			
Olive, Gallipoli		68	0	73	0			
Cocoanut, Cochin, ton		53	0	55	0			
Palm, fine		39	10	40	0			
Linseed		31	5	34	0			
Rapeseed, Eng. pale		33	0	0	0			
Cottonseed		31	0	33	0			

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 18, 1868.

THE NEED FOR BETTER INSTRUCTION OF THE PUBLIC IN MATTERS OF ART.

IN the report of the Society of Arts on the important subject of technical education, which has been for a considerable period under the consideration of that body, some valuable remarks upon the artistic element of such education will be found.

It will be remembered that the sub-committee appointed by the society to deliberate on the subject, and to whom the report is due, sought the aid of the Royal Institute of British Architects and of the Architectural Association at a somewhat late period, when their work was already in a considerably advanced state, and that Mr. Seddon, as honorary secretary of the Institute, and Mr. Spiers, as president of the Association, were deputed to act upon the committee as the representatives of those professional bodies. This explains how it was that the committee "reserved for separate consideration the technical education of those who are producers of works of fine or decorative art or directors of art manufactures."

This concluding portion of the report commences by saying, "it is necessary to bear in mind that for the production of works of an æsthetic character, scientific principles occupy a subordinate position, while a knowledge of the details of execution is desirable for those who design or guide the work of others. Moreover, it must be borne in mind that the taste of those to whom works of beauty appeal is far more fluctuating than the demand for productions in which utility is alone considered."

We apprehend that the taste of the public, who are here referred to, is "fluctuating" mainly because it is like the flame of an expiring candle, and that flickering would be a term more to the point. A thing of beauty is not a joy to all, simply because very few are able to appreciate it. For these reasons we heartily endorse the practical suggestion which in the report follows the above preamble, viz., "Your committee are of opinion that one of the first conditions of progress is the cultivation of artistic knowledge and taste in all classes of society."

Nothing can be more explicit than this statement, which dispels any fear as to the question of art being overlooked in the discussion, since, however late in order the subject may have been considered, its proper prominence is thus unhesitatingly acknowledged and asserted. The report continues—"With this object in view, no less than with a view to the technical education of the art workman, provision should be made for the teaching of drawing in all schools, primary and secondary, as a branch of general education, in order to train the eye and hand, and in order to cultivate habits of observation." Nothing can be clearer or more satisfactory than this. The first step towards amendment is to be aware of the fault to be amended. It is gratifying to find that, through the exertions no doubt of those gentlemen who were invited to advise with them as to the artistic questions, the committee have realised so thoroughly the importance of their bearing, and it is to be hoped that, should the efforts of the society to improve technical education meet the success which they deserve and we desire, this prominence given to them may not be lost sight of. The truths thus forcibly enunciated are by no means truisms admitted by everyone. Unfortunately the public is not only ignorant of art generally, but is equally blind to the fact and to its results. We fancy that far from feeling it to be desirable even "that drawing should be taught in all schools primary and secondary," the majority of persons would look upon such as a mere waste of time in comparison with other branches of instruction, and we think, therefore, that the committee are entitled to great credit for their discernment of the want, and that they were judicious in so tersely giving the reason for their faith.

There is an old tale, entitled "Eyes and No Eyes" which well shows the advantages to be gained by one boy over another in acquiring knowledge and pleasure during a country ramble simply by the habit of observation, and we are inclined to think that in the capacity and custom of properly using the visual organs lies most of the differences between man and man. To most persons education is necessary to train their eyes to see anything and their hands to do anything, and the cultivation of habits of observation is about the most useful culture a human being can receive. Now, that the committee should have perceived and recognised that the teaching of drawing is the best means to secure these ends is, we think, fortunate, and from the bare admission of the fact we look for useful results. As an instance of the difficulty in properly using one's eyes, Mr. Ruskin has conclusively proved that none of the earlier landscape painters—Claude, Salvator Rosa, Poussin, &c.—have drawn a single natural object as it is in nature. We are not now following him in depreciating them as poetical artists. They may, with conventional (*i.e.*, unnatural) trees, rocks, and clouds, have conveyed noble ideas, but as pretended imitators of nature they signally failed, simply for want of education of their powers of observation. And it may be safely affirmed that the host of self-constituted critics in our picture exhibitions, who one hears declaring that this and that are unnatural, have really never looked in such a manner at natural objects as to impress on their memory their actual colours or forms. What is the remedy for such a state of things? Why, to teach them to draw, that is, to put down upon paper with the hand what the eye sees, and so force the brain to observe. But it will be said that all cannot draw, a statement we would meet at the outset with a positive denial. All persons certainly cannot draw equally well, just as all persons cannot write equally well. But it is far easier to learn to draw than to write. Everyone knows the tedious hours through long years of schooling which it took them to master the intricate mystery of pothooks and hangers, for this simple reason, that pothooks and hangers, *per se*, convey no idea. Nothing enters the mind or can get fixed therein while the fingers are learning to form shapely p's and g's, but every stroke of the pencil in learning to draw *an object* is informing the mind and educating the eye.

Provided only, and it is herein expressly agreed, that the above statement is true only under a proper system of teaching to draw, for lamentably it is possible to invent a system which shall deprive the art of drawing of all its beneficial effects, and render it as an exercise less intelligent and less instructive than the formation of the aforesaid pothooks and hangers.

That such a pernicious system exists is evidently contemplated by the committee, who conclude the paragraph we have last quoted from by the observation to which we would direct especial attention. "It is essential that drawing should be part of the regular school course and not an extra lesson, and, further, *that it should be taught intelligently, not from mere copies, but from real objects* (the italics are our own). Here, again, we would give credit to the committee for the perception, though it seems obvious enough, of what is apparently anything but obvious to the world. The fact is that, though the converse of the above passage is but literal truth, and that teaching drawing not from real objects, but from mere copies, is thoroughly *unintelli ent*, it is the very system pursued in the Government Schools of Design, no less than in such other seminaries, primary and secondary alike, where drawing is taught to a few, not as part of the regular course, but as extra lessons alone.

At the present moment, we believe, there are on exhibition at South Kensington, drawings by students, under the title of "Freehand Drawing Exercises." It is obvious, at a glance, that these drawings have been made from mere copies, not from the objects themselves, and so the name of "Freehand" is a misnomer, a delusion, and a snare. They are of the pothook and hanger class—a niggling exercise of the hand, cramping the eye, and preventing the mind from thinking. The poor student who copied the acanthus leaves in perspective from a drawing some one else had made was only looking to the bent and crinkled lines on the paper. Had he done it from the plaster cast it would not have been the nice, symmetrical, and pretty, but absurd and useless, drawing for exhibition purposes, but it would have been something worthy the name of freehand, and would have taught him something about acanthus leaves, and how the curled lines in sight have reference to their fellows beyond and out of sight. His eye would have traced things, not lines; his mind would have been taking in principles, not forms. We wish clearly to be understood when we declare that the system of teaching from "mere copies" is, as the committee consider it, the reverse of intelligent, is wholly and utterly bad; it is wrong for the beginner as well as the proficient, being not only a waste of time, but absolutely pernicious. In fact, had it been invented for the purpose of preventing a person from attaining the art at all it would have had then, but in such case alone, some claim to ingenuity.

Although we have spoken strongly, and in otherwise than a complimentary sense, as to the present knowledge of and taste for art on the part of the public, we in no wise believe in any want of capacity on their part to understand and appreciate it. It has been their misfortune and not their fault, and it is due entirely to the wretched style which has overridden every effort during the past three centuries.

The public have asked bread and got but stones from the hands of their artists, and who could expect that they should take any interest in them? It has been the fashion to deny the ability of the English to produce or appreciate art of any kind. Popular prejudice has denied them even the love for music, whereas Mr. Macfarren, in an able article in the current number of the "Cornhill Magazine," shows that our nation preceded and excelled all others in its study and practice. As architects we may fairly challenge any country in the world to produce two equally national and perfect styles as our Early English and Perpendicular; and if we are sunk now in rather a slough of despond, it is in ample company, for in no branch of art need we fear to compare our condition with that of any continental nation; and the "Pestilent Renaissance" which is the cause of the blight under which we suffer was of foreign not English growth. It was a parasite which strangled the healthier insular life that struggled after better things, even to the days of Elizabeth.

SYMBOLISM.—I.

SYMBOLISM, whether in architecture or elsewhere, is essentially the representation of ideas by visible and familiar forms—as of innocence by the figure of a lamb, or of eternity by a circle. It is a kind of parable, where the more distant and important, sought to be suggested or illustrated, is presented, not in words, but in forms of things already well understood. That delight which the human mind feels in relieving the process of abstract thought, or veiling the sanctity of a spiritual object, in marrying the invisible to the visible, in letting in the light, so to speak,

through "storied windows," is at the bottom of all symbolism. But the philosophy of symbolism goes much deeper than this. It combines not only the concrete and abstract, but pre-eminently recognises the principle of fitness and resemblance. The sense of congruity must be satisfied as well as the thirst for variety and contrast. Any arbitrary visible sign, such as an +, if only agreed upon and made fixed and permanent, might serve to represent Justice as well as a blind figure holding a balance; but the greed and righteous demand of our nature for correspondence and harmony would not thereby be fully satisfied. That wonderful mode of mental manifestation which we call imagination, and which is the architect of poetry (*ποίημα*, a thing made, a work), is also the arbiter in symbolism, which is itself in a true sense poetry without the intrusion of words. Without figure or simile, what we usually call poetry is nothing but prose, or prose, perhaps, in rhyme. The construction may be very perfect, exhibiting a thing well "made," or compacted, in the grouping and action of historic events, the description of a character, or of a landscape or domestic scene; but the main element of the highest form of poetry will be absent unless the flow of thought be dimpled, oft and sweetly, by fitting simile. The invisible or abstract thing, be it spirit, principle, passion, thought, or what not, must be, for highest effect, bodied forth in tangible, material, and natural form—chastity, "like the lily"; care, "wrinkled"; and laughter, "holding both his sides." So in symbolism. Not only must the senses be presented with tangible and material forms, holding recognised relation with the thing symbolised, and standing in its stead with some advantage of simplicity and sensuousness to recommend them, but they must furnish also an element of nice and somewhat surprising correspondence, they must possess, as material things, something which is a fitting and instructive exponent of the prime attribute of the higher or deeper thing or thought they are employed to represent. Thus there must be construction, unity in variety, a bodying forth of the otherwise invisible, an adding to the wealth of the bare idea by grace and ornament; in a word, truth must be embodied and draped in all symbolism—Peace must take the form of a dove with an olive branch, Hope that of a calm expectant figure grasping an anchor.

This interweaving of threads of various hues in symbolism is not mere arbitrary prodigality and purposeless waste. It is, on the contrary, a necessity. It is the result of a craving of the mind arising from the susceptibility it has of enjoying pleasure from beautiful combinations, and of the passion it has for truth in association with beauty, and for remoter truth under the guise of what is more familiar. Symbolic representations are, doubtless, convenient oft-times as an aid to memory, or as an exciting cause of curiosity and attention, and are extremely conducive to the facilitating of mental action and perception, for they powerfully call into play the association of ideas, one of the most important facts in the phenomena of mind. But the chief charm of symbolism—the great secret of its power over mankind—is found in the stimulus and nutriment it affords to the imagination. How freely the mind soars in a region otherwise impenetrable when the sun is made a symbol of the deity, or an ocean voyage a symbol of human life.

The dangers of symbolism, both in architecture and ecclesiastical life, are at least twofold. In the former they are economical and æsthetic, in the latter they are materialising and conducive to superstition; and yet in both the danger is worth encountering for the sake of the gain. Symbolism in some of its earliest historically known forms, as in Egyptian hieroglyphics, was an economic necessity, but in modern architecture it often runs into senseless and wasteful riot. Symbolism of course is not synonymous with ornament, although decorative work is at times, and might be much more frequently made to be, symbolical. But we often see painful indications both of a want of good taste and of careless expenditure of money in this respect. The moral dangers are much more serious. Not to speak here of the readiness of the human mind, when sought to be familiarised with sacred subjects, to sink to the level of material things when those material things are made vehicles of instruction, it may be fearlessly said that the more degrading forms of superstition, where what ought to be the loftiest exercises of man's mind and soul have dwindled down into mere slavish bodily acts, are in great measure associated with symbolism. All real idolatry—a thing doubtless existing only in ignorant and depraved minds, and in all countries an abuse of this good rather than its direct product—is an accessory of symbolism. You call the various manifestations of the supernatural divinities, and for convenience sake you cast these manifestations, by force of your own imagination, into the form of beautiful or grotesque idols (*εἴδωλον*—a thing seen), that the rude worshipper may be brought into nearer contact with them, and catch some idea of them. So far so good. But by your thus throwing together (*συμβάλλω*—to throw together, compare) the visible and invisible, the spiritual and material, while it makes the unseen appreciable in the seen and tangible, it also makes it possible that, as the seen alone is then tangible to your sensuous worshipper, he, the worshipper, may by-and-bye conclude that the seen and tangible is the chief and only real object to be worshipped, and therefore distinctly associates with the idea of Deity nothing but the material form which you in your ingenious benevolence had only intended to be its suggestive and instructive representation. The origin of all real idolatry is such. Symbolism is here abused. Possibly there are Christian minds that almost to this extent abuse it in the "sign" of the cross.

BRIDGE CENTREING.—I.

WHEN the Lords of the Admiralty signified to the late Mr. Robert Stephenson their unalterable dictum, that the Britannia Bridge should have a clear minimum headway of 100ft. above high water mark, and that no fixed centreing would be permitted, the great engineer was fairly driven into a corner. Either of these conditions would have of itself been sufficiently onerous, but the imperatively demanded fulfilment of the two conjointly rendered an adherence to the recognised methods of construction an impossibility, and necessitated the adoption of means upon a scale of originality commensurate with the unparalleled magnitude of the design. The prescribed regulation respecting headway put a veto upon the employment of the arch, the type of bridge first proposing itself to the mind of the engineer. It was found that, although adopting the flattest curve consistent with safety, yet an elevation, at the springing or lowest point of the arch, of 100ft. over the Straits, would throw the crown so high that it would not be possible to reconcile the level of it with those of the adjoining railways. The question of erecting cast-iron arches with spans of dimensions so unprecedented as 350ft., without any fixed centreing underneath, was of a nature calculated to startle the most intrepid. But still this obstacle was not insurmountable; the problem was difficult, but not absolutely insoluble. The roots of the equation were real, not imaginary; the unknown quantity, recondite, but not indeterminable.

The erection of a fixed centreing, supporting the permanent arch during its construction, is plainly nothing more than employing a temporary bridge, the duty of which ceases with the commencement of that of the new structure. That the duties of a temporary bridge, constituting a series of centreings, are not of a trivial character, is amply demonstrated by the appearance of the river at Blackfriars. Under each of the iron arches at present "in position," there is a perfect forest of upright timbers, crossbraced with struts and ties, stiffened by posts and stays, and diagonally interlaced in almost every conceivable direction. A glance at these centres and the manner in which the iron arches are supported at once indicates to the practised eye the discrepancy existing between the erection of iron and that of stone arches, and in the description of centreing required. An arch of stone consists of comparatively a large number of individual parts, termed the voussoirs or arch stones, and its stability depends upon the efficiency with which each of these elemental components contributes to the equilibrium of the whole. In building a stone arch, in which the voussoirs are placed seriatim, it is evident that the support underneath must be continuous; every stone must have a bearing upon the centre, since, until the arch is keyed in, there is no self-sustaining power among its numerous components. Mathematically speaking, the *points d'appui* must be infinite. The case is otherwise with an arch similar to that of the new Blackfriars Bridge. Here the whole structure is not a collection of individual voussoirs, but composed of a number of arched ribs, which are erected in a certain number of subdivisions or sections. Each subdivision, consisting of its vertical and horizontal plates with the connecting angle irons, is riveted together before being placed "in position" upon the centreing, and may therefore be regarded in the light of one large voussoir. Supposing the length of this subdivision or voussoir to be 20ft., there is evidently no necessity for supporting it continuously. Three or four bearing points will be sufficient, their relative distances being determined by the engineer in charge of the works. The perfection of an arch would be attained when it was all in one piece. This, except in window heads and other insignificant examples, is impossible when stone is the constructive material employed, but it is virtually accomplished with the wrought-iron arched ribs used at Blackfriars. Practically, the dozen joints necessary to unite the subdivisions of each rib are equally strong with the rest of the work, and the whole may be, therefore, considered as one entire arch stone, from springing to springing. At present, the ribs at Blackfriars are completely supported by their centres, and do not exercise any pressure or thrust upon the piers or abutments upon which they will finally repose. While this arrangement is unquestionably a wise precaution upon the part of the engineer, bearing in mind how much is at stake, yet there is no doubt but that it is, viewed professionally, an unnecessary one. There is no reason why the ribs might not, similarly to an arch of stone, have been put together successively from the springing towards the crown, as the piers are amply strong enough to take any pressure that might be due to the weight, assisted by the centres underneath. In this instance we have no keying-in; the ribs and superstructure being complete, the striking of the centres will allow them to settle almost imperceptibly upon their beds of sheet lead. Looking at the different circumstances attending the construction of stone and iron arches, if we were desirous of drawing a nice distinction, we should say that stone arches were built, iron ones erected. In speaking thus critically we omit all consideration of instances where arches may be constructed of cast-iron voussoirs, and where, although the material is different, the principle is identical with that of stone. One solitary example of this type of bridge exists at Sunderland, but from the fact that it was one of the earliest specimens of iron bridges, and has never hitherto been imitated, there is little probability of it ever being taken for a model.

To return, however, to Mr. Stephenson and his difficulties, and the statement we made, that the prohibition of a fixed centreing was not an insuperable obstacle to the execution of his first idea, provided other circumstances had been favourable to the adoption of the cast-iron arch principle. It may be mentioned, *en passant*, that it is much to be regretted the arch type was not employed instead of the present horizontal form. Those who have seen the drawings of the original design must be well aware of the great superiority in an æsthetical point of view it possessed over the structure now spanning the Straits from shore to shore. There being no possibility of supporting the bridge during its erection from below, there were but two courses open—one, to endeavour to support it from above, and the other to dispense with all support whatever. Among the various plans projected for overcoming the difficulty was that of erecting the arch entire upon pontoons, floating them to the site, and allowing the burden to drop with the fall of the tide quietly into its place. Another embraced the construction of a suspension bridge, solely for the purpose of a temporary duty. But the most scientific plan was one that was borrowed from an idea of Sir Isambard Brunel, which consisted in building each arch, commencing upon opposite sides of the same pier, so that the segments as they progressed could be tied together across the breadth of the pier, and maintained in equilibrium until the completion of the whole arch effected a junction at the crown. The theory of this method of dispensing with centreing from below is perfectly sound, and might be practically carried out to a much greater extent than was at that time anticipated. The reasons we have mentioned, and others in addition, led to the abandonment of the arch type and to the adoption of that particular form of structure which at present connects the shores of Anglesey and Carnarvonshire.

RESTORATION IN THE BRITISH MUSEUM.

WE do not in these modern days see fine and high art or even common art as the Greek of antiquity saw it, or as the men of the Middle or Dark Ages saw it. We do not build Parthenons now or Westminster Abbeys, or even Temple churches, but we do build tall brick warehouses, and we do build, and nothing else, *cheap* churches. We do not carve modern saints, but we do cut out objects in stone and marble sometimes, which pass muster, and which appear to satisfy the public and artistic mind of the time and place, but which certainly are not saints either living or dead. And there is yet one other thing we do which is more remarkable still, and that is we "*restore*," as it is termed, the broken and mutilated remains and ruins of antiquity and past art; and no small amount of ingenuity is sometimes exerted to accomplish this impossible feat in the most effectual and life-killing way. Sometimes the work of many centuries, and all the results of its accumulated experience, are made to disappear in a few weeks or perhaps hours, and no small amount of fame and even glory is acquired by those who get the work to do. From the first moment when, in Westminster Abbey, the very first and primitive organ, consisting only of a few pipes and a pair of hand bellows, made its appearance, for the wonder of the simple souls who then saw and heard it, down to yesterday, when the immense modern instrument was pulled to pieces for repairs and additions, every successive generation must have puzzled itself how to improve it, and *where best to place it*. What, therefore, took a multitude of thoughtful men and centuries to do so well is in this our day undone in a single hour, and with no small amount of glory too got out of it.

If, therefore, we could for a moment hope that anything so unlikely to happen as the *real* restoration of the Westminster organ to its proper place were in time to come to pass, why all this talk will not have been in vain, and printer's time will not have been altogether wasted, and this leads me to indulge a very faint hope, that we may altogether stop, or at least hinder, another improvement which is now growing almost as fashionable and glorious as the destruction of cathedral organs—I mean, the "restoring of antiquities"—*i.e.*, antique fragments, not churches, and the then putting them under *glass* for "preservation."

Most people, I suppose, know well enough that all *white* marbles are not alike in colour. The Carrara marble is snow white when it first comes from the quarry, but afterwards, by exposure to the atmosphere, acquires a fine stone colour. The Pentelic marble, of which the Greek frieze is composed, is never white; it is always a pale stone colour from the first, and only seems to deepen a little by age and weather influences. Of course, therefore, the Museum marbles are not white, nor even pale stone colour, but have deepened a little, and are some of them a *dark* stone colour, but they are, as may be allowed, none the worse for it. Again, it must be understood that the rough quarry and natural surface of marble is, after the fine edge of the chisel has passed over it in the act of carving, gradually brought almost, if not quite, to a fine polish, and the surface thus acquires a transparency which is extremely beautiful and telling, and shows certainly the most beautiful appearance which marble can exhibit, and is that which makes it so fit for the purposes of the sculptor and carver. This is important to keep in mind. Now the Museum is a slow place, and things move in it lazily enough; the catalogues will never be finished within the lifetime of any mortal *now* living, but still there is in it a slow sort of movement which, perhaps, accomplishes sometimes more mischief than quicker changes, for nobody notices them. The Greek marbles by Phidias are now in process of *cleaning*. I ask attention to the word "cleaning," for it includes two things in modern estimation—first, the destruction of the fine chiselled surface of the marble, and then the destruction of the colour of it. Marble can only be cleaned in this sense by some very strong application, something far stronger than water or tea. I do not know what brandy or rum will accomplish, but dilute acid, or strong alkali or soap solution, will do a good deal by eating into the polished surface, and, if applied vigorously, and there is enough of it, the marble surface will disappear and the marble colour too! Let any one go and look at the Greek marbles and the busts in the Roman room, and attentively examine the colour and surface of the "cleaned," and it will soon be seen what a little energy and love of fine Greek art can accomplish in these days. It is all truly deplorable. These marbles have lasted now through evil and through good report, for some twenty-five hundred years, out of doors and exposed to all the changes of weather and neglect; and does it not seem a pity that now in these artistic and educational days, and, at least under cover, they should meet with their death sentence? Will anyone with a little influence try and stop it, and save a few of the slabs? or will anyone with a little influence or money have careful gelatine moulds and casts made of the whole series before they disappear altogether? It would really be a patriotic and truly good act, and one for which our successors will be, it is certain, not a little thankful. I speak from the bottom of my heart, for the favourite Phidian bulls have already been pretty well polished off into nothing, but are certainly whiter than they were. We are not, thank heaven! yet come to the famous and glorious group of horses on the further side of the room. I know what will be said: the damp from the badly built walls rises through the bad cheap mortar and so gets into the marble slabs. It would be a wonder if it did not. Of course it will do so again *after* all is whitened into nothingness and the surface polish gone.

But there is yet one thing more to note amongst many others, and it is a master stroke of modern ingenuity and scientific cunning. After all is done in the way of whitening the marble and destroying the surface, and all is accomplished, the next thing is to preserve it, and how is that done? It would not occur to everybody. It is done by putting the whole of the marbles in a glass case, so that it becomes almost hopeless the thought of ever seeing them more, for it is then the reflection of some skylight that is visible on the surface of the glass, and not the object underneath that is seen. This is now going on at the Museum at South Kensington. Almost everything is in a glass case: you see not the objects in them, but a reflection of yourself or a skylight or a row of gas-burners. Let us still remember that these marbles have now lasted for some thousands of years in the open air; why should they not last some thousands more under cover of a roof in a close room, and yet be left uncovered, and visible, and untouched? The sounds from the Westminster organ and the Greek marbles at the Museum are alike records and remembrances of the past, and as such should not be made mere means of a little temporary hubbub in the little narrow societies which nowadays are thought to represent Religion and Art. C. B. A.

THE INTERNATIONAL WORKING MEN'S CONGRESS.

THE third International Working Men's Congress commenced at Brussels on the 6th inst. Seventy-three delegates were accredited, twelve of them being from Paris, representing trades' unions. Mr. Young, of London, was chosen as president. Mr. R. Shaw, of London, read the annual report, which mainly consisted of an account of the various persecutions to which the International Association had been subject at the hands of continental powers. One paragraph states that in the struggle maintained by the building trades of Switzerland the masters made it a preliminary condition of coming to any terms with their workmen that the latter should forsake the association. The workmen refused to comply with this condition and by aid from France, England, Germany, &c., through the association, they have obtained 10 per cent. increase of wages, and a diminution of one hour of labour. The concluding paragraph of the report affirms that the existence of an International Association is absolutely essential to the prosperity of national organisations. The discussion commenced on the question of war, and it was suggested that working men should refuse to serve as soldiers, and to strike work while war was going on. Of what avail the refusal to serve as soldiers would be in France, or even in this country, was not stated; neither was the source of the money to support a nation of working men on strike indicated.

The second day's proceedings commenced with a discussion on strikes and courts of arbitration. The debate was preceded by the reading of papers sent in by the various local sections or branches of the association. The first paper read was from the Geneva section, and commenced by affirming that strikes are contrary to the principles of political economy, but that they are necessitated by the power assumed by capitalists of being the sole judges in all matters concerning the carrying on of business operations. It was suggested in this paper that every one of the affiliated branches of the International Association should establish a special fund for defensive purposes, and for creating a central fund like that established at Geneva. There the different societies contribute to a central fund, managed by the delegates of the different trades. With a weekly contribution of 2½d. four great strikes had been sustained. At the last strike—that of the building trades—3,000f. was placed at the disposal of the strike committee. A thorough organisation of the association in this manner would effectually prevent strikes. The second paper read was from Antwerp, and deprecated strikes both on principle and in practice. Strikes, it was contended, are destructive in every sense, and, as a means of increasing the rate of wages, are pronounced totally useless, and frequently productive of in-

jury to all concerned. The only means recognised by this paper as capable of benefiting the labouring classes and of suppressing strikes, is co-operative labour. The next paper was from the Brussels section, and expressed almost identical opinions, stating that in numbers of strikes the masters have triumphed, but in very few have the men had the best of it. In England, where the men have more practical experience in these matters, the working men assert that the reason of this is that where the men are successful in their applications for an increase of wages, or a reduction of the hours of labour, the public never hears anything about it, and that it is only when there are protracted strikes that the matter is taken notice of by outsiders, and if the conviction gained ground that the men would not strike, they would be worse treated than they now are. While condemning strikes, the authors of this paper declare that trades' unions are indispensable for keeping up the rate of wages, and an essential portion of the operations of a union should be the equable distribution of workmen. To make this completely effectual, all trades should be locally, nationally, and internationally united. A federation of trades' societies would tend to equalise wages, and would prevent work being done in one place to the detriment of the workmen in another place. Councils of arbitration, in which the workmen would be properly represented, are approved. Foremen in large establishments, it is asserted, are frequently on the look-out to lower the men's wages, in order to keep their own situations or raise their own wages. The new tendency of strikes was to the establishment of productive associations, and trades' unions will become, say the authors of the paper, the corporations of social production—*i.e.*, co-operative associations. In conclusion, the paper said:—"Strikes but perpetuate wages labour; we want to abolish wages labour. Capital is at present absorbing labour; in future labour must absorb capital. United for the defence of wages in the first instance, the trades' societies will explode the system of wages labour, and found a new social order."—In the discussion which followed the reading of these papers, a delegate from Paris stated that though the Parisians disliked strikes, they had been unable to establish councils of arbitration. To solve the question of arbitration they had proposed to elect syndics by universal suffrage—a moral power to settle trades' disputes. They had shown the Ministry that the *conseils des prud'hommes* consisted for the most part of masters and foremen, and, as a matter of course, they did not enjoy the confidence of the workmen. The Ministry had told the men that they must have confidence, and there the matter had ended. The rights of property were guaranteed by law; labour was unprotected and left to chance.—A delegate from Geneva urged that political freedom was essential for enabling the working classes of any country to remedy their grievances.—Mr. Shaw, of London, was convinced that, though much suffering had been endured on the occasion of strikes, no body of working men had ever been ruined by a strike; on the contrary, the balance of gain was considerably in favour of strikes. He instanced the calculations and results of the Amalgamated Carpenters and Joiners—a society which, perhaps, more than any other, aimed at equalisation of wages in different localities. Under existing circumstances, he was in favour of strikes as a means of enforcing the just demands of the working men, and could not agree with the wholesale condemnations that had been uttered against them.—Mr. Dupont, of London, agreed with the last speaker. The association had succeeded in many cases in preventing men being obtained from abroad to work for English employers in cases of strikes or lock-outs.

On the third day, the following resolution on strikes and courts of arbitration came on for decision. There was a very lively debate, on account of some opposition being made to certain parts, which, however, were ultimately carried, to form part of the resolution. The resolution is as follows:—

1. That strikes are not a means to the complete emancipation of the labouring classes, but that they must frequently be resorted to under the actual situation in the present struggle between labour and capital.

2. That it is necessary to submit to certain rules and regulations in their organisation, to be mindful of the proper opportunities, and not to infringe the law.

3. As there are many places in which no trades' unions exist as yet for mutual support, the International Working Men's Association ought to take the initiative to create such institutions in all trades of every country, to combine them locally into federal unions, for mutual assistance in cases of strikes or lock-outs, and by this means to organise the whole labouring population.

4. That wherever there is an opportunity and no legal obstacles interpose places ought to be named in which groups may be formed, and that in every such place the local committee ought to consist of delegates of the divers societies to constitute councils of arbitration, and to judge of the legitimacy of strikes. It will be necessary to leave the different sections a certain latitude in the mode of forming these courts of arbitration in accordance with the moral habits and the particular legislation of the respective localities.

In the evening sitting the question of machinery and its influence was discussed. The papers read dwelt principally upon the wage-reducing effect of machinery, resulting from the displacement of manual labour, and substituting women's and children's labour for that of men. That a complete transformation of society had occurred, an unprecedented progress in production made, which had resulted in a sweeping competition, which was always detrimental to the working-classes; and that this would continue as long as machinery remained the monopoly of the capitalists. The commission appointed to report upon the question proposed the following:—

Considering that the introduction of machinery in the process of manufactures has always been a means of using the labourer for the profit of the capitalist; considering that the machine will not render a real service to the working men until it is in their hands, we conclude that it is only in the co-operative association that the producers can arrive at any practical result, and that the obstacles which to day prevent working men from deriving any benefit from the machine can be removed.

In the discussion which followed, Lessner, of London, said that the Congress ought to be careful not to do anything which might go forth to spread a notion that they were hostile to machinery. Machinery had relieved man from some of his most laborious work, and it could not for ever remain in the hands of the capitalists. Although it might have been expected that machinery would have reduced the hours of labour, the contrary had been the fact; the working day had been prolonged by the introduction of machinery. Machinery, too, had facilitated the employment of women and children, and so wages had been lowered. A delegate from Paris expressed similar views, stating, however, that machinery was progressing, and could not be impeded. It enabled more human beings to live than could have lived without it, although the workmen's miseries increased as it progressed. De Paepe, a Brussels delegate, said that if the trades' unions were well organised they could claim compensation for the workmen displaced by the introduction of machinery. He proposed:—

That the machines and all the instruments of labour ought to be in the hands of the productive labourers; that notwithstanding the actual state of things, the working men organised in trade societies could attach conditions to the introduction of new machinery in workshops to receive compensation.

Eccarius (London) said it was the oppression of machinery, and not its beneficial results, which was to be deprecated. He moved that the Congress do adopt the following:—

Resolved,—That on one side machinery has proved a most powerful instrument of despotism and extortion in the hands of the capitalist class; that on the other side the development of machinery creates the material conditions necessary for the superseding of the wages system by a truly social system of production.

This resolution was received with great applause by the audience, and the Commission withdrew their proposition in favour of it. Eccarius had no particular objection to the compensation question being appended. Schöppler, of Mayence, and Cohn, of London, also spoke upon the subject. The latter expressed himself very strongly against infant labour.

The education question was discussed at the fourth sitting, and on the next day the financial statement was submitted, and papers on credit and banking and the land question were read. On the sixth day, the London delegates brought on the hours of labour question, and the following resolution was agreed to:—

A resolution having been unanimously passed by the Congress of Geneva of 1866 to the effect that the legal limitation of the working day is a preliminary condition to all ulterior social improvement of the working classes, the Congress is of opinion that the time has now arrived when practical effect should be given to that resolution, and that it has become the duty of all the branches to agitate that question practically in the different countries where the International Working Men's Association is established.

A long discussion then ensued on the peace or war question. At the evening sitting the question of private property in land was discussed. In relation to canals, highways, and telegraphs, the following resolution was proposed:—

Considering that the roads and other means of communication require a common direction, the Congress thinks they ought to remain the common property of society.

And in relation to forests the following resolution:—

Considering that the abandonment of forests to private individuals might push the destruction of forests to certain points of territory, involving the conservation of springs, and, as a matter of course, the good qualities of the soil, as well as the health and the lives of the population, the Congress thinks that the forests ought to remain the property of the nation.

The last question on the programme was, "the best means to establish co-operative production," on which subject a report was read by a commission appointed to inquire into the matter. In the evening, the Brussels section entertained the delegates at a banquet, and so ended the Congress.

BUILDING SOCIETIES.

To the Editor of the BUILDING NEWS.

SIR,—In reference to Mr. Bell's communication on "Building Societies," published in last week's issue of the BUILDING NEWS, I beg to submit that whilst in the main I agree with him, that the interest charged by these societies is, considering the small risk, much too high, and, indeed, on the average, amounting to 7½ per cent., yet in the calculations published last week he is radically wrong, and that they lead to a result far too favourable to his view of the case.

For illustration we will take his two instances, A and B. A has a capital of £100 and chooses to purchase a house value £400, rental £36, through the medium of a building society, from which he borrows £300, and to which he pays £42 annually for 10 years in redemption of loan and interest, and he is also subject to the annual contingent expenses of £10. B prefers paying an annual rental of £36, allows his capital of £100 to accumulate at 5 per cent. for 10 years, and annually invests the sum saved from the building society and in contingent expenses, and allows it to accumulate at compound interest at 5 per cent. for 10 years.

The following, then, becomes the statement of the two cases, which, in order to render the source of error more clear, is, perhaps, more complex than could be desired:—

A pays annually, for 10 years, in redemption of a loan of £300 and interest on same	£42	0	0
Contingent expenses on house ...	10	0	0
Total payments...	£52	0	0
Deduct rent	36	0	0
Total payments in excess of rent ...	£16	0	0
And loses annual interest on £100 lying dormant	5	0	0
	£21	0	0
B invests £16 annually at interest for 10 years at 5 per cent.	£202	0	0
Do. £5 per annum interest on £100 invested for 10 years	63	0	0
Capital remaining at the end of the term	100	0	0
	£365	0	0

The error in Mr. Bell's account consists in this. In his sum of £21 is already included the annual interest on £100, and it is evident that if from this £100 he yearly abstracts the interest to invest it at 5 per cent., he can only have his capital of £100 remaining at the end of the term. The interest on this sum is already accounted for in the £21. In fact, he cannot accumulate the interest on his £100 twice over.

At a first glance it may be said how can you redeem a loan of £300, and interest on same, by annual payments of the total value of £202 only? But this is altogether ignoring the payments which are made instead of rent, and which with the annual excess, equal to £42, is equal to a capitalised value of £528, and, deducting £300 from this, we have £228 remaining for interest, equal to more than 7½ per cent. on £300 for 10 years at simple interest, which is really what the building society would obtain for the use of their money, presuming that, like B, they invested each annual payment at compound interest—5 per cent. Where the interest accruing on the use of their capital is annually, quarterly, or otherwise distributed to their proprietary in the shape of dividends, this is of course impossible. In this case, their original capital only can be actively employed, and as they can invest this on more

favourable terms than 5 per cent, they are enabled to declare dividends of from 7 to 8 per cent—the rate of interest they exact from the borrower.

I have not had access to any more complete tables than those in "Hurst's Handbook," and perhaps this may account for another discrepancy between Mr. Bell's account and that I now submit. The total capitalised value of £21 invested annually at 5 per cent. for 10 years, I make £265 and not £298. This, possibly, may be accounted for by Mr. Bell assuming that the investments are made quarterly, which would undoubtedly give a higher result than mine. In conclusion, although of this I have had no actual experience, I should imagine that it would be found exceedingly difficult to invest small sums like these at 5 per cent. compound interest on safe security.

Apologising for the length to which my letter has extended, and which can only be excused by the interest which many of your readers take in this subject,—I am, &c., IGNOTUS.

SIR,—I again request your permission to offer a few remarks on the above subject, seeing that your correspondent, "Mr. Ingress Bell," adheres to his assertion "that it is really wiser to continue to pay rent to a landlord than to buy a house through the aid of a building society." In support of these views he has submitted to your readers two examples—first, that of buying a house, at the price of £400, by providing £100 and borrowing £300 from a building society; and, second, of continuing to pay £36 a year rent and investing the surplus and £100 at interest. But it appears to me he has arrived at an erroneous conclusion, and that his own calculations, if correctly made, will show absolutely no wisdom in continuing the payment of rent.

In the *first* case he takes the annual charges (*including interest on the* £100) at £57, or £21 in excess of the rent; and in the *second* case invests this £21 per annum for ten years at 5 per cent., making it accumulate to £298, and *also* the £100 capital to £162. Now both these sums are incorrect; the interest on the £21 is overstated, and the £100 cannot earn interest, as it is already included in the £21. He has thus exaggerated his profit by upwards of £90.

If I bought a house or made money investments on the conditions suggested by Mr. Bell the following would be the result of the transactions, as recorded in my ledger at the end of ten years.

First case.

HOUSE.

To cash paid down	£100
To compound interest thereon for ten years at 5 per cent.	63
To annual repayments on loan, £42; ground rent, insurance, repairs, &c., £10, making £52 Less rent 36	
£16 per annum for ten years ...	160
To interest thereon, as before	42
To cost of house, producing a nett income of £26 per annum or over 7 *per cent.*...	£365

Second case.

CAPITAL INVESTED.

£100 for ten years at 5 per cent. compound interest	£163
£16 per annum at 5 per cent. compound interest	202
By cash	£365

for investment in a house to produce a nett profit of £26 a year, as above.

If the rate of interest allowed in both cases were reduced by 1 per cent. the cash investment would only amount to £340, whilst the house would then be yielding a nett annual return of more than £7 12s. per cent., after having been debited with 4 per cent. interest on the expenditure from the commencement. It is obvious, therefore, that the house at even £400 would be a good investment.

If Mr. Bell, in reviewing the case I gave in illustration, asserts that the house referred to could not be purchased for less than £400. This is a matter of opinion. My conviction is that a prudent man would not give more than £300, and that it would be well worth buying for occupation. I would observe, however, that the value of a house depends upon the term of lease. He also says that only three-fourths of the purchase money would be lent by a society. My experience does not confirm this. In many instances the whole amount is advanced, and in others fully nine-tenths, by old-established and responsible societies.

Mr. Bell appears to base his calculations on the supposition that leasehold houses, as a rule, will not yield a nett return on the capital *sunk* in them greater than 6½ per cent. per annum. I think, however, that owners of this class of property (from practical experience) could testify to the *average annual return* being considerably more, provision being included for replacement of the purchase money. He also supposes that small sums of cash can be safely invested in realisable securities yielding 5 *per cent.* per annum compound interest, but has not pointed out where this can be done, and it is very doubtful whether he could easily do so without relying on the aid of building societies. I should certainly be glad to know where a working man could invest his savings at 5 per cent. interest with security equal to a house with himself for the tenant.—I am, &c., S. S.

London, September 15.

SIR,—A controversy has lately been carried on in your pages as to the merits of building societies, and as to the advantages to be derived by borrowers from them. As is very common in controversial discussions, the disputants, each anxious to make out a strong case, somewhat overstate the merits and defects, and the consequence is, in this instance, as in a great many others, that each party is right, and each wrong. To me, as an accountant, and entirely free from prejudice in the matter, it seems not difficult to reconcile the two, and with your kind permission I propose to offer my services as arbitrator between them, remarking at the outset that the two circumstances which determined their respective positions as to "right" and "wrong" are:—1. The number of years purchase at which the property may be bought which forms the subject of their calculations; and 2, the society from which the loan may be obtained, and consequently the rate of interest paid for it—the conclusion to be arrived at being this, that, presuming the rate of interest paid to be not more than usually extortionate, if a property can be bought at eight or ten years' purchase, it is advantageous to buy, with the assistance of a building society, rather than to pay rent as tenant, while, if the price be high, say equal to fifteen or sixteen years' purchase, then it is more economical to occupy as a tenant, accumulate the annual saving, as recommended by Mr. Bell, and make the purchase with ready cash, and on the perfectly independent terms which a buyer with the money in his own pocket can always command.

Let us assume, then, that the rent of the house is £50 per annum; that it can be purchased for £400, and that the whole price can be borrowed from a building society, repayable in quarterly instalments of £13 6s. 8d., extending over a period of ten years. The yearly payment to the society will then be £53 6s. 8d., while the other charges for ground rent, insurance, repairs, and contingencies, we will assume as being £10, making the yearly payment £63 6s. 8d., in place of £50 being paid for rent. In ten years this would come to £633 6s. 8d., while the rent for that period would have amounted to £500, leaving as excess of payment beyond what would have been payable as rent, £133 6s. 8d., in consideration of which payment of £133 6s. 8d., the party has become the owner of a house presumed to be worth £400. I have made no allowance for interest on the yearly excess of £13 6s. 8d., but even if that sum were to be accumulated at compound interest at 5 per cent. per annum, it would in ten years only amount to £167 14s. 2d., so that had the party continued to pay rent of £50 per annum, and invested the £13 6s. 8d. in the way mentioned, he would only have been the possessor of £167 14s. 2d. in cash, in place of being the owner of a house worth £400. It seems evident that in such a case as this Mr. Bell's antagonists must be held to have the best of the argument.

But if we now assume that the house cannot be bought for less than £800, the result will be different. The whole price of £800 being borrowed, as before, the quarterly payments (to continue for ten years) will be double what they were in the former case, viz, £26 13s. 4d. per quarter, or annually £106 13s. 4d., while the ground rent, insurance, repairs, and contingencies we will assume as formerly at £10, the extra cost of insurance being held as balanced by the saving of repairs from the superior character of the property, making the yearly payment £116 13s. 4d., and the ten years' payments, £1,166 13s. 4d., while the rent for the period in question would only have amounted to £500, leaving as excess of payment beyond what would have been payable as rent, £666 13s. 4d., in consideration of which the party has become the owner of a house worth £800. This seems also to tell against Mr. Bell. But had the extra payment of £66 13s. 4d. been accumulated at the rate of 5 per cent. per annum it would have amounted, at the end of the ten years, to £838 10s. 2d.; so that in this case Mr. Bell is right, and the party would be paying £838 10s. 2d. for a house assumed to have been worth only £800 at a date ten years prior to that at which he becomes the real possessor of it, the property having, in the meantime, deteriorated in value, from tear and wear, and from the shortened duration of the lease.

The rate of repayment which I have been proceeding upon is that charged by the National Freehold Building Society, calculated at the rate of 6 per cent. per annum. But that is much below the rate charged by many other societies. The only other tables I have beside me are those of a society* which, from the fact that its annual income exceeds one million, must be presumed to stand high in public favour, and I find that they are based on a rate of interest of between 7 and 8 per cent. per annum. If we assume the money to have been borrowed from it, then the result would be very much more favourable to Mr. Bell's views. It would even then be advantageous to borrow on the low class of property, rather than to rent it, but, as regards the property of superior class and higher price, it would be downright folly in anyone to avail himself of the aid offered by it, as will be made evident by the following statement.

Assuming the rent to be, as before, £50, the price £400, and the whole price to be borrowed from this latter society, then the monthly payments would be £5 9s., equal to, per annum, £65 8s; ground rent, &c., as before, £10; annual payment, £75 8s.—amounting in 10 years to £754; deduct 10 years' rent, £500; cost of house worth £400, £254. Were the yearly excess of £25 8s. to be invested at 5 per cent. interest, it would amount, at the end of 10 years, to £319 9s. 2d; but even here the borrower has benefited, having acquired a house worth £400 in place of merely possessing £319 9s. 2d. in cash.

But if we assume the price of the house to be not £400, but £800, then—the whole price being assumed as borrowed from the society—the monthly payments will be £10 13s., or annually, £127 16s.; ground rent, &c., as before, £10; annual payment, £137 16s., amounting in ten years to £1,378 Deduct ten years' rent, £500; cost of house worth £800, £878. While, were the excess of £87 16s. to be invested at 5 per cent. per annum compound interest, it would amount at the end of ten years to £1,104 7s., representing the actual cost of a house presumed to have been, ten years before, worth only £800; so that had the party, in place of accepting the aid of the building society, occupied the house as tenant, investing the annual saving of £87 16s., he would at the end of ten years have been able to expend £800 on the purchase of a house, and have had a balance of £304 7s. cash in hand.

From all this it seems evident that no general rule can be laid down as to whether it is judicious on the part of anyone to purchase through the assistance furnished by a building society or not. Each case must be determined according to its peculiar circumstances; and the advice I would beg to offer to all intending borrowers from such societies is this, that as no prudent person, not possessing more than usual skill in such matters, would think of buying a house without consulting an architect as to its value, so none should pay for it with money borrowed from a building society till he has taken the opinion of a properly qualified accountant as to whether he is or is not suffering himself to be imposed upon or misled.

Undoubted advantages derived from building society loans are, that a man is thereby enabled to have the gratification of living in a house which he can call his own, and that persons of improvident habits are thereby in a manner compelled to save what otherwise they would have squandered; but these advantages, as has been stated by Mr. Bell, are not unfrequently purchased at a very

* Birkbeck Building Society.

high pecuniary cost—of the real magnitude of which the borrowers have not the most distant conception.—I am, &c., WM. L. M'PHIN.

93, Chancery-lane, W. C., September 17.

SIR,—In a society I belong to in the city I find the secretary, besides holding this situation, is also an *auctioneer*. I am at a loss to know how it is possible for one man to do the duty of both. No wonder some of your correspondents are dissatisfied with the management of these societies. I hope there will be a good discussion on the subject in your pages.—I am, &c.,

A CITY MEMBER.

September 15, 1868.

COTTAGES FOR THE CO-OPERATIVE SOCIETY, BURY, LANCASHIRE.

SIR,—We are always interested in designs you publish which have for their object the improvement of dwellings for the labouring classes, and, considering such designs open to criticism, would make a few remarks on those illustrated on August 14, for the model dwellings at Fulham. Surely, Sir, if these dwellings are considered model—built under the auspices of a bishop, and the superintendence of so noted an architect as Mr. Seddon—the condition of the dwellings upon which these are considered an improvement must be wretched indeed.

We have calculated the area of one of the middle houses, which we find contains about 350 superfeet of flooring, which is apportioned into two bedrooms containing 82 and 60 super feet respectively, with a scullery 4ft. wide, a water-closet 4ft. by 2ft. 3in., and a small living room. This is very bad, and the harm is increased by the utter disregard of all sanitary precautions in arranging the water-closet and scullery, which latter is throughout totally without light, and the former—which in houses of this description are rarely of the very best description or well attended to—are certain to prove a nuisance, and in hot seasons like the one through which we have just passed, will, we are afraid, become mere hotbeds of disease and death.

Looking down your description we find that the dwellings upon the basement floor are still worse—one bedroom and one living room, with two water-closets for six dwellings. Surely this is not model. Still more surprising is it when we come to consider the question of cost. One living room, one bedroom, miniature scullery, and water-closet, altogether containing 350ft. of flooring, and the cost £155 per dwelling! This is enormous.

We take the liberty of enclosing specimens of three classes of houses we are building in Bury for the Bury Co-operative Society, who, to their credit, are doing much to remedy the want of good cottage accommodation there, and which houses are intended to be purchased by individual members by a small increase of the rent.

The cottages No. 1 are part of a block of ten containing two large houses at each end, as shown, with six smaller ones between to suit different classes of purchasers. The larger houses contain 930 super feet of flooring, the smaller ones 725 super feet; the cost of the ten, including outbuildings, yard, walls, and architect's commission, but exclusive of land, is £1,420, or an average of £142 per house.

The cottages No. 2 are part of a block of sixteen containing each 750ft. of flooring. These houses have three bedrooms each, with garden in front and ornamental iron railing and pierpoint wall; the cost of the sixteen is £2,380, or about £149 per house. These figures speak for themselves. Our cottage No. 1, with an average of 800 super feet each, costs £142. The Fulham dwellings, containing 350ft., cost £155.

We are aware that it will be said that the expense of land in London precludes the idea of building separate cottages; this may be, but then the cost of dwellings in blocks should be proportionately reduced, as there is the saving of stairs, yard, walls, and outbuildings to each house, as well as less roof. There surely must be some wrong principle at work here. If the object of buildings of the Fulham class is merely to provide a handsome block of buildings as an ornamental adjunct to a palace, then we have not a word to say against them, but if the object is to serve as models for wholesome and airy dwellings for a large and deserving class, then let us by all means study a reasonable economy; not necessarily deforming our streets with hideous workhouse-like structures—for simplicity and taste are quite consonant—but especially aiming at providing sufficient breathing space in the bedrooms, which, in the Fulham dwellings, is sadly neglected. Were this principle universally carried out we should see fewer of our artisans with the wan, sickly faces which are a sure index of breathing foul air. We would, in conclusion, add a word to the working men themselves, and call upon them to be up and stirring; not relying upon misguided charity, not despondently wearing out their own and their children's lives and health in vile slums, where pure air is an unattainable luxury, but taking heart, by the example of their Lancashire brethren, to cheerfully and patiently work out their own redemption from these giant evils. Then, and not until then, will the English workman be lodged as a christian, and not, as is the case in most of our large towns, in dens where we should scruple to house our dogs or horses. Until that happy day arrives we must be content to see the poor carrying to the grave the results of the heritage they have received of foul air and defective sanitary arrangements from which so many of them suffer — We are, &c.,

MAXWELL AND TYKE, Architects.

2, Silver-street, Bury, Lancashire.

DESIGNS FOR THE MANCHESTER TOWNHALL.

NO one can deny that we have given a prominent place to the designs sent in for the Manchester New Townhall. We give to-day the Albert-square façade, as submitted by Mr. Thos. Worthington. On a preceding occasion (BUILDING NEWS No. 699) we gave two other views of the same building by the same architect. Having on previous occasions freely given our opinion of Mr Worthington's architecture, there is no necessity to repeat it now.

THE ARBITRATION MOVEMENT.

THIS movement makes progress. We find that at a recent meeting of the Liverpool Trade Union of Operative Bricklayers, it was unanimously resolved to request the Master Builders' Association to join them in settling a permanent code of regulations which shall be satisfactory to all parties, through a court of arbitration, as suggested by the masters in May last.

On Wednesday, a meeting of the masters and workmen in the building trade of Nottingham and district was held in the Exchange Hall for the purpose of forming a board of arbitration in connection with the trade. A resolution was carried:—"That this meeting is of opinion that it is very desirable that a board of arbitration and conciliation should be formed in connection with the building trade of this town and district." Mr. Mundella stated that there were already 500 boards of arbitration established, and there were 200 candidates for the coming parliament who had adopted it in their electioneering speeches, and who were going to the House of Commons on this principle—that working men have a perfect right to combine for their own protection; that the funds of working men ought to be protected just as effectually as the funds of life insurances or any other society which belong to the middle and upper classes.

WORCESTER CATHEDRAL RESTORATION.

THE works here are, according to a local journal, making considerable progress. The great north porch is rapidly approaching completion, all the statues being in their appointed niches, which are canopied and elaborately carved. The top or front cornice of the porch contains a row of diminutive figures, representing Adam, Noah, Moses, Aaron, David, Solomon, Jeremiah, Isaiah, and Daniel. In the centre, above the apex of the arch, is our Lord, having on his right and left the thirteen apostles, terminating at the bases on either side of the arch with St. Peter and St. Paul. These figures are by Messrs. Powell and Hardman, of Dublin. The paving of the porch floor will be of variegated stone, and the gates will be highly decorated. For these latter the skill of Messrs. Skidmore, of Coventry, has been enlisted. The outer gates will be of wrought-iron open work, richly foliated, closely copied from the best examples of ancient metal work, and in the interior of the porch, entering into the Cathedral, will be two folding doors of thick oak, with deeply sunk panels and Perpendicular tracery, canopied and buttressed, and a rich moulding of a five leaved flower, forming the outline of the arch, beyond which the Norman shafts and capitals which flank the doorway will be left remaining, as also the Decorated tracery of the window above. At the south entrance from the cloisters into the nave there will likewise be a new outer iron gate of beautiful open work, after the Early English pattern, and an inner door of close boarded work, with similar open ironwork upon it. The Chapter-house will also have a door of the same character, having around it a band of oak foliage, the niches on either side being filled with statues of a bishop and a king. The designs for these gates are prepared, and it is hoped that very shortly the general restoration (except the re-arrangement of the interior) will be finished. The carvings of the tower are being executed by Boulton, and will be completed in a few weeks. The timber truss work for the new bells will, however, yet occupy a considerable time in erection. Meanwhile, the great hour bell has been cast by Messrs. Taylor, of Loughborough, with great success. It comes out of the mould perfectly true to the intended note (B flat.) The weight is five tons, and the diameter 6ft. 4½in.

DECAY OF THE PALACE OF WESTMINSTER.

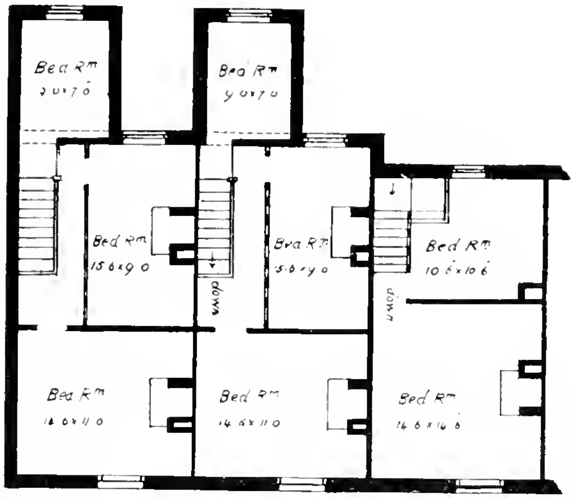
FROM time to time the public have been disquieted by the rumour that the Houses of Parliament, upon which so much money was expended, and which have been the occasion of so much art controversy, were slowly crumbling away. Experiment after experiment has been tried, only apparently to fail. Mr. Abell, the chemist of the War Department, was requested to inspect and report upon the results of the various applications, and in a paper just published he reports:—"That of the processes enumerated (each of which was applied with every care by its proposer) not one has proved successful in arresting or preventing the decay of the stone. Inasmuch as the total period which has elapsed since the application of these processes is less than four years, it would be superfluous to discuss their relative merits or demerits. I may, however, observe that one half that period of time had sufficed to demonstrate the utter inefficiency, as applied to dolomites, of the majority of the processes, and that the only one which until comparatively recently afforded promise of success was that proposed by Mr. John Spiller." Mr. Abell then enters into an examination of several systems. He gives preference to the process of Mr. Szerelmey, but this one is very defective. From his concluding paragraph we are led to hope that something may be done, however. "In my recent examination (he remarks) of the stone of the Houses of Parliament, both in the original and prepared condition, I have been strongly confirmed in the conclusion to which I arrived when my attention was first directed to this subject, and which was also entertained by the committee appointed in 1861, of which I was a member; namely, that the principal cause of decay of the stone is the lodgment of water, and its frequent retention for long periods by the exposed portions, and especially by those parts which are situated immediately between string-courses and other projecting surfaces. I am convinced that if the recommendation of the above-named committee had been acted upon, and such projecting surfaces had been protected, either with a light metallic covering, or with some other sufficiently impervious coating, the most disfiguring portions of the decay, which has been proceeding since 1861, would have been arrested or prevented."

The western extension of the Metropolitan Railway is now virtually completed. The laying of a few lengths of permanent way and the carrying out of some minor details at the stations will render the line ready for traffic. The official inspection was made on Monday last, and the line will be opened for traffic on October 1. This portion of the Metropolitan Railway system leaves the parent line at Praed-street, midway between Edgware-road and Bishop's-road stations, and joins the Metropolitan District line at Gloucester-road, Brompton.

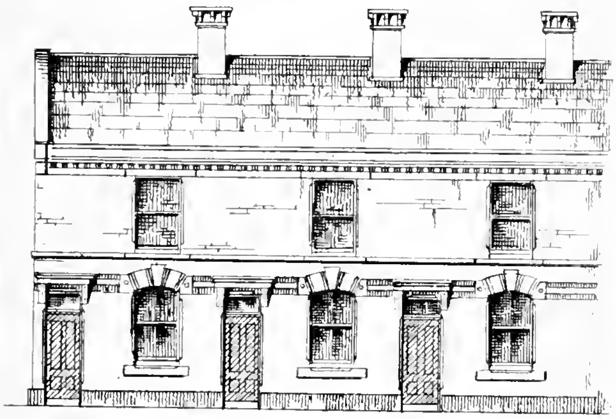
COTTAGES FOR THE CO-OPERATIVE SOCIETY BURY LANCASHIRE

MAXWELL & TUKE ARCHITECTS.

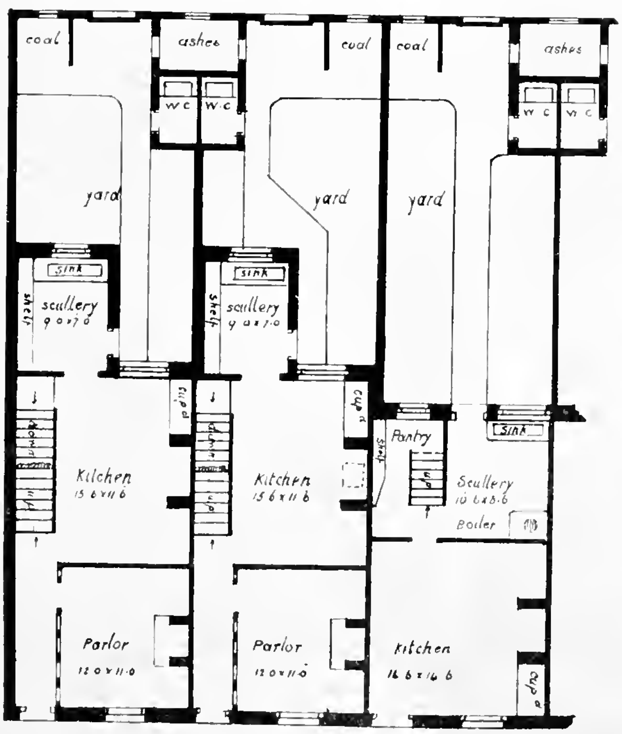
DESIGN No 1



FIRST FLOOR PLAN.

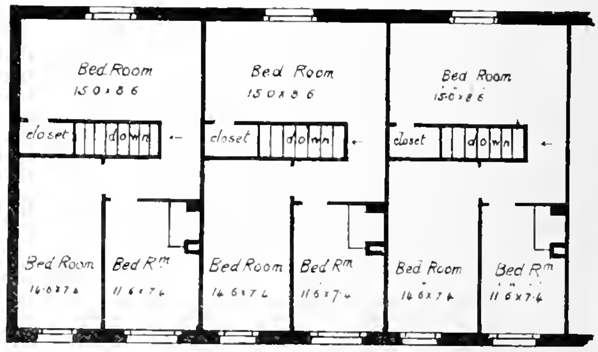


FRONT ELEVATION.



GROUND PLAN.

DESIGN No 2.



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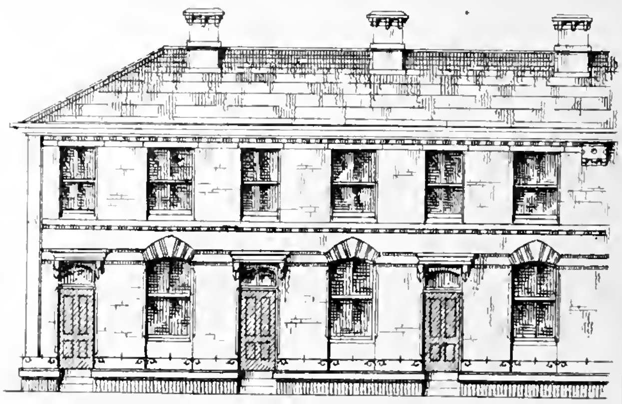

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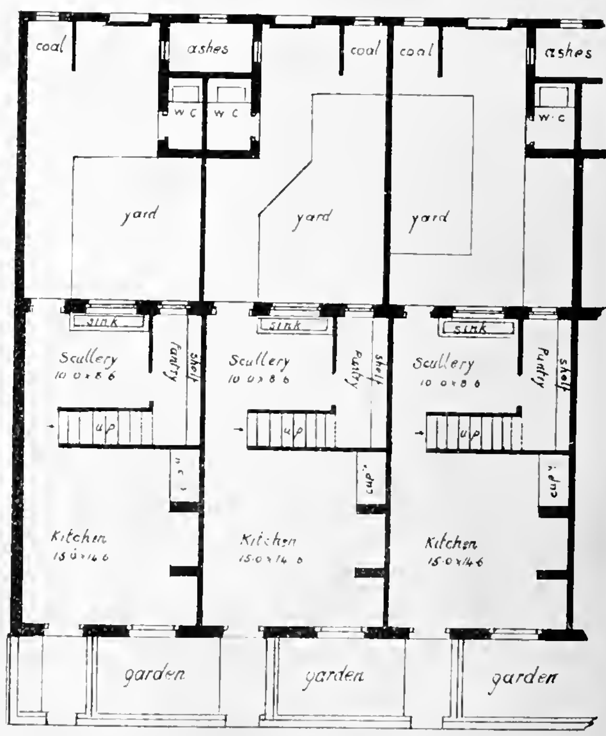
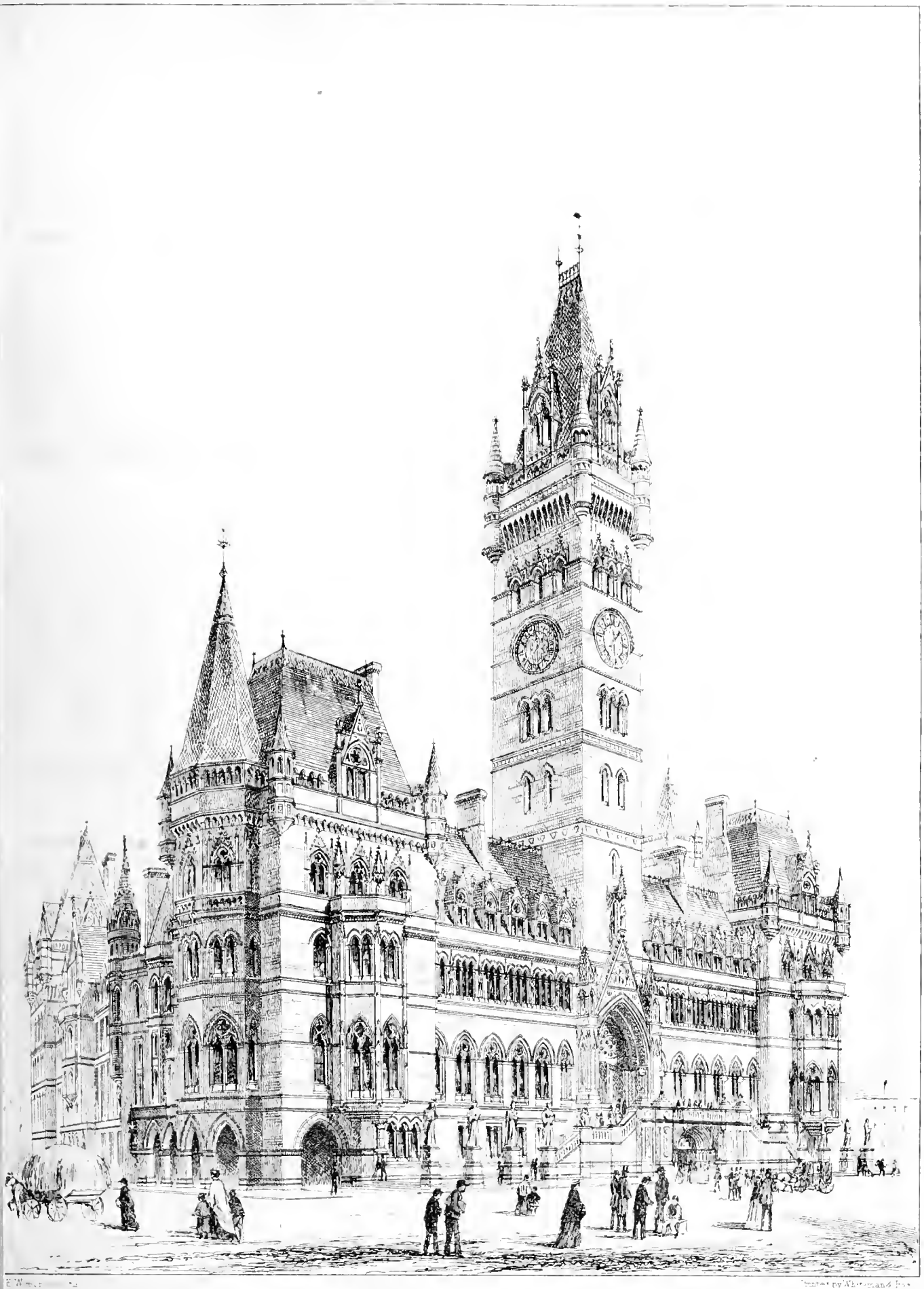


GROUND PLAN.

E. Pos... lith
Printed by Whiteman & Bass



Design for Manchester New Town Hall.—Albert Square Facade.

MR THOS WORTHINGTON, ARCHT

SUBURBAN *VERSUS* URBAN BURIAL.

THIS important question, which during the past eighteen years has, by a sort of common consent, been allowed to rest *sub silentio*, and, in the vast enlargement of London, find a new level and fresh exigencies, must, we presume, in the new parliament, in some form or other, come up for discussion. Except, perhaps, in a solitary column of the Registrar-General's annual report, or in some semi-philanthropic paper read before one of the learned societies, the fact is rarely noted, that death carries off from the London population something near 70,000 persons every year; a number equal to the population of a large-sized provincial town. For example, the annual mortality of London is considerably more than the whole population of York, Hull, or Durham. Hence, it may well seem a consideration of some moment how and where this large number of human bodies are disposed of in burial? As a matter of fact, some 50,000 or 60,000 of this number are buried within the limits of the metropolis, notwithstanding the prohibition of such interments, by the act of 1850. The London suburban districts of 1850 are the urban districts of 1868. The principal metropolitan cemeteries, with the exception of the Necropolis at Woking, are all within the postal districts, and some of them now in the very midst of large and rapidly increasing neighbourhoods. The question may, therefore, fairly be raised, whether burial in those neighbourhoods is not in direct contravention of the spirit of the act of 1850. On sanitary grounds the matter is beyond controversy. Many of the cemeteries which, in 1850, were condemned by the then existing Board of Health as unfit for further use, are now as choke-full of human remains as were the common graveyards of that period, and cannot be disturbed without loading the air with poisonous miasma and incipient disease. In this special view the subject is most dismal and uninviting. But it will have to be approached and dealt with vigorously and thoroughly; though, perhaps, not till some sweeping epidemic has again taught us in its painfully imperious way the folly and wickedness of neglecting, in our municipal regulations, sound sanitary laws.

NOTES FROM SALISBURY.

(FROM A CORRESPONDENT.)

A TRIP to the episcopal city of New Sarum has plenty of archæological interest to recommend it, but little or nothing of the present. A fixed population, pleasant, homely, and sociable, with the surroundings of antiquity, its elegant spired cathedral rising out of a plateau of rich pasturage and water meadows, over which, at eventide, a thick mist may be seen hanging like a cloud—Salisbury, in a word, has all the circumstances of a quiet sequestered city, though sadly deficient in modern improvement. Though very flat, few cities are so badly built as regards regularity of style. Its streets, composed of tiled and gabled houses, present a picturesque mixture, or, as we moderns would say, a jumble of private houses and shops. There is, moreover, a strange admixture of cleanliness and squalor, and an absence of enrvature in the streets that, combined with their flatness, divests them of the picturesqueness noticeable in other cathedral cities. This is, perhaps, partly attributable to the streets being laid out rectangularly, or intersecting each other at right angles. So much for the general aspect. We would urge the necessity of filling-up the water-courses or open brooks that now drain the streets, and substituting an efficient system of sewerage, as such open courses must be detrimental to health by polluting the atmosphere with the sedimentary deposit, and adding to an already humid air. We believe the authorities are doing something in this direction.

Besides the Cathedral, there is little of much architectural interest, though there is plenty of detail of the fourteenth and fifteenth century work to repay sketching here and there. The Poultry Market Cross, hexagonal on plan, is a not very pure example of Late Decorated of Edward III.'s age. The Council House is as heavy and ugly as any of the pseudo-Classic erections of the Georgian era, and in this category may be classed the Infirmary.

The glory of Salisbury, its cathedral, always repays a visit. Externally, we noticed that considerable progress had been made with the western front restoration under Mr. Scott. The niches are being fast re-tenanted, and the sculptor is doing his best to preserve the original character and feeling of their saintly occupants, comprising in all upwards of one hundred statues of apostles, saints, and prelates. New Plymouth marble shafts have replaced the old ones, and we think the capitals to those of the western porches should be thoroughly restored rather than only partially renewing them by leaving some in their former perishable and almost indistinguishable state. Such restoration is to our minds over-conservative. As to the western façade, as a whole it is but a frontispiece—in modern parlance a sham; and had it been erected nowadays would have been deemed intolerable. As our readers probably know, it totally conceals the aisles, and is coped level with the springing of nave roof. The detail of it does much, however, to atone for this defect.

The plinth members, a few years ago in a great measure hidden by the ground, have been brought to light, and a well-paved border, forming a fitting basement, has been laid, with an ample fall outwards to a channel gutter. The noble tower and lofty spire have been thoroughly repaired, as likewise the whole external fabric, and here and there pinnacles and weatherings in new white stone contrast rather markedly with the rich grey brown of the old stonework. Perhaps the finest view of this purest of our mediæval cathedrals is at the north-east entrance of the close, the grouping of the double transept (the plan being that of a double or archiepiscopal cross), and the grand centralising feature—

> The lessening shaft of that aerial spire,

being all that the artist of skyline could possibly demand.

The restoration of the Chapter-house, under the superintendence of Mr. Clutton, is now complete, the central shaft of Purbeck marble restored to its perpendicular, and the whole interior has been most harmoniously treated polychromatically, the original colouring being preserved as nearly as possible. The colours are chastely subdued, no bright or pure colours obtruding. We will resume our notes on another occasion.

HOFFMAN AND LICHT'S METHOD OF BRICKMAKING.

THAT brickmaking is a very ancient business needs hardly to be said. Moreover, the quality of the bricks produced seems to have been deemed an important consideration at an early period, for did not the builders of the Tower of Babel say to each other, "Let us make bricks, and burn them thoroughly?" Thus, although the Egyptian bricks at which the Israelites toiled had apparently been merely baked with straw to give them tenacity, the builders of the earliest times must have made bricks in substantially the same way as they are now made.

A very excellent and scientifically complete mode of brickmaking has just been established (says the *Aberdeen Free Press*) at Ruthrieston, by Messrs. Keith, Harrimann, and Watson, of the Northern Patent Brickworks. The new works are constructed on the principles of Hoffman and Licht's patent annular ovens, only that the kiln—if it may be so called—in place of being built in the form of a circle, has been built in the form of an oval. Let the reader, then, imagine an oval 175ft. in length and about 95ft. wide, as the extreme width. The circumference is formed of something like a small railway tunnel, arched with firebrick, and strongly bottomed with the same. There runs round the whole oval the tunnel, as we have called it, being a chamber about 15ft. wide and 8ft. to 9ft. in height; the outer walls, 10ft. thick at the base, and in which are twelve openings or doors, dividing the whole into as many sectional chambers. Inside the tunnel is another brick wall, or rather double wall, filled with earth in the middle, with smoke chambers, and a number of flues pointing towards the centre of the oval, from which rises the chimney stalk, 175ft. high. In the tunnel we have described the bricks are burnt. As we have said, the tunnel is divided into twelve chambers. Each of these is capable of containing 15,000 bricks, representing a day's produce of the ovens. The *modus operandi* is this:—In place of only one apartment or chamber being filled at a time the whole are filled, save one, which is being emptied of the burnt bricks, and another next to it, which is being simultaneously filled with "green" bricks, the fire being meanwhile kept up in only one chamber. But it is here that the special value of the patent oven is seen, for while the fire is led round from one chamber to another, feeding coal through a series of small metal-covered holes in the crown of the arch (the whole of the chambers being hermetically closed up to the one that is being emptied, which is shut off at the end nearest the fire by an iron door), the hot air and flame, finding no other means of escape, go forward into the chambers in advance of the fire, gradually heating up the wet bricks. Nor is this all, because the cold air that comes in where bricks are being emptied must pass through a series of chambers in which the bricks burnt on four or five days preceding are cooling. It touches, first, a chamber of nearly cooled bricks; next, one burnt a day later, which is considerably hotter; then another, hotter still, till by the time it reaches the fire it is quite at the point of combustion, carrying forward the flame in waving lines among the interstices of the burnt bricks. There is thus secured the utmost possible economy of heat, and at the same time any smoke evolved is thoroughly consumed, the only "visible emanation" from the top of the chimney stalk being a little steam off the green bricks when they begin to feel the influence of the heat. The economy in fuel which is secured by these means is of course obvious, while the scientific principles on which the power of the fire is concentrated enable the cheapest coal dross to be used in firing. All these arrangements will materially cheapen the price of bricks.

CORNISH CHURCHES.

IN a paper sent to the "Archæological Journal," in 1854, by Mr. J. J Rogers, of Penrose, it was stated that in Mawgan Grade, Cury, and Landewednack parish churches were low side windows called lynchnoscopes, "at the south-east angle of junction of transept with chancel." At Wendron Church, says a correspondent of a Cornish paper, was one in the north wall of the chancel, and somewhat removed from the angle of the transept. Mr. Rogers deemed the date of these lynchnoscopes to have been shortly before the Reformation, and that it was difficult to determine their utility with certainty. It appears that the east chancel windows of Mawgan and Wendron churches are similar, and that they date from the middle of the fourteenth century. At St. Helen's, Hangleton, in Sussex, wrote Mr. Rogers, is a south low window, like that in St. Wendron Church, 5ft. by 13in.; that at Wendron is 3ft. 9in. by 11in. Probably all were contemporaneous, and not part of the original plan of the church. A writer in the eighteenth volume of the "Archæological Journal" deemed it to be probable "that the characteristic features of Cornish and Devonian churches—the absence of any constructional distinction between nave and chancel—is traceable to the primitive arrangement of the old Cornubian oratory, that of a double square without break. Even the church of St. Gwithian is not really an exception to the general rule. Padstow Church was rebuilt in the fourteenth century, but some parts may be traced to an earlier period. The font and piscina are engraved in "Lyson's Cornwall," and show respectively the

twelve apostles and the patron saint. In the "Gentleman's Magazine," 1781, p.305, it was stated that the north aisle of Cornish churches was not used generally. A field, generally glebe land, was near the church or cemetery, called the "sentry," as that near Canterbury Cathedral, being Cemetery Gate, is called "Sentry Gate." As to cemeteries, Mr. W. Cotton, in his "Illustrations of Stone Circles and the other Remains of the Aboriginal Britons in West Cornwall," 1826, stated that in Cornwall and elsewhere, are kist-vaens, an enclosed area, the size of a human body set up in the ground, which enclosed dead bones. The cromlech is a kistvaen of larger side stones, covered with a mass of magnitude on the top, as the cromlechs of Molfra and Chun. Mr. Cotton referred to the fourteenth volume of "Archæologia," where the Lanyon cromlech was described "with human bones," which left no doubt of its having been on an ancient sepulchre. In the "Encyclopædia of Antiquities," vol. II., page 508, the kistvaen is stated to be "for the reception of corpses." When covered with earth or stones it was a cairn. When the destructive fire occurred at St. Hilary's Church, near Penzance, the tower was preserved, where in 1853 a Roman stone was discovered. It was built into the wall, and was inscribed to the Emperor Constans (A.D. 337-350), or to Constantius II., his successor.

NEW DRAINAGE AND WATER WORKS AT BEDFORD.

ON Friday, the 11th inst., these works were officially inspected. The water is obtained from an artesian well, which is driven through a bed of very close-grained, compact limestone. On the excavation attaining a depth of 25ft., several large fissures in the rock were met with, from which strong jets of water bubbled up, and from that moment the supply has continued at the rate of 200,000 gallons in the twenty-four hours. The storage well is 60ft. long, 18ft. wide, and 25ft. deep; with this is connected a pumping well by a heading 60ft long and 6ft. wide. For raising the water there is erected a perpendicular plunger, worked by an engine of 40-horse power. This engine will pump 30,000 gallons per hour. The perpendicular lift of the water from the well to the reservoir on Foster's Hill is 150ft. The reservoir is cut out of the dense boulder clay which forms the eastern ridge of the Ouse Valley, and as the top water in it stands 140ft. above the average level of the town of Bedford there is pressure sufficient to throw a jet to the top of the highest building. The tank is 64ft. long and 60ft. wide, and contains 15ft. 6in. of water, giving an available supply (in round numbers) of 400,000 gallons of water, double the quantity at present required for a day's consumption. The reservoir is covered by a roof, supported on iron columns. Near the reservoir, on Foster's Hill, is the highest portion of the system of sewerage, and the contiguity of the waterworks is a great advantage, as the whole system of drains throughout the town can be completely flushed at any moment with the greatest ease. Bedford, from the peculiarity of its situation, has been more than once described as a town not capable of being entirely drained, but Mr. Lawson, the engineer, made the most minute surveys, and his drawings sent in to the Local Board included sections of every street and site likely to be brought into connection with the sewerage operations at any future time. There are thirteen miles of main sewers, all straight, and capable of being seen through from the manholes when inspection is needed. There are two levels in the system, but they come to one outfall, provision being made in the upper level for conveying sudden overflows of storm water into the river. The main sewer on the north side is brought to the left bank of the river, and passes along the margin, the surface being utilised as an embanked promenade, 25ft. wide. In the suburb of Waterloo the main sewer of the south side of the town is brought under the river by a tube, joining the main under the embankment, which is continued by the side of the river for three-quarters of a mile, until Newnham is reached. Here, a tank has been constructed for the reception of the sewage. From this tank it is lifted by centrifugal pumps, worked by 12-horse engines to the "lift," whence it passes by gravitation to a field of 54 acres, where it is distributed. Mr. John Lawson, C.E., was the engineer, Mr. J. Lund the clerk of works, and Mr. L. B. Moore the contractor.

ART SCHOOLS IN PARIS.

IN the year 1851 the following establishments for instruction in drawing and the decorative arts existed in Paris:—The Impèrial Mathematical and Drawing School (Ecole Impèriale de Dessin et de Mathématiques); the Free School of Design for Young Girls; five schools aided by the city of Paris, of which two were female schools; and seventeen courses of instruction in drawing attached to the adult classes. At this date the sum set apart annually by the municipality of Paris for art education only amounted to 39,000f.

Since the year 1851, both the number of schools and the grants in aid have very largely increased. This increase is, in great part, due to the reports of the French jurors at the Exhibition of 1862, who were loud in praising the great advance made by England in design and decoration since the development of her art schools, and who did not hesitate to express an opinion that much must be done in France to enable her to keep her place in the front rank of industrial art. An establishment for advanced instruction in art for men is now in course of being formed.

It is proposed:—

1. To create a museum and library of applied art, consisting of objects presented or lent for a certain period; the collection to be continually augmented by specimens, models, or photographs of all the art-products manufactured in France.

2. To found a superior and central normal school of industrial art.

3. To organise special exhibitions of designs and works of art, with competitive prizes.

A portion of this programme has already been carried into execution by the Central Society of Applied Art (Union Centrale des Beaux Arts Appliqués). This society is already favourably known by its periodical exhibitions at the Palais de l'Industrie, and of works of art of different epochs. The last of these exhibitions was enriched by many objects lent by celebrated collectors, and was very numerously attended. The project of a museum and library, to be opened in a room in the Place Royale, is still in embryo; but the normal school is in course of being organised, and, by special permission of the Minister of Public Instruction, it is to have the title of college—"Collège des Beaux-Arts Appliqués à l'Industrie."

ST. PANCRAS WATER SUPPLY.

THE oldest waterworks in the metropolis, says the *Marylebone Mercury*, are said to be those connected with the Highgate Ponds, which supplied the City of London before the New River was formed, and which were in the possession of the Hampstead Waterworks Company until a few years ago, when that company was bought up by the great New River Company. The water from these ponds is still supplied for non-domestic purposes to the districts extending as far as King's Cross, and during the present season numerous complaints have been made to the vestry of the stinking water thrown on the public roads. Dr. Hillier, Medical Officer of Health, has also reported to the vestry as to these ponds, representing that they received a certain amount of house drainage, and that there is an iron pipe entering one of the upper ponds which brings foul water, and apparently house drainage. The drainage of the upper part of Kentish Town, both east and west of Kentish Town-road, is certainly very unsatisfactory, and urgently requires the serious attention of the vestry. Mr. Rouch, the Sanitary Inspector, has also reported that he found a flow of sewage water into pond No. 4, from an iron pipe laid into the pond from Fitzroy Park Dairy, and an accumulation of black filth where the down pipe discharged into the pond. On representations being made to the New River Company as to the state of the ponds, a letter was received from the secretary, stating that "the New River Company have received a serious complaint of the foul state of one of the Highgate ponds, near Milford-lane. Our engineer, on several occasions, has represented to your surveyor the necessity of action to abate this nuisance, who intimated that a committee of his vestry had inspected the affected locality with a view to apply some remedy, still nothing has yet been done. I am, therefore, desired strongly to urge the necessity for your constructing drains to intercept the sewage, which has now become intolerable to the neighbourhood, and prejudicially affects the quality of water used by the company for ordinary non-domestic purposes." The vestry, having referred the matter to the Committee of Works, that committee, accompanied by Mr. Scott, the chief surveyor, has made a careful inspection of the locality, and it has been clearly ascertained that sewage has been brought into the pond in considerable quantities. The matter is now under further consideration by the Works Department. The New River Company state that the water from these ponds is used for "ordinary non-domestic purposes," but the officers of the vestry have proof that either filtered water or this impure water can be turned on at the pleasure of the company.

VILLAGE WATER SUPPLY.

IF anything were needed to impress more deeply on the public mind the necessity of a plentiful supply of water and the hardship consequent on its scarcity the protracted drought of the last summer must have had the due effect—at any rate upon the minds of country residents. In large cities the evil has not been so much felt, although many of the provincial towns—Liverpool and Sheffield to wit—have been obliged to diminish their accustomed supplies in order to prevent total exhaustion. In country districts the condition of things has been bad indeed. From day to day we read in the daily journals of many weary miles over which farm stock had to be driven to obtain water; and in many villages the inhabitants were paying for the precious fluid at the rate of ½d. and 1d. per pail. To remedy this Mr. J. Bailey Denton makes this week, in the *Daily News*, several valuable suggestions applicable to different districts. He first proposes to render it compulsory on all owners of cottages in villages to provide, by the construction of tanks, as much soft water as the roofs will furnish. By the Sanitary Act of last session all owners of cottages are obliged to supply privies and ashpits properly secured, and there is no reason why this compulsory provision should not be extended to water tanks. For purposes of drinking a different supply is necessary, and in seasons of drought, like that which has just passed, the tanks of course will fail. To meet this state of things, it must be made compulsory on the vestry or sewer authority to have in reserve a sufficient supply. The practical effect of these compulsory provisions will be to secure, in many instances, one copious and constant supply for all purposes through the sole agency of the sewer authority, as the cheaper and better source.

The storage of roof-water by underground tanks will in some years provide all the soft water required, and in many districts throughout the old and new red sandstone, the Bagshot sand and the postertiary drifts, a shallow well and ordinary pump, costing between £15 and £20, will often serve a whole village under all circumstances. Where such a shallow well will suffice, Norton's Abyssinian pumps may frequently be adopted. They will cost less money, and where a village is straggling, or of any great extent, they may be multiplied with great advantage. In other cases, where constantly running streams are not far distant, they may be turned to use by the application of the motive power they afford to raise water to tanks on higher ground; or the surplus flow of those streams in winter may be collected and dammed up for summer use.

But these facilities of obtaining water do not extend over the whole country. On the contrary, about one-third of the rural population must resort to the storage of the winter's excess of rainfall if they are to have a constant supply through the summer. This is the case with a large proportion of the flat lands of Lincolnshire, Huntingdonshire, and Cambridgeshire, as well as those that exist on the east of Lancashire, and in Somersetshire, Kent, and Essex, and of those high grounds which distinguish the porous chalks and oolites, and the clays overlying them. The "fog ponds" of Wiltshire afford us a lesson of how wonderfully nature will assist art where man does his best to help himself, and to provide for the animals dependent upon him. Some of these ponds existing on the tops of the chalk hills are known not to have failed throughout the whole of the dry summer just passed, although they have served with water many hundred sheep during the whole period of drought.

We know how little the rain has helped to maintain the supply of these ponds, and that they must, therefore, have been replenished insensibly and wholly by the hygrometric condi-

tion of the atmosphere. On the porous chalk and oolites the use of "fog ponds" may readily be extended to the supply of villages as well as cattle and sheep. We have only to study more closely than we have hitherto done the data Nature has afforded. In clay districts, recourse must be had to the storage during winter of either the surface rain water or the discharge of under drainage. The minimum quantity obtainable from the latter source will be at least 2½in., or 60,000 gallons per acre, for every acre made tributary to the supply. If, therefore, we seek to supply a village of 100 dwellings and 500 inhabitants, and assume that it is necessary that each person should have ten gallons of water per diem for 120 days, and that an allowance of 50 per cent. must be made for waste by evaporation or otherwise, it will be necessary to store 900,000 gallons to satisfy the case. Thus the minimum drainage discharge of fifteen acres will suffice; and a reservoir of half an acre in extent, 7½ft. deep, will hold the requisite quantity.

The cost under ordinary circumstances, including delivery by stand pipes, for public use in the village, would vary from 3d. to 1s. per person per annum, where the cost is reduced to an annual charge on the properties forming the village, assuming that the money to pay for it is borrowed by the sewer authorities, and repaid by instalments in thirty years at 6 per cent. In considering that each inhabitant requires ten gallons a day during the summer, Mr. Bailey Denton considers he has taken an extravagant quantity. It will be advisable, nevertheless, to provide a superabundance, in the hope that with increasing intelligence, and under the influence of sanitary examples, the use of water in villages will be largely increased.

RELIGIOUS ART IN THE NINETEENTH CENTURY.

WHY should religious painting be now extinct throughout Europe, is a question often asked, and the reasons given in reply are more numerous than satisfactory. The vital spirit being fled, the body of art, it is said, lies dead. On the other hand, we are met by two facts—first, that the world is still able to produce much good art; and secondly, that religious communities both in England and abroad give many practical proofs of the possession of true religion. The misfortune would seem to be that the good art and the true religion cannot be brought together. Thus "religious art" seems to be in abeyance partly because religious people deem themselves too good to care about art, and partly because painters are too exclusively artistic to give much heed to religion.

What the world wants, said Dr. Arnold, is not so much positive religious writings as secular works animated by a religious spirit. And this perhaps, after all, is the want in art. The problem between the Church and the world, which many earnest minds are seeking to solve—how to make religion practical and the world godly—may possibly involve the causes and the remedies for that breakdown in art which certainly is an unhappy anomaly in the existing phase of our civilization. Religious art is now severed from the world's life, and it seems vain to look for revival save through a recurrence once more to what is actual and real. Painters of old were able to take a man from the streets and put him upon canvas as a prophet. Thus Raffaelle, seeing a simple mother and child seated in the public way, seized the top of a cask as nearest to hand, and sketched on the very spot the circular composition now know in the Pitti Gallery as "La Madonna della Sedia." So with our artists; if, instead of vainly striving to emulate Fra Angelico, they would paint religion as she walks through the world, and mark the visible signs of duty and devotion in daily life, works might be produced which should come home to the experience of the people. This line of reasoning makes Overbeck, with the entire school of so-called Christian art in Germany, a warning rather than an example. Such modern revivals stand as anachronisms in the nineteenth century—pale shadows and false shows. Nothing, indeed, can be more certain than that, in all vital creations in sacred art, no abrupt transition is found from secular to sacred, no impassable barrier raised between the world and the Church. As to architecture, we know that the people passed at once from pointed doors in the houses where they dwelt to pointed porches and vaulted roofs in the churches where they worshipped; no invidious distinction was made between the mart for merchandise and the church for prayer. In fact, in all countries, and under all creeds, the law under which an earnest and true art has been developed appears to have been similar. Thus, in Egypt we find no essential difference between the palaces, the temples, and the tombs; the same art, in architecture, sculpture, and painting, encircled the people at their feasts, their festivals, and their funerals. So it was in Assyria and Greece. Religious art drew vitality from the life of the people; noblest form and action in grove or temple was modelled in the clay, and the people who walked the streets of Athens found, through sculpture, apotheosis on the pediments of the Parthenon. Even hostile religions may come into accord through art. St. Paul, while standing on Mars Hill, could see the figures of Phidias as they looked down from the Acropolis; and now these marbles from Minerva's Temple, and the cartoon of the Apostle preaching to the people of Athens, brought almost side by side in the same metropolis, seem to show that art, when noble and true, is almost of necessity religious. A spirit solemn and silent presides over the Elgin Marbles, and many minds will feel that the Theseus of Phidias has at least equal religion with Thorwaldsen's figure of Christ. The platitude then may be once more permitted, that the condition for the birth of every religious school, whether classic, mediæval, or modern, seems always the same; the religion and the art must hold together closely, must be knit compactly as in unity of organic life, and, above all, must not be bound down to obsolete tradition and vague abstraction.

Yet it were rash to assert that religious art, worthy of the name, can in any age of the world be readily obtained; otherwise Europe would scarcely have remained without it for the last three centuries. We would say, indeed, even at the risk of paradox, that one difficulty, especially of late, has been that the proximity between art and nature on which we have insisted has been made even too close. In fact, to gain proximity to actual life and yet to preserve distance, to stand on the common level and yet to rise to an elevation, involve some of the chief difficulties in the settlement of a sound religious style. The German modern school and the English school, if we have one, err in fact in opposite directions; if the one may be designated sublimated spirit, the other assuredly is too substantial flesh. Such pictures, for example, as Mr. Holman Hunt's "Christ and the Doctors," and Mr. Madox Brown's "Patriarch Jacob," however admirable otherwise, are too near to common nature. The "Doctors" in the Temple, though picked up, we believe, in modern Jerusalem, might equally well have been taken from some of the Twelve Tribes that dwell in the Minories. In aspect they have not the calling of prophecy, but only the trade of old clothes. It must be admitted that some of our would-be religious painters treat nature with a familiarity which breeds contempt. Coleridge said that a picture ought to rise to an intermediate something between a thought and a thing. Mr. Herbert's "Moses" in the Houses of Parliament, and certain of the Legislators painted by Mr. Watts in Lincoln's Inn, may attain to the desired abstraction without loss of the required individuality and reality. The old painters, at any rate, had a faculty for drawing near to nature, while rising above her. Saints portrayed by the old masters are men, and something more; prophets and apostles standing in Italian pictures bear not the aspect of mere ordinary men or every-day acquaintances with whom we may shake hands and chat; they inspire awe rather than invite to familiarity, for they seem to have held converse with the skies. Yet it becomes a question worth the inquiry of those who may seek a style consonant with religion, how far this elevation of spirit which has been termed supernatural is beyond or contrary to nature. The better opinion would seem to be that the so-called supernatural or spiritual principle in art is but a higher aspect of nature, that the storehouse of creation contains materials more than sufficient for the artist, however transcendental may be his aim. Thus it would appear that the office of the painter is chiefly to select. Still something more nearly approaching to a mental function is needed than the "pre-Raffaelite" operation of penny-a-lining. What is mainly required is such study as shall lead to the clear understanding of nature's meaning, to the distinction between essentials and accidentals, to the discrimination of the difference between generic forms and individual detail. The subject is far too large to admit of elucidation within small compass. It may, however, be added that in these studies help may be found in Oersted's Essays, which treat of the philosophy of nature; also in German authors who descant and dream on æsthetics; likewise in the discourses of Reynolds under the head of general ideas. The practical lesson to be learnt from such inquiries seems to be that the religious painter of the present day must do something more than copy the individual model before him. In London we knew a model who was accustomed to personate the Apostles, and we have encountered in the streets of a provincial town an old man who, following the calling of a common porter during the day, sat by night before the students of the Academy as St. Peter. And what was the result? Why, of course, the studies made were after all nothing better than the realistic figures painted by that Neapolitan school of Naturalisti who mistook lazzaroni for Apostles. The English porter looked upon canvas the porter still, notwithstanding a beard worthy of St. Peter.

The preceding thoughts may be put into another form; thus it may be said that nature, before she takes her place in a religious composition, requires what artists in general call "treatment," and what Reynolds signified by "style"—that is, a style and treatment in keeping with the subject-matter. We have seen how Phidias, a pagan, rose to religious expression; and, under a very different guise, Gothic carvers in our venerable cathedrals fashioned a true Christian art; they reached, through stiffness, solemnity; through restraint, a repose and dignity not far from religious. As usual, our modern revivalists seize defiantly on defects, and thus certain manifestations of religious art in the present day—for instance, painted windows and carved doorways to modern Gothic churches—though commendable in motive, are hard as petrifactions, and lifeless as fossils of extinct species. The treatment which nature calls for at the hands of art may find illustration through literature, whether sacred or profane. In the transition, for instance, from prose to poetry, nature has to be thrown into artistic form; she has to be dressed for the occasion; the thoughts must be cast into rhythm and symmetry, and the stanza, when settled, encloses, as it were, the imago within a frame. More express illustration may be found in the sphere of religious poetry, and especially in the poetic parts of the Bible. It is not easy to define, either here or in sacred art, wherein consists the religious style or treatment. Sometimes it may lie in a stately roll of periods, sometimes also in a certain severity of manner, generally in simplicity, often in repose, and certainly usually in humility rather than in ostentation. Most easy, however, is it to tell, either in a written or a painted composition, when all goes right, and it is equally soon felt when anything is wrong; for even an inapt word or metaphor, or an ill-placed line, may at once break the spell, and sink what might otherwise be sublime into the ridiculous. The Psalms, Isaiah, the Book of Job, afford illustration, at least indirectly, of the treatment which religious art calls for. Even the translators of our Bible were religious artists in the best sense of the word; no such artists are now found to work on paper or on canvas.

We have already said that one reason why religious art in the nineteenth century has been a failure is that it does not belong to the century; that is, it ceases to reflect the Christianity by which men now live and die. It must be admitted, indeed, that some of the older phases of our faith were more pictorial than the present forms. There was a breadth, simplicity, picturesqueness, and, as it were, a colour of emotion, in early popular belief, which is now wanting. When teachers spake in parables, church walls were covered with sacred panoramas, for an artist can paint a parable, but not a creed. Still, means of revival might possibly be found if, for example, as already indicated, art could assume somewhat of an ideal realism, if the characters portrayed could reach to high mental types, if the subjects chosen embodied the best thoughts current in the age; if, as in days of old, we could make our art a thank-offering of what was rich and rare in our substance. At all events, any man possessing genius for the new work would doubtless find some new mode of utterance scarcely inferior to the old.—*Saturday Review.*

A committee has been formed at Swindon for the establishment of a school of art there.

CONCRETE STABLES.

To the Editor of the BUILDING NEWS.

SIR,—The annexed plan and elevation of stable buildings, with enclosed stable yard, house, &c., for poultry, recently built about twenty miles from London, with walls of concrete, and fireproof floors to rooms above, may be of interest to many of your readers as showing the comparison in cost of walls of brick *versus* walls of Portland cement concrete.

The building is 45ft. 6in long, 16ft. 6in. wide, and 16ft. high to roof, comprising two-stall stable with loose box 2ft by 15ft., divided from the harness room by a 9-inch wall, coach house 14ft. by 15ft., divided also from the harness room by a 14in. wall carried up through the roof and forming the chimney stack.

The rooms above are a loft over stable 29ft. by 15ft., with outside door at gable end, and door from roof over harness room, gardener's room over coach house, with entrance door at gable and outside approach step ladder with rails.

The stable yard is 40ft. by 21ft., a portion is devoted to three rooms for fowls, communicating with three feeding yards outside, with roof over, and in juxtaposition with three separate and one large exercising yard, with sides and top enclosed by galvanised wire.

The stable buildings, with walls of 9in. or one brick in thickness, and proper footings in 1½ bricks, would absorb 31,500 bricks, viz., about 7 rods of reduced brickwork, according to the London standard of 272ft. super of 1 brick to a rod; say, cost of bricks delivered at 30s. per 1,000, £6 15s. per rod; ditto lime and sand, labour and scaffolding, £3 10s.: total cost per rod, £10 5s. This will show for the 7 rods the sum of £71 15s, and, with the bricks at 40s. per 1,000, £87 10s. The walls contain 2,660ft super of 9in. concrete, and where the materials for making the concrete—viz., the stones, gravel, sand, or brick ballast can be delivered at a moderate price, the cost would be from 2s. to 2s. 6d. per yard super—say 2s. 3d. This will give the cost of walls £33 6s., with the advantages of a wall material impervious to moisture, and of strength equal to granite.

There are many localities in which the external walls should be 1½ brick thick, to keep out the damp, thus adding one-third more to brick walls.

Should it be desirable to stucco the outside of the walls with Portland cement and jointed, the cost would be 4d. per yard super to stable buildings—2 6 yards, £4 19s.—requiring only a thin skin of one of cement to four parts of sand.

By forming rebates in the thickness of the walls, and inserting dove-tailed wood blocks, or iron hooks, to receive the hinges and fastenings, door frames of wood are dispensed with.

The wall between coach house and harness room is 14in. thick. The chimneys, with their gathering throats to lead into the circular flues, require no projecting breast. A space is left at the back of the range in the harness room to send warm air into the coach house.

The entire floor throughout the stables, &c., is finished with a coat of Portland cement on a bed of concrete, at a cost of 3s. per square yard—£10 10s.

The floor above is fireproof, formed by 12 iron joists, 16ft. long, £8; 15 segmental corrugated galvanised panels, £17; Portland cement finish on concrete, £7; total, £32. The corrugated panels, as above, are an unnecessary expense; they look well, but level panels of concrete or segmental would look as well.

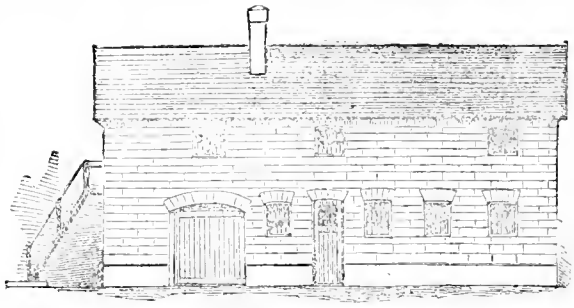
It would be occupying too much of your valuable space to go into other details, such as the slate roof with the wood framing to receive the same; also the fittings to stable in the stall divisions, or fittings of manger, racks, &c. Over the head of each stall a square of stout fluted glass is placed near the ceiling 2ft. by 1ft. 6in. to give additional light for the horse to be accustomed to. All the windows are of iron, and hang on centres; those below are two in height. In the stable lobby is fixed the pump, with sink; over the same is a cistern, with a supply pipe to coach house. The coach house door and entrance gates are not made folding, as when so made they are very inconvenient in windy weather.

The economy of concrete for walls, when bricks are 30s. per thousand, equals a saving of more than half. It is admirably adapted for farm buildings, such as stables, cattle sheds, &c., and block model dwellings in cities and towns, being approved by the Metropolitan Board of Works as suitable for all kinds of dwellings. Block buildings, decent and healthy, may be provided in the country so as to let rooms from 6d. per room per week, and in cities from 9d. per room per week.

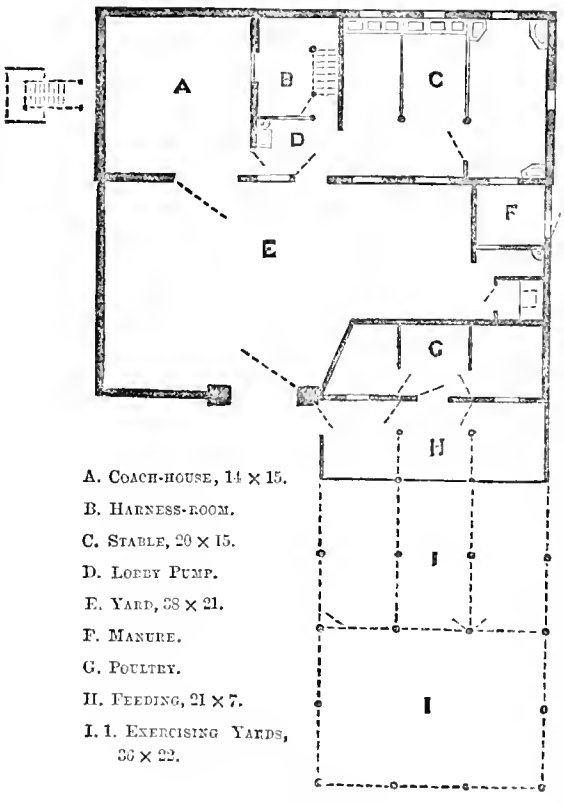
24, High street, Marylebone. PETER THOMPSON.

Total Cost of Coach House, Stable, Harness Room, with three rooms over, viz., Loft with iron corn bin, Groom's and Gardener's Rooms.

	£	s.	d.
To excavate for foundations and manure pit, and concrete walls	36	0	0
To floor to stable, coach house, harness room, and finished Portland cement on concrete	10	16	0
To iron surface drains to stalls, with iron traps to glazed drain pipes to manure pit, and drain from sink in lobby	5	10	0
To fireproof floor, iron joists, with segmental galvanised corrugated iron and concrete, finished with Portland cement	27	10	0
To framed wood roof, with gable boards	11	15	0
To countess slating on battens, with slate ridge roll	21	16	0
To metal gutters and down pipes	3	15	0
To iron posts and rails, with tongued boards to stalls, and framed door to loose box, with brass flush fastenings	16	10	0
To iron mangers, racks, &c., as fittings	10	18	0
To seven iron windows, and ventilating bricks	7	6	0
To glass to ditto, and in lobby glazed	3	19	0
To stairs, shelves, rails, and doors to harness room	6	10	0
To saddle and collar brackets, harness pads, hooks, &c.	3	10	0
To 3-inch coach-house door with weighty hinges, to framed door to stable with brass flush fastenings, and two outside doors to rooms over and step-ladder	14	16	0
To iron corn bin in loft with down pipe measure	6	10	0
To plastering walls and ceilings	24	16	0
To staining wood and varnishing, painting iron	11	19	0
To a lift pump (not including a well) a sink with cistern above, and service pipe to coach house	12	16	0
To a range with boiler in harness room and two cottage stoves in rooms over	4	15	0
	£240	9	0



ELEVATION OF STABLE, &c.



A. COACH-HOUSE, 14 × 15.
B. HARNESS-ROOM.
C. STABLE, 20 × 15.
D. LOBBY PUMP.
E. YARD, 38 × 21.
F. MANURE.
G. POULTRY.
H. FEEDING, 21 × 7.
I. I. EXERCISING YARDS, 36 × 22.

PLAN OF STABLING, &c.

ARCHÆOLOGY.

ON Saturday week, as the ironstone diggers on Mr. E. Jones's farm at Wellingborough, were excavating, they came upon a well, which, on being emptied of the thick water, was found to contain (besides bones of what seem to have been deer, &c.,) the remains of several Roman urns. One of them is perfect, and one a very large unburnt one, with a piece broken out of its side; when whole the shape must have been handsome. They are in the possession of Mr Cramp, the overseer of the works. The well is neatly lined with limestone, and has a sloped bottom. From the above description it appears that this is one of the so-called "sacrificial wells," several examples of which have been found in Oxfordshire, Stone in Bucks, Biddenham and Sewell in Beds., &c. One theory is that these were kept for the deposit of the remains of sacrifices and other objects held in veneration.

Recently, the excavators employed on the new West Dock Works, Hull, when digging just where the outlet of the limekiln used to be, about 16ft. below the surface, turned up a hard lump, which, on examination, proved to be some hundreds of small silver coins—halfpennies of the reign of King Edward I. When first discovered the coins looked quite fresh, but on exposure to the air, they changed to a yellowish tint. Some of them appear to be counterfeit, and others are a mixture of silver and copper; a few are doubled. The soil in which the coins were found was an amalgam of warp and gravel, and the spot where they were digging up appears to have formerly been the boat channel near the mouth of the River Hull, previous to the warping up as narrated by old historians, and prior to the time it was diverted into its present outlet through Sayer's Creek, the harbour of the present day. Another interesting discovery has been made in connection with the works now in progress for the Dock Company. In clearing away for the foundation stone of the new dock offices, near the Wilberforce monument, a portion of the old moat, which formerly surrounded the town, and of a brick arch connected with the historical Beverley Gate, were brought to light.

WATER SUPPLY AND SANITARY MATTERS.

A CONFERENCE of three Local Boards at Leamington has decided to unite the three parishes for sewage purposes. It was also decided in favour of irrigation, in consequence of the failure of the lime deodorising process, and the threatened injunctions against the pollution of the river by a sewage outfall. 400 acres are said to be necessary for irrigation purposes, and the works will cost about £40,000.

Building Intelligence.

CHURCHES AND CHAPELS.

The new church of St Clement's, Leeds, was consecrated yesterday week. The plan consists of nave, north and south aisles, apsidal chancel, with organ chamber and vestry. A tower at the south-east angle rises to a height of 122ft. The nave is 88ft. long by 29ft. 6in. wide. The cost of the church is about £8,000. Mr. George Corson, of Leeds, was the architect.

On Tuesday week a new church was opened at Treherbert, Rhondda Valley, Glamorganshire. The building is in the Early English style, and comprises nave, north and south aisles, chancel, and north chancel aisle. Local stone is used for the exterior, with Bath stone dressings, and the interior is of red and white bricks. A "saddle back" tower, 80ft. high, will complete the edifice. Mr. C. Buckeridge, of London and Oxford, is the architect.

The parish church of Norton, Radnorshire, was reopened on the 10th inst., after restoration. The style of the building is Early English, the plan consisting simply of a nave parted at the east end by a rood screen to form a chancel. The whole of the interior has been restored, and a small transept let in by means of low turned pointed arches. The building has also been entirely re-seated. The cost of the work was £2,200. Mr. G. G. Scott, of London, was the architect, and Mr. Coleman, of Claxhill, near Gloucester, the builder.

A new Free Church was opened at Gilcomston, Aberdeen, on Sunday week. The style is Early Decorated, the walls being of hammer-blocked granite, with freestone dressings. The tower and spire, when complete, will attain a height of 145ft. At the south-east corner is an octagonal tower, 75ft. high. Exteriorly, the church is divided by buttresses into six bays, a triplet window in each bay affording light to the interior. The internal length, exclusive of vestibule, is 80ft., and the width 54ft. 6in. The height from floor to apex of roof (which is open-timbered) is 47ft. A gallery runs round three sides of the building. Sittings are provided for 1,200 persons. The building is from designs by Mr. Smith, city architect. The cost has been £4,786 13s. To complete the spire £1,000 more is required.

On Saturday last the foundation stone of a new Roman Catholic Church was laid at Great Ancoats, near Liverpool. The style of the building, which is dedicated to St. Michael, is Early English, and the plan consists of nave, aisles, chancel, lady chapel, and sacristy. The length will be 87ft., the breadth 61ft., and the height of bell turret 71ft. 6in. Accommodation will be provided for 1,000 persons. Mr. W. Nicholson, of Liverpool, is the architect.

The inhabitants of Yoxford, Suffolk, have determined to re-seat and otherwise improve the interior of the parish church. The building, which is in the Perpendicular style, was considerably enlarged and restored about thirty years ago, at a cost of £12,000, and 430 additional seats were then provided. It has now been determined to take down the old-fashioned pews and to replace them with open benches.

The new church at Houghton, Notts, erected from the design of Mr. James Fowler, of Louth, by Mr. Hopkinson, builder, of Retford, was formally opened on the 15th inst.

The parish church of Llechgynfarwy, Anglesey, which is dedicated to St. Cynfarwy, was reopened for Divine service on August 21, after having been rebuilt almost from the foundations. The style is Late Decorated, or Second Pointed. The church is seated for 105 worshippers, and is fitted up with open seats, which are lightly stained and varnished, as are all the internal fittings. The plans, &c., were prepared by Messrs. Kennedy and O'Donoghue, architects, of Bangor, and Albion-chambers, 11, Adam-street, Adelphi, London, and the work carried out under their supervision.

The foundation stone of a new Presbyterian Church at Portadown was laid on the 8th inst. by the Duke of Manchester. The church will be in the Gothic style, and will present a neat front to the Armagh road. The material to be used for walling will be the black or whinstone of the locality, with Dungannon freestone dressings to doors, windows, buttresses, &c. Accommodation will be provided for about 300 persons. Messrs. Boyd and Batt, Belfast, are the architects, and Mr. John Cullen, Portadown, the contractor.

The new parish church of Holmpatrick, near Skerries, Co. Dublin, was consecrated on the 2nd inst. by the Archbishop of Dublin. It is in the Gothic style. The material is limestone from the Milverton quarries. Mr. James Rogers was the architect, and Mr. Walter Doolin the builder.

St. Wilfrid's Church, Alford, Lincolnshire, was reopened on Thursday last, after undergoing enlargement and restoration. The plan of the church comprises a nave 59ft. long by 20ft. wide, divided into four bays by arcades of octagonal columns and deeply moulded arches, having north and south aisles 9ft. wide, and a new north aisle 16½ft. wide. The chancel is 44ft. deep by 20ft. wide. A massive tower stands at the west end of the nave, 17ft. square within. The entire length of the church is 125ft. 6in.; width, 62ft. There is a large porch on the south side, with vestry above for choristers, &c. The style adopted is that of the thirteenth century, or Second Pointed, the windows and other details being as nearly as can be ascertained of the date of the original church. The arches of the nave and chancel are richly moulded, having foliated capitals and moulded bases. The tracery in the chancel windows is to be filled in with the remnants of the old stained glass. The roofs are open, high-pitched, and stained and varnished. The chancel roof is of stained oak, and of the waggon-head shape. The old rood screen at the entrance to the chancel is to be repaired and retained. The seats are all open, of pale oak, with carved ends. The middle aisle is flagged with ancient tombstones, and the other aisles are paved with red and black unglazed tiles, from Godwin's works at Lugwardine, near Hereford. The windows are glazed with pale green cathedral glass, and the roofs are covered with pale Westmoreland slates, having moulded stone ridges. The wrought-iron hinges to doors and the gas pendants, &c., are from the works of Messrs. Peard and Jackson, of High Holborn. The new organ, by Forster and Andrews, of Hull, has cost £400. At the eastern end of the south aisle there is a piscina, with shelf, and at the east end of the north aisle there is an aumbrey, and several steps formerly leading over the rood screen. There is also a hagioscope or squint, to enable those sitting in the north aisle to see the east end of the chancel. The dark green sandstone used is from the quarries at Welby, the light stone for the angles, mullions, &c., being from Ancaster. The new gurgoyles and beads on the corbel stones have been carved by Messrs. Ruddock, of London. Sittings are provided for 600 persons. Mr. G. G. Scott is the architect, and Messrs. Hasnip and White, of Alford, the contractors. The total cost of the restoration and enlargement has been £6,200.

BUILDINGS.

On Friday last, the foundation stone of a new building intended to take the place of the well-known old Whitfield's Tabernacle, in Moorfields, was laid by Mr. J. Remington Mills, M.P. There was a large attendance of the leading Nonconformist ministers.

At the last meeting of the Marylebone Board of Guardians plans for extensive alterations at the workhouse were submitted by the architect. The plan adopted (subject to the approval of the Poor Law Board) provides increased accommodation for 100 inmates, at a cost of £2,500, 750 cubic feet of space being allotted to each inmate.

On Tuesday week the foundation stone of a new public hall was laid at Antrim. The dimensions are—length, 63ft.; breadth, 42ft; height, 2[illegible]ft. It will consist of two committee rooms and a large assembly room capable of accommodating about 1,000 people. Block stone will be used in the erection, and the style of architecture is to be Doric. Messrs. Young and Mackenzie are the architects, and Mr. W. Vance, sen., is the contractor.

A new fever hospital, containing twenty-four beds on the ground-floor and five small wards above, has just been erected at Chester, in connection with the general hospital. The cost is £2,500.

The new Hop and Malt Exchange, Southwark-street, was opened on Monday for business. The sculpture work in pediments and all the other carving have been executed for the architect by Messrs. Frampton and Williamson, of Fulham. We have made some observations on this building before, and shall allude to its architectural pretensions again next week.

The Sunderland Gas Company opened their new offices on the 9th inst. They occupy a conspicuous position at the south west corner of Fawcett-street, one of the finest sites in the borough, and are erected from the design of Mr. G. G. Hoskins, architect, of Darlington and Sunderland, who obtained the first premium in a public competition in March, 1867. The style of the building is Gothic, and is dependent for its effect rather upon breadth of treatment of the whole than the elaboration of parts. It has a bold and commanding appearance, and is indicative of the purpose it fulfils. The materials employed are red pressed bricks, with Dunhouse stone dressings. The whole of the windows and principal entrance doors on the ground-floor have segmental pointed heads, those of the doorways being very deeply recessed and furnished with columns of grey Dalbeattie polished granite, with carved caps of Dunhouse stone. The south front or principal elevation occupies a frontage of about 80ft. towards the Borough road, and is distinguished by a noble oriel window, supported by a stone buttress and bold shaft of grey Dalbeattie polished granite, which is surrounded by a carved cap representing a group of ferns. On the ground floor the following accommodation is provided, viz., public offices, 33ft. 3in. by 22ft.; secretary's office, 24ft. 4in. by 17ft. 3in.; outdoor manager's office, 17ft. by 15ft.; meter inspector's office, 14ft. by 13ft.; principal or directors' entrance from Fawcett-street, 26ft. 6in. by 10ft.; strong rooms, with iron doors by Chubb; lavatories, water-closets, &c. The first-floor comprises directors' room, 33ft. 3in. by 22ft.—this room has a handsome panelled ceiling and an oak dado 3ft. 6in. in height, the oriel window forming a good feature; photometrical and experimental room, 17ft. 3in. by 13ft.; meter warehouse, 35ft. 1in. by 15ft.; book room, lavatories, &c.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—A and G. T.—D. B.—B. and Co.—W. C. B.—B. and P.—A. P. B.—I. W.—I. A. H.—P. E. M.—I. C.—W. D. and E.—G. H. G.—R. C.—C. L.—I. A. H.

A. P. B.—Thanks for sketch of Ambone, which will appear—details not wanted.

Correspondence.

THE ST. ANDREW'S CHURCH, HERTFORD, COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—According to the rules furnished to the competitors, this church was to cost £3,000. The lowest tender for the design accepted is, it appears, £4,300. Now the committee may be quite certain of this, that it is simply impossible to reduce the cost of the building from the latter sum to that originally stated without sacrificing the integrity of the design in every way—materials, construction, ornament, and accommodation. It is evident that the design as submitted in competition cannot be carried out, and therefore, as a matter of common sense and honesty, the next eligible competitor should take his stand for the same ordeal. It is a common thing for competitors to send in designs which they know cannot be executed for the sum specified, and it is a great pity the trick should ever be successful. My experience of competitions is this, that the more conscientious a man is the less chance of success he will have. The great fault in competitions is the want of honour in those who compete.—I am, &c.,

FAIRPLAY.

SIR,—In answer to "Fairplay," I beg to state that the instructions of the above competition have not been ignored by me, therefore I consider no unfairness has been done to the other competitors.

With regard to the cost, I have received tenders from most respectable builders, which have been forwarded to the committee. The amounts I am not, of course, in a position to state. However, I can assure your anonymous correspondent, who has no personal interest in the affair, that I believe he will be quite satisfied when he knows more about the matter than he does at present.

As to the requirements, my design provides sitting accommodation, allowing 20in. for adults, for about 630.

"Fairplay" merely assumes that it is quite clear that the design cannot be carried out for anything like the money unless considerably altered or reduced. I can only say that it would be impossible for me to alter my design without the sanction of the committee, and it not being necessary to alter my design, such sanction has not been asked for; therefore it has not been granted. I may add that several copies of my design (about 40 drawings altogether) were made in June last; some of them have not been in my possession since.

I should be very glad to see a little more fairplay after as well as at the time of a competition. The profession, in my opinion, require reforming quite as much, if not more, than committees. The sharp practices (this is a very mild term for them) resorted to by architects during a competition considerably lower the reputation of the profession in the estimation of the public.—I am, &c.,

JOHN JOHNSON.

35, Moorgate-street, E.C.

WESTMINSTER ABBEY AND ITS ORGAN.

SIR,—Your correspondent "C. B. A." finds fault with the removal of the Abbey organ from its old position on the screen to its present *locale*, and even goes so far as to designate the act of removal a "stupid blunder." He further condemns the very object to effect which the change of site was made, viz, "to open out the Abbey and exhibit to greater advantage its Gothic proportions." Now with respect to the musical effect of the instrument being impaired I cannot agree with him. Who that has often attended service in the glorious old minster but can dwell with a thrill of emotion on the subdued harmony of the diapasons rolling through the building, eddying from column to column, streaming along the vaulted aisles, and then losing itself in the lofty nave? If the organ were replaced as it formerly stood, a great portion of the enchanting dreaminess its music now has would be lost; the sound would not be so beautifully diffused as it is, but dash on the ear at once, with but half the solemnity it now has. I do not mean to defend in all instances conformity with the existing fashion of placing organs in chancels, whether fitted to receive them or not, either on musical or architectural grounds, the splendid instrument at the Temple Church being quite smothered in its stone box. But with the Abbey the case is different; there there is ample space for the sound to radiate in every direction. It does not follow, either, that the "swell" does not act because the organ is divided; nor for that reason need the organist be separated from the "quoir," as your correspondent delights to call it. The loss of the accidental echo of the "swell" from the western wall may be one of those minor evils with which every good thing is sure to be accompanied, but if "C. B. A." would only consent to ornament the western wall for a day or two, Dean Stanley might be gratified with the thing itself instead of a mere echo.

As to the architectural effect of "this stupid

blunder" I have also somewhat to say. "Opening out" is simply Gothic destroyed, so at least says "C. B. A."; then, Mr. Editor, pray use your potent influence to get all the old galleries of the pious times of the Georges restored, cause high backed pews once more to reign triumphant, let the nave and the choir of the venerable old Abbey of Selby be once more divided by tiers of deal boxes, and pray let a few more screens add "confusion and mystery" to the length of St. Albans. What a pity the division walls of Cologne have been removed; but there is one consolation yet left for "C. B. A." He has only to travel as far as Beauvais, and there he may have "confusion and mystery" to the end of time. The whole building cannot be seen at once, for there is no nave beyond the walled-up transept, and never will be. Only think of the scope for imagination, and picture the giant nave extending until stopped by the waves of the Channel!

In sober earnest, each case must be judged on its own merits, for while the wondrous beautiful proportions of the old Abbey are "opened out" by the transference of its "kist of whistles" to another site, hardly any excuse can be given for the contemplated removal of the fine old instrument at St. Stephen's, Walbrook, which so fitly fills the position the celebrated architect of the church intended that it should.

Permit me to finish by expressing a hope that the "authorities" at St. Paul's may some day act with a little of the judgment displayed by those at Westminster. W. C. J.

HOW A DESIGN WAS OBTAINED FOR A NEW LOCK-UP AT MORETONHAMPSTEAD, DEVON, AND HOW IT WAS LOST AGAIN.

SIR,—Your columns being always open for the exposure of abuses in our profession I make no apology for sending you particulars of the above, which tend to show how plans are not unfrequently obtained, and at the same time exhibit a degree of parsimony paramount to all other considerations, and seldom equalled in connection with the carrying out a public work. It being decided to erect a new police station with residence for the constable at Moretonhampstead, the magistrates of the Crockernwell division of the county, acting under the powers of the quarter sessions, appoint a working mason and another, I believe a carpenter, to make the requisite drawings, the cost of which is not to exceed £5! Now these men knew nothing whatever of drawing, but I suppose, not liking to expose their ignorance, they undertake to make plans. What course do they adopt? Why they, on their own responsibility, consult an architect, who prepares drawings which in due course are submitted to the magistrates, and subsequently to the county surveyor, for examination, and are ultimately approved of by them. They are then forwarded to the Secretary of State, who reports he cannot consent to their adoption unless the cells are enlarged as recommended by the Surveyor General of Prisons. The plans are consequently returned to the before-mentioned workmen, and in due course again find their way into the hands of the architect for amendment.

The architect having got possession of the plans and feeling his position to be a most improper one, applies to be engaged by the justices in the usual way as architect of the building, and this not being complied with, the plans are consequently withheld. It remains to be seen what course the justices will further take that they may obtain plans for the paltry and ridiculous amount offered by them for a building, the cost of which will be from £500 to £600 at least. More than twelve months have elapsed since the project was started. Had the matter been placed in proper hands in the first instance the building would have been nearly finished. If the same system of jobbery he pursued another twelve months will probably expire before the building becomes a reality.—I am, &c.,

OBSERVER.

The Winchester Town Council have a very unique method of providing funds for a holiday. On Monday week they had an excursion to Netley Abbey, the object being "to spend the amount of fines received from those who have during the year neglected to attend the monthly meetings of the local board." An excellent dinner, well washed down with champagne, was partaken of by over twenty persons. The non-attendants must either be very numerous or the fines very heavy.

Intercommunication.

QUESTIONS.

[1015.]—METHOD OF CALCULATING.—Thinking that the knowledge of two or three short and at the same time accurate methods of calculation may not prove wholly useless to the readers of this journal, I append the following, which, in working out some problems, I lately discovered. To find the length of the side of an octagon from the diameter of the inscribing circle, let—

d = diameter of inscribed circle,
z = required length of side of octagon.

$$x = \frac{d}{6}$$

$$z = \frac{d - x}{2}$$

To find the length of the side of a pentagon from the diameter of the circumscribing circle, let—

d = diameter of circumscribing circle,
x = required length of side of pentagon.

$$x = \frac{d + \frac{d}{6}}{2}$$

To square any whole number up to 100. Given a certain number 47. Square units and tens separately, bringing the product into four figures, thus:

1649
56-

2209 Answer.

And to this amount add double the product of the two figures composing the given number 47, leaving the space under the units open. When the square of the units only amounts to one figure, a cipher is always placed before it, proceeding the same as in the foregoing, thus:

$4^2 3^2 = 1609$
24

1849 Answer.

A. P. B.

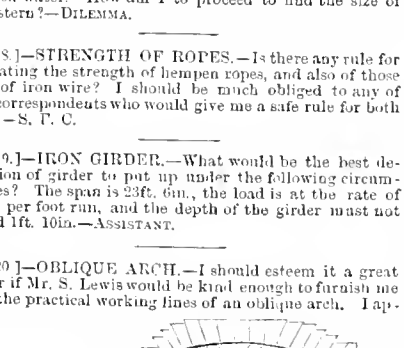
[1016.]—SKEW FACING TO ARCHES.—Can any of your correspondents inform me how I am to find the templets for cutting the face stones of a skew arch to the proper line? The arch is built on the square in brick, but stone rings are put in at the two faces. I want to know how I am to obtain the templet for cutting the rings, so that they will range properly with the direction of the face, which, of course, is parallel to the road above.—CONTRACTOR.

[1017.]—CONTENTS OF CISTERN.—Will you be so good as to insert the following in your valuable column of "Intercommunication":—For years my supply of water for the house has been stored in an enormous butt. Owing to some alterations in the house, I am about to replace it by a cistern or small tank, which I want to contain three times as much water. How am I to proceed to find the size of the cistern?—DILEMMA.

[1018.]—STRENGTH OF ROPES.—Is there any rule for calculating the strength of hempen ropes, and also of those made of iron wire? I should be much obliged to any of your correspondents who would give me a safe rule for both kinds.—S. T. C.

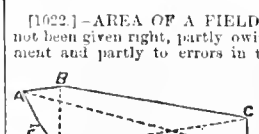
[1019.]—IRON GIRDER.—What would be the best description of girder to put up under the following circumstances? The span is 23ft. 6in., the load is at the rate of 6 cwt. per foot run, and the depth of the girder must not exceed 1ft. 10in.—ASSISTANT.

[1020.]—OBLIQUE ARCH.—I should esteem it a great favour if Mr. S. Lewis would be kind enough to furnish me with the practical working lines of an oblique arch. I append a plan for his guidance. By so doing he will greatly oblige.—EXCELSIOR.



[1021.]—LINING RESERVOIRS.—I have often seen asphalte recommended in the "Intercommunication" column for lining reservoirs, so as to make them watertight. Would anyone inform me of the method of laying it on, and of the proportion, and of what it is compounded?—NEMO.

[1022.]—AREA OF A FIELD.—As the dimensions have not been given right, partly owing to incorrect measurement and partly to errors in the figures, I give what I believe to be the correct length of the lines, A B and A F equal each 196ft.; F E = 165ft.; B E 320ft.; A D = 1170ft.; B C = 930ft.; E C = 945ft.; E D = 940ft.; and D C = 185ft. Allow me to add that your correspondent "R." is too hasty in his suppositions. I should be obliged to "J. M'Namara" if he would inform me how to get at the total contents, as I do not quite comprehend those attempted to be given.—YOUNG SURVEYOR.



REPLIES.

[987.]—TRUSS.—From indistinct writing on my part, or some other cause, there are two misprints in my reply last week to the above, which, if not corrected, may confuse "Beginner" in interpreting my explanation. The first is in the figures giving thrust of rafter, where $\frac{20\text{cwt.} \times 9\text{lb.}}{5 \times 2}$, &c., as printed, should be "20cwt. × 9ft.," &c.; the 9ft. being the length of rafter. And the second:—In the fifth line of text from top of page where "simply *by* its own weight," &c., should be "simply its own;" that is, it would have to support only its own weight and that produced by the tendency of the tie-beam to sag (as more closely explained by "W., Tenby," in his reply of the same date) by its own weight, which, in the case under notice, would give even le s weight than I mentioned in my reply of last week.—A SUBSCRIBER.

[1001.]—PLAN DRAWING.—Would you allow me to call "Stonemason's" attention to the fact that if he intends purchasing "Gwilt's Encyclopædia," there is a copy for sale at the second-hand book shop opposite St. Clement Danes church, in the Strand, which I think was marked 12s. or 14s. 6d.; cheap, if it is perfect, which he can prove by inspection, if not already sold.—SUBSCRIBER.

[1004.]—TELESCOPE GLASSES.—It is in order to save the necessity of an extra glass that the telescopes of all surveying instruments view the objects inverted. This will be seen at once from the cut. Let A be the object glass, B the eye glass, and C the object viewed. The object is shown inverted in the focus of the eye-glass. Were it

desirable to view the object erect, it would require the aid of another glass to invert the image shown at B. As every glass is a source of some obscurity and indistinctness, the fewer that are employed the better, and a little practice soon renders the beginner accustomed to the method.—LEVEL.

[1005.]—FREEZING MIXTURES.—The theory of all freezing mixtures is that the ingredients, in their act of chemical combination, absorb so much heat, which becomes converted into what is called "latent heat," that their temperature is at once lowered. The commonest freezing mixture is snow and salt, which produces an amount of cold sufficient to freeze water almost instantaneously.—CHEMIST.

[1006.]—MOIST WATER COLOURS.—"H. K." can obtain what he wants at Windsor and Newton's colour warehouse, Rathbone-place, High Holborn.—ARTIST.

[1009.]—ADDRESS WANTED.—The address wanted by "Alpha" is Messrs. Paley and Austin, Castle Hill, Lancaster.—H. J. A.

[1013.]—PARTY WALLS.—In answer to "H. R. T.," I should very much doubt if a larger opening could be legally made, although the wall might certainly be rebuilt with the former opening in it.—CLERK.

BUILDING AND LAND SOCIETIES.

THE first annual general meeting of the Monarch Building Society was held on Monday evening at the London Tavern—Mr. J. Duncan in the chair. The society had during its first year invested upwards of £80,000 upon undeniable and real security. The directors, after paying 5 per cent. on all share capital, interest on deposits, preliminary and general expenses, had a surplus of profit amounting to £4,785 to carry to next year's account. It was also stated that next year the society will be able to declare a bonus of 10 per cent. The report was adopted, and the retiring directors and auditor re-elected.

The directors of the Bristol Equitable Permanent Building and Investment Society in their eighteenth annual report, congratulate their shareholders on the prosperity of the society. After providing 5 per cent. compound interest to all investors, and paying the working expenses, there is a surplus profit of £156 3s. 11d. for the year on the profit and loss account; also, a surplus profit of £147 5s. 9d. on the contingent fund account; and also a total profit of £466 14s. 5d. on the guarantee fund account. The number of new shares issued during the past year is 425, and the amount advanced to borrowers for the same period is £15,209 11s. 11d., being more than double that of any previous year. The total income of the society up to the year now ended is £79,972 7s. 11d. as against £60,299 7s. 5d. of the preceding year.

LEGAL INTELLIGENCE.

THE question "What is a smoke nuisance?" was raised in a curious manner at the County Magistrates' Court, Bassett-street, Liverpool, on Saturday last. The officials of the West Derby Local Government Board were prosecuting the proprietors of several works (amongst them the Corporation of Liverpool as owners of the Green-lane waterworks) for alleged smoke nuisances. As, however, the prosecutors' inspector could not say that the dense smoke had continued for more than five minutes, and admitted that, generally, it had continued only three or four, the magistrates on the bench held that this was not such a nuisance as should incur a penalty. The board's legal representative pointed out that the court on previous occasions—when other magistrates had presided—had held five minutes dense smoke to be a nuisance within the terms of the Act, and had inflicted penalties; but the gentlemen then on the bench maintained their own view and dismissed all the informations on the ground stated. There was some talk of having the matter settled by a higher tribunal.

BREACH OF CONTRACT.—LUND *v.* LUCAS.—This was an action in the County Court, York, for the recovery of £10 2s. 4s. for breach of covenant. The plaintiff, on February 14, 1862, purchased a portion of building land

of the defendant, and the deed contained a covenant that defendant should complete the road to it when necessary. A house No. 19, Park Crescent, now stands in their ground, and, as the defendant neglected to perform his agreement with reference to the road, the Local Board of Health had done the work and charged plaintiff £10 2s 4d for it, which he now sought to recover. Mr. Mann, for the defendant, admitted the covenant, the payment of £10 to the Local Board of Health, and that his client did not pave the road as required in the covenant, but he submitted that in 1861 the defendant made an assignment, and in consequence he contended that his client was not liable for the amount claimed. His Honour ruled that to set up a plea of bankruptcy it must be proved under the bankruptcy and gave a verdict for defendant.

AN ARCHITECT'S COMMISSION REDUCED.—HARRISON *v.* C. H. STEIN.—This case was heard at last sitting of the Hartlepool County Court. The claim was for £21 12s 8d, commission to plaintiff, as architect, for superintending the erection of West Hartlepool Theatre; the defence being that the duties were inefficiently performed, and the building placed in jeopardy by being based on an insecure foundation.—His Honour decided that the plaintiff had not exhibited that precaution which was desirable, by not informing the defendant of the character of the foundation. Under those circumstances, his Honour allowed commission with a deduction of two fifths, making the sum payable £3 1s.

OBSTRUCTION OF LIGHT AND AIR.—At the Keighley County Court, on Wednesday week, Mr. W. T. S. Daniel, Q.C., the judge, gave judgment in an action, brought and heard on August 5 last, by Mr. Joseph Fieldhouse, of Keighley, against Mr. John Hartley, comb maker, and Mr. John Craven, of Steeton, J.P., who were trustees of certain property to recover damages from the defendants for taking away and obstructing the free access of light and air to two of the plaintiffs' cottages. The Judge observed that the plaintiff had shown by evidence that the windows, the obstruction of which was complained of, were ancient ones and had existed for upwards of fifty years. The cottages, it also appeared, were originally erected by the plaintiff's father on waste land, and for many years an annual rent had been paid as an acknowledgment to the Duke of Devonshire, from whom, in 1864, the plaintiff, after his father's death, had purchased the fee simple in the land. It was also shown that Joseph Hartley, from whom the defendants took their estate, in 1851, erected the buildings, which were now complained of as causing obstruction, with the knowledge and consent of the Duke of Devonshire's agent, and that they had ever since been continued. A complaint had been made, but no action was brought until the present. On these and other grounds the judge ordered judgment to be entered for the defendants, with the usual costs.

Our Office Table.

No. 71, Leadenhall-street, opposite Aldgate pump, will shortly be pulled down for city improvements. Under these premises, and at a depth of about four to five feet, are the remains of the ancient crypt of St. Michael's Church, Aldgate, a beautiful Gothic structure in an excellent state of preservation. It measures north by south 46ft. in length, and east by west 17ft. in breadth. The walls are of square pieces of chalk, in the manner of Rochester Castle, and the arches of stone exhibiting as skilful masonry as anything in this age of refinement.

The Tower subway, which we described and illustrated some months back, will be shortly commenced. The engineer (Mr. P. W. Barlow, jun.) reports that numerous borings have been made in and near the line of tunnel, all indicating that it will be everywhere deep in the solid London clay, and that no water is likely to be met with. A tender has been made to execute the tunnel and shafts entirely in iron for £9,400.

We regret to learn the death, at Capri, in the Bay of Naples, of Mr. J. T. Hixon, a young water colour painter of considerable promise. He was known chiefly by his drawings of Algerian subjects, and was recently admitted as associate of the Institute of Painters in Water Colours.

Green pigments, says "Once a Week," have been in such bad odour for years, on account of their real or imagined poisonous influence, that chemists have laboured hard to find a form of the favourite colour that shall be above suspicion. Success appears to have crowned their experiments at last, for we are told that a new preparation of a salt of chromium yields a green colouring powder that leaves little to be desired. It is brilliant in tone, perfectly harmless, and possesses other requirements of technical character. It will be known, when it is known, as "Imperial Green."

The *Boston* (Massachusetts) *Advertiser* records the death of Mr. Charles Loring Eliot, which took place at Albany, on the 25th ult. He was one of the best known of American portrait painters.

The library shelves of the British Museum, if placed in a continuous line, would extend no less than twenty-five miles. The accession of books keeps growing at the rate of 20,000 volumes a year, or between 50 and 60 a day.

The town of South Danvers, Massachusetts, United States, has resolved to change its name to "Peabody," in honour of the charitable millionaire who was born there.

Over 150,000 of Cliff and Son's white glazed bricks have been used in Messrs. Nelson and Son's new premises in Paternoster-row. The whole of the interior is lined with them, producing a good effect and giving the greatest amount of light. They are fireproof, and supersede the use of plaster, paper, match lining, or any other wall lining.

Yesterday week the "rearing" of the Rochdale Townhall was celebrated by a supper to the workmen in the Assembly Room over the co-operative stores. About 200 men in the employ of Mr. Warburton, of Harpurhey, the contractors, were present, and spent a very merry evening. Mr. W. H. Crossland, of Leeds, is the architect of the building.

In consequence of a competition opened by public notice for the plans of a new cathedral at Berlin, forty-nine have been sent in, and amongst them several furnished by French architects. The award has not yet been made.

The tender of Mr. Rider has been accepted for the enlargement of the Essex County Lunatic Asylum. The amount of the contract is £18,560.

Builders, allotment gardeners, and others who employ home-grown timber for fencing and other purposes, will be glad to hear that an effectual preventative for the "dry rot" has been discovered. The recipe is forwarded to the *Gardeners' Chronicle* by Mr. J. Baily Denton, and has been thoroughly tested by experiment. It consists in soaking the timber for a short time in lime water. A pit or tank or good-sized barrel, according to the extent of requirement, will answer the purpose, the lime being added to the water in the proportion of eighty-eight grains to one gallon. Timber creosoted in this way stands the weather remarkably well, and is not subject to the decay to which unprepared timber is so liable.

About 70,000 tons of clay from the Purbeck Hills are annually exported from the port of Poole, Dorsetshire. This clay is adapted for the manufacture of coarse earthenware. Some portion of the clay is shipped to foreign ports at Parkstone, near Poole. Extensive pottery works have been established for the manufacture of drain pipes, tiles, &c. The surface clay is converted into bricks, and machinery has been put up there which can make 14,000 bricks daily. About 200 persons are employed at the Parkstone Pottery Works.

It is stated that the project of uniting Lake Huron and Lake Ontario bids fair to be a reality. Able engineers have decided that the work is feasible, and that it will not cost more than 40,000,000 dollars.

The scarcity of teachers in Yorkshire duly qualified to give instruction in science in accordance with the regulations of the Department of Science and Art has led the council of the Yorkshire Board of Education to concert measures for the supply of the deficiency. One important step is the organisation of Schoolmasters' Science Classes, to meet on the afternoons of Saturday during the winter, for the study of special branches of science. The movement was brought under the notice of the schoolmasters in the Leeds district at a public meeting held on Saturday in the Civil Court of the Townhall, under the presidency of Sir Andrew Fairbairn, Mayor of Leeds. The first class will be opened in Leeds, on Saturday, October 3. Classes of a like character will be formed forthwith in Sheffield and Stockton-on-Tees. By providing a staff of men fully qualified to conduct evening science classes for adults the council of the Yorkshire Board hope to be able to bring instruction in science within the reach and means of the industrial population of the country.

The Government palace at Smyrna is to be rebuilt. It is in a good situation by the sea shore, and is close to a large and striking building, the Great Barrack, formerly the English hospital during the Crimean war. It is supposed the architect will be M. Rocca-Vitulis, a native of Smyrna. The old palace was a picturesque but tumble-down wooden building.

On Friday last the designs for the new law courts, which were deposited at the old Insolvent Debtors' Court, were removed by order of the Government to South Kensington Museum, for exhibition and for the purpose of study.

A new entrance has been opened in that part of Hyde Park which is set apart for equestrians on the south side of the carriage drives that run parallel to the Bayswater-road. The entrance, which is opposite the Edgware-road, allows the equestrians to enter the gallop without interfering with the carriage entrance at the Marble Arch in the vicinity.

Trade News.

TENDERS.

BERSLEM.—For additions to Messrs. T. and R. Boote's manufactory. Mr. R. Butler, surveyor, Burslem:—

Brindley and Critchlow	£1160
Blackhurst	1151
Bowden	1 34
Watkin (accepted)	1127

DALSTON.—For alterations and additions to Pownall-road Independent chapel. Mr. Henry Fuller, architect:—

Pritchard	£647
Staines and Son	579
Feast	535

ERDINGTON.—For the workhouse to be built for the Guardians of the Aston Union:—

Dover and Co.	£18,175 13 0
Cresswell and Sons	17,500 12 0
W. and J. Webb	17,166 11 0
Wilson and Son	17,100 10 0
Briggs and Son	16,950 9 0
Partridge	16,750 8 0
W. and B. N. Smith	16,900 7 0
Bumsley and Sons	16,280 6 0
Matthews	15,950 5 0
Jones	15,651 4 0
Horsley Brothers	15,172 3 0
Trow and Sons	14,950 2 0
Jeffery and Pritchard	14,850 1 0

HANLEY.—For the erection of stables and coach-houses, for Hanley Hotel. Messrs. Scrivener and Son, architects, Hanley:—

Grosvenor	£1795 0 0
Woodridge	1615 0 0
Clews	1566 0 0
Matthews	1549 0 0
Bennett and Cooke	1543 0 0
Bowden	1444 10 0

LINCOLNSHIRE.—For restoration of Sempringham Church Lincolnshire. Mr. Edward Browning, architect, Stamford:—

Allen, Billingborough	£994
Millson, Donington (accepted)	910

LINCOLNSHIRE.—For additions and part restoration of Bourne Abbey Church, Lincolnshire. Mr. Edward Browning, architect, Stamford:—

Hinson, Bourne	£1400 0 0
Richardson and Roberts, Stamford	1372 0 0
Millson, Donington	1316 0 0
Bignell and Tinkler, Stamford	1193 10 0
Halliday and Cave, Oakham	1172 0 0
Perkins, Easton	1097 10 0
Hall, Norman and Vinter, Bourne (accepted)	1080 0 0

PETERBOROUGH.—For additions to the Deanery, Peterborough. Mr. Edward Browning, architect, Stamford:—

Peach and Furniss, Peterborough	£510
Halliday and Cave, Oakham	472
Perkins, Easton	465
Hobson and Taylor, Hogsthorpe (accepted)	457

SOUTHBOROUGH.—For the erection of a house for Mr. H. Marchant. Bricks supplied. Henry Stapley, architect:—

Peck (brickwork)	£1 3 10 0
A. Brown (carpenter)	175 0 0
Wood (plumber)	70 0 0
Lambert (smith)	25 15 0

SOUTH MOLTON.—For drainage works for the Local Board:—

Stephens and Sons, Exeter (accepted)	£2400

TUNBRIDGE WELLS.—For three houses and shops for Mr. T. Elliott:—

Kilby	£3849 0 0
Hammond	3647 14 0
Vidler	3580 0 0
Walker	3565 0 0
Mercer	3503 19 0
Strange and Sons (accepted)	3339 0 0

TUNBRIDGE WELLS.—For three houses and shops in the High street, for Mr. Thomas Elliott. Henry Stapley, architect. Quantities by Mr. Clever:—

Kilby	£3849 0 0
Hammond	3647 14 0
Vidler, jun.	3580 0 0
Walker	3565 0 0
Mercer	3503 0 0
Strange	3339 0 0

TUNBRIDGE WELLS.—For alterations to Hawthorndeane, for Colonel White. Henry Stapley, architect:—

Hammond	£220

ST. JOHN'S WOOD.—For new boundary wall and repairs, painting, &c., at No. 7, Marlborough-road. Mr. John Ladds, architect:—

Staines and Son (accepted)	£21

SUNDERLAND.—For Union Workhouse Schools, Sunderland. Messrs. Potts and Son, architect:—

Masons and Plasterers.

T. and A. Cooke	£6060 0 0
Allison	5867 10 0
Young	5666 8 1
Wetherall	5509 0 0

Joiners, &c.

D. and J. Rauken	2935 0 0
Armytage	2900 0 0
Peart and Humble	2890 0 0
Armstrong	2855 0 0

Whole Work.

Hurst and Son (accepted)	8053 0 0

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

METROPOLITAN BOARD OF WORKS.—September 24.—For constructing and maintaining in repair certain intended brick sewers. J. Pollard, clerk, Spring gardens.

HIGHGATE.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

LEAVESDEN WOODSIDE (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

WEST HAM UNION.—September 23.—For the erection of an apparatus capable of cooking for 800 inmates. F. E. Hilliary, clerk to the guardians, Leytonstone.

METROPOLITAN BOARD OF WORKS.—September 29.—For the erection of fire brigade stations at Amhurst-road, Hackney, and Upper Tooting. J. Pollard, clerk to the board, Spring Gardens.

STRATFORD.—September 23.—For the erection of a store in Maryland street. H. Ough, architect, 23, Charing Cross.

PETERBOROUGH.—September 26.—For the erection of a new Baptist Chapel. J. W. Chapman, architect, 14, Great Western-terrace, Westbourne Park, London W.

PADDINGTON.—For refitting certain stoves to the new wing of St. Mary's Hospital. J. G. Wilkinson, secretary.

THORPE, NEAR NORWICH.—September 26.—For the erection of an additional wing to the Norfolk Lunatic Asylum. F. J. Blake, clerk to the visitors, Norwich.

TAUNTON (Somerset).—September 30.—For building a shop, with house and offices. Messrs. Giles and Robinson, architects, 7, Furnival's Inn, W.C.

HEMEL HEMPSTEAD UNION.—September 23.—For the erection of new infirmaries at the union workhouse. C. E. Grover, clerk, Hemel Hempstead.

LINCOLN.—September 23.—For the erection of the new church of St. Swithin. J. Fowler, architect, Louth.

BICESTER (Oxon).—September 24.—For restoring, refitting, and making certain additions, &c., to the Parish Church at Stoke Lyne, near Bicester. Rev. C. D. Marsham, the Rectory, Caversfield, near Bicester, Oxfordshire.

GLATTON (Hunts.).—September 22.—For the restoration and reseating of Glatton Church, in the county of Huntingdon. James Ruddle, North street, Peterborough.

SLOUGH.—September 30.—For the erection of two villas in Windsor road. F. Charsley, Herschels, Slough.

PORT MADOC (North Wales).—October 5.—For the excavation and building of quay wall. G. Lea, 54, Chancery-lane, London.

EATON (NORWICH.)—For designs for new suburban church. Messrs. Hewitt and Capon, London and Norwich.

DERBY.—October 1.—For the erection of new hotel, &c., in Cornmarket and St. James-street. W. C. Watson, Company's offices, Wardwick, Derby.

WAR DEPARTMENT.—For raising the practice butt in Plumstead marshes. Capt. W. Mitchell, R.N., Royal Engineer office, Woolwich.

ST. PANCRAS (Middle-ex).—September 30.—For the erection of infirmary for this parish at Watford, Herts. F. Moore, clerk to Guardians.

ATHERSTONE.—September 23.—For construction of brick and earthenware sewers and manufacture of pipes, &c. W. Bishop, clerk to committee.

TUNBRIDGE WELLS LOCAL BOARD.—September 29.—For construction of outfall sewers, overflows, sewage tanks, &c. T. Elliott, clerk

WITHAM LOCAL BOARD OF HEALTH.—October 1.—For the construction of sewers and waterworks.—J. H. Blood, clerk.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Samuel Keetch, Hornsey-road, Holloway, carpenter, September 25, at 12—Thomas Potterton, Balham hill, builder, September 24, at 1—Charles Saunders, Leytonstone, builder, September 29, at 11.

TO SURRENDER IN THE COUNTRY.

John Crossley, Burnley, painter, September 24, at 3—William Hampshire, Huddersfield, mason, September 28, at 10—James Johnson, Warrington, joiner, September 24, at 12—Richard Thomas, Perran-arworthal, Cornwall, surveyor, September 21, at 12—John Carver, Wellington, builder, September 25, at 11—Cornelius Cochrane, Manchester, joiner, September 30, at 12—William Davies, Allt-wen, Glamorganshire, plasterer, September 29, at 11—Griffith Evans, Newport, Monmouthshire, mechanical engineer, September 25, at 11—George Hanlon, Liverpool, civil engineer, September 29, at 11—Edward Hanlon, Liverpool, civil engineer, September 29, at 11—William Tyres, Nottingham, builder, September 29, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 22, C. Turner, Ann's-terrace, Camden-grove, Peckham, builder October 22, H. O'Connor, Battersea, contractor for railway works—October 8, J. Watson, Blagrove-road, Notting-hill, builder—October 15, G. Day, Kingsland-road, builder—October 12, W. Baker, Kingsland road and Russell road, Holloway, cement manufacturers—October 12, H. Edwards, Cardiff, builder—October 5, R. Robinson, Monks Coppenhall, joiner and builder—October 17, J. Jowling, Rose, builder—October 7, J. Marsh, Moorfields, Gloucestershire, carpenter and builder—October 6, G. Baker, Bristol, painter—October 8, D. B. Hamer, Rhayader, builder.

DIVIDENDS.

October 13, J. Potts, Adswood, near Stockport, brickmaker.

PARTNERSHIPS DISSOLVED.

Morton and Son, Toxteth Park, builders—Williams and Schofield, Montague-street, Bloomsbury, surveyors—Lee and Hibbard, Leeds, builder—Shaw and Emery, Burslem, builders—Bocock Brothers, Bradford, Yorkshire, contractors.

SCOTCH SEQUESTRATIONS.

John Inglis, Glasgow, builder, September 18, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, rawback, 1s.

Teak .....load	£11	0	12	10	Archangel, yellow..	£11	0	£12 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12 0
,, yellow pine..	3	0	4	5	Finland	7	0	8 0
St John N.B. yellow	0	0	0	0	Memel.....	0	0	0 0
Quebec Oak, white..	5	0	5	10	Gothenburg, yellow	8	0	9 10
,, birch.....	4	0	5	0	,, white	8	0	9 0
,, elm	4	0	4	14	Riefle, yellow.....	8	0	10 10
Dantzic oak	4	0	6	0	Soderhan	9	0	10 10
,, fir	2	15	3	15	Christiania, per C.,			
Memel fir	3	0	4	5	12 ft. by 3 by 9 in.			
Riga.....	3	0	3	5	yellow	11	0	13 0
Swedish	2	0	2	8	Deck Plank, Dantzic,			
Masts, Quebec red pine	4	10	6	10	per 40 ft. 3 in.	0	12	1 0
,, yellow pine..	4	10	6	0	Pumice Stone per ton	6	0	8 0
Lathwood, Dantzic, fm	6	10	7	10	OILS, &c.			
,, St. Petersburg	8	0	9	10	Seal, pale....per tun	36	0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	80	0	0 0
					Cod	38	0	0 0
					Whale, 8th. Sea, pale	37	10	0 0
Quebec, white spruce	13	0	20	0	Olive, Gallipoli.....	0	0	73 0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	53	0	55 0
Yellow pine, per reduced C.					Palm, fine	39	10	40 0
					Linseed	31	5	34 0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	33	0	0 0
2nd do.....	11	15	12	10	Cottonseed.....	31	0	38 0

METALS.

IRON:—				
Welsh Bars in London ....per ton	6 5 0	6 5 0	3	
Nail Rod ..... do	7 10 0	7 12 6		
Hoops..... do	8 5 0	9 0 0		
Hoops, Single ..... do	8 0 0	9 0 0	2½	
Staffordshire Bars... ..... do	7 5 0	7 15 0		
Bar in Wales ..... do	5 10 0	6 0 0	3	
Nailrods ..... do	7 10 0	7 15 0	2½	
Foundry Pigs, at Glasg. No 1 .. do	2 12 3	2 17 6	net.	
Swedish Bars ..... do	9 17 6	10 10 0	2½	
COPPER:—				
Sheet & Sheathing, & Bolt ....per ton	79 0 0	2 2 0		
Hammered Bottoms ..... do	97 0 0	0 0 0		
Flat Bottoms, not Hammered .. do	83 0 0	0 0 0		
Cake and Tough Ingot ..... do	1 0 0	3 0 0	3	
Best Selected ..... do	77 0 0	85 0 0		
Australian ..... do	77 10 0	0 0 0		
Yel. Metal Sheathing & Rods ....per lb	0 0 3	0 0 7½		
LEAD —				
Pig, English .....per ton	21 5 0	0 0 0		
,, Spanish Soft ..... do	18 10 0	0 0 0	2½	
Shot, Patent ..... do	22 10 0	22 15 0		
Sheet ..... do	20 0 0	20 15 0	5	
White ..... do	27 0 0	30 0 0		
IN:—				
English Block .....per ton	95 0 0	0 0 0		
do Bar ..... do	96 0 0	99 0 0	2½	
do Refine ..... do	97 0 0	0 0 0		
Banca ..... do	0 0 0	97 0 0	nett	
Straits ..... do	92 10 0	92 0 0		
ZINC:—				
English Sheet .....per ton	25 10 0	26 10 0	2½	
Devaux's V. M. Roofing Zinc .... do	25 0 0	0 0 0		

* And 5 per cent. discount if laid upon the new system

STEEL:—				
Swedish Keg, hammered .....per ton	15 0 0	15 10 0	2½	
Swedish Faggot ..... do	0 0 0	0 0 0		
SPELTER:—				
On the Spot .....per ton	20 0 0	0 0 0		
QUICKSILVER .....per btl	6 17 0	0 0 0		
REGULUS OF ANTIMONY				
French ..... ton	43 0 0	0		

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 25, 1868.

CITY SAUNTERINGS.

IT would be idle to assume that the disasters which have fallen upon the commercial world during the past few years have not greatly checked the progress of building. Where one building is erected in the City at present there were at least four in progress in 1865. There are, however, several works completed or approaching completion which are well worthy the attention of the student, and, to one who can use his eyes, the City at all times offers a field for improving observation. In the first place, there is diversity, and the progress of national art is better traced in a multitude of minor examples than in a huge representative one, as in the Houses of Parliament, the future Law Courts, or National Gallery. In the City, buildings worthy of notice are met with at almost every step. There is the graceful Grecian style, the palatial Palladian, and the gimcrack Gothic. In short, "no milliner can so fit his customers with gloves" as the student may be fitted with his favourite style of architecture anywhere between St. Paul's and Aldgate pump, though eastwards of that useful structure architecture decidedly wanes. The traveller can scarcely do better than take an omnibus to that *ultima Thule*, and, setting his face westwards, observe what is to be seen in Leadenhall-street. There is not much that is absolutely new, but there is a good deal that is nearly so. On the north side of the street will be seen the offices of the London and St. Katharine's Dock Company, a rich-looking but quiet building. The polish has gone off the grey granite, and the effect is better than at first, when the glitter was obtrusive. The carving on this façade is remarkably good—delicate without being finiking, and bold without being coarse. There are few buildings in the City which are ornamented with such excellent carving. Close by is the office of the world-renowned Peninsular and Oriental Company, a building of delicate details, though somewhat wanting in breadth. The treatment of the arcade of the first floor is not thoroughly satisfactory. It is most difficult to design a circular-headed window divided into two circular-headed lights; if it is well done the effect is good, but if absolute excellence is not attained positive ugliness is the inevitable result. We know of but two examples where excellence has been reached—in the Palazzo Strozzi and the Palazzo Ricciardi, at Florence. In company with the Peninsular and Oriental Company's building may be seen an old-fashioned overhanging house, No. 133, connected with old world courts of the famous Ship and Turtle. Of the building erected on the site of the East India House the less said the better; it is painfully mediocre. Leaving the building of the London and Lancashire Fire and Life Assurance, by Mr. Allom, with its excess of carving, the traveller should turn southwards down Gracechurch-street, bestowing a cursory glance on the City Offices' Company's building at the corner of Lombard-street, where he will see nothing to admire, though much to wonder at. A few steps will now bring him into Eastcheap, face to face with the important building now being completed for Messrs. Hills and Underwood, by Mr. Roumieu, Messrs. Browne and Robinson being the contractors. This building is, by all odds, the most striking the City can boast of. The style is Gothic, and there is no doubt whatever about it. It would be impossible to attribute it to any particular date or country. It is English Gothic of the middle of the nineteenth century, and not bad Gothic at that. It has a frontage of 46ft., a depth of 96ft., and a height of about 60ft.; the materials are red brick, with dressings of Tisbury stone, and the brickwork is much the more expensive. The hoods over the windows of the second story have a great, perhaps an excessive, projection, and, as the walls are very thick, deep shadows are obtained throughout. The hoods are sustained by eight little columns of Devonshire marble, which have already lost their polish. The roof is broken into gables, and is handsomely crested. A description of this building will not convey a fair idea of its merits; it must be seen. We are far from saying that it is perfect, or, indeed, any great way on the road to perfection, but it is an honest and earnest effort, and the pity is that Messrs. Hills and Underwood had so much money and Mr. Roumieu so little moderation. The staircase and halls are lined with a dado of tiles, bright and clear. The carving is of a very superior character, as may be seen in the boar's head in the spandrel over the central window, and elsewhere. The metal work of the gates, and, indeed, throughout the building, is very good. It is by Peard and Jackson, Holborn, from designs by Mr. Roumieu. The crane for lowering casks, &c., into the cellars is Sisterson's patent, a most compact and powerful affair worked by one man with an endless chain; it is a sort of telescope, with extraordinary capability for extension and change of direction. The gablet in the centre of the façade is a mistake. The construction is scientific and the workmanship very good. Altogether, this is a representative building. We think we perceive a *soupçon* of Bruges and a slight flavour of Rouen, and, moreover, we have our notions of timber construction and building in brick and stone, and do not care to see the principles mixed; but we should be glad to see three or four dozen buildings designed with as much care and carried out with as much skill as the warehouse of Messrs. Hills and Underwood, in Eastcheap.

From Eastcheap to Mark-lane, "*Non è lontano il tragetto*," as the wicked duke observes in the opera, and Mark Lane presents many improving spectacles. The comparatively ancient buildings, those erected seven or eight years ago, we do not propose to notice at present, but one by Mr. Aitchison, in the true Venetian style, close to the Corn Exchange, is deserving of more than a passing glance. No. 29 is in course of building. It promises well. No. 36 is an ambitious structure in the London-Venetian style, and must have cost a lot of money. It has a frontage of about 70ft., and is about 50ft. in height. It is four stories high, and consists of an arcade of seven arches. The architrave is supported by clustered columns of granite, with the usual carved caps, and the architraves are of red and grey Mansfield stone. The cornice is not all that a cornice might be, but in these narrow streets the architect is restricted; he is not allowed "verge enough" under penalty of an injunction, with the prospect of a motion to make the injunction perpetual. The interior of this building is satisfactory. The offices are light and cheerful. The ironwork of the staircase is of elegant design. The gates are a study, and the wrought-iron girders, which are visible in every direction, are craftily pierced in the web. The halls and staircase are lined to a height of five feet with tiles of good design, and the building generally is well worthy of a visit. The ironwork is by Handisyde, of Derby; the contractors are Messrs. Jackson and Shaw, and Mr. Edwin A. B. Crockett is the architect. There are some little attempts at coloured decoration in the iron caps to columns in the rooms of the ground floor which are not successful; but paint is cheap, and experiments in that line are neither difficult of execution nor exhausting to the mind.

From Mark-lane to Bishopsgate-street is no great distance, and Crosby Hall should be visited. With regard to this establishment it were well to bear in mind the inscription on the resting places for those who "fardels bear" in front of the Old Bailey and elsewhere—"Rest, but do not loiter," more particularly if you desire to see the Hop Exchange in the Borough. About a year ago we had occasion to speak of this building in terms the reverse of complimentary. We see no reason at present to modify one expression we then used. The building is a discredit to all concerned in it, and represents £60,000 diverted from the cause of true art into the *maelstrom* of bad taste. £60,000 for the building and a similar sum for the site is a good deal of money, and in its application ought to result in something better than the Hop Exchange, which was inaugurated on Monday, the 14th. It is impossible to criticise this building, but we may remark that the vestibule or lobby, which was commented upon in these pages last year, is now enclosed by temporary gates, which will shortly be replaced by iron of more or less elegant design. The fault of the vestibule consists in this—that it is over-decorated, and is neither indoors nor out. The gates are a step in the right direction. The hall is light and airy, and we have no reason to doubt but the offices opening into the balconies will be convenient, but, as far as elegance goes, the Hop Exchange is as near the zero of merit as a building well can be. It covers 1¼ acres, has 5½ acres of warehouse space, with an area of cellarage of 1¼ acres. The façade is 340ft. in length, and 100ft. in height. There are ten stories above the pavement. The Exchange proper is 80ft. long, 50ft. wide, and 124ft. high. We wish it had cost less, cheap as it is, and looked better. We have trespassed into the Borough, and sauntered out of the City, but there are in the City many other buildings possessing architectural merits which will call for notice sooner or later. It is plain that occasionally fault must be found. Indiscriminate praise is "censure in disguise." It is not easy to tell the student what he should do without exhorting him to avoid certain things, but in praise we hope to be ever hearty, and in censure ever considerate.

BRIDGE CENTREING.—II.

ONE of the principal advantages connected with the substitution of iron for stone in the erection of bridges was that the necessity for fixed centreing could be dispensed with provided circumstances rendered the adoption of such a course imperative. It would be hardly within the limits of possibility to build a stone arch without the support of centreing below. Brunel, the great engineer, succeeded in constructing a couple of semi-arches in brickwork springing from the same pier, so that they may be said to have balanced one another, but this must be looked upon more in the light of an experiment than an example to be imitated in actual construction. It was, no doubt, a very satisfactory demonstration of the strength of cement and hoop bond, but scarcely suitable as a model for engineers. Brunel had immense faith in the strength of cement, and that it was not unfounded is evidenced by the durability of the bridge he constructed at Maidenhead, for the Great Western line. This is a brick structure built on the skew in three arches with spans of nearly 130ft. When first constructed in ordinary mortar, it was discovered upon striking the centres that the arches would not stand; they were consequently re-turned in cement, and there has never since been any doubt of their stability. With regard to the subject of fixed centreing, the most important detail connected with its duties is that which is brought into notice at almost the expiration of its term of temporary service, when the time has arrived to "ease the centres," "décintrer," as continental engineers call it.

The description of bridge exercises a considerable influence upon the care and attention

that should be bestowed upon this operation, and we may here institute a comparison between an iron and a stone structure. The new Blackfriars and the old Waterloo bridges will answer admirably. Let us take the arches of the former as they are now, suspended as it were in mid air, not resting upon their beds, but supported at intervals only by the centreing underneath. The usual method of easing centres is to slacken the wedges upon which the uprights or some other portion of the framework is supported. There is another more elegant and scientific *modus operandi* which we shall allude to presently, and which has recently been practised in France. Now if we confine our attention to one of the iron arched ribs at Blackfriars, it is clear that, as it is one continuous mass of metal from springing to springing, and stiff enough to be proof against any lateral distortion, it requires to be lowered only at its two extremities. In other words it could be supported, when once the union of the separate subdivisions was accomplished, at those two points, and consequently the *décintrement* might theoretically be restricted to two points, also. One of the arches, in which a considerable waterway is left clear for the shipping, is virtually only supported by its two springings. A stone arch, on the other hand, demands not merely a more elaborate description of centreing, but a vast deal more of circumspection and care in the striking and easing of it. Were one end of an iron rib to be allowed to settle down on to its bearing before the other, there would be no harm done, but if one portion of a stone arch were to settle before the other, it would be a difficult operation to "reduce the dislocation" and restore the structure to its original form and conditions of stability. When the centres are struck beneath the arch every voussoir should settle uniformly and contemporaneously; the lowering should take place gradually, imperceptibly, and surely. It is not too much to assert that the whole of the previous labour, time, and expenditure incurred may be jeopardised by an unskilful and careless performance of this last duty. A glance at the soffit of an arch of either brickwork or masonry is sufficient to indicate the manner in which the centreing has been put up, maintained in its place during the turning of the arch, and removed when its services were no longer required.

In order to permit of the gradual and uniform descent of the centres, a method said to be borrowed from the Egyptians has frequently been employed, and was recently successfully applied in France. We do not mean to assert that the Egyptians used this plan for the purpose of bridge building, but that they were acquainted with the principle, and adapted it to the lowering into position of many of those gigantic monoliths and enormous masses of stone which so strongly characterised that period and style of architecture. The modern instance to which we allude is the *décintrement* of the large skew bridge of Lelles-sur-Cher, upon the line of railway from Tours to Vierzon. This operation was performed by means of small boxes filled with fine sand, and a French authority assures us that there is a remarkable example of the application of this principle under different circumstances in the ancient pyramid of Cheops, which is situated a few miles from Cairo, and has for ages existed in all the majesty of its solitary and imposing grandeur. A brief description of this instance of the antiquity of an ingenious engineering feature will not be without interest to our readers. In the very heart of the pyramidal erection is placed, in gloomy isolation, the mortuary chamber, the entrance to which is reached after traversing a long and narrow corridor equally sombre as the funeral vault into which it conducts the intrepid explorer. Within this inmost "penetralia," there lies a sarcophagus of syenite or Egyptian granite, supported upon a layer of exceedingly fine sand. Upon each side of this massive block are two apertures large enough to admit the hand. Nearly fifty centuries have elapsed since the sand was first submitted to the superincumbent pressure, but upon introducing the hand and abstracting it, the enormous stone can be observed to descend gently and perceptibly. The easing or striking of the centres of large bridges has occasionally been performed by this principle. Each upright of the centreing, or as many as may be considered necessary, is supported upon a small column of sand enclosed in a strong wrought-iron box, and the *décintrement* is effected by tapping the sand, so to speak, and allowing it to flow out at the bottom of the box. This operation being executed simultaneously with all the boxes forming the *points d'appui*, the centreing settles with all that uniformity and steadiness demanded by the nature of the circumstances.

It is often alleged that English engineers are too practical, and that, although the days of doing work by "rule of thumb" are gone never to return, yet there is some of the old leaven remaining. Possibly this statement may be to some extent correct, but if we err in the one extreme, our continental *confreres* are not altogether beyond suspicion of trespassing upon the other. If it were not that they had learned after some hard lessons to combine some of the rough and ready style of working that belongs to all our self-made engineers and contractors with their own more cognate and scientific system, we should still be in possession of a monopoly of railway and other engineering works on the continent. A railway cannot be either designed or constructed "by the book," and, provided due regard be had to theory, and none of its rules absolutely violated, precedent and practical knowledge will ever do more than algebra and the *calculus*. The example we have adduced is sufficient to point out that French engineers delight in *tours de force*; they prefer, if possible, accomplishing their purpose by an intricate, complicated, and needlessly scientific method, instead of executing it in the simplest and most common sense manner. An English engineer in the first instance regards a project in a practical point of view, and then calls in the aid of science if necessary to enable him to complete his designs and calculations. He makes the theory in one sense subservient to the practice; he uses the latter largely, the former sparingly.

DEVELOPMENTS OF NONCONFORMIST CHURCH ARCHITECTURE.

(CONCLUDING ARTICLE.)

HAVING noticed in previous papers the arrangement of the main feature—the auditorium—it remains to say a few words about certain adjuncts and details. The first of these which naturally suggests itself is the tower. It is the fashion just now to put some sort of a tower to every Nonconformist church, no matter how poverty stricken. In very many of these cases, and in very many Anglican churches too, it would be wiser to save this expense and use it in giving height and solidity to the rest of the building. A good church with no tower is better than a starved one with it. But, supposing that funds are sufficient, what is the purpose of a tower in the edifices now treated of, and what character would, therefore, be appropriate to it? The towers of Nonconformist churches generally are not bell-towers. *Why* they should not be is a different question, though until better bells than most modern ones can be afforded it is devoutly to be hoped that they may not be. If the quality of the bells were on a level with that of the architecture, some neighbourhoods would soon become uninhabitable. But there are other uses for a tower besides the one just named, the chief one being to call attention to the church at a distance, to indicate its position, perhaps even to make known its very existence. There are numbers of churches in the back streets of London quite unknown to nine-tenths of the people who pass near them daily, simply because they are destitute of towers. But a tower built as a signal or mark need not surely be copied from a bell-tower. The minaret of a mosque, or some of the southern Gothic turrets of similar character, would be a much more suggestive model. Height is what is wanted, not breadth of base. For the sake of economy, as well as for that of fitness, something different from the ordinary ecclesiastical model is to be desired. Something of the sort has, doubtless, been tried, but hitherto unsuccessfully. The overgrown pinnacle which so often does duty for tower and spire in a certain type of chapel seems like an attempt to realise this idea. Unhappy as the result is, it is worth noting as one effort after what is still not attained, a fitting tower for a Nonconformist church. A tower of this kind, since it exists mainly for the sake of being seen, should be a beautiful, or at least a picturesque object. Features of necessity or structural use have some apology for awkwardness; a chapel tower has none. Its beauty ought to be its own justification. Many ancient structures of the class have an almost shapeless massiveness—well fitted to their purpose, but absurd in a reduced copy when that purpose is wanting. The chapel tower should be the flower of the building rather than its main stem; its model the minaret rather than the belfry.

A little more variety in the *position* of the tower is an object very much to be desired. There is no reason why it should, perhaps in nine cases out of every ten, occupy the same invariable position at the side of the front gable. Monotony has really gone a little too far in this matter; and even a change for the worse, if that were possible, would almost be felt as a relief. This practice, which avails itself of the gallery staircase walls as a base, probably originated in motives of economy. Unnecessary outlay on such a feature was liable to be severely criticised; but, when so much of the height was practically needed, it was only a pardonable extravagance to carry the structure a little higher and make a tower of it. Besides the wearisome uniformity, however, which the system involves, it often makes the tower larger on plan than is at all desirable. Even in the existing type this is felt as a difficulty; witness the contracted, strangled-looking throat of the ordinary chapel turret just above the roof. So much for following architecture in a half-hearted spirit; the little economy at starting is just sufficient to spoil the effect of all subsequent outlay. But if the tower were intended from the first for a definite use, instead of being considered an ornament scarcely to be defended, some variety might be hoped for both in its position and its design. The gallery staircase would not have to stand as a kind of excuse for it, and, from its smaller size, too, the cost would, probably, after all, be no more than now.

The tower, then, being once made an independent feature and not a mere capping to the staircase, the latter might become an effective and characteristic adjunct. At present the custom is to hide it in the interior of the building, to disguise it as the fragment of an aisle, or to make it appear in other ways like anything but what it is. All this, of course, is part of the same system, that which tries to make a galleried church pass for an un-galleried one. To show the staircases would be to confess the truth. And yet in the few instances where they have been boldly exhibited, the result might almost have tempted chapel architects to lapse for a moment into naturalness and reality. Here, as elsewhere, the necessary arrangement of the building only needs thoughtfully working out to produce new and excellent forms; but the thought and labour are wanting, and what passes for architecture is the disguise of the actual facts into that shape which Nonconformists amusingly suppose to be the "correct" one.

The entrance lobby or vestibule is another feature which might be further developed

with great advantage. In a climate like ours it is almost a necessity. A small porch does not give the accommodation needed; and even the Classic portico, inappropriate as it is, is often more serviceable. Something differing from both, less open than a portico, and less cramped than an ordinary porch, seems to be what is required. Large lobbies of this kind are, indeed, common enough internally, but as an element in external design they are all but unknown. There are a multitude of other points which might be noticed, did space permit. Very much might be said on the general use of open roofs of a steep pitch, on the forms of ceiling sometimes substituted for them, on defective ventilation, and on the need of more facility for admitting air in hot weather, as well as on such matters of detail as the design of pulpits and gallery fronts. It is not, however, intended at present to follow the subject into these minutiæ, nor to take up the important questions of style and building materials. None of these items belong so specially to this class of buildings as do the questions of plan and arrangement, to which our remarks have chiefly been directed; but they will inevitably come to be reconsidered if any life and reality are ever infused into Nonconformist church architecture.

It is not, however, by Nonconformists only that the first principles of church design have still to be decided on. Their system is but one branch of a much wider one: the ideal type for their buildings is but one variety of the ideal type for Protestant worship generally. While all religious thought seems to be arranging itself round one of two centres—the Protestant or the Catholic—the system of free inquiry and the system of authority; when all minor divisions bid fair to be obliterated in these two great ones, it is plain that the first yet lacks that visible embodiment which the second long ago attained. The accessories of the one are complete, those of the other chaotic and fragmentary. A mediæval church, or even a good modern ritualistic one, is expressive of the creed which raised it. It is, at any rate, consistent throughout, everywhere suggestive of the same feelings, animated by the same spirit, fitted with the same perfection for the service to be conducted. How many Protestant churches are equally perfect, equally distinctive and characteristic? The best of them are still in a transitional state, with the germs of future growth half hidden by the dead remains of the past. It is vain to nurse any longer those forms from which life has departed; the best hope is to cultivate those which are rising from the soil. Protestantism has tried long enough to bend the Catholic type of church to its uses; the results all join to bid it evolve a type of its own.

SYMBOLISM.—II.

IT is clearly not sufficient that one thing be constituted the sign or emblem of another to render it a symbol of the higher and more instructive type. The algebraic signs —, +, =, are termed symbols of the ideas of reduction, addition, and equality respectively, and the Chinese alphabetic characters are symbols of words, or rather of the ideas which words express; but in these cases no natural correspondence, no conceivable resemblance, exists between the representing and the represented things. Such symbols are simply arbitrary. A nearer approach to the higher conception of a symbol was made *ex. gr.* in the Egyptian hieroglyphic of a bird with its beak in the water to represent "fishing," or two feet in apparent motion to represent "walking." When the Greeks made a trident to symbolise Poseidon, the god of the waters, they fixed upon an arbitrary sign; a bident, if it had the advantage of having been chosen, might have done quite as well, the suitableness not being in either case inherent, but the effect of *stet pro ratione voluntas*. But not so when the lion is put for courage, or the cornucopia for plenty. The destination here is not altogether arbitrary; it is justified in measure by the immediate and agreeable perception of harmony enjoyed by the mind, and what otherwise would appear a dead and unmeaning sign, compelled to do reluctant service, is welcomed and valued for its obvious appropriateness and expressiveness.

Symbols, then, are arbitrary or natural, conventional or rational, just as the accident of their first selection may have determined, although when once selected and having become customary and acknowledged, they all alike pass current as of equal value for their specific purpose and sphere. In the nature of the thing there is no reason why a lamb should not stand for youth or tenderness as well as for simplicity or "innocence;" or a sceptre represent royalty as well as be technically confined to the expression of "power" or "authority." But since, with a degree of arbitrariness as well as with a degree of reason, the latter objects have been coupled with the emblematic figures, and custom has established the usage, every purpose is answered. So in the alphabet, the letter *a* represents one variety of sound, *e* another, *i* a third, although in these forms themselves there is scarcely any conceivable certainty, no professed analogy, with the sounds for which they are equivalents.

Much explanation, owing to the greater or less degree of arbitrariness thus shown in symbolical selection, is required to school the mind into a perception of appropriateness, even where appropriateness does exist. Every Englishman, of course, knows that—

Britannia rules the waves,

and the Englishman enters therefore, without much effort, into the meaning of the trident-bearing figure resting on a disc or chariot wheel, and all apparently floating on the water, on our copper coinage. You have only to explain to him that the figure is a personification of Britannia or the English people, and that the trident denotes authority over the sea, to enable him to conceive the proud idea that he is part of that great power which sends forth the "mariners of England" and the "wooden walls of England"—now, alas! as taxpayers well know, no longer "wooden," but built of penetrable iron, before whose might all the navies of the world cower, and the fancy, with its flattering symbols, is never likely to be forgotten. But it is with greater difficulty, in spite of the measure of veiled appropriateness existing, that one accepts the crescent, or imperfect moon, as the symbol of Mahommedanism or the Turkish power. If intended to have any relation to progress, it is obvious that a crescent may suggest a waning as well as a growing moon, and in the former sense would be a faithful, though not flattering, emblem of the Turkish power in our days. But, in truth, this symbol, borrowed from the Greeks, was intended as a new moon, to indicate the progress towards greatness and complete fulness of Islam.

Between civil and religious symbolism there seems to be no distinction whatever, except what exists in the objects represented. The seen and known is indifferently used to suggest and explain the hidden, be the hidden of greater or less significance. The commonest things rise to medium or highest dignity as shadows, in proportion as their substances rise. A bundle of sticks in the fasces spoke of Roman authority; two pieces of wood in the Christian cross awaken associations of a far loftier and more sacred kind. A ship is commerce in England; but the early Christians saw in this emblem all that was stormy, precarious, and yet buoyant and progressive, in the fortune and character of the Church in those sore and trying times.

In the same manner, common things become exponents equally of material objects or of mental states. The Egyptian ideograph of the figure of a dog meant a real dog only, while that of a female bearing a tambourine expressed, not the thing or act visibly represented, but the mental state, "joy," implied in the act. But the pleasure imparted by emblematical representation increases in proportion as the object ascends and hidden meanings are revealed, and the humble instrument of instruction has reflected upon it a lustre in proportion as it brings to view the high and distant, the ideal, moral, and divine; and it is most pleasing of all when symbol and object meet in a variety of surprising and expository correspondencies which tempt to a belief that the outer world is but a covering of the inner, and that all things, when philsophically seen, are seen in doubles.

Symbolism, pursued in this direction, was carried to its highest pitch, and far beyond its legitimate sphere, in the great Swedish dreamer's system of "correspondencies." All things may, indeed, by fanciful effort, be conceived as having their counterparts or shadows. The variety of the universe is so exhaustless, and the seeking mind of man so fertile in invention, that all ideas and all spiritual beings may easily have assigned to them, by an uncurbed fancy, relations and congruities which have no real basis in nature, but are mere imaginations of the thinker. Swedenborg believed himself to have made the sublime discovery that this huge creation is hung together on the principle of "correspondencies," that all material things are but visible copies of things invisible. That such a theory of the universe is beautiful and attractive none can doubt; but all things beautiful to the imagination are not, therefore, real, as has been proved by the falling through of many theories of Utopia, besides that of Sir Thomas More. It is most likely true that—

Things are not what they seem,

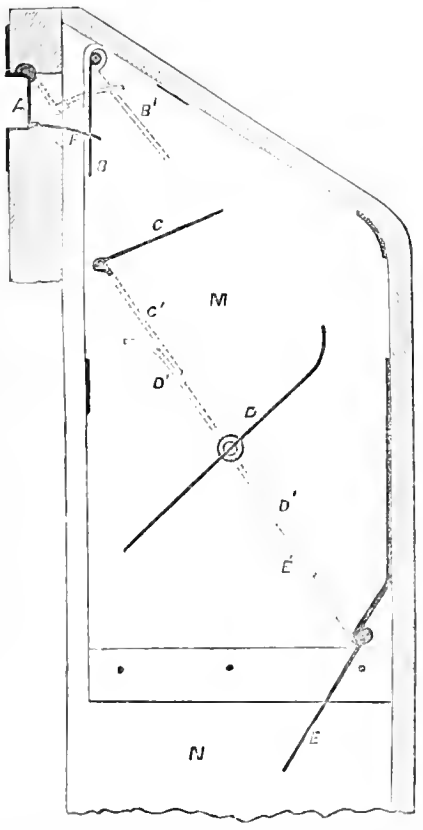
that they are deeper in significance, and fold in their draperies stranger mysteries than we have dreamed of, and a theory of correspondencies such as that alluded to, if anything but an illusion, would give the world a harmony and sanctity which would intensify the enthusiasm of nature's most wrapt admirers, and make not only poets, but, after a sort, worshippers of us all. It is a pity it is not true.

In this aspect of it the philosophy of symbols, though utterly impossible of wide belief, is more consoling in its very illusions than the dissecting-room philosophy, whereby some moderns, reviving old dreams, would show that mind is but a mode of action of matter. Mankind are, it is true, infinitely credulous, and this is a comfort to the new worshippers of muscles and nerves; but they are not half credulous enough to peruse, rosary in hand, the new missal, and believe that all intellectual and emotional phenomena are but fabrics woven by the material machine of the body. Have not, however, these very priests of the dissecting-room, with M. Comte at their head, their little partialities for a kind of symbolism also? They verily have, and their symbolism is full of little or great, indubitably ingenious disguises, to please the childish partiality for the invisible and supernatural, by some strange oversight on the part of the nerves and muscles, inherent in the constitution of man. They think it desirable to humour this partiality by means of a fine system of visible symbolic make-believes, representing another system of supposed, but absolutely unreal, so-called "spiritual" things. It is well to suppose that there is a God, and with grand ceremonial, in the finest temples you can provide, with music and incense and the other adjuncts, offer Him worship; but know ye at the same time that all these visible solemnities, all these words of adoration, all these bowings and reverences, all these signs and sounds, are but a vain show to please your childish years, until you have been educated into the perception that there is no god but "aggregate humanity," and that

"woman" is his prophet. On the whole, the world had not, before M. Comte's time of enlightenment, heard of a symbolic worship so interesting as this. Professor Bain has not yet developed his cultus. From the symbolism of ideas and of invisible things generally, to that of temples, and hence architecture, there is scarcely the distance of a step, and this distance we shall by and by retrace. In the meantime we must continue a little further our remarks on the less circumscribed applications of symbolism.

SHOVE'S PATENT LETTER-BOX.

IT has often been remarked that if one-tenth of the skill and ingenuity employed by thieves and burglars were directed towards the accomplishment of good instead of evil, we should be further advanced than we are in the useful application of the mechanical arts. The utmost endeavours of human invention have been unable to defy the efforts of the practised and skilful burglar. It is no wonder, therefore, that we witness continually new inventions designed to obviate and frustrate all felonious attempts. Among these is a patent letter-box by Mr. Shove, which is intended to prevent the possibility of any tampering with the contents. The insecurity of the ordinary letter-box and the facility with which the letters or other contents can be fraudulently abstracted are notorious. With the view of securing them against such attempts, Messrs Hart and Son have completed arrangements by virtue of which they have become the sole licencees and manufacturers of Shove's patent letter-box. Before describing in detail this ingenious little apparatus it may be stated that the principle upon which its construction is founded renders it an absolute impossibility for a letter or newspaper that has once been delivered to be extracted, except by the proper opening at the back of the box. It will be perceived from the accompanying illustration that Shove's patent



letter-box consists in reality of two divisions or compartments; the upper, M, and the lower, N, which are separated by a movable partition capable of being so adjusted as to open or close the communication between the upper and lower compartments according to circumstances. This movable partition is composed of three leaves, C D and E, comprising an upper, a central, and a lower one, and, in order to demonstrate the advantages belonging to the invention and the admirable and simple manner in which the mechanism acts, we will imagine the box attached to a door in the ordinary manner with letter-plate and everything complete. In this state the letter-plate is down, represented by the thick black line A, the opening or slit closed, and the communication between the upper and lower compartments of the box open. Directly a letter is to be delivered the plate is pushed back and the opening or slit revealed by the inner plate B and the letter-plate A assuming the position shown by the dotted lines at B', and now the ingenuity of the mechanism becomes apparent. The pushing back of the plate sets in motion small arms or levers which immediately act upon the three leaves C D and E composing the partition separating the two compartments of the box in the following manner. The central leaf D makes a quarter turn, the upper and lower C and E do the same in contrary directions, and then relative motions bring them close together, slightly overlapping each other, so that they form an inclined plane extending right across the box, and totally shutting off all communication between the upper and lower compartments. The new position is shown by the dotted line C' D' and E'. The letter is, therefore, received upon this inclined plane and remains there so long as the postman or the deliverer of it keeps the door plate pushed back, but directly he removes his hand and by so doing shuts the opening, the falling-to of the plate restores the small levers to their original position, the three leaves of the partition separate from one another and recover their original position shown by the black lines C D and E, leaving ample space for the letter to fall through into its final receptacle, namely the lower compartment N, where it remains until removed in the proper manner.

Upon an attempt being made to abstract the letter through the delivery opening the preventive action of the invention is at once apparent. No sooner is the plate pushed back in order to get at the centre of the box than all further fraudulent endeavours are at once frustrated, since, as has been already explained, the least motion imparted to the letter-plate immediately connects the leaves D C and E of the partition and places an impassable barrier between the upper compartment M, into which we may suppose a pair of clippers or other instrument to be introduced, and the lower N in which the letter is lying. In a word, it is an utter impossibility to reach the lower compartment so long as the slit is kept open by the pushing back of the letter-plate. The very act of moving the letter-plate so as to introduce through the delivery opening any instrument for the purpose of abstracting a letter or other contents of the box effectually frustrates all such attempts. The preventive arrangement is perfectly self-acting, and cannot be tampered with. This box can be readily substituted for any of the ordinary kind by simply removing the one and screwing or holding the other in its place after making a simple connection between the plates A and B. There is not the slightest necessity for the removal of the original door-plate, nor any especial fastenings of any kind required. The box is constructed entirely of zinc, a material well known for its non-oxidability, its clean appearance, lightness, and durable powers. It is handy and portable, and the mechanism is of so strong and simple a character that nothing short of wilful violence could put it out of order. A portion of the patent includes the addendum of an alarum, which would be set in motion by the movement of the letter-plate. This would also act as a signal, and might be found of use in many instances where the usual means of calling attention to the delivery of a letter were not available. Mechanically and practically considered, the real value of the apparatus lies in the arrangement of the shifting leaves, whereby the communication between the upper and lower compartments is cut off upon the least attempt being made to abstract the contents of the box.

THE COST OF AGRICULTURAL LABOURERS' COTTAGES.

MR. J. BAILEY DENTON, in a long letter to the *Daily News*, says much that is of interest to designers and builders of dwellings for the agricultural poor. After showing, upon economic grounds, that it is the real, if not the apparent interest of landowners, to provide dwellings for agricultural labourers, in the same manner as manufacturers provide dwellings for their operatives, he asks why we should not ascertain and unhesitatingly state what the real cost of cottages is, and why we should attempt by misrepresentation to make each other believe that cottages cost less than they really do It is clearly possible to ascertain with the greatest precision what cottages of different accommodation will cost under specific circumstances, and it is an illusion to declare that the local and attendant circumstances are so various that a correct representation cannot be made. Instead of determining the exact space and accommodation which each class of cottage should contain, and fixing the degree of substantiality requisite in each case, we seem to have been endeavouring for the last twenty years to obtain "cheap cottages," without any basis for calculation whatever. Cottages should not always be of one accommodation, as we are now disposed to build them, and if those with two bedrooms were mixed in due proportion with others of three bedrooms each, we should not only spend less money, but we should supply that which is equally wanted. Again, the space allowed in the model lodging-house is about 550 cubic feet per person, and if we adopt these figures as some guide to the cubical contents required in each class of cottage, we should clear the way of much misunderstanding. Supposing the height of the lower rooms to be, from floor to ceiling, 8ft., and that of the upper rooms 7ft. 6in., and that the living room should contain 1,200ft., the parents' bedroom 900ft., and the boys' and girls' room 650ft. each, while the scullery, pantry, and passages take in the aggregate 1,000ft. more, we then arrive at the space and dimensions applicable to each class of cottage. With these figures to regulate designs, it is not in the power of any architect, by any twisting and changing of the internal arrangements, so to vary them as to reduce the cost £10 per cottage in each class—assuming that the materials, degree of substantiality, and amount of internal accommodation are the same. Such is the conclusion arrived at from the study of the numerous prize designs with which the country has been favoured, and if Mr. Webster's recently-appointed committee of the British Association would carefully ascertain what has been done and actually paid where cottages have been built under the supervision of the Inclosure Commission, as well as what has been done by landowners independently, a great national advantage would be gained by the examples that would be afforded. It will be absolutely necessary, however, that persons competent to dissect details and arrive at facts and figures in a practical shape should be the examiners, and surely all architects whose plans have been used and are considered to be most economical would be willing that they should be submitted to such an ordeal.

Very striking results have followed the giving of prizes by our principal agricultural societies. It has been invariably assumed by the prize-givers that three-bedroomed cottages can be built for £100 each, and it has been a condition that the designs should be prepared accordingly. Directly, however, that the successful plans have been put to the test of contract, they have been found never to cost less than £130 each, and then under favourable circumstances only. The most approved plans for three-bedroomed cottages have in certain cases reached £175 each, where the prices of materials and labour were high, and where everything has been paid for except the land upon which they have been erected. Can we wonder that landowners, misled by pretensions of which this is an example, should hesitate to provide dwellings for the poor? In 1864 the Society of Arts offered prizes for designs of rural labourers' cottages, and 134 architects competed. Mr. C. F. Hayward (member of the Council of British Architects), Mr. John Clutton (President of the Institute of Surveyors), and Mr. George Dines (the well-known builder) were appointed to examine them. Their report closed with these words:—

> In fine, we may observe that, although good cottages may possibly be erected under favourable circumstances in some parts of England for a lower sum, we consider the probable average cost of a pair of cottages built with the conveniences we have enumerated, would be about £280 to £300, and that the attempt to erect them at any considerable reduction upon the amount must result in some inferior kinds of buildings discreditable to the owner, and wanting in much of the necessary accommodation for a labourer and his family.

There is no doubt, continues Mr. Denton, that this quotation represents the facts of the case accurately, and that wherever three-bedroomed cottages cost less than £280 the pair the reduction arises from circumstances which exclude them from general comparison.

It has often been stated, by men whose words make a deep impression upon the public, that

cottages are at the present moment being built on certain estates at £200 a pair. Having investigated some of the instances spoken of, Mr. Denton gives a few particulars. In one case he found that the bricks of which the cottages were built had been supplied by the owner of the estate at 18s. a thousand, the cost price, while he (the owner) was selling the same article to his neighbours at 28s. Gravel was allowed from the estate for concrete, and sand for mortar, without any charge. The haulage of the whole of the materials was done by the tenant of the farm to which the cottages were to be attached. This haulage of materials is worth from £20 to £30 per pair, according to circumstances; and thus there was upwards of £50 accounted for directly, which under ordinary circumstances would have to be added to the cost. In other cases it has been found that not only have the materials been chiefly supplied from the property, but the estate carpenter and mason have been employed to build, in which case the contractor's profit has been saved as well as the interest on money which a builder paying his men weekly, and only receiving payment on completion, looks to recover. Under such conditions a saving would be effected of from £30 to £40 on each pair of cottages, but inasmuch as comparatively few landowners have their own carpenters and masons, all fair comparison fails. Again, in the essential requirements of water and drainage, one landowner will be very particular in providing them, while another avoids them. In the provision, too, of sinks, coppers, ovens, cupboards, shelves, grates, and other minor items of accommodation, the greatest difference prevails. Mr. Denton says that he has said sufficient to show that a difference of at least £100 per pair of cottages may be accounted for in the way in which the work is carried out, and the amount of accommodation furnished. The cottages now being erected by the Earl of Leicester on the Holkham estate have cost from £210 to £230 per pair. Lord Leicester provides all materials, including doors, windows, and frames ready for fixing, the additional labour only being done by local tradesmen, by contract, under the supervision of his lordship's resident clerk of the works. Thus the trader's profit is saved on the materials and the labour incident to their preparation. The price named does not include haulage, which is done by the tenant of the farm upon which the cottages are built.

In conclusion, Mr. Denton expresses his conviction that the stereotyped form of cottage-building (*i.e.*, with three bedrooms upstairs, with living room and scullery below, and the necessary outbuildings in addition) must be departed from, and that we must, in certain cases, have one bedroom on the ground floor, as adopted by Captain Dashwood, and in others one larger living room, with the scullery as an outbuilding. Moreover, if we are in any sensible degree to reduce the cost of cottage building, it must be by the use of materials different to those that have hitherto been adopted. The use of home grown timber steeped in lime, and thereby made as durable as Baltic deal, is one object well worthy of consideration. The same may be said of concrete in the various forms in which it has been recommended.

THE SEWERS AND CESSPOOLS OF BRIGHTON.

WHEREVER noxious matter of any kind is allowed to accumulate, however salubrious may be the locality, the health of the inhabitants must suffer. The sewage of Brighton, a town of 80,000 or 100,000 inhabitants, is only partially carried away by sewers, a great portion being stored up in those hotbeds of disease, cesspools. Thus many who may go to Brighton (or other places similar in sanitary or non-sanitary arrangements) in search of health, may possibly return with the seeds of disease implanted within them, although utterly unconscious of the fact.

The suburbs of Hove and Cliftonville are not governed by the Brighton municipality, and, from want of unity among the powers that be, it has been found impossible (says the *Lancet*) to adopt a thoroughly comprehensive system for the drainage of the district and the utilisation of the sewage on the land. As it is, the sewage is turned by no less than six outlets into the sea. This fact must damage the "bathing" reputation of the town, as compared with Hastings or Eastbourne, where such an arrangement has been obviated at a vast expense. Immense volumes of dark and stinking sewage are poured out in proximity to the bathing machines, and during the recent hot weather the stench was considerable. The course of the currents is from various causes very capricious, and no dependence can be placed on the sewage being carried out to sea. Sometimes it is driven almost directly upon the shore. The proprietors of Brills' Baths have expended £10,000 in erecting a pumping station at Hove, to supply baths in King's road. This expense was necessitated by the contamination of the water at the latter point. In the absence of an intercepting scheme, which the *Lancet* Sanitary Commissioners would prefer to anything else, they recommend a prolongation of the outfall pipe and the placing of a cowl over the extremity, in order that the sewage may be more widely diffused. At present there are about 14,000 houses in Brighton, of which less than 4,000 are drained into the present sewers. There are probably between forty and fifty miles of streets, but only twelve miles of sewers are yet in operation, so that a much greater quantity of sewage will eventually find its way into the sea. A contract is now being carried on for thirteen miles of sewers, which will drain 6,000 more houses. There is still a lingering affection for the old cesspool system. Nearly every house has its own receptacle, and many more houses have two than none at all. At a low estimate 10,000 cesspools are now in operation in the town, most of them holding from two to three waggonloads of filth, and some containing more than twice this amount. It usually takes two men two, and in some instances three, nights to empty them. It may be estimated that eight or ten are opened every night. The frequency of this operation depends on the nature of the soil and the construction of the cesspool. There are four kinds: first, those made in what is called Coombe rock, which is a species of chalky marl interspersed with boulders, probably brought down from the shore by glacial action. This substance is quite impervious to water. Cesspools made therein are speedily filled up with very liquid matter, and easily run over. They require to be often emptied, and the farmers grumble because the contents are scarcely worth the trouble of cartage. Beneath this most peculiar deposit, which reaches at some points to a depth of 70ft, and extends for a considerable distance both in the eastern and western portions of the town, there is a continuation of the shingle of the coast, composed of rough stones and fine sand, with the remains of bones and curiously burnt bricks, which must have been made by man millions of years ago. Very many cesspools communicate with this, and as it is capable of receiving almost any amount of solid as well as liquid matter, these cesspools may go for fifty years without being opened. In the northern portions of the town the cesspools are made in chalk, and in many cases one above the other. When first made they absorb a considerable amount of solid as well as liquid matter, and they go for several years without being cleansed. But as the pores of the chalk become closed up, the interval between cleaning out becomes less and less, until at length they require to be opened almost every year. Lastly, very many wells have been closed for drinking purposes by order of the authorities, and have been converted into common cesspools. A most experienced person has never known one of them stopped up. The water-courses in the chalk are immense, and will carry off any amount of solid matter. But the so called springs appear in wells and on the beach, and are, in some instances, the source from which drinking water is derived. In the cesspool districts, disease assumes a peculiarly asthenic form, and nervous depression and neuralgic affections are very marked. These do not necessarily increase mortality, but they destroy the advantages which the invalid is entitled to expect at such an admirable spot. The Brighton authorities, hitherto too reliant on the reputation of their town, must bestir themselves in sanitary matters if they wish to retain public approbation.

THE FIVE ORDERS AND THE THREE ORDERS, AND THE ORIGIN OF FREEMASONRY.

AN interesting discussion on this topic has been going on recently in the *Freemasons' Magazine*. It arose from "Pictus," a writer in that publication, speaking of the ignorance, both of Freemasonry and architecture, sometimes displayed by some of the craft. It is absurd, he said, to hear the "five" orders spoken of as existing at the time of the building of Solomon's Temple. In reply to this, a correspondent said that if "Pictus" would look into Josephus, he would find that Solomon built his house supported by "quadrangular pillars," but "the roof was according to the Corinthian Order." This drew forth another correspondent, "Not for Joseph," who asked which Josephus was referred to as an authority that the Corinthian order was employed in Solomon's Temple—Josephus the historian or Josephus Miller? Both, he says, are equally good authorities on such a point.

"Pictus" again comes to the front, and argues for the correctness of his former assertion that it was absurd to speak about the *Five* Orders as having existed in Solomon's time (about 1,000 B.C.). Solomon, he says, was undoubtedly acquainted with the style of architecture in use among the Greeks; but the Greeks only used *Three* Orders—viz., Doric, Ionic, and Corinthian. It was not until long after the foundation of Rome (752 B.C.) that the Romans made the innovation of the Five Orders. Consequently Solomon could not know anything about what was not invented until several centuries after his death. "Pictus" trusts that his Masonic brethren will see the necessity of making a distinction between the Three Grecian Orders and the Five Roman Orders, when, the chronology of architecture being better understood, we shall have no more allusions, at least, to the Tuscan and Composite in connection with Solomon. "Pictus" further says that he had no intention of finding fault with or disputing the propriety of speaking about the co-existence of Solomon and the *Three* Grecian Orders, yet, notwithstanding the quotation from Josephus, he is not aware that even the Grecian Corinthian was in existence so early as Solomon. It is questionable if Josephus could have furnished any proof that Solomon really built his house "according to the Corinthian Order." Can any Grecian specimen of Corinthian, erected 1,000 years B.C., be indicated? "Pictus" thus concludes:—"There is (I hope I will not be misunderstood) in a Masonic point of view too much stress laid upon the Temple of Solomon. As a building it was undoubtedly a fine one, yet we may believe that there were other buildings erected about that time as good specimens of architecture as it was. It was not built *by* those whom it was built *for*. It is the religious ideas fixed in our minds, connected with Solomon's Temple, that give it its greatest interest in our eyes. I am not one of the believers in the popularly-understood connection believed to exist between Solomon's Temple and modern Freemasonry. I go in with the idea of the origin of Freemasonry being with the building fraternities of the middle ages. It is easy to conceive that many allusions would be made to, and illustrations drawn from, the building of Solomon's Temple, as well as other matters mentioned in the Bible, to excite and stimulate the brethren. Such scriptural allusions and quotations were customary with writers of the eleventh and twelfth centuries; thereafter, what was merely used in illustration came ultimately in process of time to be considered as fact. Yet while I support the idea of the Freemasons being the direct descendants or representatives of the middle ages, yet, in a sense, as masons, these building fraternities were on their part the descendants of the architectural fathers of pre-Christian times."

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-first annual report of this institution has just been published. Four additional pensioners have been placed on the funds within the last twelve months, the total number now being forty-eight—twenty-four men and twenty-four women. A satisfactory addition has been made to the funded stock: £1,525 19s. 3d. having been purchased for the relief fund, and £107 8s. 6d. for the building fund. The amount now invested is £11,322 19s. 4d. stock for the relief fund, and £2,939 19s 9d. for the building fund, being a total of £14,272 19s. 1d. stock three per cent. Consols. The directors, in thanking the late president, W. R. Rogers, Esq., especially allude to the good service he did to the institution by having obtained the large donation of £100 each from ten firms. They also, in thanking all their friends and supporters, ask them to renew their efforts so as to enable them still further to aid their unfortunate and deserving brethren. George F. Trollope, Esq., has kindly consented to act as President of the Institution for the ensuing year.

ST. MARY'S CHURCH, LICHFIELD.

THE erection of one of the most fitting of the many visible memorials of the late Bishop Lonsdale was formally commenced at Lichfield on July 30. The Rev. Canon Lonsdale, younger son of the late beloved bishop, succeeded to the living, and the necessity for rebuilding the church as a matter of safety as well as of taste and convenience led to the determination to erect a new building which should harmonise with the beautiful tower and spire in memory of the late bishop. The estimated cost is £8,000, and towards this the family of the late diocesan contributed £4,000, and the rest has been subscribed with the exception of about £1,000. When the tower and spire were erected Mr. Street prepared plans for a new church, but it was determined to invite competition for the design, and the result was that the plans of Mr. James Fowler, architect, of Louth, in Lincolnshire, were selected. The new church will consist of a nave 70ft. long with north and south aisles, and a chancel 30ft. long, and will accommodate 900 persons. It will be built of stone polished inside and out. The east window will be very large and elegant, and there will be six three-light windows on each side, and a four-light window at the east end of each of the aisles. The principal entrance will be on the north side, where near the tower there will be a very handsome doorway with deeply recessed and moulded arch, and carved capitals. There is a good deal of carving in the design, which includes a handsome reredos with columns of Devonshire marble, massive carved oak stalls, and altar rail in the chancel. On the south side of the chancel there will be an organ chamber and vestry, and on the north side, over the family vault, a chapel for the Dyott family. The contract has been taken by Messrs. Critchlow and Ward, builders, of Uttoxeter.

ST. SWITHIN'S, LINCOLN.

THE parish church of St. Swithin was at one time the largest and handsomest in Lincoln. It consisted of a nave with north and south aisles and chancel. The tower, containing a peal of bells, stood at the west end of the nave, and was remarkable for its good proportions. This building continued in good repair until 1644, when it was destroyed by fire. The ruin was left standing for some years, until the tower was considered unsafe from the weight of the bells it held, and was consequently pulled down and the bells sold.

In the Bodleian Library at Oxford there is a sketch by Buck of the ruin in the year 1720, which shows the remains of the south side of the nave and a handsome east window; it appears, too, from this sketch that the parishioners had roofed in a portion of the south aisle for the purposes of Divine service.

The present little church was completed in 1801, when the population of the parish numbered only 940. From that time the parish has been gradually increasing in importance until it has become by far the most populous in the city and now contains upwards of 7,000 persons, and the only church accommodation for this large number is the little building above mentioned, which is estimated to seat about 270 persons.

At various times during the last seven years attempts have been made to build a large new church, but all these attempts proved unsuccessful, until the present incumbent (the Rev. G. H. Pratt) commenced the work in earnest, shortly after his appointment to the living. He has been so far successful as to obtain a most valuable site adjoining the present churchyard and opening into the widest and most commanding street in the city. A very effective design has been supplied by Mr. Fowler, of Louth, who won the competition against ten competitors. The work is to be carried out in three separate contracts:—1. The nave and aisles. 2. The chancel and vestry. 3. The tower and spire. The whole is estimated to cost from £7,500 to £8,000.

RESIDENCE AT BAGSHOT, SURREY.

ON another page will be found an illustration of a residence recently erected on the estate of Sir George P. Lee, Knight, near Bagshot, Surrey. It has been the endeavour of the architects to treat it in the spirit of the English cottage style, combining simplicity and economy as chief recommendations. It contains three reception rooms, kitchen, butler's pantry, housekeeper's room, and other offices on the ground floor, with eight bed and dressing rooms. It is situate on sloping ground, commanding a magnificent view of Ascot, backed by fir and pine trees, forming a pleasing contrast in colour.

A few points in the construction may perhaps be of interest. The external arches are formed with perforated bricks laid in cement and placed on end, forming level soffits, thus saving centreing skewbacks and ganging to arches; the upper portion of gables projecting on corbels and formed of 9in. brick nogg and fir framed timber, stained and varnished, with entrance porch of open timber framed. No stone has been used, except for sills. The staircase and other internal fittings are in character with the exterior. Terraces will be formed to reach the garden, which is laid out with ornamental waters, &c. The roofs are covered with the Broomhall patent tiles. Stables in character with the house are now erecting. Mr. Roberts, of Islington, was the builder, who completed the work under contract for £1,720. The architects were Messrs. Walford, Donkin, and Co., 3, Queen's-square.

MURAL PAINTINGS AT WEST SOMERTON CHURCH.

THE discovery of the Fairford windows, though much more valuable, is scarcely more interesting than a discovery recently made at West Somerton Church, near Great Yarmouth, of some fine mural paintings. Mr. John L'Estrange, on the visit of the Norfolk Archæological Society to the church, gave an interesting account of these wall-paintings. It appears that in constructing a ventilator in the south wall of the nave traces of colour were detected, and Mr. J. T. Bottle, of Yarmouth, having heard this, obtained permission to clear off the numerous coats of whitewash. He was rewarded by finding that the whole space between two of the Early English windows of the nave, in length about 12ft., was occupied by an early painting representing "The Son of Man coming in the clouds of heaven with power and great glory." Unfortunately, the central portion of the upper part of the painting was irretrievably lost by the rebuilding of that portion of the wall some time since, and the plaster at the lower right hand corner is much decayed. Our Lord was evidently represented seated, with the globe beneath his feet, upon a rainbow, the lower portion of which is still left, but of the figure nothing but the bare feet remain. On either side of our Lord is a seraphim, presenting to him a kneeling female, the one on the right being the Virgin Mary. Lower down are two angels, habited in albes and wearing crowns, trumpeting the dead to judgment. At the bottom are eleven nude figures in various attitudes, amongst them being a king and queen, ecclesiastics, and two knights, whose acutely-pointed bassinets, together with the broad, bold style of drawing, indicate the reign of Edward III. as the date of the painting. The treatment of the subject corresponds with that of other mediæval representations of our Lord's second coming. On the north wall of the nave, opposite this painting, is a smaller painting, enclosed within a decorated border, of the Resurrection. This is considerably faded, but the figure of the Saviour stepping out of the sepulchre is tolerably distinct. It is confidently anticipated that the whole of the walls are covered with such paintings, but for the present operations are suspended for want of funds.

ANTI-SMOKY CHIMNEY STOVE.

MR. THOMAS NASH, jun., of Great Dover-street, Borough, the well-known inventor and manufacturer of the copper-bound painters' brushes, has recently patented certain improvements in domestic stoves and grates, their object being the promotion of more perfect combustion and the prevention of that too prevalent evil, a smoky chimney, as it is commonly termed. Mr. Nash provides the back of the stove or grate with a hot air chamber—that is, behind the grate-back he has a hollow space or chamber, the air in which becomes heated by conduction from the back of the stove or grate, when the back gets heated by the action of the ignited fuel therein. The aperture for the passage of the smoke or products of combustion is not, as in ordinary stoves or grates, a mere opening, allowing such smoke or products to pass directly to and up the chimney, but has a sort of hood or deflector, which brings the smoke or products of combustion within the action of the rarefaction of the air in the hot air chamber, and by the power of the upward current thus created ensures the ascent of the smoke or products of combustion, downward currents being opposed by the rarefied air thus generated in the lower part of the chimney, in the hot air chamber, and in the fireplace, as well as by the hood or deflector, preventing any sudden downward gust passing direct on to the ignited fuel, but causing it to be brought within the influence of the heated air in the hot air chamber, and thereby destroyed.

THE DEWSBURY NEW WATER-WORKS.

AT the present time several extensive contracts are being executed at the Waterworks for the United Water Boards of Dewsbury, Heckmondwike, and Batley. The works are situate at and near to Dunford Bridge, on the Yorkshire and Derbyshire moors. The contracts are in the hands of Mr. Nowell and Mr. Briers, who are executing the works, under the supervision of Mr. Bateman, of London. The operations comprise the Stamcliffe reservoir and the Wimbledon reservoir. At the latter place the works are being carried on on a large scale. The difficulties which have had to be encountered have been rather formidable. A dislocation or fault, which crosses the valley at the point where the puddle wall of the embankment was formerly fixed, rendered it exceedingly difficult to obtain a good foundation. This has now been overcome, and a good foundation has been found for a considerable distance across the valley. The puddling has been commenced at a depth of 30ft. below the bank, and it is believed that the work will be made secure. It is proposed to line the trench at the bottom and on the sides with concrete, so as to prevent any leakage. A large discharge tunnel, in connection with the reservoir, has been successfully driven through, and is now being lined with stone. In the embankment about 18,000 cubic yards of earthwork have been deposited.

PROVISION FOR THE SICK AND INSANE POOR OF LONDON.

IN June, 1867, an order was made by the Poor Law Board combining the unions and parishes of London into an asylum district for insane, fever, and smallpox cases, and the Metropolitan District Asylum Board was called into existence. By this combination great benefit must result to the sick poor. Spacious, well-constructed, and pleasantly situated infirmaries or hospitals will be an agreeable transformation from the dingy and pestiferous apartments in some of our metropolitan workhouses yclept "infirmaries," and the sad condition of which the *Lancet* Sanitary Commissioners did so much to expose. The Metropolitan Asylum Board bids fair to effect this transformation. Two asylums for the insane, each to accommodate 1,500 patients, are to be erected—one at Leavesden, near Watford, on the north, and the other at Caterham, near Croydon, on the south side of the Thames. Three asylums are to be erected for fever and smallpox patients—one for the north-western, another for the north-eastern, and the third for the southern district. The site for the north-western asylum is at Hampstead, for the north-eastern at Homerton, and for the southern at Stockwell. Great opposition has been raised by the inhabitants of Stockwell and Hampstead to the erection of such buildings in their neighbourhoods from fear of contagion, but the same opposition was raised some years ago by the Islingtonians to the erection of the London Fever Hospital in the Liverpool road. The hospital, however, was erected, and the population of Islington has not been decimated by fever, as was prognosticated.

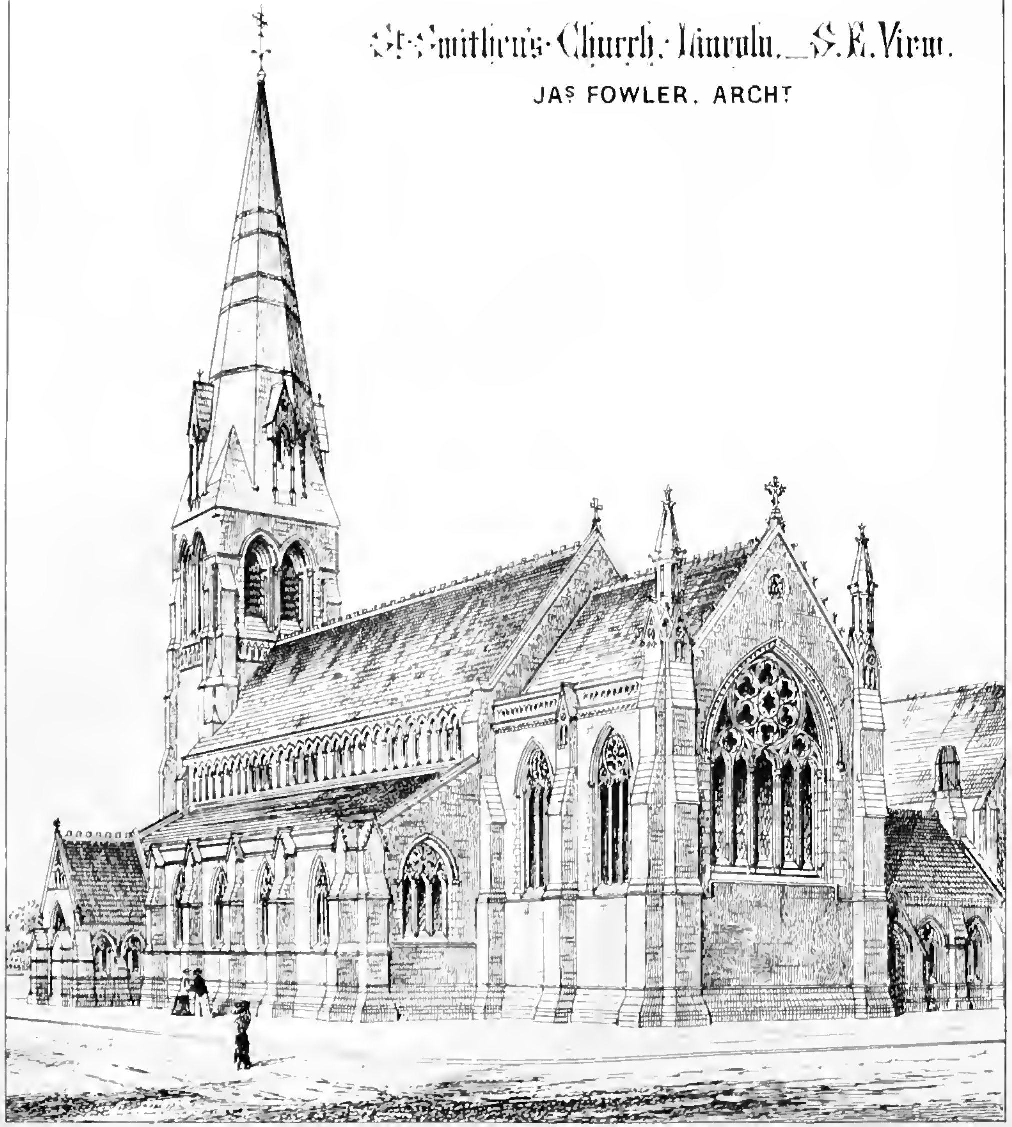
In addition to these works, seventeen parishes and unions have been required to provide infirmaries on sites detached from their workhouses. Pending the completion of such arrangements many boards of guardians have provided temporary buildings. At Camberwell, Nazareth House, formerly a nunnery, has been taken as an auxiliary workhouse, and Price's Candle Factory, in Wandsworth-road, has been hired by the Lambeth guardians. At Islington and Kensington temporary iron buildings have been erected.

Residence at Bagshot. Surrey = belonging to Sir George Lean Knt

Watford Ponkin & Evill. Architects

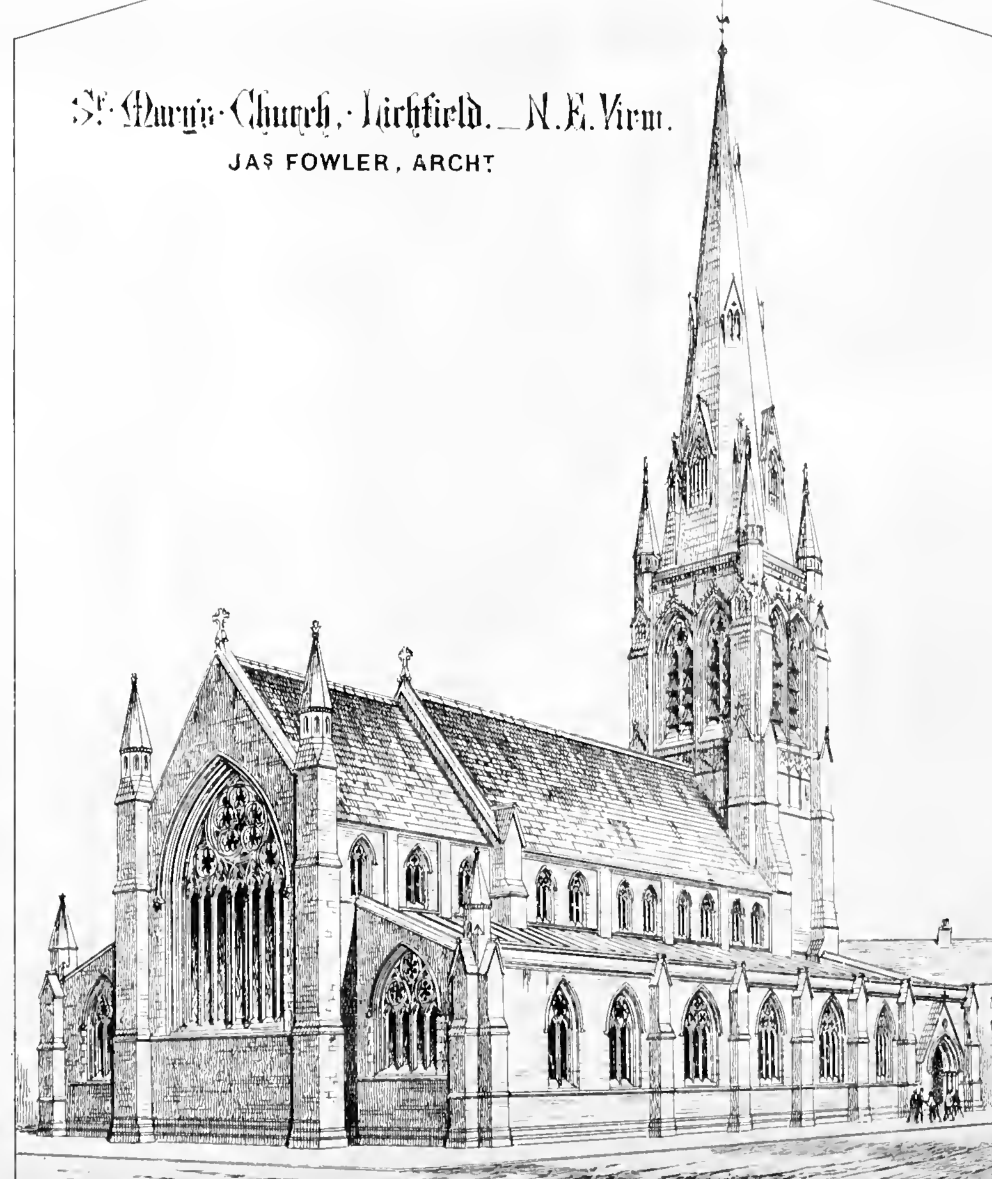
St. Swithun's Church, Lincoln. _ S.E. View.

JAS FOWLER, ARCHT



St. Mary's Church, Lichfield. _ N.E. View.

JAS FOWLER, ARCHT



E. Wimbridge lith.

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CATHEDRAL ORGANS.

IN spite of the cleverness of men of genius it must be confessed with some shame that a good deal of what is good and capital in this world, especially in art, has been the result of accident—pure accident, and nothing else. This was the case of the organ in Westminster Abbey, and in most, if not all, of the great cathedrals, including even St. Paul's. It was never originally intended, or for a moment contemplated, to put the organ in the middle of a great church like the Abbey, or York Minster, or St. Paul's. The screens or lofts on which they stand, or rather did stand, before the "Restoration Period," were simply, as everyone knows, for the purpose of shutting in from the outer congregation the "sanctuary," or place of sacrifice; though the word *sanctuary* is not quite an orthodox word, it is so expressive that it will well serve our present purpose. If the reader will, therefore, for a moment follow us into this curious and now so important subject, he will see the amount of mischief that is going on in so many of our cathedrals, confining ourselves to Westminster for the present, with an occasional allusion to other churches. First, then, it must be borne in mind that, under the old religious *régime*, such a church as Westminster Abbey was quite complete had it been confined to the simple "sanctuary" only—*i.e.*, the space included between the stalls, on either side, the screens and monuments, and east and west by the two screens, the altar screen, and the organ screen or rood-loft. This was the church or temple, the place alike of sacrifice and of those who assisted at it, while the worshippers might have been outside this sanctuary or central church altogether, under a grove of trees, without destroying the idea of the church or the purpose for which it was built. It was a simple matter of convenience to surround this nucleus or central sanctuary with nave, and aisles, and transepts, and eastern chapels, for with the idea of a *sacrifice*—and it all centres in this, and the Abbey is unintelligible without it—it was not necessary that the assembled worshippers should *see*, or even *hear*, what was going on; their mere presence near was enough, their duties and prayers were their own, and distinct from those going on in the central church or sanctuary. The surrounding nave and aisles placed them under the same roof. Thus, the whole sanctuary was consistently screened in by the two screens, the altar screen and organ screen, and stalls on either side, so that the organ screen, with which we are now concerned, is a kind of accident, and its position in the centre of the church wholly *accidental*. Now, in this our day all this is at an end; the very idea of sacrifice is over, and there is consequently no meaning whatever in the surrounding screens—they enclose nothing. This is a very curious subject indeed, for it shows how progressive enlightenment changes all things, and makes that now absurd which in past generations was all-absorbing and sanctified. Would you pull down the screens, stalls, and all else, says the reader here, and make a clean sweep of it for enlightenment sake? I reply no. I would keep all as it is—if for no other reason as a record and remembrance of the past; and, more than all, I would, had I been architect custode of the Abbey (or St. Paul's) have blessed my stars that so fortunate and happy and superstitious an accident had befallen the place as the putting of the organ screen where it is—viz., right in the middle of the church; for if all the power of human ingenuity possible had been brought to bear upon the question, "where to put an organ?" in a cathedral, so as to get the utmost power of sound out of it, nothing better could have been thought of or imagined, for it is free and open on all sides, and the four enclosing walls of the church would seem almost to have been built round it, and for it, and for nothing else. But for this to be thoroughly effective the instrument must stand in the middle of this space, right under the roof and away from the nave lateral arches, so that the sound may rise clear to the roof and travel east and west without impediment, as the sound of a musical box in the middle of an empty drawer. Your correspondent of last week remarks on the roll of the sound through the Abbey. It does this now of course, but not as it did before the stupid alteration took place, because there is no west wall reflexion, and the sound is shut in at the top of the pipes; but even this effect, pretty as it is, is as nothing to what it would be if the whole Abbey and Henry VII.'s Chapel were altogether empty and bare of furniture. There must always be something lost. If the cathedral were empty, then the sound would be at a maximum, but it would certainly lose something in architectural effect by being perfectly bare, and could hardly be utilised, so that something of *sound* effect must be sacrified. The place, therefore, of the organ loft or sanctuary screen in a cathedral church, and consequently of the organ on it, is as near as can be perfect; it could not be better or be improved. What a pity to miss all this! But it is not all. It may surprise many to be told that the whole series of pipes they see on the two fronts and four sides of this Abbey organ, and the pipes of the choir organ, are *shams*; they are not musical metal pipes, but wooden cylinders, to imitate pipes, and merely form a bad screen or case round the real instrument. The organ case proper is as bad as it can be, and the whole arrangement of the organ or rather organs would seem to be almost diabolical in foolishness of arrangement, and in certainty of failure. The "pedal organ" lies on the floor of the loft, so that the sound from its pipes blows on to the screen parapet, instead of up into the vaulted roof. Mark well, this is the *pedal* organ, that one of all which does the most emphatic work, and, to say truth, might sometimes be made to do more. The "swell organ," that most beautiful and happy of material musical thoughts, is, as I said before, destroyed, as far as it can be, and is surrounded by the aforesaid painted *shams* and with a close hoarding behind it, perhaps to deaden things a little, of which there is but small need here; and the "quoir organ"—and here is a hint for the organ builders—is right in front and between the two large ones, the organist sitting and playing between the four—*i.e.*, great organ, swell, pedal organ, on the floor, and the quoir organ in front. Now my argument is, "to open out the organ," but, if I wanted to deaden anything, and put it away out of sight—nay, out of hearing almost—it would have been this very quoir organ now so conspicuous; and for this simple reason, that if the singers be good and keep together, the instrumental accompaniment cannot be too low, except in emphatic and f. and f. f. passages; so that if I had to rebuild this Westminster organ, I would put the quoir organ in the middle of it, so that the sound of it should be low and distant. And here another loss comes to mind, which some few may perhaps recollect—the strange, almost weird effect of a musical passage, when it travels *round* a large organ, or seems to be travelling *away* from you and not to you. Of course not everyone can do this in performance, but Mr. Turle had the knack of it; and one hardly knows how musical skill and resource could be better exemplified, or a more wonderful effect produced; indeed, when well done, it doubles the power of a musical passage as it comes from the composer's hands. Thus it will be seen, partially at least, for space does not allow me to say half that is needful, what an amount of loss, musical and architectural, and mischief has been accomplished by the tampering with and the pulling to pieces of this organ. Now that the fashion is once started and on the move, it is very greatly to be feared that every cathedral organ in the country is in like manner doomed to destruction. The Temple organ, a much finer one than that at the Abbey, is shut up in a "stone box;" the St. Paul's organ is only to be found after a tiresome search after it; Canterbury finds its organ in the roof; and Westminster is distributed about in bits, and just where it cannot be played. Ought not education to commence with the upper classes? and can it be wondered at that the poor dull clerks in offices do such wretched work when those whose opportunities are so much higher are found to not only sanction but advise such destructive and ignorant policy. Westminster Abbey has yet to be *restored* in the future: let us hope that the great work will commence now with its organ.

C. B. A.

SCIENTIFIC POPULAR LECTURES FOR THE PEOPLE.—EXAMINATION AND PRIZE SCHEME.

IN anticipation of the third season for the delivery of a course of familiar scientific lectures prepared by Thomas Twining, Esq., in connection with his Economic Museum at Twickenham, that gentleman has propounded a plan for examination, and offered prizes to be competed for by the attendants at his lectures. The course will embrace the subjects of physics, chemical physics, chemistry, natural history, human anatomy, and human physiology. Arrangements are at present made for the delivery of the course at the Lambeth Baths, and, although Mr. Twining will be happy to receive proposals for the gratuitous delivery of the lectures in other localities, the examination and prize scheme is for the present limited to the Lambeth Baths, where the most numerous and attentive audiences have been present in past seasons. One of the examiners will be Mr. William Hudson, chemical superintendent of the Twickenham Museum; another will be the Rev. G. M. Murphy, and a third is to be named by the Society of Arts. Mr. Twining has desired special precautions to be taken to exclude all except *bonâ fide* working class competitors. It is sincerely to be hoped that this practical attempt at popular, technical, and scientific instruction will meet with the success so well meant an endeavour deserves. It is to be followed, according to present arrangements, by a South London Industrial Exhibition in the Lambeth Baths, opening early in March next.

ARCHITECTS AND CLERKS OF WORKS.

AT the last meeting of the Islington Board of Guardians a letter was received from Mr. Burden, the architect of the new workhouse, directing the attention of the board to the report sent weekly by Mr. Lewis, the clerk of the works, and stating that Mr. Lewis was taking a position very unusual for a clerk of works. A clerk of the works was at the disposal and service of the architect, and he held his office subject to the approval of the architect. Such was the tenor of Mr. Burden's note. A long discussion ensued, in which it was conjectured that Mr. Burden referred to the instructions given by the board to the clerk of the works to make a weekly report and to condemn all bad materials. One of the guardians said that the clerk of works had no power to condemn materials himself. His duty was to report the circumstance to the architect. Another guardian contended that the clerk of works was appointed by them to look after their interests, and was paid a high salary in order to render himself independent of both architect and builder. A third guardian thought that the clerk of works had no power even to stop work, whereupon he met with the rejoinder from another guardian that if that was so the clerk would be perfectly useless, for only the other day he stopped the putting in of some defective joists, and had he not possessed this power the joists would have been covered up and no one would have known anything about them. Mr. Fairbank, a guardian, said that he should have been better pleased with Mr. Burden if he had ordered the pulling down of that portion of the building containing improper material, so as to punish the builders. Mr. Miles, another guardian, said that they had the distinct assertion of Mr. Burden that no improper materials had been used in the building. Mr. Box, another guardian, said that it should be recollected that

the clerk of the works called the attention of the architect to the defective materials, and that it was only when the architect failed to order their removal that the clerk of the works reported the circumstance to the board. It appeared to him (Mr. Box) that Mr. Lewis, the clerk of the works, had thoroughly performed his duty. Some further conversation ensued, and it was resolved to order Mr. Burden to attend the next meeting of the board to state his grounds of complaint against the clerk of the works.

THE ROTHERHITHE DISTRICT ASYLUM.

A PARAGRAPH appeared in a recent impression stating that the Metropolitan District Asylum Board were about to erect a new sick asylum at Rotherhithe to accommodate 500 patients, at a cost of £30,000. It seems that the Board are now somewhat divided in opinion as to whether they should avail themselves of architectural or medical assistance in deciding upon the plans for the new building. The *South London Chronicle*, in some judicious remarks on the subject, suggests that, as both professions are concerned in the matter, both should be invited to aid in settling it. The medical man can best tell to what extent the health of the patient is likely to be affected by structural arrangements, and the architect can tell whether the requirements of the medical profession can be met with a due regard to difficulties of construction and the money to be expended. If full swing is given to the absolute requirements of either medical men or architects the result will not be so satisfactory as a whole, while a fusion of interests will be not only compatible with good arrangements, but absolutely essential. The plans for the new structure are all upon the pavilion principle, the only method upon which a proper isolation of the sick, with that amount of quietness, rest, and freedom from noxious exhalations which is necessary for their speedy recovery, can be attained. The days for the erection of a large hospital, says the *Chronicle*, with tier upon tier, telling of the magnificence of the architect and his ignorance of the fact that exhalations from the lower sick wards ascend to those of the upper stories, increasing the danger of contagion with the height, are gone by. Our hospitals of the future will spread themselves over a wider extent of ground, they will take advantage of the pure air of the country, be divided into several blocks of buildings, and be fitted with every appliance that the most advanced medical skill can suggest. Architectural beauty, while it must not be neglected, for it has a soothing and even restorative power of its own, must be sought in the inexpensive method of beautiful forms (and this is beauty of the highest kind), not in florid and expensive ornamentation.

OBITUARY.

ON the 23rd of July last, Mr. G. R. Burnell died at his residence in Kensington Gardens-terrace, in the 54th year of age. He was a well-known writer of several scientific works. His attainments were numerous. He had extensive knowledge of languages, and had resided in America, France, and Belgium, besides visiting Spain and Sardinia. About seven years of his life were spent in France, during which time he was engaged on the Paris and Rouen Railway, and as superintending architect of the Havre Docks. On the cry being raised of "*La France pour les Français*," in 1848, he returned to England. Though he executed several works both here and abroad, his bent was decidedly literary. He contributed several articles to the BUILDING NEWS early in his career, especially on roofs. In 1857 he wrote a rudimentary work on "Limes and Cements;" in 1861, "The Annual Retrospect of Engineering and Architecture." He edited "The Builders' and Contractors' Price-book," and "The Engineers' and Architects' Pocket-book." He was connected, too, with the *Journal of Gaslighting* for many years, and wrote several papers for the Society of Arts, and for the Institution of Civil Engineers, for which he received prizes. He was the author of many articles in Brande's "Dictionary of Science," and in the "Dictionary of Architecture," published by the Architectural Society, especially one on the word "Abattoir." Mr Burnell was a relative of Mr. W. Tite, M.P., and at his suggestion was made a member of the Government Committee appointed to inquire as to the preservation of the stone of the Houses of Parliament—a committee, by the way, that sat long, published a useful report, and never received the slightest acknowledgment of its services. He was elected a member of the Society of Arts in 1860.

The death is announced of Mr. Samuel Mitchell, of Sheffield, well known for many years as a zealous antiquary. In 1831, Mr. Mitchell, in turning over the records in the Bodleian Library at Oxford, found, in the 40th volume of Dodsworth's collection, evidence of the fact that Sheffield had been destroyed by fire during the civil wars in the time of Henry III., an event which had subsided into oblivion. About this time, in conjunction with his friend, the late Thomas Bateman, of Youlgrave, Mr. Mitchell was engaged in exploring the barrows of North Derbyshire. The result of these explorations was described at the time in a volume by Mr. Bateman, and the well known Museum at Lombardale was enriched by numerous trophies, testifying to the perseverance of the explorers. Mr. Mitchell was a valued contributor to various antiquarian publications. On the formation of the Sheffield Architectural and Archæological Society at the beginning of this year, Mr. Mitchell, though in failing health, came forth to render his assistance, and was appointed one of the vice-presidents. Mr. Mitchell died in his sixty-sixth year.

ARCHÆOLOGY.

AN international archæological congress has just been opened at Bonn, Prussia. The proceedings were commenced by a speech from the venerable M. Noiggerotte, after which the Burgomaster of the town warmly welcomed the visitors. In the evening a banquet was given to 260 members assembled.

During the construction of the works of the Western Extension Railway under one of the fashionable squares in Paddington, the workmen discovered a quantity of huge antlers embedded in the soil at a considerable depth. In a stratum above were found Roman coins and other relics of a later age.

WATER SUPPLY AND SANITARY MATTERS.

THE Mayor of Southampton recently stated that the ratepayers of that town had to pay from £700 to £1,000 annually for water wasted by the inhabitants.

The vestry of St. Pancras have resolved to reconstruct the sewers in various parts of the parish at an estimated cost of £3,637, and Mr. Scott, the chief surveyor, in accordance with instructions given to him, has made a further report upon sewers in the parish that require reconstruction or extensive repair, in addition to those already ordered to be rebuilt, the estimated cost of which is £17,071, making together £20,907. It is proposed to borrow the money for these works, and to repay it by instalments spread over thirty years.

The Brixham local authorities have met with an unexpected check in regard to their projected water supply. The act obtained by the commissioners only gives them power to purchase in their own district, whereas the waterway and source of supply are outside their limits.

The association which has been formed to promote the constant system of water supply deserves all possible support. The present enforced practice of storing water in receptacles more or less open to pollution is (says the *Lancet*) most objectionable in a sanitary point of view, as in a large proportion of cases the trouble and expense incurred by the companies to supply a good quality of water are thereby entirely neutralised. It is true that under the old law as it at present stands the companies are required to give a constant supply upon the demand of two-thirds of their ratepayers; but, from the difficulty of securing the united action of a large body of persons this provision is to a great extent inoperative. The experience of Manchester, Glasgow, Edinburgh, Birmingham, and many other communities sufficiently attests that the objection entertained by the London companies to the constant system on the score of waste is untenable; the waste from imperfect fittings on the intermittent system is well known to be enormous. Both on the score of health and economy it is to be desired that the efforts which are being made to supersede the intermittent by the constant system may be successful.

In accordance with a resolution passed some time since by the Sanitary Committee of the Doncaster Town Council, Mr. B. S. Brundell, C.E., has prepared a report with reference to the drainage of the town. Mr. Brundell proposes a complete system of sewers, pumping works, &c., and that the sewage should be used in the irrigation of a large estate the property of the corporation. The total cost of the proposed works is £9,000, or £10,000, and there is every probability that this scheme will be carried out.

In the course of a few days the block of houses extending along the Poultry from the western side of the Mansion House will be removed for the purposes of the new street which is to run from that point to Blackfriars Bridge. On the north side of Cannon-street the ground has already been cleared, and in Earl-street, Blackfriars, a large number of houses have been removed, leaving an almost uninterrupted space between the bridge and the large building in course of erection for the British and Foreign Bible Society.

Building Intelligence.

CHURCHES AND CHAPELS.

The church of St. Ethelburga, Bishopsgate, has been reopened, after a short restoration. A large body of maroon colour round the entire body of the church, for about 6ft. from the ground, has the effect of apparently heightening the building. The ornamented roof above the sanctuary has been restored and the capitals of the piers gilded.

Yesterday week the church at Ruyton-of-the-Eleven-Towns, Salop, was reopened, after restoration. The church, which is dedicated to St. John the Baptist, is of Norman foundation, the chancel of that date remaining almost entire. It has been re-roofed and re-seated throughout, and generally restored. Mr. Pountney Smith, of Shrewsbury, was the architect.

The ancient church of Llantysillio is about to be thoroughly restored and re-seated at a considerable cost, under the care of Mr. Pountney Smith, of Shrewsbury. A fine old roof of oak (perfectly sound) has been laid bare, showing very rich work in the eastern bay; and the chancel screen, so general a feature in the Welsh churches, is here found in fragments used up in benches, galleries, and other fittings. There is a curious and very ancient eagle lectern, belonging originally, it is said, to Vale Cruscis Abbey, preserved in this church.

On Tuesday week the foundation stone of a new Roman Catholic Church was laid at Old-coates, Lincolnshire. The architects are Messrs. Wilson and Nicol, and Mr. Athron, of Doncaster, is the builder.

The parish church of Cardington was reopened on the 11th inst., after restoration. The old roofs have been removed, the galleries taken away, and the church re-seated. The chancel and sanctuary are paved with Maw's tiles, and warming apparatus provided. The cost of the work was about £1,200. Mr. H. Curzon, of London, was the architect, and Messrs. Nevett Bros., of Ironbridge, the contractors.

The Cathedral of St. Lazare, at Auteen, has been inaugurated, after a thirty years' restoration, under the direction of M. Viollet le Duc and M. Durand.

On the 16th inst. the new church of St. Matthew, Leyburn, Yorks, was consecrated by the Bishop of Ripon. The style is Decorated Gothic, of the period of Edward III, the plan consisting of a nave 57ft. long by 23ft. wide, with a north aisle 13ft. wide, and chancel 24ft. by 18ft. The walls are faced with hammer-dressed freestone in parallel courses. The quoins and dressings are of ashlar. The cost of the building is slightly under £3,000. Mr. C. G. Wray, of London, is the architect, and Mr. Jones, of Leyburn, the contractor.

A new Independent Chapel was opened on the 17th inst. at Broughton, near Kettering. The style is Gothic, the chapel being built of the common stone of the neighbourhood, the front being banded by black brick and local freestone. Accommodation will be provided for 250 persons. Messrs. Habershon, Brock, and Webb are the architects, and Mr. Charles Dawkins, of Broughton, the contractor.

Whitfield's Tabernacle, Moorfields, is now being rebuilt. The laying of the foundation stone was mentioned in a recent impression. The style of the edifice is Gothic, and accommodation will be afforded for 1,000 persons. The architects are Messrs. J. R. Searle and Son, Bloomsbury; and Messrs. Dove Brothers, of Islington, are the builders. The cost will be £7,000.

A new Congregational Chapel was opened at Hythe on the 16th inst. The style is Gothic, and the building is constructed of local rock stone. The cost is over £2,500. Mr. J. Gardner, of Folkestone, is the architect, and Messrs. Candy and Gibbs, of Croydon, have executed the carved work under his direction.

On Monday the foundation stone of a new church, dedicated to St. Bridget, was laid at Wavertree, near Liverpool. The style is based upon the best known examples of the Roman Basilicas. The dimensions are—length, 126ft.; breadth, 60ft.; the east end terminating with a semi-circular apse. The columns supporting the roof of the nave will be of Irish marble. The cost will be about £6,600. Mr. E. A. Hefler, of Liverpool, is the architect, and Messrs. Nicholson and Ayre, of Toxteth Park, the contractors.

On Tuesday last the new church of the Holy Trinity, Cornforth, Durham, was consecrated by Dr. Anderson. The style is Early Decorated, a French character being observable in many of the features. The plan consists of nave, chancel, and aisle, with organ chamber and vestry. The church is built of red pressed brick, intersected by bands of a darker colour, with dressings externally of Casterton, and internally of Caen stone. It will seat 300 persons, at a cost of £2,000. Mr. J. P. Pritchett, of Darlington, is the architect, and Messrs. Dodson and Foster, of Stockton, the contractors.

Alterations and improvements have recently been made to the parish church of Rhôsmarket, Pembrokeshire, from designs prepared by Mr. E. H. Lingen Barker, architect, of London and Hereford. The principal additions have been a vestry and western bell tower, the former having been much needed. The work was entrusted to local tradesmen and has been satisfactorily carried out.

On Tuesday the Bishop of Gibraltar consecrated a new church at Hednesford. The church is Early English in design, and seats 500 adults, at a cost of £3,000. Mr. W. Rushforth, of Regent-street, London, is the architect, and Mr. Anderson, of Cannock, the contractor.

On the 15th inst. the new church of St. John, Llanbrynmair, Montgomeryshire, was consecrated. The style is twelfth century Gothic, with much of the character of Early French work. The walling is of local stone of a deep blue colour, with bands of a lighter blue colour introduced for contrast. The plan consists of a nave and chancel under one roof, the chancel terminating in an apse. Mr. D. Walker, of Liverpool, was the architect, and Mr. J. Harrison, of Newtown, the builder.

The foundation stone of the new Congregational Church, Mere, Wilts, about to be erected by Mr. C. Jupe as a memorial church, was laid on Wednesday last. The building will be in the Late Early English style, and will have nave, north and south transepts, aisles, and polygonal apse at the east end, in which will be placed the pulpit and communion table. Galleries will be carried all round, except in the north transept, which is reserved for the organ and choir. The clerestory will be carried on 6in. iron columns. There will be three entrances, one in south porch, one on north side of west front, and the principal one through a lofty porch at south-west angle of church, which has been so designed that it may be left as a porch, or form a suitable base for a tower and spire, should it ever be decided to build them. There will be accommodation for 350 persons on the ground floor and 220 in the galleries. Mr. W. J. Stent, of Warminster, is the architect.

Perwall parish church, Middlesex, was reopened on Sunday last after undergoing enlargement and restoration, which comprised building a new organ chamber, entire relaying of the floors of nave and chancel, new open seats for the nave, and stalls for the choir in the chancel; a new prayer desk has also been added. The whole of the woodwork is stained and varnished. A new window has been inserted in the south side of the nave. Several of the windows have been filled in with stained glass as memorials. New altar railings have been substituted for the old ones. The church is of the Transitional period of Early English architecture. The whole of the works have been carried out by Mr. Nye, builder, of Ealing, under the superintendence of Mr. Charles Jones, architect, of Ealing.

BUILDINGS.

The committee for building a new mechanics' hall at Otley, Yorkshire, have selected a design. Nineteen designs were submitted in competition by architects from Leeds, Bradford, and other places, all sent in under motto. The design and plans selected are by Mr. Chas. Fowler, architect, Leeds. The style is Italian, and the following are the chief features of the internal arrangements:—On the ground floor there will be a lecture room holding 250 persons, and which, if desirable, may be divided into two class rooms; there will also be retiring rooms, reading room, library, two class rooms, lavatory, &c. The basement will contain kitchens, scullery, chemical class room, heating apparatus, &c. On the first floor will be the large hall, with gallery, platform, and orchestra, and space for organ. A librarian's residence will be attached. The large hall, including gallery and orchestra, will seat 1,000 persons. There will be two staircases and three separate entrances and exits into and from the large hall. The building will be built of stone, at an estimated cost of £3,000.

Extensive alterations and additions have recently been made at St. George's Hospital. A piece of land to the south of the old building having been presented by the Marquis of Westminster a new wing has been erected on it, and a new and commodious out-patient department has been arranged on the north side, having an entrance and exit distinct from the general entrance to the hospital. A great portion of the new buildings have been devoted to the purposes of the school of medicine. The lecture theatre is a capacious amphitheatre, fitted with stained woodwork, and capable of holding 200 persons. A smaller theatre, with laboratory, is devoted to the chemical lecturer. The walls of the dissecting room are tinted and adorned with anatomical plates.

The foundation stone of a new general hospital and dispensary for sick children was laid at Manchester on Friday last. The building will cover a plot of ground of 530 square yards. The front will be executed in stock bricks, with stone dressings, mediæval in character, and will consist of a central gable, with open porch, the tympanum containing a medallion of figures illustrative of the purpose of the building; on each side a range of five arched windows will be surmounted by a frieze, with an inscription in coloured tiles. A moulded stone cornice and high pitched roof will complete this elevation. Messrs. Mills and Murgatroyd, of Manchester, are the architects, and Messrs. Neill and Sons, the builders.

A block of buildings, comprising four villas, has recently been completed at Chogford, Devon. They have been converted from ten small cottages which formerly stood upon the site, and such of the old walling and materials as were found sound and suitable have been re-used in the new buildings. They have been erected to supply the increasing demand for lodgings in this romantic and much frequented locality during the summer months. Mr. Williams, of Bristol, was clerk of the works, which were carried out by local tradesmen. Mr. Robert Clamp, of Totnes, was the architect engaged.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED—H. H. S.—C. L.—B. and P.—I. P. S.—G. T. R.—W. C. T.—S. W. and Co.—I. P. S.—I. R.—T. S. L.—E. W. G.—A. P. W.—C. B. A.—W. B.—H. H. S.—H. I. D.—E. W.—C. and G.—I. N. C.—G. W. B.—F. W. R.—I. S. S.—W. W.—W. C.

Correspondence.

BUILDING SOCIETIES.

To the Editor of the BUILDING NEWS.

SIR,—We appear now to have arrived, by common consent, at two conclusions—viz, that building societies *do* charge 7½ or 8 per cent. for their loans (they really charge more, for they declare dividends at those rates, but let that go); and, second, that in order to borrow profitably at that interest you must be able to obtain house property at eight years' purchase. These two admissions entirely establish my position. "The operations of the benefit building societies," as stated by themselves, "are based on the fact that tenants pay to landlords a much larger sum under the name of rent than the ordinary interest upon the sum which would buy the house. A tenant, therefore, who borrows from a building society to buy a house will save the difference between the interest of the money invested in the house and the rent usually paid for its occupation. This saving, if allowed to accumulate at compound interest, will eventually replace the purchase money." We have seen that borrowers pay to the society 7½ or 8 per cent. in *addition* to the ground rent and annual charges and risks. Now do tenants pay *more* than 7½ or 8 per cent. to their landlords, in addition to the annual charges on the property? That is, do landlords reap a *nett* profit in excess of the interest charged by building societies? If not, where is the difference which is to accumulate and replace the principal?

Hear Mr. Bailey Denton, in a communication of this date, to the *Daily News*:—"With the middle and commercial classes living in towns, it is different, though they occasionally spend large sums of money to gratify their taste for building, which cannot command a fair return. In the long run, however, the building of houses in towns, if conducted with ordinary prudence, is remunerative; but it is only considered *satisfactory* when it yields at least 7 per cent. return on the outlay, whereby the principal money may be repaid during the period of duration with 5 *per cent. interest on the outlay, after payment* of repairs and insurance."

It is clear that his experience agrees with mine, and not with that of some of your correspondents. I do not deny that there are houses which are to be bought at the rates quoted by your correspondents, but I know, as a surveyor, that such cheap houses are the dearest of houses, and are no reliable bases for general inferences. The annual provision for repairs would have to be larger than we have assumed it, and in all probability the house would then "fall in" before the lease.

The outcome of it all seems to be that, if you are paying your landlord *more* than 7½ or 8 per cent. on the *nett* value of the property, you can use the advances of building societies with advantage; whereas, if you are, on the other hand, paying the normal rate—say, 6 or 6½ on the nett value—by way of rent, it is the merest folly to have any dealings with them except as an *investor*.

—I am, &c., E. INGRESS BELL.

September 22.

P.S.—My acknowledgements are due to those gentlemen who pointed out an inadvertence in my statement of case No. 2 last week.

SIR,—In the interesting discussion on this subject which has recently appeared in your journal some highly important facts of great advantage to the purchasers of property through building societies have been strangely overlooked by your correspondents. As these facts most seriously affect the calculations which have been published in your columns, I beg to mention them. I allude to the very great difference between the low charges and the survey fees of building societies and those made by solicitors and surveyors to the general public, and to the circumstance that the legal documents of building societies are exempted from stamp duty. The society to which I belong would, for the case of a loan of £300, supposed by Mr. Bell, charge—law expenses, four guineas; survey fee, one guinea. The usual charges of solicitors and surveyors in such a case are, perhaps, five times as much, independent of stamp duty.—I am, &c.,

A DIRECTOR.

Carlton Hill, September 21.

MODERN CHURCH BUILDING.

SIR,—I have read with great satisfaction the series of papers which have appeared in your journal on the subject of chapel architecture. The matter has been treated in a thorough and masterly manner, and I hope we may see some result from the valuable hints which have been thrown out. But chapel architects are not alone in fault. I wish something could be done to infuse into the minds of church designers more common sense and independent action, especially as regards the sanitary requirements of their buildings—heating and ventilation. During the present summer the flagrant deficiency of ventilation in churches has been severely felt. And no wonder; ventilation architects rarely trouble themselves to think about. A few hopper casements are, perhaps, provided in the windows, but, should there be stained glass, the casements are omitted and nothing done. As to any special arrangement in the roofs or gables, in the absence of ancient authority for such a thing, it is either not considered worthy of consideration or too troublesome a matter to meddle with. And with respect to the warming, how rarely does this receive thought and proper attention! By many the heating is regarded as an extra, and when, as is often the case, a difficulty is found in the cost of the church, the heating chamber, &c., is omitted, and a miserable makeshift of unsightly stoves, or some other imperfect process, is the result at a future time. In

winter the coughing in church is often not only painful to the hearers but at times interferes with what is going on. Many, I doubt not, catch their "death of cold" in attending public worship. And what wonder when not only is the place insufficiently warmed, but people are sitting in wet clothes and with dripping umbrellas for two, or, it may be, three hours at a time! To all churches there should be a cloak room with an attendant, and in inclement weather a good fire, so that people may dry themselves and leave wet clothes, &c. All entrances should have porches or lobbies, and these warmed.

Why should those precautions which are necessary for health be disregarded in churches more than in other buildings? Our present churches with their savage incompatibility with modern civilization are positively dangerous to health. I, for one, though partial to the church service, dare not attend in winter.—I am, &c., P. E. M.

STREET LIGHTING.

SIR,—Already complained of as failing in my duty as a light to lighten the gentiles, I am made a stumbling block to them in addition by being placed within a few inches of the centre of the narrow footpath in the *too* narrow thoroughfare called "the Poultry"—the main road through the chief city in the world. Oh dear! what will become of me, what with the omnibuses and other vehicles threatening every moment to damage my personal appearance in the upper regions, and the bustling, rushing, pushing mass bruising my poor stump! Sir, I must be moved from here or else I shall one day come to grief, and I appeal to you for help. Of the two evils, Sir, I prefer having my head bumped occasionally by vehicles to having my trunk subjected to the knocks, swearings, and execrations of the time-racing city mob; but if the officials are willing to satisfy both the public and myself, I would suggest that (much as I object to capital punishment) I should be "hung" and put out of the way at once. My mediæval ancestors were hung across the street, my parents have been and are still in many places suspended on brackets, and I am not ashamed to say that I prefer to "shine" in either of these methods, rather than be called a nuisance, and said to be always in the way. Sir, pity the sorrows of a poor

LAMP-POST.

THE ORGAN IN WESTMINSTER ABBEY.

SIR,—Let me make a suggestion which may satisfy your correspondents "C. B. A." and "W. C. J." If the authorities of the Abbey will take down the organ from its present situation, screen and all, and re-erect it, greatly strengthened and enlarged, on the screen, which is sufficiently handsome, over the west door of the Abbey (the screen being turned round to face east), a new and magnificent view of the interior would be obtained, never before visible: the organ, too, would sound there better than it has ever yet done, having the advantage of the west wall of the church behind it, to throw the sound forward as from as a sounding board. Those who know the glorious effect of the voluntaries played on the great organs over the western doors of Notre Dame, St. Eustache, and St. Sulpice, in Paris, to mention only a few, will know what I mean.

Should this ever be done, an organ of moderate size would be indispensable for accompanying the singers in the choir, the position of which could easily be arranged under one of the side arches of the choir, over the stalls, all voluntaries, &c., being played on the western, or grand organ. With the new electrical apparatus lately introduced it would be perfectly possible for *one* organist to play *both* instruments from *one* place, and we should thus have a realisation of that admirable effect so universal in the great churches in France, and so unknown in England, of the grand organ at the west end of the church, and the smaller organ in the choir, being played alternately at the *same* service. This is already attainable in St. Paul's Cathedral, with its grand organ in the south transept and its lesser organ in the choir, but I have never heard of the alternate use in *one* service being attempted as yet, though I hope it will be done some day.

I should add with regard to Westminster Abbey, that the west window is sufficiently high from the ground to admit of a very large organ, on a gallery, being placed under it, without any concealment of the stained glass. I enclose my card. —I am, &c., WESTERN ORGAN.

London, September 21.

ST. PAUL'S ORGAN.

SIR,—I am uncertain as to the precise meaning of the last paragraph in the letter of "W. C. J.," but I take leave to infer that he considers the removal of the organ to the side of the choir to be a mistake. I am sure that yesterday my ears gave me proof that its former position was the best, the neighbourhood of the dome allowing of the expansion of the sound formerly, whereas now it crushes down on the congregation and overpowers the voices quite as much as in many parish churches where the organist seems to think himself bound to conceal the poverty of singers. I say nothing, *pro* or *con*, with regard to the position of the organ in an architectural point of view, except just to remark that *mere length* in a building is not a beauty; and, therefore, I think the notion of removing organs (which I believe was first tried at Winchester) simply for the purpose of extending a view is a mistake. But I am sure that to thrust a powerful instrument close among a number of vocalists is both physically and musically wrong. Both architects and organists are apt to think that their work is the most important; and yet when a methodist preacher vociferates they condemn him for bad taste. Now, the mistake is in all three cases bad proportion. The architect thinks sometimes that the longer he can make an aisle the finer the effect. The organist thinks the more sound he can get to swell a chorus the more impressive the music, but both are just as mistaken as the ranter who thinks that by loud speaking he produces more impression on his audience. Speaking particularly of the organist, there is no more decided proof of his unfitness to lead public worship than his ignoring the number of the congregation—thinking only of his book, and playing by that at all times. This marks the distinction between the mere musician and the artist. Perhaps the former might grow into the latter if he considered more the *real* object of his work.—I am, &c., VIATOR.

September 23.

INDICATORS FOR PILLAR LETTER-BOXES.

SIR,—Those who are in the habit of posting letters in pillar-boxes would in most cases be benefited by knowing whether the particular post by which they may wish to send their letters has gone or not. This object, in some cases so important, may be easily attained by a very simple plan, which is in general use on the continent. On every letter box in France there is this notification affixed to its front, "La première (ou deuxième, &c.) levée est faite;" and I think, with a very trifling addition to the present duties of postmen, that after a box is cleared an indicator, visible from the outside, might be arranged with an inscription somewhat similar to the above, as for instance, "The 8.15 a.m. (or 9.45 a.m., &c.) collection is completed." If the adoption of this is objected to as causing a detention to the postmen, I would say in reply that it is possible so to arrange the indicator that it should be self-acting—the door itself working it by a simple arrangement. The above plan is more needed at pillar-boxes than at receiving houses, since at the latter the boxes are cleared more punctually; but at the former it frequently happens that a collection is not made until fifteen or twenty minutes after the appointed time. The advantages of course are obvious; for instance, it can be seen at a glance whether the box is cleared; and, again, if a person is desirous of hastening the delivery of a letter, and finds that the pillar-box is cleared, he can proceed to the nearest receiving house, and thus, in many instances, be in time for the same post. Of course, the general adoption of the plan for all letter-boxes would be still more advantageous.—I am, &c. R. L. B.

September 21.

CANAL BRIDGE, GLOUCESTER GATE.

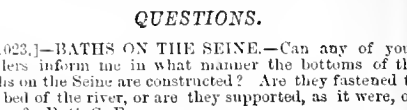
SIR,—May I, through your columns, call the attention of the authorities to the increasing necessity of widening the canal bridge at Gloucester Gate, Regent's Park? At present the footway is by far too narrow for even everyday traffic, but on Sundays it is positively dangerous to cross this bridge, the passing vehicles grazing the pushed and pushing foot-passenger in the most alarming manner.—I am, &c., A. C. G.

Intercommunication.

QUESTIONS.

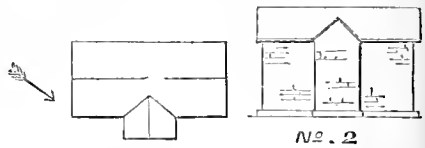
[1023.]—BATHS ON THE SEINE.—Can any of your readers inform me in what manner the bottoms of the baths on the Seine are constructed? Are they fastened to the bed of the river, or are they supported, as it were, on barges?—E. C. C. E.

[1024.]—TO EQUALISE AN IRREGULAR LINE.—I should be glad if some of your correspondents would be good enough to solve the following question?—To equalise a crooked line, thus—A B—by a straight line, as dotted,



without first having to draw an imaginary line, then to calculate the contents on each side of the imaginary line, and adjust the straight line according to the contents and the length of the line.—A SURVEYOR.

[1025.]—PROJECTION OF SHADOW.—I have often been puzzled when colouring a geometrical elevation to find the true projection of a shadow cast from a projection on to the roof. I should be obliged if some colourist



Nº. 1 Nº. 2

would be good enough to reply to this question. No. 1 plan of roof, No. 2 elevation, the sun to be the angle of 35° 16', and the light coming in the direction as indicated by the arrow.—DRAUGHTSMAN.

[1026.]—IRON AND WOOD ROOFS.—I want to cover over a building with roof of 40ft. span. Can I do this best and cheapest with timber or wrought iron? Perhaps some of your kind correspondents will oblige me with the particulars as to how far apart the principals should be both of iron and wood, and what will be the difference of cost between them? The covering, whether the principals are iron or wood, will be about the same; but I may as well state the building is to be used as a pattern-maker's and engine-fitter's shop, so that your correspondents can judge of the amount of light required.—IRON V. WOOD.

[1027.]—STEEL MAKING.—There being no steel mines or ores, what process does wrought iron bar undergo to become a steel bar?—TUBAL CAIN.

[1028.]—THE STRONGEST BRICKS.—Which is considered the strongest brick when laid in mortar, the perforated or the solid Bridgewater bricks?—BRICK CLAY.

[1029.]—INCLINE SWARDS.—What would be a safe incline or slope to ensure a constant greensward, equal to a horizontal level, that any subscriber would recommend; or, in other words, what angle should the slope be formed at?—PETER GROOME.

[1030.]—WORK ON PAINTING, GRAINING, &c.—I shall be much obliged if any of your correspondents can inform me what is the best practical work on painting, graining, staining, and varnishing, as I do not know of any which treats of it in a thoroughly practical manner.—THOMAS P. BOWEN, 27, Chatham street, Leicester.

[1031.]—THE MAGIC NUMBERS.—Can any of your correspondents inform me what are magic numbers, their properties, and why they are so called?—A. BEAVER.

[1032.]—HANDRAILING, STAIRCASING, &c.—I should feel obliged if you, or any of your correspondents, could inform me, through "Intercommunication," which is the best and simplest work for an amateur on staircasing and handrailing, where the same can be obtained, with the price, &c.? The booksellers here do not keep any building or architectural works in stock, and the mechanic's institute is very poorly supplied; having been a member for years, and have never been able to find but two works on architecture.—A JOINER, Coventry.

[1033.]—THE ARCHITECTURAL EXHIBITION.—Would you be kind enough to inform me when the next Architectural Exhibition takes place in London, and to whom I should apply for space to exhibit?—X. Y. Z., Birmingham.

[The next exhibition opens on May 1 next. Write to the secretary of the Architectural Exhibition, 9, Conduit-street, London, W.; or to J. R. Botham, local secretary, 47, Paradise street, Birmingham.]

[1034.]—MEASURING ARTIFICERS' WORK.—What is the best practical work upon measuring artificer's work and taking quantities, describing hollows, allowance for labour, &c.—A. BEAVER.

[1035.]—BOIS DURCI.—Can you tell me when this substance was introduced into England, and by whom, and also the proportions of the ingredients of which it is composed? I know the component parts are powdered sawdust and turnings of hard wood made into a paste with blood and pressed into moulds, but should be glad to learn the proportions, if not a trade secret?—JOINER, St Albans.

[1036.]—IMITATION TORTOISESHELL.—Can any subscriber tell me how to spot horn in imitation of tortoiseshell?—A. C., Lowestoft.

[1037.]—ETCHING ON IVORY.—I want a good recipe for a ground for etching on ivory; also the formula of some solution by which the design may be produced in red or black.—EUSTON-ROAD.

[1038.]—TOWNHALLS.—Can you tell me where I can obtain a book on Townhalls, giving me the necessary arrangements and number of courts, &c., required for a town of 15,000 or 20,000 inhabitants?—BEGINNER.

[1039.]—LANDLORD'S TAX AND SEWERS' RATE.—In my three years' agreement for the house I occupy I find among the conditions that the payments for rent shall be made "without any deduction or abatement whatever, and also shall pay and bear all rates, taxes, charges, and assessments payable in respect of the said house and premises (except the sewers' rate and landlord's property or income tax)." I have paid land tax and the main drainage rates. Both these my landlord refuses to allow me, under the plea that he is not liable by the agreement, and that land tax is not a landlord's tax, nor is the main drainage rate a sewers' rate. But, if not, what else is it? I shall be greatly obliged by an opinion on these matters.—R. G.

[1040.]—ST. MARTIN'S SCHOOL OF ART.—Can any of your correspondents inform me of the exact locality of the district school of art, St. Martin's in-the-Fields? I have inquired in the neighbourhood, but no one of whom I have asked seems to know of its existence.—ARTIST.

[The school is held at seven o'clock in the evening, in a large new brick building, Castle-street, Long Acre. The building is used as St. Martin's Northern School for Boys in the daytime.]

REPLIES.

[742.]—CRAYON DRAWINGS.—A recipe I have used for setting stump drawings, and which would, I therefore think, set crayon drawings also, was:—Rectified spirits of wine, 4oz.; oil of rosemary, 1dr.; white resin, 1dr. Pour over the drawing, and drain off surplus.—A. C. G.

[1017.]—CONTENTS OF CISTERN.—In reply to "Dilemma's" question, if he multiply the contents of the present butt in gallons by 3, it will be the number of gallons which the proposed cistern or tank must hold. Then divide that number by 6·25 (the number of gallons in a cubic foot); the quotient will be the number of cubic feet in the cistern. Extract the cube root of the quotient last found; it will give the length, breadth, and depth of the cistern to contain three times the quantity of the present butt, or the quotient divided by the product of any two dimensions, say length and breadth, the quotient will be the depth.—J. F.

[1017.]—Find the average diameter of the butt, and multiply this by 3 1-7th for the circumference; then multiply half the diameter by half the circumference, and this by the depth. The product will give the cubic feet, and these multiplied by 6¼, the amount of gallons contained in the butt. The cubic feet multiplied by 3 will give the size required for the cistern; and the size of the cistern must be so made as to cube to the same amount of feet. This will be the size required; and the cubic feet multiplied by 6¼ will give the amount of gallons contained in the cistern. This is not mathematically correct, but near enough for all practical purposes.—A. BEAVER.

[1017.]—"Dilemma's" question may be solved as follows: Ascertain the number of cubic feet of water contained in the butt in the following manner:—Take average diameter of water and the depth; square the diameter, and multiply by .7854, and then by the depth, which will be the number of cubic feet of water contained by the butt, which being multiplied by 3 equal the contents of tank required. If you require the tank any particular dimension one way, you must divide the sum by that, and find the square root for the other two dimensions; and if you have two dimensions and want the third, square the two dimensions and divide the sum by that, which will give the other dimension; but if not, find the cube root of the sum, and it will give you the side of a cube containing the amount of water. This is near enough for ordinary purposes; but if "Dilemma" wishes to be particularly accurate, if he will take very careful dimensions of the water-holding part of the butt I will work it out for him.—R.

*** Allow me to thank "A. P. B." for his ingenious short calculations.

[1018.]—STRENGTH OF ROPES.—In ascertaining the strength of hemp and iron wire ropes, the following formulæ appear to be what "S. P. C." requires. For tarred hemp ropes:—

c = circumference in inches.
x = breaking weight in tons.

$$x = c^2 \times 0.2.$$

For iron wire ropes—

$$x = c^2 \times 1.5.$$

In hauling, allowance must be made for tension, to obtain which the following formula may be used:—

R = weight of rope.
d = ratio of deflection from a straight line.
x = extra weight through tension in rope.

$$x = R\,d \times 0.13.$$

To obtain R in pounds per fathom:—

c = circumference of rope.
$R = c^2 \times .20$ for iron wire ropes.
$R = c^2 \times .87$ for hemp ropes.

Factor of safety 1 6th.—A. P. B.

[1018.]—"S. P. C." can find the breaking weight for ropes by the following rules:—viz., hemp rope, multiply the square of the circumference in inches by 0·2 and the product will be the breaking weight in tons. For wire ropes, multiply the square of the circumference in inches by 1·5, and the product will be the breaking weight in tons. The hemp rope is supposed to be tarred; if not tarred it will be about 5 per cent. stronger.—J. F.

[1018.]—In answer to "S. P. C.," I forward the following, from "Hurst," which will perhaps answer his purpose:—Circumference in inches being represented by c; the breaking weight in tons = $0.2\,c^2$ for hemp, and $1.5\,c^2$ for iron wire. When ropes are strained, as in the act of hauling, the tension arising from their own weight is greatly increased. Therefore, add to the weight to be moved that of the rope multiplied by the number opposite to the ratio of deflection from a straight line, as given in the following table:—

Ratio of Deflection	1-40	1-20	1-15	1-14	1-13	1-12	1-11	1-10
Multiplier	5·200	2·536	1·943	1·823	1·700	1·572	1·460	1·340

Factor of safety = 1 6.—R.

[1022.] AREA OF A FIELD.—If "Young Surveyor" would take my advice, he would measure the field again, getting the following lengths:—B D and the two perpendiculars upon it from C and E; also B F and the perpendiculars from A and E to B F. These are all that are practically necessary, the others being secondary dimensions. Now, proceeding as follows, he will obtain a sufficiently accurate result:—Multiply B D by half the sum of the two perpendiculars I before mentioned from C and E, and he gets the area of B E D C; then, multiplying B F by half the perpendicular on that line, he obtains the area of A F E B, which, added to the preceding, gives the total for the field; and an infinitely easier and shorter way this would be than working out the figures he gives (though I must not omit to mention it is impossible to obtain from them an accurate answer, and for this reason, viz., that it is possible for the point F to be in two different positions, and yet without interfering with any of the dimensions given, showing at once, if not previously seen, that the measurements are deficient—B F being wanting). Having now shown him the shortest of all plans to get at the area, I will proceed to explain how I would work to find the result from his figures. I would take it in four triangles; find the area of each, and the total of which would, of course, be the contents of the field. 1. The triangle E D C. Let S represent half the sum of its three sides, i.e., 1035; then take the lengths of the three sides severally from S, and I get 90, 95, and 850. Multiply 1035 by 90, the result by 95, and this result by 850. Finally, the square root of this last total gives the area of the triangle C E D, which, of course, is in feet, and has to be reduced to acres, &c. 2. Proceeding likewise, I obtain the area of B E C, and having got the length B F, which I believe to be about 216ft.; treat the two triangles, A F B and E F E, as before. Adding these four results together I get the area—a very laborious and undesirable task. I have now shown "Young Surveyor" how to get at the total contents as he asks, and by two different methods; but, if I am not sufficiently explicit, I am willing to answer any further questions on the subject.—J. MCNAMARA.

[1022.]—In answer to the question of your correspondent "Young Surveyor," I would ask him if he knows how to find the area of a triangle? and would then suggest that nothing could be easier than to divide his figure into three triangles. If he cannot quite comprehend this, he must not only be a very young surveyor but a very dull one.—W. E. B.

[1022.]—Assuming that the length of B F, which is omitted in this question, is 210ft., as given in question 1003, the area of the figure A B C D E F can be found in the following manner:—Find the area of each of the triangles A B F, B F E B C E, and C E D separately, and the addition of these areas will give the area of the whole figure. Now the area of a triangle is found by the following formula:—$\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$, where s represents the semi-sum of the sides a b c, of the triangle. Applying this formula, we find that—

$$A\,B\,F = \sqrt{301 \times 105 \times 105 \times 91} = \sqrt{301985775} = 17377.73.$$

$$B\,F\,E = \sqrt{347.5 \times 137.5 \times 182.5 \times 27.5} = \sqrt{238902148.4375} = 15185.38.$$

$$B\,C\,E = \sqrt{1097.5 \times 777.5 \times 152.5 \times 167.5} = \sqrt{21796641523.4375} = 147636.85.$$

$$C\,E\,D = \sqrt{1035 \times 90 \times 95 \times 850} = \sqrt{7521862500} = 86728.07.$$

Thus the area of the figure A B C D E F = 267228.63 sq. feet, which = 6a. 0r. 21p. 16yds. 7.3ft.—R. L. B.

[1022.]—It appears that "Young Surveyor" has even with his corrected measurements given a problem for solution which cannot be solved unless the figure be plotted to scale. To compute the area of an irregular piece of ground from a rough diagram it is necessary that all the lengths necessary to throw it into triangles should be given. "Young Surveyor" has given one length (AD) which is not required, but has omitted to give the length AE, which is necessary to get the size of the triangles ABE and AEF. I have plotted the field and find AE = 340ft. Having found this quantity, "Young Surveyor" should proceed by the rule given by R, or by logarithms; the rule is add the logarithm of half the sum and those of the three remainders together; half the sum of these four logarithms will be the logarithm of the area. Of course if "Young Surveyor" has plotted the field he can find the area with much less trouble by dividing it into two irregular quadrilateral figures, and multiplying the mean length of each by its mean breadth.—ANOTHER YOUNG SURVEYOR.

WAGES MOVEMENT.

THE night-soil men of Newcastle-on-Tyne have struck work in consequence of a proposed increase in their hours of labour, and at the same time a slight reduction in their wages. The corporation scavengers have been applied to to assist in emptying the ashpits, but have refused.

The dispute which occasioned the labourers' strike at Leeds, which was referred to Mr. W. St. J. Wheelhouse, is now settled, it being decided that there was no proof of the men having received the notice for a reduction of wages, which was sent through the post. The men will therefore continue to receive 4½d. per hour as before.

STAINED GLASS.

TWO stained glass windows, by Messrs. Powell and Sons, Whitefriars, have been fixed in the openings on the south side of the church of St. Mary-le-Bow, Cheapside. The design is simple, consisting of panels divided by what are technically termed "German rounds." The details of the ornamental part are in strict accordance with the style of the building.

St. Mark's Church, Broadwater, Tunbridge Wells, has lately been enriched by the insertion of six new stained glass windows, from the works of Mr. O'Connor, of Brewer-street.

LEGAL INTELLIGENCE.

CONTRAVENING THE IMPROVEMENT ACT.—Mr. James Moseley, the chairman of an organisation known as the Leeds Property Owners' Protection Society, was charged before the Mayor of Leeds, last week, with a breach of the sixty-eighth section of the Leeds Improvement Act. Mr. Moseley is the agent of a house situated in Bakehouse yard, Pollard's-yard, Mill Garth street, a bedroom of which adjoins a privy, whilst the wall of an ashpit forms at the same time the wall of the living room of the house. Notice of the nuisance had been given to the defendant in November last, and as he had neglected to remove the cause of complaint, he had according to the statute rendered himself liable to a fine of £284 this sum being made up by accumulative penalties of twenty shillings a day. Dr. Robinson, the officer of health, asked that the penalty should be enforced, as there were many cases of the same kind, and as houses situated like that in question were dangerous to the public health. Mr. Moseley stated that as the notice had been given so long ago, and he had heard nothing of it since, he had imagined that no action would be taken against him, but the Mayor reminded him that this only showed how forbearing the authorities had been. He was fined in the mitigated penalty of £20.

Our Office Table.

The Chelsea Vestry have, it is stated, the credit of being the first to put in force the Artisans' and Labourers' Dwelling Act. At their last meeting, with reference to a nuisance in Wickham-place, Mr. Armstrong moved that the new act should be put in force, a proposition which was seconded and carried.

In the demolition of the old Middle Temple Hall and the simultaneous construction of the new building, rapid progress is being made, as also with the projected alterations in Crown-office-row, Lamb-buildings, and Tanfield-court, and a new Gothic entrance is just completed to the treasurer's office. The roof of the old hall (now being removed), said to be the best piece of Elizabethan architecture in London, was built in 1572, and it is related that the screen, in the Renaissance style, was made of the spoils of the Spanish Armada; but this is an error, as the records of the society prove that it was set up thirteen years before the armada put to sea.

It is said that a Co-operative Building Society is in contemplation at Birmingham.

Guildhall narrowly escaped destruction by fire on Tuesday afternoon. Some boiling turpentine used by some of the workmen ignited, and, as usual, when recourse was had to the hydrants in the adjoining yard, which ought to be available at any moment, it was found that only three had the hose attached; and no one knew where to find the key to turn on the supply. Fortunately, sufficient water was obtained from other sources to extinguish the flames.

At the last meeting of the Greenwich District Board of Works the pumping station at Abbey Mills was one of the subjects of discussion. One gentleman expressed his regret that so great a sum as £200,000 should have been expended on the building, which he considered as being too magnificent for its purpose, and as resembling a Chinese temple or Turkish mosque. No music hall in London, he said, could come up to it for embellishments; its towers, gables, tesselated pavements, &c., he considered out of place, and the lavish expenditure thus incurred was unjust to the ratepayers. A resolution was passed expressing dissatisfaction with the amount of money expended on the pumping station.

A large piece of ground near York-road station, Battersea, has been taken as the site of a proposed West London Meat and General Market. The situation is central and convenient.—The success of the King's Cross Market, opened some weeks ago, has been so marked that the inhabitants of Islington are talking about establishing a similar market on a large piece of ground in the rear of Church-street, and having entrances from Islington Green and the Essex-road.

At the last meeting of the St. Pancras Board of Guardians the clerk presented certificates from Mr. E. C. Robins, architect of the new relief offices, in favour of Messrs. Scrivener and White, builders, for "extras." A guardian said that he had understood that there were no "extras" connected with the building, whereupon Mr. Furniss said that "the architect was not yet born who could undertake a building without extras." The payment was allowed.

The executive committee of the Leeds Fine Art Exhibition have decided that it shall close on Monday, October 26.

The Limehouse District Board have petitioned the Court of Common Council, in the event of the proposed removal of the fish market from Billingsgate, to re-establish the market at Shadwell. Among the advantages which they claim for the district is that it is the nearest site to the City abutting on the Thames, and really suitable for the new market.

The general excursion of the members and friends of the Norfolk and Norwich Archæological Society, in conjunction with the Suffolk Institute of Archæology, took place on Thursday, the 16th inst. The members had been advised by circular to meet at Haddiscoe Station, at a quarter past ten o'clock, and here about fifty ladies and gentlemen were assembled; omnibuses and carriages were in attendance to convey them, and the party was further increased during the course of the day. Mr. Phipson explained that Mr. Fitch, of Norwich, was unable to attend, and that he would be happy to take his place. The various places visited were Haddiscoe Church, Haddiscoe Thorpe, Toft Monks, Fritton, Herringfleet, Blundeston, and Flixton Ruin.

Dr. Smith and Mr. Dancer have been examining the air of Manchester by the aid of the microscope, and have found it to be full of spores and other organic germs, the presence of which in, probably, all air leads, no doubt, to the phenomena imputed to spontaneous generation, and is probably the cause of the epidemic character of many diseases. The air was first washed by shaking it in a bottle with distilled water, and in a drop of the water it was reckoned that there were about 250,000 spores, and these only required to be lodged in suitable situations to spring into activity. In the quantity of air respired by a man in ten hours it was reckoned that there would be about 37,500,000 of these spores or organic germs.

The Palace at Cheragan, on the Bosphorus, is so far advanced that the question of furnishing is under discussion, and as a matter of course the French are trying for the job. We may say, too, as a matter of course, one does not here of Englishmen looking out, notwithstanding the high character of English work in Turkey. A strong party is in favour of Turkish material and Turkish workmen. A new meteorological observatory is to be constructed in Constantinople.

Trade News.

TENDERS.

CATERHAM ASYLUM FOR IMBECILES.—Sir,—The tender of Mr. John T. Chappell—£83,677 has been accepted.—I am, &c., E. C. ALFLATT.

BIRKENHEAD.—For the erection of St. Ann's New Boys' Schools, Birkenhead:—

Fisher	£1320	0	0
Cameron	1311	7	0
Harkness and Dempsters	1309	0	0
Dobson	1259	8	9½
Black and Readie	1233	0	0
Forde	1170	0	0
Morris and Allen	1167	10	0
Bleakley	1165	0	0
Booth and Richards (accepted)	1150	0	0

BURSLEM.—For the erection of a flint mill, at Longport, for Mr. T. Hughes, earthenware manufacturer. Messrs. Scrivener and Son, architects, Hanley:—

Matthews	£2700	0	0
Beech	2725	0	0
Sidley	2710	10	6
Bowden	2685	0	0
Barlow (accepted)	2675	0	0
Blackhurst	2670	0	0
Wooldridge	2650	0	0
Woolrich	2620	0	0
Brindley and Critchlow	2580	0	0
Barley	2573	0	0
Bennett and Cooke	2490	0	0
Grosvenor	2460	0	0

CANTERBURY.—For the erection of a warehouse at Canterbury, for James Green, Esq. Mr. John Green Hall, architect:—

Epps	£3890
Dickenson and Company	3810
Sollit	3810
Wilson	3500
Gaskin and Company	3490
Adcock	3444
Naylar (accepted)	3385
Lawson	3389

CARDIFF.—For the erection of a warehouse, West Bute Dock, for Messrs. Adams Brothers. J. Hartland, architect. Quantities supplied:—

Shepton	£2294
Lock	2284
Seager (accepted)	2230

CHELMSFORD.—For additions to the Chelmsford Union House. Mr Charles Pertwee, architect:—

R. Choat and Son, Chelmsford		£557
W. Roper	,,	552
J. Baker	,,	550
T. Thorn	,,	540
G. Last	,,	470
W. Fincham (accepted)	,,	455

CHELMSFORD.—For heating and lighting Bocking Chapel. Mr. Charles Pertwee, architect:—

	Heating.	Lighting.
Harrison and Bettridge, Chelmsford	£115 0 0	... £46 10
Dennis and Scruby ,,	85 0 0	... 45 0
F. Christy ,,	66 12 6	... —
H. Farrow ,,	—	... 41 0
F. Critall (accepted) Braintree	87 18 6	... 21 18
J. Bloomfield ,,	—	... 45 0
T. Biggs ,,	—	... 29 10

FENTON.—For the erection of a smith's shop, at the North Staffordshire Engineering Company's foundry:—

Sutton	£397 15
Wooldridge	350 0
Matthews	297 0
Bradbury (accepted)	274 0

ILFORD.—For three shops and fifteen cottages at Ilford, for Miss Harvey. W. Allen Dixon, architect. Quantities supplied:—

Eaton and Chapman	£2985
Manley and Rogers	2975
Staines and Son	2448
Mann	2879
Garrad	2613
Withers	2495

LIVERPOOL.—For the erection of a dwelling house and livery stables for 22 horses in Hope street, Liverpool. Charles H. Belce, C.E., 22, Lord-street, Liverpool. Quantities by George L. Hunt, 19, Brunswick square, London:—

Wiley	£2100
Dixon and Sleight	1850
Nicholson and Eyre (accepted)	1639

LONDON.—For building No. 106, Fenchurch-street, and No. 62, Leadenhall street, for Messrs. Innes Brothers and Company, Mark-lane. A. B. Marsh, architect. Quantities by Mr. G. P. Raggett:—

Macey	£4856
Henshaw	4775
Carter	4600
Newman and Mann	4556
Foster	4529
Coleman	4500
Pritchard	4427
Myers	4389
Couder	4380
Brass	4093
Hill, Keddell, and Waldram (accepted)	4077

LONDON.—For the erection of five houses in St. George's-road, S., for Mr. Bedford. H. S. Legg, architect. Quantities supplied:—

	Amount of Contract.	Credit old materials.	Nett amount.
Ronald	£4955 ...	£150 ...	£4805
Raynham Brothers	4397 ...	150 ...	4247
Carter	4200 ...	100 ...	4100
Henshaw	4158 ...	75 ...	4083
Blackmore and Morley	4094 ...	100 ...	3994
Linfield and Son	3979 ...	75 ...	3904
Wigmore	4000 ...	100 ...	3900
Ebbs	3979 ...	105 ...	3874
Nightingale	3961 ...	115 ...	3846
Perry	3950 ...	175 ...	3775
Falkner	3779 ...	100 ...	3679
Crabb and Vaughan	3744 ...	150 ...	3594
Wills	3719 ...	150 ...	3569
Merrit and Ashby	3655 ...	101 ...	3554
Scrivener and White	3653 ...	246 ...	3407
Palmer	3570 ...	250 ...	3320
Wicks, Bunga and Co.	3505 ...	200 ...	3305
Gibbs	3285 ...	150 ...	3135
Pierce	2998 ...	237 ...	2761

PURTON.—For new Wesleyan chapel at Purton, near Swindon, exclusive of old chapel. Mr. T. S. Lansdown, architect. Quantities supplied by the architect:—

	Bath stone dressings.	Native stone.
Gray	£372 0 0	... £357 9 0
Titmarsh	300 0 0	... 290 0 0
Drew	275 0 0	—
Barrett, with Bath stone dressings (accepted)	240 8 0	... 233 0 0

SELLY HILL.—For the proposed new church. Messrs. Martin and Chamberlain, architects. Mr. W. Harris, quantity surveyor:—

	Complete Estimate.	Tower & spire deducted	Additional deduction stone to Brick.
Messrs. Horsley	£3225	£2805	£2619
Jeffery and Pritchard	3200	2755	2525
Matthews	3100	2772	2471
Webb	3130	2770	2672
Partridge	3000	2600	2600
Barnsley	2905	2602	2398
Briggs	2975	2625	2419
Hardwick	2965	2612	2517
Jones (accepted)	2865	2500	2347

SWINDON.—For new villa at Swindon. Mr. S. S. Lansdown, architect. Quantities supplied by the architect:—

Wooldridge	£808 15 0
Dover	750 0 0
Drew	745 3 9
Spreadbury	597 0 0
Selby	572 0 0

TUNSTALL.—For the erection of new store rooms, &c., at Johnson's brewery. Mr. R. Dain, architect, Burslem:—

Woolrych	£315 0
Blackhurst	305 15
Beach (accepted)	298 15

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HIGHGATE.—September 30.—For the erection of an infirmary at Highgate. J. Moore, clerk, vestryhall, St. Pancras.

LEAVESDEN WOODSIDE (near Watford).—September 30.—For the erection of schools. J. Moore, clerk, vestry hall, St. Pancras.

METROPOLITAN BOARD OF WORKS.—September 29.—For the erection of fire brigade stations at Amhurst-road, Hackney, and Upper Tooting. J. Pollard, clerk to the board, Spring Gardens.

PETERBOROUGH.—September 26.—For the erection of a new Baptist Chapel. J. W. Chapman, architect, 14, Great Western-terrace, Westbourne Park, London W.

TAUNTON (Somerset).—September 30.—For building a shop, with house and offices. Messrs. Giles and Robinson, architects, 7, Furnival's Inn, W.C.

SLOUGH.—September 30.—For the erection of two villas in Windsor road. F. Charsley, Herschels, Slough.

PORT MADOC (North Wales).—October 5.—For the excavation and building of quay wall. G. Lea, 54, Chancery-lane, London.

EATON (Norwich.)—For designs for new suburban church. Messrs. Hewitt and Capon, London and Norwich.

DERBY.—October 1.—For the erection of new hotel, &c., in Cornmarket and St. James-street. W. C. Watson, Company's offices, Wardwick, Derby.

WAR DEPARTMENT.—For raising the practice butt in Plumstead marshes. Capt. W. Mitchell, R.N., Royal Engineer office, Woolwich.

ST. PANCRAS (Middlesex).—September 30.—For the erection of infirmary for this parish at Watford, Herts. F. Moore, clerk to Guardians.

TUNBRIDGE WELLS LOCAL BOARD.—September 29.—For construction of outfall sewers, overflows, sewage tanks, &c. T. Elliott, clerk.

WITHAM LOCAL BOARD OF HEALTH.—October 1.—For the construction of sewers and waterworks.—J. H. Blood, clerk.

CHARTERED GAS COMPANY.—For purchase of breeze. J. Phillips, Horseferry road, Westminster.

ST. MARY, NEWINGTON.—October 2.—For painting the iron railing of the parish churchyard of St. Paul's, Walworth. Joseph Burgess, clerk to the board, Vestry Hall, Walworth, S. E.

GREAT WESTERN RAILWAY.—September 30.—For narrow gange carriage stock, first class and composite carriages, &c. F. G. Saunders, secretary, Paddington.

ST. MARY CRAY (Kent).—October 8.—For the erection of a new parsonage house. Mr. Christian, architect, 8A, Whitehall-place, London.

LONDON.—October 1.—For the erection of premises at the south-east corner of Gracechurch street and Fenchurch-street, City. Mr. Charles Baylis, 30, Poultry.

NORTH BERWICK.—October 3.—For the erection of coast guard station. Coast Guard Office, Somerset House.

ASKWITH.—For the erection of two good cottages, at Askwith, near Otley. William Edmondson, land agent, Denton, near Otley.

THAMES VALLEY LAND AND BUILDING SOCIETY.—Ashford Estate.—September 30.—For the construction of roads, &c. Messrs. Brewer and Son, architects and surveyors, 2, Upper Hill street, Richmond, S.W.

WEST DULWICH CONGREGATIONAL CHURCH.—September 30.—For the erection of a new school. J. Nicholls, architect, 8, Craig's-court, Charing Cross, S.W.

PROPERTY SALES.

SEPTEMBER 15.

AT THE MART.—By Messrs. Hards, Vaughan, and Leifchild. Freehold two houses and shops, Nos. 16 and 17, Park row, Trafalgar road East, Greenwich, let at £18 per annum—sold for £200.

Freehold piece of ground, with stable thereon, situate as above £400.

Freehold residence, No. 16, Park row, let at £45 per annum—£550.

Freehold residence, No. 15, Park row, let at £40 per annum—£490.

Freehold residence, No. 14, Park row, let at £40 per annum—£530.

Freehold residence, No. 21, Park row, let at £19 19s. per annum—£275.

Freehold residence, No. 22, Park row, let at £20 per annum—£275.

Freehold residence, No. 23, Park row, let at £20 per annum—£300.

Policy of assurance for £1,000, issued by the Provident Institution on the life of a lady aged 74 years—£300.

Contingent reversion of and in £3,000 Three per cent. Consols upon the decease of a lady and gentleman aged 43 and 39 years—£600.

Leasehold posting house, knowe as the Valley of Rocks Hotel, Lynton, Devon, with stabling, coachhouses, and premises, together with about 1¼ acres of land, term 1,000 years from 1680—£2,550.

Freehold 1 acre of land, situate as above, same term—£175.

Freehold 0a. 2r. 0p. of land, situate as above, same term—£80

Freehold 1 acre of land, situate as above, same term—£170.

Freehold 2a. 1r. 32p. of land, situate as above, same term—£220.

Leasehold improved ground rent of £14 15s. per annum, arising from 13 houses, situate in Hackney road and Nelson street, term 80 years, from 1807—£120.

Leasehold improved ground rent of £50 per annum, arising from 83 houses, in Hackney road, &c., term similar to above—£440.

Freehold house, No. 9, Burr street, Wapping, let on lease at £40 per annum—£550.

Freehold three acres of building land, situate in Crown lane, Fulham road—£2,400.

Leasehold business premises, No. 61, Queen street, Cannon street, annual value £750, term 14 years from 1868, at £395 per annum—£2,000.

By Mr. A. Hind.—Leasehold two houses, 1 and 2, Ebenezer cottages, Londonbrough road, Camberwell, producing £52 per annum, term 36 years unexpired, at £6 per annum—£450.

By Mr. E. White.—Freehold four houses, Nos. 30 to 33, Highbury vale, Islington, let on lease and producing £75 per annum—£1,200.

By Messrs. Norman and Son.—Leasehold messuage, No. 31, New North road, let at £42 per annum, term 62 years from 1824, at £5 5s. per annum—£290.

Leasehold business premises, No. 7, St. Ann's lane, City, term 99 years from 1772, at £20 per annum—£405.

Leasehold business premises, No. 111, Upper street, Islington, term 6 years unexpired, at £99 per annum—£83.

SEPTEMBER 17.

By Mr. Newbon.—Freehold residence, No. 15, Vorley villas, Junction road, Upper Holloway—£605.

Leasehold residence, No. 37, Barnsbury street, Upper street, Islington, let at £55 per annum, term 95 years from 1828, at £10 per annum—£590.

Leasehold four houses, Nos. 6, 11, 15, and 17, Albert street, Penton street, Islington, producing £136 per annum, term 99 years from 1848, at £24 per annum £1,270.

Leasehold house, No. 30, Brooksby street, Liverpool road, Islington, annual value £30, term 41 years unexpired, at £5 5s. per annum—£25.

Leasehold house, No 1, Wood-stock villas, Forest Lane, Stratford, annual value £26, term 77 years unexpired, at £4 per annum—£265.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots; also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Charles Mills, Dockhead, Bermond ey, contractor, September 29, at 1—George Newton, jun., Brighton, builder, September 29, at 1.

TO SURRENDER IN THE COUNTRY.

Richard Allanson Harker, jun., Leadgate, Durham, joiner, October 5, at 10—William Murray, Pembroke Dock, builder, October 6, at 10—Frances Northall, Birmingham, gasfitter, October 9, at 10—George Steere Wakeham, Plymouth, mason, October 7, at 11—John Wale, Leicester, builder, October 12, at 10—Benjamin Earnshaw, Heanor, bricklayer, September 29, at 12—Charles Percival, Liverpool, paint manufacturer, September 29, at 11—George Viner Stent, Frome, carpenter, September 30, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 20, T. Hughes, Ponthlydden, builder—October 22, R. Hoad, South Shields, builder—October 20, W. A. M. and B. Mumby, Boston, engineers—October 20, R. Porter, Newcastle upon-Tyne, builder—December 1, I. Kerridge, Basnet grove, Wandsworth road, builder—December 3, R. Fitch, Dulwich, builder—December 3, J. Perigoe, Tunbridge Wells, builder—December 3, W. J. Birtchnell, Clapham Park road, builder—December 3, A. Bacon, Hornchurch, builder—October 30, W. J. Raker, Jubilee-street, Commercial road East, painter—November 4, E. Scally, Fitts-rents, Reeves-place, Hoxton, stonemason—October 6, W. T. Randall, Ramsgate, builder—October 6, H. Sparks, Exmouth, brickmaker—October 9, C. Noble, Bramham, builder.

PARTNERSHIPS DISSOLVED.

Rogers and Rawlings, Bradford on-Avon, stone merchants—The Saltburn Iron Stone Company—A. and J. Binns, Wakefield, builders—W. and R. Kirby, Leeds, builders—Hoyle and Morley, Greasbrough, builders—Howcroft and Atkinson, Gisborough, timber merchants—Hole and Cleminson, Watchet, engineers.

DIVIDENDS.

October 5, R. Shortridge, Plymouth, plumber—September 29, T. Everett, Dudley, contractor.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, rawback, 1s.

Teak	load	£11	0	12	10	Archangel, yellow	£11	0	£12	0
Quebec, red pine		3	5	4	15	St. Petersburg, yel.	10	0	12	0
,, yellow pine		3	0	4	5	Finland	7	0	8	0
St. John N.B. yellow		0	0	0	0	Memel	0	0	6	0
Quebec Oak, white		5	0	5	10	Gothenburg, yellow	8	0	9	10
,, birch		4	0	5	0	,, white	8	0	9	0
,, elm		4	0	4	10	Gefle, yellow	9	0	10	10
Dantzic oak		4	0	6	0	Soderham	9	0	10	10
,, fir		2	15	3	15	Christiania, per C., 12 ft. by 3 by 9 in.				
Memel fir		3	0	4	5	yellow	11	0	13	0
Riga		3	0	3	3	Deck Plank, Dantzic, per 40 ft. 3 in.	0	12	1	0
Swedish		2	0	2	8	Pumice Stone per ton	6	0	8	0
Masts, Quebec red pine		4	10	6	15	Oils, &c.				
,, yellow pine		4	10	6	0	Seal, pale	per tun	36	0	0	0
Lathwood, Dantzic, fm		6	10	7	10	Sperm body		89	0	0	0
,, St. Petersburg		8	0	9	10	Cod		28	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, 8th. Sea, pale		37	10	0	0
Quebec, white spruce		13	0	20	0	Olive, Gallipoli		48	0	73	0
St. John, white spruce		13	10	15	10	Cocoanut, Cochin, ton		53	0	55	0
Yellow pine, per reduced C.						Palm, fine		33	10	40	0
Canada, 1st quality.		17	0	18	10	Linseed		31	5	34	0
2nd do.		11	10	12	10	Rapeseed, Eng. pale		33	0	0	0
						Cottonseed		31	0	38	0

METALS.

IRON:—						LEAD —				
Welsh Bars in London	per ton	6	5	0	6	Pig, English	per ton	21	5	0
Nail Rod	do	7	10	0	7	,, Spanish Soft	do	18	10	0
Hoops	do	8	5	0	9	Shot, Patent	do	22	10	0
Hoops, Single	do	8	0	0	9	Sheet	do	20	0	0
Staffordshire Bars	do	7	5	0	7	White	do	27	0	0
Bar, in Wales	do	5	10	0	6	TIN:				
Railrods	do	7	10	0	7	English Block	per ton	95	0	0
Foundry Pigs, at Glasg. No 1	do	2	12	3	2	do Bar	do	96	0	0
Swedish Bars	do	9	17	6	10	do Refine	do	97	0	0
COPPER:—						Banca	do	[illegible]		
Sheet & Sheathing, & Bolt	per ton	79	0	0	2	Straits	do	92	10	0
Hammered Bottoms	do	97	0	0	0	ZINC:—				
Flat Bottoms, not Hammered	do	83	0	0	0	English Sheet	per ton	25	10	0
Cake and Tough Ingot	do	1	0	0	3	Devaux's V. M. Roofing Zinc	do	25	0	0
Best Selected	do	77	0	0	85	* And 5 per cent. discount if laid upon the new system				
Australian	do	77	10	0		STEEL:—				
Yel. Metal Sheathing & Rods	per lb	0	0	3	0	Swedish Keg, hammered	per ton	15	0	0
						Swedish Faggot	do	0	0	0
						SPELTER:—				
						On the Spot	per ton	20	0	0
						QUICKSILVER	per btl	6	17	0
						REGULUS OF ANTIMONY				
						French	ton	43	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 2, 1868.

WALKS WESTWARDS.

IN a recently concluded case, which has occupied a very large share of public attention, Mr. Ballantine observed that if an article was said simply to come from the East it might come from Wapping. So a walk westward may mean either a stroll from Temple Bar to the Marble Arch, or a journey on foot to the Land's End. If the reader will start in our company from Temple Bar, as from the meridian which divides the East from the West, we will proceed to notice what is being done in the building line. In short, he will receive the earliest possible impression of the "Building News." On the right hand is Wych-street, and at the west end of Wych-street is what was the Strand Hotel (very limited), but what is now the Globe Theatre. Is there not magic in the name? Shakspeare, Essex, Southampton, Sidney, and perchance Elizabeth's self. In about a month Mr. Sefton Parry hopes to open this theatre, and at that time an extended notice will be given. At present nothing is finished except the entrance in Newcastle-street. Mr. Parry is his own architect. May the Globe Theatre, if only for the name it bears, flourish long! Another theatre next presents itself as the only sign of building in the Strand, and it is a noteworthy fact that in the great western thoroughfares very little building is going on. The Strand Music Hall, disastrous alike to *impresario*, architect, and shareholders, is being converted into the "Gaiety Theatre," under the architectural supervision of Mr. J. C. Phipps. It will be opened in December. Besides this alteration nothing is being done in the Strand, and passing the graceful National Bank at Charing Cross, and the somewhat flaming Sun Fire Office, with its white marble, red granite, and red brick, we come to Her Majesty's Theatre. This building, under the magic hands of the Messrs. Trollope, has risen from its ashes in a surprising manner. It will be ready to open for the next season. Adjoining is Mr. Graves' house, partially damaged by the same calamity. A new roof has been put on, surmounted by much gilt iron cresting. And here the sacred precincts of Club-land are reached, and in the vaward stands that haunt of sages and philosophers, the Athenæum. Now it may be interesting to know that these sages and philosophers have found that they are limited in accommodation for their billiard playing, that their smoking rooms are inadequate, and that their servants require a hall, seeing that their present one is required for other purposes. These adjuncts are now in course of erection in the garden at the back of the club. Passing the elegant "Travellers" and matchless "Reform," a very imposing building occupies the right hand side, the sunny side, of the way. This is no less than the Junior Carlton Club, progressing under the superintendence of Mr. David Brandon, Messrs. Lucas being the contractors. £40,000 is supposed to cover the cost, but considering the vast size of the building, that sum seems insufficient. This building, vast as it is, is anything but an ornament to Pall Mall. Its three stories of ugliness are not redeemed by the fact that each story is 20ft. high, nor can coarseness of design be compensated for by polish of granite. It is unworthy of the site it occupies amongst its compeers. These remarks may seem harsh, but let any architecturally disposed person look at the needless crowuing balustrade and observe the manner in which the rail is carried down to a lower level; let him reconcile himself, if he can, to the topmost window openings, to the glittering granite columns of the first-floor windows, to the *pseudo* bow window between the western columns on the ground floor, to the thin ungraceful balusters, to the vile design and still worse execution of most of the ornament. If he can do so he had better leave us at once. The peripatetic method of teaching is, as regards architecture, excellent, but we care not to carry with us any who cannot see the grievous faults which disfigure the outside of the Junior Carlton Club. The ground-floor windows are well treated, however, and the front towards St. James's-square is not offensive. On this front the upper windows leave nothing to be desired, and why those facing Pall Mall were not exactly similar is a mystery. It is a mistake to divide this façade into centre and wings, and the carving of a shell over the central Venetian window is abominable, but the fenestration generally is good if not original. It is difficult to trace the same hand in these fronts. We make no doubt that the crowning balustrade, a most unnecessary feature, will be removed, and that the second-floor windows in the Pall Mall front will be altered to match those at the back. "A little charge will do it." A short distance further on will be seen an Elizabethan structure, consisting of a bay window of two stories supported by a massive corbel, the front terminating with a gable. This building is capable of considerable improvement; the style especially should be more pronounced, the corbel and buttress supporting it being too Gothic, while the mouldings and form of gable are too Jacobean to harmonise. It, however, supplies in a measure the thing that Pall Mall lacks, namely, picturesqueness. Leaving Pall Mall and turning into St. James's-street, and with averted eyes passing the old Thatched House Tavern, now the Civil Service Club—a notable instance of bad taste and good carving—we pause over against Mr. Waterhouse's University Club. About this building opinions vary. No one doubts Mr. Waterhouse's talent, but many question his application of it. The style is the perpetual French Gothic, which certain architects seem to keep ready on a roll of endless paper. Now, we have no wish to run down the middle ages, for without them there would have been no Waterhouse, no Seddon, no Street, no Scott, and, worst of all, no Barges; but it is impossible to forget that great works were done before the middle ages, and that still greater have been done since. Of the general features of this building many will be found to approve, but we cannot conceive that any will admire the little half sill, half balcony projections with their supports on the first floor of the bay. It is, moreover, indisputable that gurgoyles are for carrying off water, and for no other purpose. When we see them in connection with iron rain water pipes, which take off the water which the gurgoyles should discharge, however much we may admire the beautiful, we must allow that the true has been sacrificed.

Crossing the Park in the direction of Buckingham Gate we soon reach Grosvenor Gardens, an account of which was given in these pages about a year ago. Since that time considerable progress has been made. The block of nine houses, facing south-east, is completed, or on the point of completion, and the triangular space in front is enclosed with a substantial railing and stone piers of some pretensions, and is planted with lime trees. The National Bank, a corner building, is ready for occupancy. If less money had been spent on the supposed front of this building more would have been left to adorn the back, which is practically as conspicuous. The architect is Mr. P. C. Clarke. The terra cotta so freely used in the cornices and chimney caps of these houses has toned down from bright red to a very good red grey. Messrs. Blanchard and Co. are the manufacturers. The entire range of Grosvenor Place is nearly ready for occupation, the ceilings of many of the houses being of extreme elegance. An enormous house to the north is in a forward state, and five houses in the Crescent at the back of the hospital are carried up to the second floor.

Crossing the road great improvements since last year will be observed. The hoarding round the Park has given place to a granite curb and handsome iron railings with standards at intervals of about 10ft. The walk between the flower beds is pleasant still, as, though somewhat withered, the flowers or the leaves retain strong distinctions of colour. Park-lane is always picturesque, though there are few houses in it of what may be called architectural pretension. The exceptions are too well known to require notice. At the corner of Upper Brook-street a large building of four stories is in course of construction for Mr. Marjoribanks, from the designs of Mr. T. H. Wyatt; Mr. l'Anson is the contractor. This is a remarkable rather than a handsome building, and no donbt will be very stately in its interior. The entrance, which is at the eastern extremity in Brook-street, is adorned with four large columns of polished red granite. The west front consists of two bays carried up the full height of the building, with large triple windows or arcades in the centre. On the first floor it seems that this arcade is to be left open, forming a sort of *loggia*. At the back, rising above the roof, is a circular tower. The iron cresting is not what we should wish to see, and no amount of gilding or colour will improve it. Attached to this house, or rather connected with it by an underground passage, is the kitchen, with a billiard-room over, forming a sort of pavilion in the garden. This pavilion is a very pretty and quaint affair. The general material of the house is red brick, with stone dressings, and at present the contrast is too strong. Against polished granite and marbles we have always protested, and regret to see them used here. If, however, they are ever justifiable, it is in a case like this, where red brick forms the chief element in the colour of the house. Nearer the Marble Arch, on the spot where Hereford-street once stood, Messrs. Trollope and Sons are putting up a row of eleven large houses, similar to those at Grosvenor Gardens, the ground being the property of the Marquis of Westminster. Five of these are nearly finished. The space between Oxford-street and these houses will be left open and planted ornamentally. In New Bond-street (No. 90), Mr. Wimperis, of Sackville-street, has designed a very quaint front, which is well worthy of inspection. The materials are not varied like a harlequin's suit. Yellow brick and Bath stone will, in skilful hands, go a long way. The way in which the roof is made into an upper story is very ingenious. And now, as we are near the Circus, and have seen nearly all that is going on at the West End, within a moderate circuit, we will take leave of our companion, hoping for his company for a walk still farther westward on another occasion.

SYMBOLISM.—III.

THE excesses of symbolism in ecclesiastical architecture have often given birth to a cry against symbolism itself. The bare four walls of the Puritanic tabernacle, and the equally bare ceremonial within them, have been amongst the results. But even to those who, on grounds of conscience, tacitly submit to such violations of taste, a sense of dissatisfaction is present, as if something were lacking. The fact is that in all human life symbolism takes its place, and it cannot be altogether eliminated from the ecclesiastical any more than from other departments of thought and interest without loss. The principle is founded in nature, and its development in ecclesiastical life is not the fruit of superstition, nor need it conduce thereto.

In one form or other symbolism has held sway in human society to a far greater extent than is usually conceived. Indeed, hardly a phase of mental action, or of social or even political life exists, but in some of its subtle operations this principle is called into play. A prime fact in human history is language; but all speech is made up of mere symbols of thoughts, and all written language is made up of symbolic signs of the sounds of speech. In an immense proportion of human speech words are perfectly arbitrary signs of mental action; for, to take examples, what resemblance have the vocables "human speech" and "mental action" to the *things* thereby signified? and what resemblance have the alphabetic characters forming those vocables to the *sounds* they serve to represent? But this absence of resemblance is not always witnessed. Every language has sounds which tally wonderfully with the things they name. Follow the stream of human speech towards its source. Examine the tiny rivulets, its first tributaries, trickling down from those regions where man's presence is first witnessed by history and the most ancient monuments, and you receive the conviction that many of the earliest articulations of the human tongue were meant to be *imitative* as well as representative; that is, they were meant to be not merely signs of objects or ideas, but significant signs, suggested by some chief characteristics of such objects or ideas. For example, sounds were chosen as names of creatures, corresponding with the cry or the nature of the animal, and when simple thought or emotion was indicated, the sound chosen was soft or sharp, strong or weak, to correspond. Thus the lowing of the ox is imitated in his name in many languages, as in the Greek *βοῦς* and the Celtic *buwch*. Instances innumerable might be cited of names of animals given on this principle in all the older tongues. And how often in the newer materials of speech do we find this same symbolic practice prevailing! The "hum" of a crowd, the "crash" of a falling house, the "gurgling" of a liquid, the "cooing" of a dove; and such words as smack, whisk, clack, whistle, slap, thump, bang, shriek, are examples of imitative vocables which form a wide element in every language. Indeed, animals themselves seem not devoid of power to symbolise emotion by articulation. They have shrill cries of distress, and sweet tones of joy and love. The dog has a variety of barks, all indicative, even to our apprehension, of a corresponding variety of feeling.

Symbolism is largely practised in human gesture. There is scarcely a phase of emotion but flows forth in it. Even the expression of the countenance is a natural and universal herald to the outer world of what passes within; and is capable, by power of will and habit, of reduction into a system of telegraphy whereby a vast variety of mental states can be indicated, concealed, or simulated at pleasure. In oratory, when speech is accompanied by natural action and expression, a three-fold system of symbolism is practised at once, and this is the reason why the same sentiments, when well spoken, are so much more effective than when read.

Men of all nations have learned to make the covering of the body symbolic. The burgomaster, the notary public, the beadle, has half his authority in his gown. The priest, the field marshal, the king, is a common man without cassock, gold lace, and diadem. The Herald Office separates society into sections and orders by a few devices which form permanent and impassable barriers. On the table of St. Stephen's the mace tells of the power and kingship of the realm. There is scarcely a guild or craft which portrays not its purpose and nature in some symbolic invention. If it be a weakness that is thus indulged, nations have it as well as Odd Fellows' clubs. Whatever the first reason of the adoption of the Union Jack, and whatever "Jack" in such a connection may mean, the whole world knows the significance and inviolable sacredness of that flag in whatever clime it floats. *La Grande Nation* is an "eagle." The Great Republic is "stars and stripes."

And all this is not the invention of learning, or a formula of civilisation. It is a creature of the human mind in all stages of development, under all conditions of creed, nationality, and climate. The savage with his tattooing and feathers proclaims his rank with a care neither greater nor less than that of a coronetted English duke or capped Venetian doge. Symbolism in dress, official emblems, and armorial bearings is a beautiful language, suited to give information respecting facts which it is desirable to know, without the intervention of description.

The clerical vestments, after which the weak and feminine-minded are in our day so eagerly running, have in them but little that is symbolical. For the most part they are in reality but copies of articles of common dress worn by the Romans, and worn as a matter of course by the early christians, whether clergy or not clergy. They are, therefore, in themselves, not worth contending for in an age and country in which costume of a different kind is in use; and the partiality shown for them seems to arise almost entirely from their antiquarian and their mediæval doctrinal associations.

Light and darkness, day and night, summer and winter, and all the phenomena of nature have been seized upon by the poet to portray the varying aspects of human fortune and feeling. The "light of the dwelling," the "night of sorrow," the "winter of discontent," the "autumn of life," embody in brief more than long chapters of description. And in symbolism the colours which are felt most to resemble light, and gloom, and darkness, are largely used. We speak of what is "bright" in feeling and circumstance, and body it forth accordingly to the eye. Hymen's altar is approached in white; the sorrow of the mourner is typified in black. No colour is dark enough to stand for despair.

If this passion for instructive resemblances and bodying forth in material form the invisible, which mankind has universally betrayed, were wholly absent from any department of human doings, even the most prosaic and matter of fact, we should say that something was wanting, and that the free flow and play of feeling and imagination had been violently impeded. No such department is found. From the imperial sceptre to the barber's staff—through all ranks and descriptions of privilege and employment—men seek for and find a symbol of their status and distinction. Great interests, great hopes, are all represented. The market hall is decorated by the Cornucopia; over the judge's seat stands the figure of even-balancing justice; the Cemetery-gate is surmounted with the burning lamp of immortality; and the church is crowned with the cross. All such symbols are for use and not for abuse; they are monitors and witnesses to those who understand, and teachers to those who learn.

Erections for shelter, or for assembly, are amongst the greatest and most universal of human works, and, as might be expected, are found to display to some considerable extent the use of symbolism. At the same time it is somewhat remarkable that when man came to exchange the shelter of the cave, the over-canopying oak and the forest, and the grander dome covering of the starry heavens for substitutes built of wood or stone, he did not scheme his first designs in a manner to embody more of nature's features. Or if it be not a cause of wonder that with a necessarily imperfect knowledge of art he did not accomplish this, it is at least cause of no surprise that in the noontide of classic art frequent and elaborate endeavours were made to garnish the villa, the triumphal arch, and the temple with emblems of natural and supernatural things.

NOTES IN CHESTER.

THE picturesque and old-world capital of Cheshire does not present, by any means, those indications of architectural progress and activity which a visit to the town some years ago might have led us to expect. Chester always seemed, to the visitor reaching it from any of our large manufacturing or commercial towns, a place fifty years behind the rest of the world—a place of odd nooks and angles, overhanging gables and eccentric skylines; where houses stood propped together in a marvellous manner, at any angle but a vertical one, a whole street looking as if it must inevitably come down by the run if the end house were once removed—a place where those who were tired of the incessant bustle of a "go-ahead" town could indulge in a little quiet sauntering, and, once out of the sight and sound of the railway station, fancy themselves for a moment in the England of the last generation; a fancy to which, unhappily, an additional reality was lent by the bad smells and dirty alleys which told plainly of a drainage system as antiquated in spirit as the aspect of the buildings. It would be far from us to wish that all the ancient character of this and some other similar localities should be eliminated. It is a pity to lose any of the few remaining links which seem to connect us with the past of our country, and assist us to realise it; but such feelings must give way to some extent before practical and sanitary considerations; and, considering the many evils attendant upon narrow and low rooms, and bulging and leaning tenements crowded together in picturesque confusion, it was with satisfaction that we observed in Chester, some years ago, an apparent stirring among the dry bones, a removal of "sagging" brestsummers and leaning story-posts, in favour of some new erections, in which an attempt was evidently made to combine the old picturesque style of the place with firm and solid modern construction. This effort was mainly observable in sundry new shop fronts in Eastgate-row, two or three in the old half-timber fashion of the place, and one, the large establishment of Messrs. Brown, a stone front of picturesque general design, but bad and weak details, the work of the late Mr. Penson, who enjoyed considerable local reputation as an architect. At the same period it was that the new bank, with its orthodox Roman temple front, swaggered into Eastgate-street with its hands in its pockets (so to speak), domineering over the slighter and more picturesque buildings adjoining, with an air which rendered all questioning as to "Which is the bank?" perfectly superfluous. But from whatever cause—whether it be that the commercial stagnation which has checked building so much in Liverpool and elsewhere, has also made its influence felt in the non-commercial town of Chester, we know not—the promise given at that time has not been fulfilled; and, with the exception of the new Townhall, the visitor of to-day finds no building of any interest in progress, and the aspect of the streets and rows little altered from what he may have remembered for a good many years back.

The general effect of the townhall, the tower of which is now well clear of the roofs, is very satisfactory. There is a depth of reveal in the openings and a general solidity of design in the details which evince the true architectural spirit in its designers; and, for *present* effect, the selection of the two tints of stone for the masonry, the white or cream coloured stone from Manly, with bands and alternate voussoirs of red Runcorn stone, is singularly harmonious and pleasing. The only question is whether the contrast of colour is strong enough to retain its effect long against the action of weather, constantly tending to bring it to a uniform tint. It appears to us that these sources of effect from contrast of external material cannot be expected to last long unless they are at first made rather too strong and decided, and allowance thus made for the

action of a climate so trying to architectural effect as that of England. The surface finish of the walling, scutched rather lightly so as to produce just sufficient roughness to give a texture to the stone, is very good; and the Irish marble from Ballinasloe, which has been largely used for shafts, &c., seems a very good material, and harmonises well with the stonework. Internally the finish of the corridors, so far as is yet apparent, is of red brick, not quite so good in quality as brick in such a position should be; but this is, perhaps, a question of funds. Opposite the entrance a vista right across the building will be obtained, the centre portion being left open as a kind of general waiting hall, and crossed by a very picturesque bit of semi-circular staircase leading to the mayor's private room. The large hall is a good open room, well lighted, but with nothing very striking about it so far, and the roof is a poor and ineffective one. Externally, we dislike also the open balustrade round the roofs, a row of miniature columns carrying little pointed arches, which on that small scale have a disagreeably thin and slight appearance. It does not seem to be sufficiently recognised among architects that a proportion of parts which looks well on a large scale will often look very meagre on a small scale, and the use of either miniature shafts and arches or miniature columns (as we have seen them over the cornice of a classical building), with the same proportions as when used the ordinary size, always has a card-house kind of effect. The one real invention of the Renaissance style, the balustrade, is an admirable instance of the correct treatment of these kind of small parts; the heavy round lines of the balusters would be hideous on a large scale, but as generally used they have just the amount of weight and thickness which so small a feature needs to give it due solidity and importance. This is, however, the only positive defect which strikes us in the exterior of this building; as townhalls go, Chester is certainly fortunate, and the building looks all the better by contrast with the hideously ugly front of the market adjoining, erected some little time since from the designs of a Liverpool firm who have done much better things, but of whom, in this instance, we may say, in the old nursery rhyme—

> We do not like to tell their name,
> Because they are so much to blame.

It is to be regretted that the small space between the market and the townhall is disfigured by the retention there of two shops, part of the old buildings on the site, of the most wretched hole-in-the-wall style; and that a design submitted by Mr. Lynn for replacing these by a picturesque gateway and small loggia connecting the two buildings has been, so far as we can learn, discarded. There have been heart-burnings, too, about the application of some of the townhall building fund to sculptured subjects for the tympana and panels, &c., in the interior of the building; let us hope that art considerations may happily prevail over those of the pocket.

In Bridge-street-row is the largest and most important of the more recent rebuildings of shops in Chester, designed, but not we believe carried out, by the late Mr. Penson, aforesaid, who also designed the large hotel in Eastgate-street, the "Grosvenor," which has been so ridiculously praised, and which is about as weak and unsatisfactory a design as could well be instanced; nor are these bridge shops much improvement thereupon. *De mortuis nil nisi bonum* is a rule that we fear must not be allowed to hold good in art criticisms; and in these buildings we are struck by the poverty both of design and construction displayed. The first floor of course projects over to the front of the "Row," the front wall above this being carried by stone piers in the ground story. These piers carry wooden brest-summers, which are pretended to be further supported by ornamental angle brackets from each pier to the soffit of the brestsummer; but not only are these brackets so slight as to be evidently inadequate for any practical purpose, but even the brest-summers themselves are too weak for their work, and are already visibly bending under the load of brickwork over them, and this with all the warning examples which the architect had before his eyes of the twisted, distorted shapes into which all erections ultimately fall which depend upon timber of insufficient scantling. Above there is an expanse of brickwork in panels of *rouge et noir*, pierced by isolated window openings without any horizontal band or stringcourse to give connection and unity to the design. A very plain and unpretending shop front in Foregate-street, by Mr. T. M. Lockwood, is quite a relief after these, owing to the evident strength and solidity of the beams, corbels, and piers which carry the overhanging portion, and which are effectively treated, though the ornament is derived only from chamfering and from the outline of the corbels. Mr. Douglas, a local architect (formerly, we believe, a pupil of Mr. Paley, of Lancaster), has a new shop by the bank in Eastgate-street, very weakly and poorly treated in front, the upper story merely an oblong window in the centre of squares of timber and plaster. There is some good solid brickwork at the side and in the chimney stacks; but the system of cutting away half of the stone lintels to make a sort of *quasi* flat-headed arch out of one stone is a most inarchitectural and really absurd practice, involving simply the cutting to waste of nearly half the material. As a general rule, architectural design, in proportion as it is good and true, is conservative of material, using it in the least wasteful manner possible. Mr. Douglas has, however, redeemed his credit in the lodge he has built for what is called the "New Park," presented to the city by the Marquis of Westminster; which at present, however, is little more than a large lawn. The lodge is a very pretty thing indeed, built in timber and cement; part of the cement between the timber covered with an incised or stamped diaper ornament with good effect; while the principal vertical timbers, above the first floor level, are carved into Gothic figures of knights in armour, possibly intended to represent some ancient Cestrian worthies. There is a good deal of other ornamental wood carving, good in design and execution. It is a pity that the porch, which of course is nearest the eye, should be so much more heavy and clumsy in design and detail than the rest, and picked out with that meagre and helpless sort of decoration which consists in boring holes with a centre-bit in different parts of the timber. Behind the lodge proper are retiring-rooms for ladies and gentlemen (an accessory which should always be provided in any park which may be used as a place of public amusement). The form of the window-heads to the ladies' apartment is too *outré* and cut up; but, in the main, it is a very pleasing design; and we hope, for the sake of its architect, that he did not design the very unsightly piers of the lodge gates adjoining.

In a street out of Eastgate-street is a Welsh chapel, with a solid Gothic stone front and porch, by the Messrs. Audsley, of Liverpool—the details better than the general effect. At the Cathedral, which is now at last to be refaced, restored, and "made good" generally (to use a builder's phrase), there appears, so far as we could ascertain, to be nothing done yet in the way of absolutely replacing or repairing the stonework, but a large amount of stone is on the ground and in a state of preparation. The restoration has certainly not been commenced too soon, for doubts might reasonably have been felt as to whether the old weather-beaten structure would have been safe much longer, so much was the stone decayed, and so serious were the deviations from the perpendicular in many parts. The nave is fitted up with benches and chairs for the Sunday evening services in a manner sadly detrimental to its architectural effect, but which is, we suppose, a necessary consequence of the effort that has been recently made to put new life and popular interest into the cathedral system. For those who are interested in such matters it may be noted that the frequenters of the cathedral are indebted to the present Dean for having introduced a fully intoned service, thus rendering complete and uniform in its effect what was formerly, at this Cathedral, a medley of intoning on the part of the choir and speaking on that of the officiating minister. Let anyone who visits Chester cathedral enter it by the dark vaulted passage leading into the east side of the cloister adjoining the chapter-house; the sunlight seen at the end of the passage, falling through the broken cloister window and on the green foliage beyond it, is as charming a bit of effect as one often sees.

Looking to what may be done in the way of future architectural improvements at Chester, we should recommend that while every attention be paid to the character of the surrounding streets and buildings, and the *genius loci* generally, as influencing the style of a new design, that nevertheless the half-timbered style of the old houses should *not* be adopted in future erections. Picturesque effect can be obtained from this style, no doubt, but it is scarcely architectural effect; and no care can make it as solid and durable as stone and brick, while the danger from fire is of course very much greater. The effects of a fire in Eastgate-street at present would be disastrous; it would be almost impossible to stop it. And there is no reason why the charming effect of *chiaroscuro* obtained by the open ground story, with the "Row" passage-way behind it, should not be made quite as piquant and effective with stone piers or granite columns and arches as with story-posts and lintels; indeed, much more so. Nor need the design be confined to the pointed arch style. The round arch arcade gives more light, and can be made as graceful and picturesque as a pointed arcade; and that even in the "classical" style, if desired. It is too late to introduce this feature into our newer towns, where all the front ground floor is already occupied as valuable land; but whenever the time comes (and it ought to come pretty soon) for extensive rebuilding of the Chester Rows, the inhabitants of the old city will have an opportunity before them for securing an architectural effect in their streets superior to what any other town in England can now boast. It will be for them to see that this opportunity is not thrown away; that the work is entrusted to really good and competent architects; and that it is carried out in such a manner as to prove a lasting and enduring construction, and not fall into such strange defiance of all perpendicular and horizontal lines as is exhibited in the present remains of Old Chester.

ESTIMATE AND PRICE BOOKS.*

IT is a common objection to all compilations, whether their contents assume the form of pocket-books, manuals, estimate or price books, that they fail to supply data for particular examples. One is inclined to imagine that their resources should be exhaustless, and one becomes disappointed if upon reference a single item that may be required is not found to be included. This is expecting too much from any compilation. While every effort should be made to render the contents as universal and comprehensive as possible, still it would be manifestly impossible to afford information upon every point connected with the various branches of the architect's and engineer's profession. In the volume under notice, the Messrs. Atchley have launched out in a line somewhat novel,

* "Atchley's Civil Engineer's and Contractor's Price-book for Home and Foreign Service." By W. Davis Haskoll, C.E. To which is added "The Law of Contracts, &c." By W. C. Glen, Barrister at-Law. London: Atchley and Co., Engineering and Architectural Publishers, 106, Great Russell-street, Bedford-square.

and introduced a price-book possessing many distinguishing features in comparison with other volumes of a similar character. The work is professedly adapted for the use of the civil engineer and contractor, and is, therefore, based upon a foundation differing in many respects from that constituting the groundwork of other books of a like description that are more particularly suitable for the architect and builder.

In the chapter alluding to tunnel estimates, the author selects a couple of examples which he mentions "may almost be taken as instances of a minimum and maximum of cost of tunnel work." The instances selected are the Lydgate tunnel and the Buckhorn; the former being situated upon the line of the London and North-Western Railway, and the latter upon the Salisbury and Yeovil line. The average cost of the former per lineal yard was £30, and of the latter £72. In these two estimates the average was calculated from a mean of the cost of those lengths where lining was required, and also where it was not needed. In the latter, the contingency of water was included, as a large quantity was encountered and had to be dealt with accordingly. Let us now take some other instances of tunnelling, and by comparison check the statement put forward in the volume under review. The following instances are in every way fair comparisons, as the circumstances under which they were constructed were precisely similar to those selected by the author. Were they not so, the remark "minimum and maximum" would be equally incorrect. The Kilsby tunnel, situated upon the London and North-Western Railway, cost £130 per lineal yard; the well-known Box tunnel, on the Great Western line, and carried for a portion of its length through an oolitic formation, exceeded £100 per yard run. Perhaps one of the best examples illustrative of the uncertainty of tunnel estimates is afforded by the Bletchingley and Saltwood tunnels, both of which are works upon the South-Eastern Railway. Their cost per lineal yard was respectively £72 and £118. In the face of these facts, an engineer who based his estimates upon the data supplied in the "Civil Engineer's and Contractor's Price-book," might discover, when the work came to be executed, that his calculations were erroneous, and would have to submit to the mortifying reflection that he had involved the company in an expenditure which had not been anticipated or provided for. Evidently £30 and £72 per lineal yard cannot be fairly assumed as the "minimum and maximum of cost for tunnel work."

The title "foreign service," implying that the "price-book" is available for the preparation of estimates of works intended to be constructed abroad, appears rather a misnomer, since the only portion of the text bearing out the appellation is that relating to "East Indian railway prices." How far these prices would be of the least utility in estimating for engineering works in the Cape, the West Indies, Canada, or on the Continent we must leave our readers to determine. We would only remark that it is one thing to adopt a comprehensive title and another to practically illustrate it in the context. The distinguishing feature of Messrs. Atchley's new production is the incorporation of several specifications in the body of the volume, together with Mr. Glen's treatise upon the "Law of Contracts." It is questionable whether the introduction of these addenda, which must be acknowledged to be somewhat germane to the real character of the book, serves any other purpose than to swell its contents and raise its price to an amount far beyond what is usually paid for a work of a similar description. The few pages devoted to "Contractor's Plant and Tools" are of a very valuable character, as it frequently occurs that no reliable information can be obtained respecting these particular items, which are of the greatest importance to anyone requiring their aid in the execution of works. In the preface to this part of the work there appears a little slip. It is stated "we are no advocates for anything that is *cheap* merely because it is *bad*." We should not suppose anyone ever was; the passage should run, "we are no advocates for anything that is *bad* merely because it is *cheap*." A person acting upon the motto "penny wise and pound foolish" will often purchase a bad thing simply because it happens to be cheap, but we confess we never heard of anyone purchasing a cheap thing because it was bad. This is putting the cart before the horse with a vengeance. The Messrs. Atchley, as well-known publishers, ought thoroughly to understand the "art of book making," and we will, therefore, not comment upon the questionable propriety of introducing advertisement pages in the very middle of the volume. The type is bold and clear, and the figuring distinct, two very essential features in all books of reference, since one wishes to find what they require at once without the necessity of reading an adjoining page of the context. It is a pity the same principle of clear and distinct lettering and figuring was not adopted in the half-dozen plates attached to the work. As it is, the letters and figures are scarcely discernible without the aid of a microscope. The "Civil Engineer's and Contractor's Price Book" is a larger and more pretentious volume than any of its predecessors, and, therefore, naturally is published at a higher price. For the engineer and contractor it certainly supplies items and details not to be found in other books of the same kind, but the architect and builder will find their wants better supplied in "Laxton" and "Lockwood's Builder's and Contractor's Price-book for 1868."

THE NEW MIDLAND RAILWAY STATION, ST. PANCRAS.

THE completion of the Midland Railway Company's new line from London to Bedford, although announced some time since, was only yesterday brought into requisition in its entirety. Hitherto the company has had no London passenger station of its own, all its traffic running into and out of the Great Northern Company's station at King's Cross, to the great inconvenience of both companies. The new Midland station opened yesterday is almost immediately contiguous to the King's Cross station, having a frontage to the Euston-road; or, rather, we should say that the new terminus hotel, not yet completed, will front the Euston-road, the station being behind the hotel, as at Cannon-street and Charing Cross. Like those of the latter stations, the roof will be in one span, only a much wider one. This roof is 700ft. long, 100ft. high, and 240ft. in width. Its crown is glazed to the depth of about a third of the space from the ridge to the eaves throughout its entire length, but the dark chocolate colour with which the ironwork is painted greatly subdues what would otherwise be a very brilliant effect. The boarding of the unglazed sections of the roof is coloured French grey. A somewhat novel mode of construction has been adopted. Instead of erecting massive walls for the support of the roof it is made to spring directly from the ground, the spaces between the ribs (which are twenty-five in number) being walled up so as to present the appearance of a wall supporting the principals of the roof. The ribs of the roof are not semi-circular, but on the model of the "drop arch." The feet of these ribs rest on a thick bed of concrete laid on the London clay, and are kept in position by means of iron shoes, each weighing 4½ tons. Massive tie girders beneath the floor of the station impart great rigidity to the roof principals, and further security is afforded by the use of tremendous iron bolts, 24ft. long, and 4in. in diameter, which pass through the piers on which the principals rest and are fastened by huge nuts to anchor plates below. Great strength is by these means secured, and the forest of ties, beams, and supports so common to many of our large roofs are dispensed with. The weight of each main rib is 50 tons. A mammoth travelling scaffold was brought into requisition for the erection of the roof. It was 100ft. high, 240ft. wide, and 30ft. in depth, and some hundreds of tons of timber were used in its construction. It travelled upon several lines of rails, going forward as the roof was completed, and it was fitted up with workshops, forges, cranes, &c. The new station not being on the ground level, as is the King's Cross Station, but on arches, inclined approach roadways have had to be made for vehicles. The hotel is not yet built. Flanking each side of the enormous structure is a row of picturesque shops and other buildings. The platforms have edges of dressed stone, and are floored with red deal planks, dressed, close jointed, and tongued with hoop iron. The planks are laid crossways, and spiked to wall-plates laid upon brick walls built upon the buckle-plates. There are four platforms and a carriage road, and eleven lines of rails, with room for two more. Excepting one along one wall of the station, the platforms are available at both edges. A tesselated frieze, about 2ft. deep, is being inlaid with Minton's coloured tiles. The moulding above the frieze will be surmounted by an iron cresting of floral design, the leaves to curve inwards from the cornice. The face principal at the entrance to the station is a fine piece of ironwork, and presents a commanding appearance, the effect being much enhanced by the cresting round the end of the roof, with pinnacle at the apex. The side walls are finished by a projecting base of Nottingham red brick, returned round the feet of the principals with Staffordshire blue bricks, and capped by a massive moulding of red Mansfield stone. On Saturday and Monday last Colonel Hutchison, of the Railway Department of the Board of Trade, was engaged in inspecting and testing the bridges, the roof, and other portions of the works. The results were highly satisfactory. A great deal yet remains to be done in the station, and only a comparatively small portion of it can yet be made available for the business of the line. Fully two months must elapse before the station proper can be said to be completed. In the construction of the station 9,000 tons of iron, 60,000,000 of bricks, 80,000 cubic feet of dressed stone, and many thousand feet of glass and timber have been used. The general style is a modification of Gothic to the requirements of railway architecture, the architect being Mr. George Gilbert Scott. When completed, the station will be lighted by sixty small sun-burners suspended from the roof and protected by glass, and having a brilliant effect. The lighting arrangements have been entrusted to Messrs. Sim and Barff, of Parliament-street, to whose patent hydro-carbon process is attributable the brilliancy of effect referred to, while a saving of 60 per cent. is said to be effected. Underneath the station and level with the Euston road is what may be called an enormous "hall of columns," which will be devoted to the storage of goods. The floor of the station is supported by these columns, which are 600 in number, placed at intervals of 14ft. 6in., and resting on piers having their foundation on the London clay. Below this "hall of columns" run the Fleet sewer and a branch of the underground railway.

BIRD'S PROCESS OF SEWAGE DISINFECTION.

THE *Lancet* gives an account of another new method of disinfecting sewage which is now in operation at Stroud, Gloucestershire. The works at Stroud were originally constructed for a lime process, differing materially from that which is now employed. The disinfecting agent is a sulphate of alumina and iron, obtained by treating a ferruginous clay with sulphuric acid, and then drying and pulverising the result. The stream of sewage, on arriving at the works, is made to turn an immersed wheel by the force of the current. Above this wheel is a hopper, by which the "sulphated clay" powder is suffered to fall into the sewage at a definite rate, and the wheel mixes it thoroughly with the liquid, which then passes on into a large tank. In this tank a certain degree of separation takes place. The heavier portions of the sewage subside quickly, carried down by the fall of the clay. The lighter portions—hair, feathers, fat, and other substances—float on the surface, and are removed by skimming. The middle stratum of the liquid is, therefore, comparatively clear; and an outlet is provided at about half the depth of the tank by which this middle stratum is suffered to escape at the same rate as that of the admission of sewage. The escaping middle current receives from another hopper a second dose of sulphated clay, and then passes into a second tank. From this it ascends through a charcoal filtering bed to a third tank, and from the third tank through a similar bed to a fourth. From the fourth it

escapes as "outfall water," and is suffered to pass into a neighbouring stream. The tanks in which this process are carried on are arranged in two parallel lines, each line containing a complete series. The inlet is so placed that the entering stream of sewage can be turned into either series at pleasure, and thus, as soon as a sufficient quantity of deposit has accumulated in one set, the sewage is diverted into the other, and the first set is emptied for cleansing. The deposit thus obtained and the skimming of the first tank are spread out upon drying beds and covered with a thin layer of the sulphated clay powder. When sufficiently dry the whole is collected, and forms the basis of a manure that is compounded and sold at £8 per ton. The works at Stroud may be fairly said to be free from offence. Mr. Bazalgette, who lately visited them, says:—"The processes of deodorising and manufacturing the manure cause no nuisance, and may be carried on in the immediate neighbourhood of dwellings." The only period at which any smell is given off is during the short time occupied in cleansing the tanks. The outfall water as it escapes from the last tank to flow into the stream is free from anything unpleasant to the senses. It has a slight yellowish-brown colour, due to suspended oxide of iron, and is free from odour. Analyses made of the sewage and the outfall water show that the sewage before treatment contains 53·25 grains per gallon of dissolved and suspended matter, among which there are 2·48 grains of ammonia and 1·506 of phosphoric acid. The outfall water contains only 0·560 grains of ammonia and 0·063 grains of phosphoric acid. It may be inferred, therefore, that four-fifths of the ammonia have been completely oxidised, and that 24-25ths of the phosphoric acid have been thrown down.

OUR ARCHITECTURE.

UNDER the above title a writer in the September number of "St. Pauls" comments at some length on the general adoption of Gothic by the architects of the present day. His ideas, summed up in a few words, are—that it is absurd to speak of Gothic as "English architecture," architecture being, as he contends, a thing of period and not of nations; that the style of architecture which admirably suited the want of the fifteenth century is altogether unfit for the nineteenth. We reproduce some of his arguments for the especial benefit of our Gothic readers.

"Let us," he says, "for a moment consider the influence which the single material, glass, would naturally have upon building. Anciently, in the beautiful climate of southern Europe,—probably then even more genial than now, because the land was better cultivated, and where glass was as a building material practically unknown,—the light and air required were generally admitted freely from the top; but where openings in the walls were used they were in character like those of our modern houses. But in the north, to keep out the weather by a substantial roof was a first necessity; and for a like reason, and for security from violence, the window openings were made very small. When glass became more easily procurable, light could be admitted without the probable accompaniment of rain and wind, and the size of the openings was increased; but as glass was precious, and in the leaden frames in which it was mounted was liable to damage if the openings were large, the plan was invented of subdividing one large opening into several smaller ones, which, woven and interlaced in the upper part of the openings, became, under the name of tracery, one of the crowning glories of the Pointed styles. The mediæval artists, giving free play to their fancy in the devising of an endless variety of graceful forms, converted, by the means by which it was surmounted, what was really an obstacle into a source of beauty. But with the costliness of glass passed away for ever the necessity for tracery; and now, as ever since, its use is a mockery and a sham. Let any one consider whether in a building in which plenty of light is required—and in what modern building is it not?—he would take away, as by the use of tracery he must, a great portion of the upper and therefore the most light-affording part of his window openings. There can be but one answer; except, perhaps, from a professed Gothicist."

"Must we," he asks, "for ever be mere imitators of the past? must we for ever see Corinthian and Ionic, First-pointed and Second-pointed, Italian and Renaissance, Romanesque and Byzantine? Certainly it seems proved that if we depended upon an eleven of gentlemen in good practice, we should have to do so. But surely we may hope for better things. There are signs in this very city, in even some of the warehouses and like buildings, that a sounder knowledge of the principles of taste is growing up. A palace of justice, or a national gallery, is a higher flight, it is true; but if the intelligence of the kingdom be asked to essay its powers, it may well be expected that far worthier designs will be produced than any of those by the chosen few. All England against 'The Eleven' is all the world to nothing."

He concludes with a humorous sketch of the sorrows of a poor antiquary or archæologist who a few hundred years hence shall discover, "say, far north in Scotland, a church early Norman in style. How his eyes sparkle! Nothing was known of the Normans having penetrated here. He has made a discovery; he will throw a new light upon history. The style is something feeble, it is true; but it is clearly of about 1100 A.D. Then the stone comes from a quarry many miles off, and in a spot which clearly must have been inaccessible to wheels before the present road was made. This proves that the road must have been in existence before 1100. Wonderful race, the Normans! Again he finds in the work some characteristic previously supposed to have been introduced about the time of Victoria I., or Edward VII.; and he thinks, with Alphonse Karr, that, after all, inventions are only things that the world has had time to forget. So he muses and moralises, and goes on peering among the mouldering stones until at last he comes to the foundation, where he finds a glass bottle which, more elated than ever, he pounces upon, and, opening it, learns that the first stone of this church was laid in the year 1868."

FRENCH UPHOLSTERY.

THE raw materials used in the manufacture of fabrics for upholstery are very numerous. The organzines of France and Piedmont, the wefts of China and Japan, are used in the manufacture of the silk fabrics. The price of these materials has much increased during the last few years. It is now at 120fr. to 130fr. for the warp, and 110fr. to 120fr. for the weft. The French silk is the dearest and most esteemed. The manufacture of reps and table cloths is composed of French wool, valued at 10fr. to 15fr. the kilogramme, and floss silk, worth from 40fr. to 60fr., which is chiefly derived from Switzerland. Utrecht velvet is made of goats' hair, spun in England, and sold at from 9fr. to 30fr. the kilogramme, according to its purity. Horse-hair fabrics are woven of materials of French origin; that which comes from Buenos Ayres is much more expensive, costing from 16fr. to 30fr. Woollen damasks are woven with wool coming from the north of France; the weft is worth from 7fr. to 8fr. the kilogramme, the warp from 9fr. to 10fr. For the mixed silk fabrics, they use warp at a price of 50fr. to 60fr. the kilogramme. The Algerian fabrics are composed of cotton warps and woollen wefts, worth from 5fr. to 6fr. the kilogramme. The price of the cotton fabrics, such as calico and cretonne, used for making prints and chintzes, is from 50c. to 1fr. 50c. per metre; these fabrics are woven in Alsace and Rouen. The cloth used in upholstery is manufactured at Mouy; the widest, used for table covers, is worth in its rough state 3fr. the metre; and that used for covering furniture about 8fr. the metre.

The manufacture of fabrics for upholstery is one of those for which France is most justly celebrated; the tapestry of the Imperial manufactories of Gobelins and Beauvais are without a rival. The production of these fabrics is estimated at about 60,000,000. The exportation of carpets and tapestries is now very large. French woollen manufactures bear comparison with those of the best foreign markets; and their silk fabrics are unrivalled.

GUARDIANS OF THE POOR AND ARCHITECTS AGAIN.

AT the last meeting of the Clerkenwell Guardian Board a letter was read from Messrs. Messenger and Gundrey, architects, enclosing a bill for a sum of £184 4s 4d., due to them for preparing plans and specifications for a supplementary workhouse, proposed to be built some time ago at Highgate, for the reception of the aged and infirm poor. Another letter on the same subject was read from Mr. Trollope, surveyor, enclosing a bill for £70 for work done in connection with the proposed building by order of the architects. Mr. Franklin (a guardian) said that the guardians had no power to pay the accounts in question, and he would move that the clerk be instructed to write to Messrs. Messenger and Gundrey and to Mr. Trollope, to explain to them the position in which the guardians stood in reference to their claims. The Clerk said that the act prohibited the board from dealing with the claim, and he had told Mr. Messenger that he had better apply to the Poor Law Board. Mr. Mence (another guardian) said he thought the accounts ought to be forwarded to the Poor Law Board. He considered that, although the guardians had no power to pay it, the claim of Messrs. Messenger and Gundrey was well founded, for when the plans which those gentlemen had prepared were submitted to the guardians various alterations were suggested in them by the Poor Law Inspector, and they were sent back to the architects to be corrected. A revised plan was sent and forwarded to the Poor Law Board for their approval, and the work was just about to be commenced when a letter came down from the Board stating that they had changed their minds. It would be monstrously unjust, after putting the architects to all this trouble and expense, that they should receive no payment. He would, therefore, move that the account be forwarded to the Poor Law Board. Mr. Thompson (a guardian) here intimated his doubts whether Messrs. Messenger and Gundrey had any claim upon the board beyond the amount of the premium, to which they were entitled for having sent in the best plan. He doubted whether they had been instructed to take any further steps in connection with the building, and whether, if they did so, it was not on their own responsibility. Under these circumstances he thought that the best course to adopt would be to refer the matter to the clerk, with instructions to search the minutes and bring up a report as to what instructions really were given to the architects in reference to the plans and specifications which they sent in for the proposed building. This proposition having been seconded, Mr. Mence withdrew his motion, and the matter stood adjourned for a week.

THE WORKING CLASSES AND TRADES' UNIONS.

THE proceedings at the late International Congress of workmen (says *Galignani*), where such strange theories were propounded, give peculiar interest to an article entitled "Les Associations Ouvrières en Angleterre," by Dr. Montucci, which has just appeared in the September number of the "Revue Britannique." We glean from it the following curious calculation, by which the author endeavours to show what the workman gains by contributing to a trades' union:—Taking the most common case, that of wages between 30s. and 40s. a week, suppose the workman to pay into the savings bank the 4s. a week he now pays to the union. There his money will, at the lowest, produce 3 per cent. interest, payable every six months. As the workman gets nothing in that shape from his union it is but fair to admit that in the case under consideration he leaves his interest to accumulate in the savings bank. Now, calculating the produce of his capital at compound interest, with the regular weekly increase of 4s., the workman, at the end of twenty years, will find himself in possession of a sum of £380. Allowing for illness and other mishaps let it be £300. Now, it is clear that with such a capital at command, a shop may be opened, some profitable business or other may be carried on by the wife, while the husband, not older than fifty, perhaps, at the time, earns his wages as usual at his master's establishment, with the certainty of having secured comfortable means of living for his old age. Comparing this hypothetical state of things with the real one, the author of the article shows that the workman who contributes to the union fund at the end of twenty years has nothing; that by belonging to the association he loses not only the £10 a year to which his subscription amounts, but, also, on an average, three months' work per annum, in consequence of strikes and other direct or indirect interference with the regular course of business; so that his means are reduced to £72 per annum, instead of £110, as they would be in the former case.

CARVED OAK CABINET.

THE subject of our lithographic illustration is a rare old cabinet or chest of cupboards in the South Kensington Museum collection. It is of sixteenth century German workmanship, and is probably composed partly of or generally restored from older materials. The iron mounts and diaper door panels of black oak are evidently earlier than the horizontal and vertical bands of gouge-cut carving. Sixteenth century ironwork, too, was more strappy, wavy, and flowing. The cabinet measures 7ft. 2in. in length, 6ft. 8in. in height, and 1ft. 8in. in depth. It is rudely dovetailed and pinned together, and forms two separate chests of two stages of shelves each, the joint being concealed behind the centre horizontal band of carving. Formerly the sides had massive iron handles to each chest; in one or two instances the rings and roses still remain. The bold design of the lock plates and drop handles demands especial attention. Large latches and handles are still in common use in Germany to ordinary doors and fastenings. Portions of the carving have been painted light red, black, and green, most of which colouring has been scraped or worn away. The ironwork has been restored within the last few years, but with most questionable success. The chamfered stops, both above and below the locking plate, are of deal, and of modern addition.

Our forefathers were given to making cupboards of very large dimensions, of which this one may be considered as a moderate specimen. The general effect is very impressive—a rich medley of forms, yet every detail in proper keeping, totally unlike the wretched shams which crop up from Wardour-street and its neighbourhood. We shall illustrate the details of the cabinet to a convenient scale in an early number. O. W. D.

ANDERNACH.—DETAILS FROM SOUTH DOOR OF CHURCH.

ONE of our lithographic illustrations this week represents some details from the south door of Andernach Church, on the Rhine. The engraving is taken from one of the photographs published by the Architectural Photographic Association. Andernach Church is an excellent example, says Mr. Seddon, in his "Rambles in the Rhine Provinces," of the early Transitional style of the commencement of the thirteenth century, though some portions of its eastern end, particularly of the towers which flank the apse, are pure Romanesque, and no doubt formed part of the older church, which is known to have been built about the year 908.

THE METROPOLITAN DISTRICT RAILWAY.

AT the eighth half-yearly meeting of the Metropolitan District Railway, held recently, it was stated by the chairman that, if no unforeseen circumstances intervened, the line would be opened to Westminster by the 1st of January next. This will join the Metropolitan Extension line from Paddington to Gloucester-road, Brompton, which was opened yesterday, so that by the beginning of the new year, if all goes on well, passengers will be able to go from any of the stations on the old Metropolitan line to Chelsea and Westminster. The works of the section of the line between Westminster, Blackfriars, and Cannon-street (which will be carried under the Thames Embankment and a portion of the new street from Blackfriars Bridge to the Mansion House) are in progress, an equal number of men and horses being employed by night as well as by day, the whole twenty-four hours being devoted to the prosecution of the works. This line, while completing an important link in the "inner circle" of metropolitan railway communication, has in its progress opened up the way for great improvements in some of the densely-populated districts through which the line passes, particularly in the neighbourhood of Tothill-street, Westminster. Vast numbers of dilapidated houses have been demolished, and the passage of the railway through the neighbourhood will give a stimulus to the erection of suitable dwellings for the working classes. The Metropolitan District Railway Company will aid in this work not only by running cheap trains, but by disposing of their surplus lands for the purpose. Forty acres of the company's land, situate at West Kensington, are already set apart for this purpose. It is proposed to utilise a portion of this land for workshops, but the greater part will be appropriated to the erection of workmen's dwellings.

When the line is completed to Cannon-street, the works will be undertaken for its extension to Tower-hill, where it will join the Tower-hill Extension of the line from Moorgate-street, and thus will be completed the "inner circle" of metropolitan railway communication.

IMPROVED DWELLINGS FOR THE WORKING CLASSES IN SHOREDITCH AND BETHNAL GREEN.

THE Improved Industrial Dwellings Company, which has already erected so many lofty piles in the metropolis, is greatly extending its accommodation by the erection of new buildings in Shoreditch The site of these buildings is eastward of Tabernacle-square, on a plot bounded by Willow-walk and Leonard-street, in the direction of Curtain-road. It is between two and three acres in extent. There are six blocks of buildings at present erected, side by side, each seven stories in height from the basement, being one story higher than any of the other buildings erected by the company. The plan may be described as a parallelogram, having a frontage of 56ft. by a depth of 14ft., divided into four sections by a party-wall in the centre and a passage in the middle of each wing. The two centre sections are set back about 3ft. from the front line, for the purpose of giving space for a balcony of that width on each of the upper floors. The balconies are reached by a fireproof staircase, which extends from the basement to the roof. The end sections of the buildings, which are designed for the occupation of separate families in flats, comprise three rooms and a washhouse on each flat. The living-room in each tenement is provided with proper cupboards, and with a fire-range having an oven and boiler. Leading out of the living-room is the washhouse or scullery, which contains in every case what may be called the necessaries of the dwelling—water cisterns, sink, a small fireplace, washing copper, dust shoot, and water-closet. The fireplace in the washhouse may be used for cooking, so that it will greatly conduce to the comfort of the living room in summer time. The front room of the three-roomed tenement is a spacious parlour having two windows The fireplace being situated a little on one side of the centre of the room affords space for an additional bed in the corner when necessary. On the narrow side of the fireplace is a sideboard and cupboard. The centre sections comprise tenements, which are also in flats, and consist of only two rooms and a washhouse. They are supplied with exactly the same conveniences as the larger tenements. The arrangement is the same, and each side of the centre party walls, and every floor or flat, is a repetition of the other. Close to the ceiling of each of the rooms is a ventilator which communicates with air shafts running through the centres of the chimney stacks. The air in these stacks will be constantly rarified by the warmth of the flues, and a system of natural ventilation will be thus produced. It is obvious that by opening the windows a current of external air will pass through every room. The windows are made to open outwards, like ordinary French casements, but the two lower panes are fixed, in order to prevent children falling out. The drainage is effected by means of stoneware pipes, which pass down the corners of the washhouses directly to the common sewer. The dust shaft carries the dust to a covered receptacle at the base of the building. The greater number of the rooms, especially the living rooms, have scarcely any external walls, and will therefore be always warm and dry.

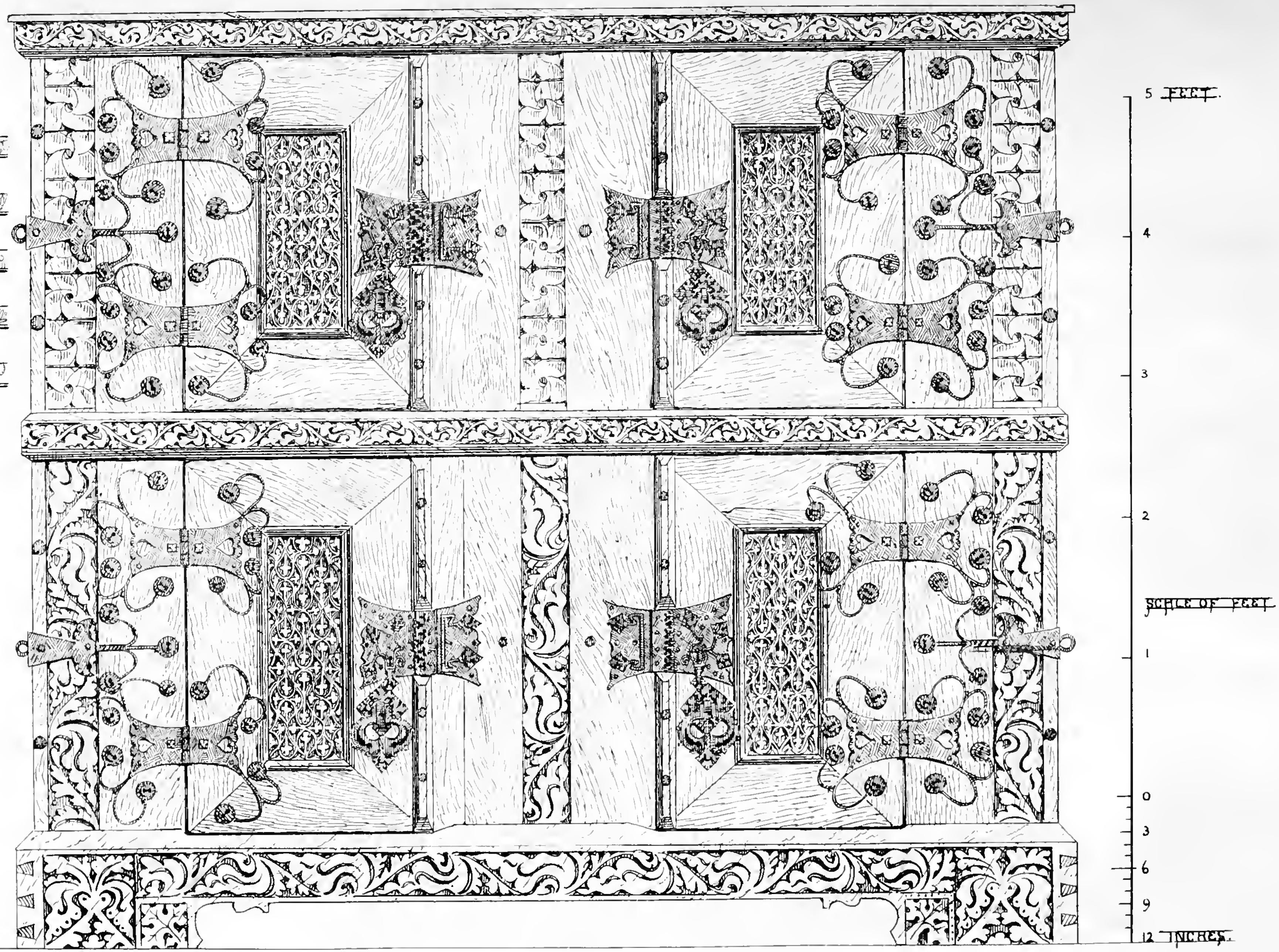
At Bethnal Green, the company has purchased what is known as the Barnet estate, about nine acres in extent, situated near the "Salmon and Ball" tavern. Here, from the lowness of the ground rent as compared with that at Shoreditch, a different class of building may be erected without detriment to the commercial success of the company. The dwellings which the company intends to erect on this site will have the appearance of what are called "breakfast-parlour houses," every occupation having its own front door, and every family occupant a perfect home, completely separate from the residences adjacent. Where required, some of the blocks will be carried four stories high, and will have porticoes to hide the appearance of the doors, which will open into corridors leading to the several flats. There will also be gardens on the ground level behind.

THE POLLUTION OF THE RIVER WEAR.

RECENTLY, Colonel Sir William Denison, K.C.B., R.E., Dr. Frankland, F.R.S., Mr. John Chalmers Morton, the Commissioners for inquiring into the Pollution of Rivers, accompanied by Mr. S. J. Smith, secretary, visited Sunderland to inquire into the pollution of the River Wear. From the evidence given it appeared that large quantities of ballast, rubbish, cinders, and mining refuse were constantly being cast into the Wear. Last year the River Wear Commissioners had dredged 2,000 tons of rubbish, at a cost of £4,500. The foul and poisonous matter from the mines rendered the water of the consistency of pea soup when the river was shallow. Experiments had been made, at a cost of £1,200, to purify the waste water from the mines, but in the opinion of one witness filtering ponds were the only means of attaining this object. With the exception of Waskerley Burn, the Beck of Brancepeth, and the Old Durham Beck, the whole of the streams flowing into the Wear are polluted. The causes are various. In some instances the pumpings from collieries made the water so thick and discoloured that nothing could live in it. In others the cause was the coal washings, for the discharge of which into the river there was no excuse, as the same water could be used over and over again, and need not be turned into the river. At Durham it was the practice to deposit all the building rubbish of the town by the edges of the river, and the ashes from private dwellings were thrown bodily into the water. The sewage of Bishop Auckland found its way into the Wear, from which Durham derived its water supply. Mr. Henderson, a carpet manufacturer, of Durham, said that the paper works poured their waste water into the river, for which there was no excuse, as it could be completely purified before being returned there. At his carpet works they had accepted a mode of dealing with their dye water, which might be followed by thousands of manufacturers. The liquid was run into a cistern in the centre of the dye-house. Thence as much as would pump was conveyed away a distance of 400 yards to a piece of waste ground near the river, where they had constructed a large filtering pond. Here it was filtered and run off in a comparatively pure state into the river, and it was only necessary about once a fortnight to remove the solid matter that had accumulated. The cost of the plan was not more than £200, with the addition of 3s. or 4s. once a fortnight, and he believed that the construction would last for years without alteration or renewal. Another witness said that the conservators of the Wear had jurisdiction only a short way up the river, and while no one was allowed to throw anything into the harbour the inhabitants of Durham and other places did just as they liked, without restriction. When the water was low it became so polluted that fish could not live. Sir W. Denison said that that might be to some extent obviated by having storage reservoirs in the upper portions to trap the floods, and then, by means of sluice gates, the flow of the river could be kept at a mean level. Mr. Alderman Wilson said that he had no doubt but that the corporation of Sunderland would be glad to give their sewage free to any company that would undertake to pump and utilise it. After the examination of one or two more witnesses, the proceedings closed.

An improvement is now being effected in Kensington, involving the demolition of sundry blocks of buildings to facilitate the passage of the traffic through the High-street of the "old Court suburb." On Tuesday, twenty-seven dwelling-houses and premises situated in High-street, Young-street, Market-court, and Gardener's-buildings, forming a portion of the projected alteration, were disposed of by auction, and arrangements made for the immediate clearance of the ground in order to widen the thoroughfare.

CARVED OAK CABINET. GERMAN 16TH CENTY WORK.



Owen W. Davis del. et lith.

Printed by Whiteman & Bass

Andernach.—Details from South Door of Church.

THE MARBLES OF FRANCE AND ALGIERS.

WHEN touching upon this subject in a previous article, we expressed a hope that ultimately a material so admirably adapted for the purposes of construction would be more extensively used than at present. Many are in the habit of regarding marble solely in the light of an ornamental adjunct to architectural erections, and not equally well adapted to examples where strength and utility are the chief considerations. This erroneous conclusion is based upon the assumption that there are no descriptions of marbles, except those which are suitable for the purpose first mentioned, whereas the real truth is that there are certain descriptions which are endowed with properties rendering them more valuable as a constructive than as an ornamental material. Marbles of the former kind are used extensively in France. They are quarried at Boulogne, Château-Landon, and Jura, and are possessed of a remarkable degree of compactness, a very high crushing resistance, and a closeness of grain particularly adapting them to resist the influence of the weather. They are quarried in large quantities, and are sold at a comparatively low rate. We shall give presently some statistics respecting the price of marbles. In contradistinction to these, there are others which are susceptible of a higher polish, and better suited for details of a purely ornamental character. Consequently they are not quarried with the same regularity and uniformity as the former; the demand for them is fluctuating, and their price is higher. The palace of Versailles owes a large portion of its architectural beauty to the employment in its construction of the celebrated classic marble of Campan. Owing to the cost of this marble (about thirty shillings per cubic foot), its employment is virtually precluded in the present day, when economy in every class of building, from the palace to the cottage, is carefully adhered to.

The transport of the raw material, or what is usually termed the "carriage," is in many instances the principal bar to its employment. Railways have been the means of removing, in a great measure, this obstacle, although the impediment is not, and never will be, altogether destroyed. As an example of their efficacy in the present case, it may be mentioned that previously to their introduction in the department of Ande, the red marble with streaks of a vivid carnation tint cost thirty-four shillings per foot cubed. Now the price has fallen to eight shillings the cubic foot: six times the quantity is used that was formerly required, and its employment is no longer restricted to the building of palaces, cathedrals, and monuments. At the late "Exposition" our readers must have observed a considerable number of splendid marble columns, the majority of which were intended to be used in the new Opera-house. These were quarried at Seumont, Saint-Antonin, situated at the embouchure of the Rhine; Saint Béat, Sarrancolin, in the Hautes-Pyrénées; and at Pourcieux, in the department of Var. It appears, from the report of the Inspector of Customs, that during the last twelve years the exportation of French marbles has been tripled in value and quantity, and that this increase has taken place not merely in the case of ornamental marbles, but also of those which are exported in the block, and in what might be appropriately called a crude state. Similarly to ourselves, continental architects and engineers have the great difficulty of a comparatively high-priced material to contend against when advocating the extended use of marble, but there is no doubt that time and more organised means of communication and transport will gradually remove this serious obstacle.

Passing on to the marbles of Algiers, we find that we are not breaking fresh ground, or are the first to discover their beauty and value. Ages ago they were quarried in great abundance by the Romans, who have left there as well as elsewhere unmistakable traces of that activity and enterprise which contrasted so forcibly with the sloth and apathy of the people they subjected to their sway. It is to be hoped that our Gallic friends may find the opening up of the old quarries and the extraction of the material a source of remuneration and profit. We shall briefly describe a few of the more important of these colonial acquisitions. Upon the banks of the Isser, in the province of Oran, there exists a rare and beautiful marble, to which the name of onyx has been given, owing to its close resemblance in points of transparency and streaking to that particular variety of agate. The depth of the beds varies from 20ft. to 40ft., and the superficial area of the quarry at present determined extends over a space of nearly 300 acres. A considerable exportation of this marble takes place, as well as of those quarried at Pescade, Chenouah, and Nédroma, but the quarries situated at Fondouk and Cape Matifoux are too difficult of access to hold out fair promise of remunerative working until some additional means of intercommunication be opened up. At Telfela, in the province of Constantine, there exists a species of white marble, bearing a great resemblance to that of Carrara. It is also associated with others of a turquoise blue, a variegated azure, a black with white veins, a yellow and a red. The marbles of Bône present a white ground with yellow and blue veins, and those of Génois are greyish-white, streaked with black. It is manifest, from the above enumeration, that the Algerian marbles are not the least sources that that colony possesses of mineral wealth. The quarries of Chenouah and Telfela will probably be worked upon an extensive scale, and sooner than the others, owing to the fact that they enjoy a situation near the sea coast, and are consequently well-adapted for the purposes of exportation. Before these natural advantages, however, can be rendered fully available, not only is capital required, but a proper system of supply according to demand must be organised, and the whole matter conducted upon sound business principles.

The three operations necessary to render marble fit for ornamental purposes are, the quarrying, cutting, and polishing, the cost including two distinct items—viz., that of the raw material and that of workmanship. At the quarries in the Pyrenees, the raw material, in slabs about an inch in thickness, is worth 11d. per square foot; the polishing and cutting costs 3½d., and the carriage to Paris 5½d., making the total cost per square foot, delivered in the capital, fit for actual use, 1s. 8d. Were the demand to increase and become tolerably regular, it is estimated that this valuable building material could be delivered in Paris, cut and polished, at the rate of 11d. per square foot, which would make it as cheap as many descriptions of stone now employed in its stead. Stucco is, in fact, slightly dearer than marble at this price, and imitation jasper and artificial marbles range from 1s. to 1s. 8d. per square foot. Where water power is available, the expense of sawing would be considerably reduced, as the motive power for the machinery would be furnished gratis. In England, as well as in France, all that is required to effect an increase in the employment of the various coloured marbles is a manifestation upon the part of architects and the public generally of a predilection for this class of constructive material. So soon as the demand is established, the supply will follow at a much cheaper rate than has hitherto prevailed. Taking the mean of ten different marbles employed at Paris, the price is 19s. 2d. per cube foot, the lowest being at the rate of 8s. 6d., and the highest at 28s. Some of these are evidently of an inferior description, and not suitable for work of a highly ornamental character, but there is no reason why ultimately the former should not be used in those parts of buildings where durability and strength are the chief objects in view.

PARIS SCHOOLS OF DRAWING AND SCULPTURE.

AT the distribution of prizes to the pupils of the Municipal School of Drawing and Sculpture, which is conducted by M. Justin Lequin, a few days since, M. Robert Fleury, the artist, presided, and addressed the students. Having passed a high eulogium on the talent and zeal of the masters, and urged the students to make all possible use of the resources which were placed at their disposal by the Government, he concluded with a wholesome warning not to abandon industry for the beaux arts, properly so called, without mature reflection. "Industrial art," he added, "offers ample scope for glory; it has the sympathy of all the world—the production of a potter of Athens finds passionate admirers. Anyone may be proud to add his name to the long list of famous art workmen. Believe me, industry offers a fine field for those who know how to distinguish themselves in it. Work, for labour is honourable; it renders men better, and therefore more capable of fulfilling all the duties of life. Develop your faculties by study, and raise industry to the level of art. Remember that the grand epochs which make the glory of nations are also those in which art and industry were at their apogee."

WORKMEN'S DWELLINGS IN LAMBETH.

IT would be well, says the *Daily News*, if some copies of the "Artisans' and Labourers' Dwellings Act" found their way into Lambeth. We are told of a row of cowsheds portioned off as dwellings for labourers and woodcutters; of streets which in winter are swamps to the doorsteps of the houses; of rows of houses without water, and of others where the water has been putrid all the summer; and of the utter absence of all convenience for health or decency. But why are these things permitted to exist? Full power of remedying them is in the hands of the local authorities, and if they are reluctant to move, any four householders living in the neighbourhood may take the matter in hand. They may appeal, first to the local authority, and if in three months the local authority fails to act they may carry their appeal to the Home Secretary. Such scandals are therefore no longer the fault of the law, but the fault of the people of the district. They need not cry to the press, for they can help themselves. Mr. Torrens, by his act, has rendered it possible to remove the worst plague spots of our great cities, and we ought not much longer to hear of human beings living in places not fit for pig-styes. He has put another instrument of physical and sanitary improvement into the hands of philanthropy. Nor need there be any reluctance to use it. The act is very sparing of the owners of such property, charging them only 4 per cent. for money spent in improving it, and granting them a charge of 6 per cent. on money they themselves lay out in works ordered by authority. Of course, as the act is only seven weeks old, it has had no time to work as yet; but we are hopeful that before it is seven years old such a state of things as at present prevails in Lambeth will be among the evils of the past.

Last spring the Council of the Royal Scottish Society of Arts convened a conference in Edinburgh, which was largely attended by provosts, local magistrates, and heads of educational establishments. It was felt that there was a great want of proper information on the conditions upon which aid was rendered by the State for promoting scientific instruction. Application was made for the services of Mr. Buckmaster, who had long been engaged in delivering lectures and attending meetings on this subject in various parts of England and Ireland. Public meetings have been held in a large number of towns in Scotland, which Mr. Buckmaster has attended and delivered very able and satisfactory addresses, which have resulted in the appointment of local committees for the purpose of co-operating with the Science and Art Department in promoting scientific instruction.

ARCHÆOLOGY.

William Rufus's tomb at Winchester has been removed from the position it so long occupied between the north and south doors of the chancel, to a spot between the chantry chapels of Cardinal Beaufort and Bishop Waynflete - close to the sarcophagi which contain the remains of Bishop de Lacy and Sir William de Gaveston, one of the knights banneret of Edward III. In removing the royal tomb a stone coffin was discovered lying near Rufus's tomb, but quite concealed beneath the pavement. Upon being opened, the bones of some person, doubtless illustrious, from the position of the tomb, were found wrapped in sheet lead. The remains are conjectured to be those either of Bishop Eloi, interred in front of the high altar in 1171, or of Bishop Henry Woodlock or de Morewell, buried in 1316. They were not exposed long, and, like those of William Rufus, every care was taken in reburying them.

The *Cologne Gazette* says that some peasants belonging to the village of Mintei (the ancient military colony of Nymphæa), near Kertch, the former Panticapæum, in Southern Russia, recently discovered in a tomb a pair of earrings in gold, the drops representing a stag at full speed and bearing on its back the Diana of Tauris. They also found a ring and some buttons of the same metal, as well as a cameo, cylindrical in form, on which Apollo and Hercules are represented disputing the possession of a tripod. The artists who produced these objects obviously lived in the most flourishing period of Greek art. One of the earrings was sold for 75 roubles, and the other for 105; the latter was immediately afterwards disposed of for 700 to a Kertch merchant, who also bought the other for 500.

A letter from Rome announces the discovery, in a cellar in the Vicolo dei Balestrari, of a marble pedestal bearing an inscription to Hercules, by M. Silius Messala, who was Consul with Sabinus under the Emperor Caracalla, A.D. 214. It is to be observed that this dedication has been excavated near Pompey's theatre, where, under the Biscione Palace, the great bronze Hercules now in the Vatican was found in 1864. The inscription (which is in capital letters) is as follows: "Hercvli Defensori M. Silivs Messala Consvl."

The annual meeting of the Cumberland and Westmoreland Antiquarian and Archæological Society was held at Penrith on Wednesday week. The Rev. J. Simpson read a paper which had been contributed by the Rev. J. Maughan, of Bewcastle, on "Supposed Roman Stations at Kirksteads, Burgh-upon-Sands, and Boustead-hill." The conclusions at which Mr. Maughan arrived were that Kirksteads, near Kirkandrews, was the Glannibanta of the Notitia; Burgh-upon-Sands, Alona; and Boustead Hill, Brementuracum. Dr. Taylor next read a long paper on "Vestiges of Ancient British Occupation near Ullswater, and the Buried Stone Circles by Eamont Side." The ancient British implements found here, said Dr. Taylor, illustrate well the ages of polished stone and of bronze. Referring to the earthworks and entrenchments, he remarked that though we had no vestiges here of what were called "hut circles" or "British dwellings," we have many examples of the lines of ramparts, ditches, and hollow ways or streets which surrounded or permeated those settlements. He concluded by describing the sepulchral relics which had been discovered on Barton Fell and elsewhere. Dacre Castle was then visited and described by Dr. Taylor, who assigned its date to the middle of the thirteenth century. A visit to the ancient church near the castle, and to the Celtic remains on the hill of Dunmallet, brought the day's proceedings to a close.

WATER SUPPLY AND SANITARY MATTERS.

At the last meeting of the Bath Town Council a communication was received from Mr. V. F. Hovenden, secretary of the Baths and Laundries Society, calling attention to the case of the baths and laundries which derive their whole water supply from the River Avon. The sewage of Bath being now so effectually discharged into the river that the water has become utterly unfit for use (at least in dry weather) for the purposes of washing clothes or bathing, unless something was done to provide a proper supply of water the committee will have to consider the expediency of closing the institution during the summer months. This, with other communications, was referred to the cold water committee, which has been appointed to consider the subject of the water supply to the city.

The little town of Kilsyth, Stirlingshire, has set a worthy example to places of far greater importance. The authorities have commenced operations for supplying to the inhabitants thirty gallons per head daily of pure water, brought from springs of traditional celebrity in the hills adjacent.

Notwithstanding the late heavy fall of rain, the quantity of water in store at Rivington, near Liverpool, has decreased during the last fortnight by 213,000,000 gallons. On the 22nd ult. the reservoirs did not contain more than 817,000,000 gallons, whilst at the corresponding period of last year they held 1,584,000,000 gallons, or nearly double the present stock. An opinion has gained currency that the prolonged drought had effected the red sandstone supply; but the Chairman of the Water Committee stated, at the fortnightly meeting of that body on Monday, that he did not believe there was any good ground for arriving at such a conclusion.

At a meeting of the Harrogate Improvement Commissioners, held on Monday evening last, it was resolved to adopt the surveyor's plans for sewerage, at an estimated cost of £7,000, and to advertise for tenders.

Two stained glass windows, executed by Mr. F. Barnett, of Leith, have just been placed in the east side of St. James's Episcopal Church, Leith. They are both memorial windows, one representing scenes in connection with the trial of Abraham's faith, and the other depicting the Resurrection and incidents in connection therewith.

Building Intelligence.

CHURCHES AND CHAPELS.

Crowmarsh Gifford parish church, Oxon, was reopened for public worship on Monday week by the Bishop of Oxford, after restoration. The church, which is said to be upwards of 800 years old, is of the Norman style of architecture. The roof has been taken off, and a new one put on, with an open roof to the nave. New lancet windows, to correspond with the ancient character of the building, have been put in, and the large high pews removed, and the church re-seated with benches in stained deal. The work has cost about £600, and has been carried out by Mr. Moses Winter, of Wallingford, under the direction of J. H. Hakewell, Esq.

On Sunday last the parish church of St. Nicholas, Liverpool, was reopened, after restoration, consequent on a fire which occurred in February last. Occasion has been taken to raise the roof of the nave three feet. A new system of warming and ventilation has been introduced, and the old organ, which was destroyed, replaced by a fine instrument by Willis. Messrs. Culshaw and Summers, of Liverpool, were the architects employed.

Christ Church, Patricroft, was consecrated on Saturday, the 19th ult. It is in the Early English style, and comprises nave, 82ft. by 30ft., with north and south aisles, chancel 30ft. by 20ft., with vestry and organ chamber adjoining. The chancel is laid with encaustic tiles. The principal entrances are at the west end. The nave has an arcade of six arches of moulded bricks of varied colours, with pillars of Mansfield stone, with carved caps of Bath stone, which support the lofty clerestory. The roof has open principals, and is of high pitch. The west elevation is pierced with large circular window, and from the gable springs a lofty belfry terminated with gilt cross. The pulpit is of Caen stone, at the north-west angle of nave. All the seats are open, stained, and varnished. The church is faced externally with Yorkshire masonry, relieved with bands of stone of varied colours. Accommodation is provided for 600 persons, of which 318 are free. The works have been executed by Mr. Southern, of Salford, at an outlay of £3,900, under the direction of Mr. J. Lowe, architect, Manchester.

The additions to St. Oswald's Church, Manchester, comprise a tower and spire, which have just been completed. The tower is divided into four stages, with buttresses at each angle with canopied heads. The tower is faced with Yorkshire parpoints with ashlar dressings. The spire is of dressed ashlar, with gurgoyles at springing of broaches, with ornate lucernes, and relieved with bands of stone of different colours, and is terminated with gilt vanes rising to the height of 150ft. The outlay is £1,300. Messrs Ellis and Hincheliffe, of Manchester, were the contractors, and Mr. J. Lowe, Manchester, the architect.

Upon the northern banks of a little Middlesex rivulet, the Brent, about eight miles from St. Paul's, stands a small church, erected by our early English or Saxon forefathers out of the chalk of the Chiltern Hills. It is one of the rudest edifices of the kind in England. Some attempts to beautify it were made about the fifteenth century, as there are several two-light windows having label mouldings of limestone, besides oaken benches and pulpit and an octagonal font, all of that date. It was somewhat ruthlessly handled in Puritan times, but it suffered most in the eighteenth century, when the oaken benches gave place to unsightly square boxes, and a miserable window of wood was substituted for what was without doubt a fine one in the chancel. The building comprises nave and chancel. It is questionable whether a tower formed part of the original edifice. The Georgians also erected an unsightly inner doorway to the porch. This, with the other unsightly appurtenances named, have lately been swept away. New floors have been laid down, and new benches, altar rail, prayer and litany desks, and stalls (of deal, stained and varnished) have been fitted up in keeping with the style of the church. The chancel floor has been raised, and an organ chamber erected. Mr. C. Jones was the architect; Mr. Nye, of Ealing, being the contractor. The church is one mile and a-half from the Ealing Station, Great Western Railway.

Designs for a cathedral for the city of Melbourne are about to be prepared by Leonard Terry, Esq., diocesan architect, Melbourne, and Robert Speechly, A.R.I.B.A., late resident cathedral architect for Canterbury, New Zealand. Instructions were given in July. The probable cost will be about £80,000, exclusive of tower and spire.

The *Westminster Gazette* states that the lady abbess and the community of St. Marie's Abbey, Stanbrook, have taken the first steps towards the revival of the true type of an abbey and its precincts. The entire scheme has been well matured, and the plans for the building have been carefully worked out before commencing operations. Unlike most modern convents, the whole group of buildings will be quadrangular. Around the four sides of the great cloisters will be arranged the church, chapter-house, refectory, and other buildings of the abbey. The church is to be built immediately. The designs are from the pencil of Mr. E. Welby Pugin.

A new church was consecrated at Exeter on Wednesday, in St. David's parish, dedicated to St. Michael and all Angels. It is built of blue Westleigh stone, with exterior dressings of Hamhill stone, and interior dressings of Bath stone. The stained windows are very fine. Mr. Hawkins, of London, is the architect.

BUILDINGS.

The new Wesleyan college at Headingley, near Leeds, was opened on Friday last. The style is Early Gothic of the twelfth century. The walls of the building are of Potter Newtown stone, with dressings from the Meanwood quarries. A tower rises to the height of 70ft. Messrs. Wilcox and Wilson, of London and Bath, are the architects, and Mr. Whiteley, of Leeds, the contractor.

On Monday, the 28th ult., Messrs. Tarvis's bank at King's Lynn was reopened, after having undergone great extension and improvement; the whole carried out from the designs and under the superintendence of Mr. W. Newham, architect, of the same place.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received —A. W.—C. B. A.—T. I. S.—W. C. T.—H. H. —W. W.—Rev. E. W.—C. S.—C. L.—C. G. D.—J. W.—A Subscriber.—I. L.—H. L.—H. E. R.—R. P.—J. F.—B. and Son —D. and W.—S. S.—S. F.—R. S., Melbourne, Victoria.—W. H. B.—H. H. S.—A. Shaw.—B. and H.—S. S.—I. R. P.

Inquirendo.—At the Museum of Building Appliances, Maldon street, Regent-street, London.

L. L.—Dalbeattie Granite.—It is too widely known to bear insertion in "Intercommunication."

Correspondence.

BUILDING SOCIETIES.

To the Editor of the Building News.

Sir,—"A Director," in your last issue, in his comparison of the expenses payable in private and building society mortgages, has omitted to state *all* the expenses charged by the latter. I am not sufficiently experienced to say whether uniformity prevails in this matter. The prospectus of a building society of good standing now before me provides that, in addition to the legal and survey fees (which no doubt are very moderate), there is chargeable an *entrance* fee on each of the number of shares representing the amount of the loan, and a "*small* commission" (?) "of 5s. per cent. per annum of the duration of the loan." These being paid by the borrower or deducted from the loan at its commencement would be increased by compound interest during the term of the loan. This, it appears to me, would completely turn the tables and result in favour of private mortgages. I also believe that some societies pay less in professional fees than they charge, and thus unwar-

rantably make profit by the deception. I am an advocate for building societies in principle, but disapprove of many of the constructive details and hope this discussion may result in purging them of some of their evils.—I am, &c,

Fair and Square.

Sir,—In common with many others of your readers, I have been much interested in the correspondence about building societies which has recently appeared in your columns; and although I cannot agree with Mr. Ingress Bell in his conclusions, I thank him for opening the subject, as it will cause intending borrowers to examine the scale of payments adopted by different societies before they become members, and they will then find that building societies form two classes—the one favourable to investors, the other favourable to borrowers.

I have before me an example of each. To the first, I should, if borrowing £300, yearly repay £43 10s. for ten years, making a total payment of £435, of which £135 would be for interest on the £300 borrowed. To the second, I should, for the same amount borrowed, repay £36 per annum, for ten and a half years, or £378 in the whole term, £78 only being charged for interest, which is a difference of nearly 75 per cent. Taking the latter scale, and applying it to the illustration given by Mr. Bell in the Building News, of the 11th inst., the case will stand as follows:—

Original cost of house letting for £36 per annum	£400	0	0
First case.			
Annual payments for ten and a half years on loans of £300 and interest	£36	0	0
Contingent expenses	£10	0	0
Total yearly payments	£46	0	0
Yearly rent of house	£36	0	0
Annual excess of payments over receipts	£10	0	0
Second case.			
£10 per annum invested for ten and a half years with compound interest (say)	£138	0	0
£100 capital invested for ten and a half years with compound interest (say)	£167	0	0
	£305	0	0

So that in the first case I shall have a house of the value of £400, for which I shall have only made cash payments of £205; and in the second case I shall have in hand £305, supposing I have in the meantime been able to invest £10 yearly, with interest and compound interest at 5 per cent.—I am, &c, B. B.

Windsor, September 29.

Sir,—Notwithstanding all the assertions of your correspondent, Mr. Ingress Bell, it has, I think, been clearly shown, by the recent communications in your journal, that a leasehold house yielding the average or at least a satisfactory return of profit, can be obtained through the assistance of a building society by a tenant not possessing the required capital, without sustaining any pecuniary loss by the transaction.

I am, therefore, very unwilling to occupy the valuable space in your columns with any further remarks on the subject, but Mr. Bell's letter of last week contains a statement which I hope will not be permitted to remain uncontradicted. He says, "We appear now to have arrived, by common consent, at the conclusion that in order to borrow profitably at the interest charged by building societies, you must obtain house property at eight years' purchase."

This conclusion has certainly not been arrived at by "common consent," and I cannot agree with him that the property must return over 12 per cent.

I know not from what document Mr. Bell obtained the extract he has given on "the operations of the benefit building societies," but it should not be looked upon as correctly representing the working of such institutions, and it is quite unfair to mystify the question by introducing such matter—more especially the inquiry "Do landlords reap a nett profit in excess of the interest charged by building societies? If not, where is the difference which is to accumulate and replace the principal?"

When the tenant buys a house he becomes entitled to the clear annual income receivable by the landlord from it, and the difference, therefore, between this income and the amount paid to a society will be the principal or outlay during the time occupied in redeeming the mortgage, after which the whole of the landlord's profit will be free to replace the principal and accumulate a surplus fund. In other words, whatever outlay may be incurred during the period of repayment of the purchase money over and above the rent that would have been paid to the landlord will be fully reimbursed by the profit or rent saved after the loan is cleared off, if a moderate amount of discretion has been exercised in making the purchase.

Mr. Bell quotes from a communication of Mr. Bailey Denton, C.E., who states that "the building of houses in towns, if conducted with ordinary prudence, is remunerative; but it is only considered satisfactory when it yields at least 7 per cent. return on the outlay, whereby the principal money may be repaid during the period of duration, with 5 per cent. interest on the outlay after payment of repairs and insurance." But Mr. Denton is referring to freehold houses, and that class of property it is well known can seldom be bought so profitably through the agency of these societies as leaseholds.

It would undoubtedly be most absurd for anyone to contend that all house property can be advantageously obtained by borrowing from a building society. There are numbers of houses returning so low a rate of interest that few persons would think of investing their money in them at all if they could get 4 or 5 per cent elsewhere without risk or trouble.

I freely endorse the remark of one of your correspondents, "that no general rule can be laid down as to whether it is judicious on the part of anyone to purchase through the assistance furnished by a building society or not. Each case must be determined according to its peculiar circumstances." It should in reality be settled by calculation, and upon the result of such calculation three elements have an all-important bearing:—

1. The term for repayment of the purchase money.
2. The difference between the landlord's annual profit and the amount paid to the society.
3. The rate of interest at which this sum is invested, if saved for buying the house without the society's aid.—I am, &c, S. S.

London, September 30.

LABOURERS' COTTAGES.

Sir,—I have read with interest the letters which have appeared lately in your valuable journal on the above subject, and also your abstract of Mr. Bailey Denton's letter to the *Daily News*. There is no doubt that the problem how to build labourers' cottages so as to yield a fair interest on capital when let at a rent that a labourer can pay is one all important to solve, and it appears to me that the closing remarks in your abstract, viz, "to reduce the cost it must be by the use of materials different to those that have hitherto been adopted," point to the real solution. Why is it that cheaper materials are not used? It cannot be for the want of them. I should be inclined to believe that it is simply from an inordinate love of routine, an inexplicable red-tapeism, that forms so large an ingredient in the British constitution. Let us take Mr. Bailey Denton's model figures; let us construct cottages with the same cubic contents, but with the cheapest known material and the most inexpensive labour combined with substantiality, and see for what amount such dwellings can be erected. Suppose we take concrete for the walls, floors, and even the roofs, what material can be used more fitted for the purpose? Totally impervious to damp, a sure preventive of vermin, much stronger than brickwork, and, under the most unfavourable circumstances, not more than half the cost. There are few estates that do not contain the necessary ingredients, clay, gravel, or flints, and presuming either of these can be obtained (say) at 2s. 6d. per yard, what would be the result? Why, that cottages containing 4,400ft. cube, with every moral and sanitary law complied with, would not cost more if built in pairs than £85 each. These are not figures merely; they are facts, and will bear testing. With such a material, as applicable for a mansion as a cottage, for the simplest style of architecture or the most ornamental, why should it be so overlooked? And why should brickwork be so persisted in when a cheaper material is a necessity? It is not only in the walls that the saving is effected; one coat of plaster only is needed, door and window frames can be dispensed with, and there are innumerable other expedients in the detail that can be resorted to which not only lessen the cost but increase the durability of the structure. I am satisfied that, until material becomes a more general study with architects, true economy of construction will continue to be a name only and never become a reality.

There is one more point in Mr. Bailey Denton's letter I would briefly touch on. Is it not a disgrace to our profession that an architect's estimate of cost will rarely, if ever, stand the test of contract? I am ashamed to own that the greater part of the prizes offered for public competition are obtained through this dishonest practice of underestimating. As it is evident that nine-tenths of the committees who award the prizes wink at the discrepancy, cannot the profession take the matter up and use its influence to stamp out such a blot on its character? It would be a salutary law that made an architect pecuniarily liable for the accuracy of his estimates; it would protect our employers from what in some cases is little short of fraud, and in others ignorant blunders, and would raise the standard of our profession above those pettifogging practices into which some of its members are subsiding—I am, &c., W. F. Hooper.

3, Park Prospect, Queen-street, Westminster, September 28.

THE ORGANS AT ST. PAUL'S AND WESTMINSTER.

Sir,—The suggestion of your correspondent, "Western Organ," is an admirable one, but could it be carried out successfully in an architectural point of view? It is true that the vista obtainable by a removal of the screen would be superb, yet, although the sill of the western window is at a great height from the floor, it is very questionable whether even an 8ft. pipe on top of the screen would not hide a portion of the window, to say nothing of the 16ft. pipes. I know, indeed, that the longer pipes might be placed away at the sides of the instrument as at York and Exeter, but if the organ front underwent this flattening process, would not the effect be most miserable and disappointing? Again, if I remember rightly, St. Eustache has no western window, and the whole volume of sound is reflected into the church from the wall, and St. Sulpice and Notre Dame have but comparatively small window openings—the latter a rosace at a great altitude; but with the large expanse of glass at Westminster, I fear that the sound would be in a great degree lost, and the shaking of the glass caused by the reverberation of the deeper notes would be most unpleasant.

If a large organ could be placed at the western end of our cathedrals (or in the transept, as at St. Paul's, Rheims, or Laon), with a small one near the choir, there need not be the smallest difficulty in playing both from the same manuals; a simple composition pedal would bring either or both under control at the will of the performer.

Your correspondent, "Viator," is uncertain as to the meaning of the concluding portion of my former letter referring to St. Paul's, and with your permission, Sir, I will enlighten him. First, however, let me express entire concurrence in what he says with regard to the removal of the organ to its present position in the choir, where, through being enclosed by deep piers (not light pillars as at Westminster), and through its near proximity to the roof, the sound comes crashing down so as to be anything but comfortable. Indeed, at St Paul's, the alarming state of things spoken of by your facetious contemporary *Punch* is often realised. We have "the organist drowning the choir, and a canon in the pulpit." The presence of the dome was exceptional, and even at the expense of a little architectural effect the organ should have been left in its old position, especially as its prominence served in the distance to bring out the vast proportions of the building.

What I *did* refer to in my previous letter was the utter want of order, of system, and even of decency, so palpably apparent in our metropolitan cathedral, the gilding of some of the dome arches and the leaving of others undone, the putting up part of an organ, which has been from year to year a memento of the lack of energy on the part of those who should have been able to raise *any* amount of money. Why, Sir, I can

point out a district church in the east of London, the congregation of which has raised enough, since the works at St. Paul's were begun, to complete organ, screen, and gilding as well, to say nothing of the few coppers necessary for removing the smuts from Nelson's face, or blowing the dust out of the eyes of Cornwallis. One of the latest tombs is of *black* marble, but the difference will not be noticeable in a short time.

Then, too, what is all that ghastly array of black tressels for, barricading every nook right away to the western doors? Surely a simple cord stretched along just before and during service time would be sufficient, without disfiguring one of the noblest conceptions of man as at present.

I write in no unfriendly spirit, but would be one of the first to rejoice at an altered state of things.

It would, perhaps, be looking too far into futurity to imagine the time when the churchyard railings will be removed and the soot washed from the walls, let alone the gilding of the dome externally protected by waterglass or other such solution.—I am, &c, W. C. J.

ST. SWITHIN'S CHURCH, LINCOLN.

Sir,—The following tenders for the new church were received and opened by the committee on Saturday last, the 26th instant:—Patterson, Ruskington, £9,721; Wallis, Rasen, £9,600; Slingsby, Lincoln, £8,600; Lovelee, Branston, £8,559. The committee were surprised to find the lowest tender to be £1,059 beyond the sum proposed to be expended and the estimate accompanying Mr. James Fowler's (the architect) design, and it was through the architect's assurance that his design could be executed for the money, £7,500, that it was selected. In consequence of this discrepancy between the lowest tender and the architect's estimate, the following letter has been sent to the committee signed by three of the competitors.—I am, &c., Fairplay.

(Copy of Letter.)

Gentlemen.—In accordance with the litho raphed instructions issued by you to architects desirous of furnishing designs for a a new church to be built in St. Swithin's parish, we submitted drawings which we believe could have been carried out in their entirety, *including the seats*, for the stipulated sum.

It has been intimated to us that the design selected by the committee cannot be carried into effect except at a considerably increased cost. It also appeared by the instructions that if such a result occurred "it shall be competent for the committee to return such plans to the architect who submitted them, and to select such other plans as may be capable of being carried out for the sums herein specified."

In justice to ourselves and other competitors, we respectfully call upon the committee to carry out this condition, or to permit us to furnish other designs to include the extra sum required to carry the selected design into effect.—We remain, gentlemen, your obedient servants,

Goddard and Son.
Drury and Mortimer.
Bellamy and Hardy.

Lincoln, September 29.

THE CANAL BRIDGE, GLOUCESTER GATE.

Sir,—A resident in the immediate vicinity of the canal bridge for the last twelve years, I can fully corroborate the statement of "A. C. G." respecting it. I can testify to its utter unsightliness, the inconvenience and danger resulting from its narrowness, and the want of security in its rotten rust-eaten railings. Its present state is a disgrace both to the parish and the Government, and demands immediate attention.

To meet the requirements of the case a slice should be taken off the corner of the park, and the bridge enlarged to thrice its present size. It should, too, be sightly as well as convenient, as becomes the principal thoroughfare of so large and wealthy a district. But I earnestly hope, if the Government does move in the matter, the job will not be entrusted to the tyro who is guilty of the lately erected and neighbouring bridges in the park. These deserve a word of description. The podium of stone is out of all proportion to the size of the bridge, and is capped with a clumsy cornice of classical mouldings combined with Gothic foliage. This mongrel cornice, either from its bulk or cost, is not carried along the inside of the wall, the side on which ornament is most wanted, but is seen in section flush with the blank wall. Some squat vases and leggy lamp-posts of cast iron complete the queer *melan c*. The westernmost bridge of the two, instead of having its roadway on a level with the adjacent roads, is sunk between the banks, and the pedestrian has to descend on one side and then ascend on the other. The new bridge now required will, I hope, be placed in competent hands.—I am, &c., M.

A CORRECTION.

Sir,—I should feel obliged by your correcting a mistake which you have made in your criticisms upon No. 34, Eastcheap, City, E.C. The building, &c., was erected for *Messrs. Hill, Evans, and Co., of Worcester, and Martin's-lane, Cannon-street, City, E.C.*, and not for Messrs. Hills and Underwood, as stated in this week's News, and the style is more French than English Gothic, of the nineteenth century.—I am, &c.,

J. Pethybridge,
for R. L. Roumieu,
Architect to 34, Eastcheap.

10, Lancaster-place, Strand, W.C., September 26.

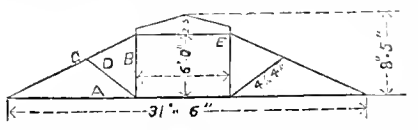
Intercommunication.

QUESTIONS.

[1041.]—ANTS IN HOUSES.—Can you, or any of your readers, inform me, through your columns, the best way of freeing a house from a very small ant with which it is infested?—Edward Monson.

[1042.]—RESILVERING.—I have a German silver watch chain, and the coat of silver has come off, leaving it a yellowish colour: could you, or any of your subscribers, inform me how I could resilver it?—W. L.

[1043.]—TIMBER ROOF.—Will some of your correspondents show me how to work out the strains in a roof of this description, and give me the sizes to make the different parts; also distance apart of principals? A tie-beam; B queen-posts; E straining-piece; G rafter.—Birmingham.



P.S.—What is the tenacity and crushing force per square inch of section for timber used in these kinds of roofs?

[1044.]—MEASUREMENTS OF HEIGHTS.—I am learning to use the aneroid barometer. Could any of your correspondents give me a simple formula for calculating the height by means of the difference of pressure shown by the instrument?—Reader.

[1045.]—PRIME NUMBERS.—Would you allow me to ask, through the columns of your "Intercommunication," what are prime numbers, and what is meant by saying numbers are prime to one another? I cannot find the definition in the books at my command.—Arithmetic.

[1046.]—PAVING AND ROAD MAKING.—I should be much obliged to any of your readers who would tell me what is the proper course to pursue under the following circumstances:—I have lived in my present house for a year and a half, and the road has never been made up properly, or the footpaths paved, although the street is built over continuously with houses. Is it the landlord of the house that is bound to see to this, or the vestry? Now that the winter is approaching the street will be nearly impassable, if not put in a proper state.—Householder.

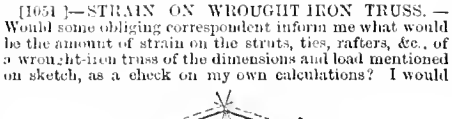
[1047.]—COLOURING BRICKS.—What do the bricklayers wash bricks with before they point them, and give them that peculiar yellow mottled appearance observable in new houses?—S. N.

[1048.]—THE BUILDER'S PRACTICAL DIRECTOR.—I shall be glad if some correspondent will inform me where I can obtain the above work. It was published and issued a year or two ago in parts.—Sandyarms.

[1049.]—GWILT'S ENCYCLOPÆDIA OF ARCHITECTURE.—A student would be glad to hear from anyone having a revised edition of "Gwilt's Encyclopædia" to dispose of.—Address, A. B., 27, Old Jewry.

[1050.]—WATER-CLOSETS.—Would anyone explain the action of the gear for flushing water closets by means of a chain or cord attached to the door, used at some railway stations, and whether likely to get out of order? The name of the makers would greatly oblige. Has anything simpler been invented? The name of the makers of the white ware seats and risers would oblige.—A S Inquirer.

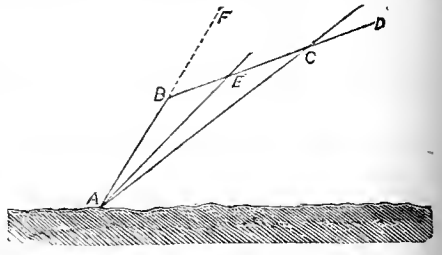
[1051.]—STRAIN ON WROUGHT IRON TRUSS.—Would some obliging correspondent inform me what would be the amount of strain on the struts, ties, rafters, &c., of a wrought-iron truss of the dimensions and load mentioned on sketch, as a check on my own calculations? I would like to have the strains on the struts marked s s, &c.; the ties, t t, &c.; the side and middle portion of main tie-rod; and the greatest crushing weight on each rafter.—Constant Subscriber.



15½ tons distributed over each Truss, including its own weight.
s s, &c., are Struts. t t, &c., are Ties.

REPLIES.

[1008.]—RETAINING WALLS.—I think the following investigation will meet the question of your correspondent "X + Y." Let A B in the cut be the face of the wall; B D that of the surcharged embankment sloping in any direction upwards; A C the natural slope of the ground or angle of repose; and A E a line bisecting the angle B A C. Put angle B A C = θ; angle F B D = θ^1; angle B A E = ϕ; angle B C A = $\phi^1 = (\theta^1 - \theta)$. Let R =



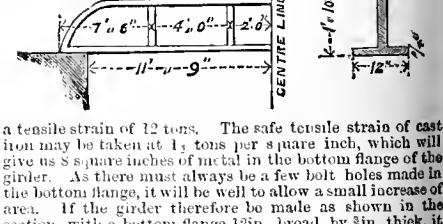
the greatest resistance or pressure against the wall; H its height; and W the weight of a cubic foot of the bank of earth. Then, as a general equation applicable to all cases, we have $R = \frac{W \times H^2}{2} \times \frac{\text{tang.}\,\theta^1 \times \text{tang.}^2\,(\theta - \phi)}{\text{tang.}\,\theta^1 - \text{tang.}\,\theta}$. The value of the quantity tang $(\theta - \phi)$ may be found from the equation tang. $(\theta - \phi) = (\text{tang.}^2\,\phi^1 + \text{tang.}\,\theta \times \text{tang.}\,\phi^1) \frac{1}{2} - \text{tang.}\,\phi^1$. When there is no surcharge the angle and the face of the wall is vertical, the angle A B C = 90 deg., and then $R = \frac{W \times H^2}{2} \times \text{tang.}\,\frac{2\theta}{2}$.—Q. E. F.

[1010.]—WALL FINISH FOR SMOKING ROOM.—The best plan for "A Country Builder" to follow is to give up the idea of papering the room altogether, and to paint the walls a light chocolate brown or maroon colour; they can then, if necessary, be washed, and all traces of smoke removed.—S. C.

[1016.]—SKEW FACING TO ARCHES.—If the arch is built on the square line in brick it is impossible to make the courses range with a skew face. The best plan to adopt is to take the brick arch out again, and start from the proper lines.—M. J., Cardiff.

[1017.]—CONTENTS OF CISTERN.—Multiply length, width, and depth together to ascertain cubical contents; this again multiplied by 6¼ (the number of gallons in a cubic foot) will give contents.—F.

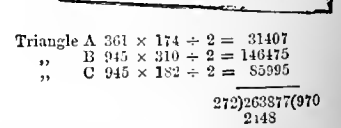
[1019.]—IRON GIRDER.—"Assistant" should put up a cast iron girder, which will be the cheapest kind of thing he can adopt. To find the proportions he may proceed as follows:—Let W = total wall uniformly distributed, which is equal to 23ft. 6in. × 6 cwt. = practically 7 tons. The depth being 1.8ft., the strain at the centre will be given by the equation $S = \frac{W \times L}{8 \times D} = \frac{7 \times 23.5}{8 \times 1.8} = 11.4$, or, in round numbers, 12 tons. We must, therefore, provide sufficient metal in the lower flange of the girder (see figure) to resist



a tensile strain of 12 tons. The safe tensile strain of cast iron may be taken at 1½ tons per square inch, which will give us 8 square inches of metal in the bottom flange of the girder. As there must always be a few bolt holes made in the bottom flange, it will be well to allow a small increase of area. If the girder therefore be made as shown in the section, with a bottom flange 12in. broad by ¾in. thick, it will answer its purpose effectually. The elevation may be as represented in fig. 1. It will make the girder a little stronger at the ends than absolutely necessary, but it is always well to be on the safe side. The top flange may be 4in. by ¾in., and the web or centre part ¾in. in thickness.—C. P. P.

[1021.]—LINING RESERVOIRS.—I would advise "Nemo" not to think of lining his reservoir himself, as he is sure to make a bad job of it, especially when the case is one requiring particular care. He had better get the Pyrimont Asphalte Company to do it, who have special apparatus and appliances for doing that sort of work properly.—Z. Z.

[1022.]—AREA OF A FIELD.—Although not "J. M'Namara's," perhaps "Young Surveyor" will deign to accept the following method of obtaining the total contents:—



Triangle A 361 × 174 ÷ 2 = 31407
" B 945 × 310 ÷ 2 = 146475
" C 945 × 182 ÷ 2 = 85995

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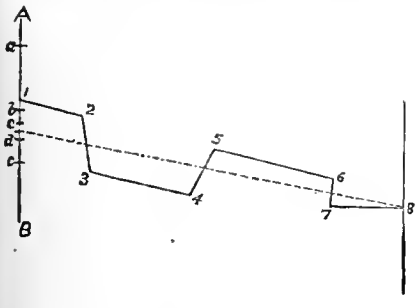
F.

[1022.]—I am exceedingly obliged to "J. M'Namara" for his solution, and for the trouble and patience he has shown me. In answer to the remarks of "Another Young Surveyor," I would observe that the only object of field notes is to plot the survey made, and that I have plotted to scale the dimensions I gave in the BUILDING NEWS of the 18th inst., and found them accurate, since the survey closed. I should not have ventured to trouble "J. M'Namara" a second time unless I was sure that the measurements were correct. I did not plot the lengths in the first instance, and therefore was not aware that they were wrong.—YOUNG SURVEYOR.

[1023.]—BATHS ON THE SEINE.—As far as I can remember, the bottoms of the baths at Paris are fixed to piles driven into the bed of the river. The bottoms are composed of narrow strips of wood, about 2in. wide, fixed about 1in. apart, thus allowing a continual change of water. The bottoms also slope longitudinally, to provide against any difference in the level of the water, which, I believe, is not much affected by the tide at Paris. On the Loire, at Orleans, the baths are floating, and the bottom is there formed by the natural bed of the river. I may be mistaken as to the manner of fixing the baths on the Seine, since the floating plan is certainly preferable to the other, though it may be more expensive to keep in repair.—R. L. B.

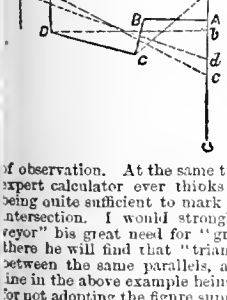
[1023.]—I have frequently bathed in the baths on the Seine, but do not remember having touched the bottom; but there is a similar bath moored in the Lagoon, opposite Venice, of which I noted the construction. It is formed of a number of barges joined together by planks, in the form of a parallelogram. These are anchored, and rise and fall with the tide. Sometimes there is a rapid current through the bath, and to guard against this, and to prevent the bathers being washed under the barges, a grating is fastened to the inner side. The bottom was the natural bed of the Lagoon, said by the man in charge to be 30ft. deep?—A. BEAVER.

[1024.]—TO EQUALISE AN IRREGULAR LINE.—Let "Surveyor" try the following method, which he will find based upon mathematical principles:—Lay the parallel ruler from 1 to 3, move it parallel to 2, and mark the line A B at a. Lay the ruler from a to 4, move it parallel to 3, mark the line at b. Lay the ruler from b to 5, move



it parallel to 4, and mark the line at c. Lay the ruler from c to 6, move it parallel to 5, and mark the line at d. Then lay the ruler from d to 7, move it parallel to 6, and mark the line at e. Lastly lay the ruler from e to 8, move it parallel to 7, and mark the line at f. The dotted line f 8, will be the line required.—T. L. P. HIX

[1024.]—The simplicity of the method shown in figure, which is mathematically correct, of equalising irregular lines is so apparent, that beyond the first operation much explanation is quite unnecessary, all others being similar to the first. In the first place, we must assume any line (in this example G H), and be provided with an accurate pair of parallel rulers. In commencing operations, the parallels must be laid upon the first and third points (in our present example A and C); next, they must be run carefully up or down, as the case may be, until they touch exactly upon the second point (in this case B); while upon this point accurately mark the intersection with the assumed line a; and from the point of intersection draw a line to the third point c; and this line a c will equalise the crooked portion A B C, and allow us to discard the two lines A B and B C. We now take a for the first point, C for the second, and D for the third point, and proceed as before. 'A Surveyor" may find the dotted lines at first slightly confusing; but I have drawn them in so that he may have all the benefit of observation. At the same time, I may remark that no expert calculator ever thinks of dotting in his lines, it being quite sufficient to mark and number the points of intersection. I would strongly impress upon "A Surveyor" his great need for "grinding up" his Euclid, as there he will find that "triangles on the same base, and between the same parallels, are equal." The equalising line in the above example being the line F d. My reason for not adopting the figure supplied by "A Surveyor" was its being too confined for the end in view.—HENRY COCHRANE, C.E.



[1029.]—INCLINE SWARDS.—The slope should not be formed at a greater angle than 45 deg., which, I believe, is the usual angle for railway slopes. I should think 30 deg. would answer the purpose, though a less angle would probably be better if it could be obtained.—R. L. B.

[1029.]—In reply to "Peter Groome," I find terrace slopes formed at two horizontal to one vertical to burn up, in ordinary summers, quite brown, and therefore very objectionable. I would recommend a slope of not less than three horizontal to one vertical; but of course it somewhat depends upon the nature of the soil, position of slope, &c.—T. C. T.

[1032.]—HANDRAILING, STAIRCASING, &c.—The simplest and best work on the above I have yet seen is the "Joiner's Instructor on Staircasing and Handrailing," revised, corrected, and enlarged, by Joseph Galpin, architect; can be had at C. Chalcot's, 9a, Skinner-street, Snow Hill, London; the price is 28s. or 30s. It contains the square and bevel cut, and all information that an amateur would require. I have one, equal to new, I would dispose of for 20s.—F.

[1036.]—IMITATION TORTOISESHELL.—To imitate the marks of the tortoiseshell on horn metallic solutions must be used. To spot it red, use a solution of gold in aqua regia; black, a solution of silver in nitric acid; and brown, a hot solution of mercury in nitric. These solutions must be applied to the right side of the horn. Brown spots can also be produced by a paste made of red lead with a solution of potash applied in patches and subjected some time to the action of heat.—CUMBERLAND.

[1037.]—ETCHING ON IVORY.—Callott's etching ground is a very good one; so is the following, which I use myself:—1oz. of pure white wax, 1oz. of transparent tears of mastic, and 1oz. of asphalte. Reduce the mastic and asphalte separately to powder, and having dissolved the wax stir in and dissolve first the mastic, and then the asphalte. Pour into lukewarm water, and knead it as it cools into balls about 1in. in diameter, which keep closely wrapped. The design can be produced in purple or black by using an acid solution of silver or gold for etching instead of the usual sulphuric acid.—K. F.

BUILDING AND LAND SOCIETIES.

A MEETING of shareholders and others interested in the National Temperance Land and Building Company was held at the City Terminus Hotel, Cannon-street, on Tuesday week, for the purpose of allotting shares which the directors had kept in reserve. Mr. Henry Robinson, chairman of the company, presided, and in his opening remarks invited those present to assist in its further progress by taking up shares. The company had progressed slowly, steadily, and safely. The business it transacted was perfectly sound and profitable. In the first six months of its existence it had lent £300, and at the present time it had advanced £23,000 upon the most undoubted security, and had applications for £7,000 more. The shares already allotted were 3,600, and they had now 4,400 more to allot. The shares, upon which interest of 10 per cent. had been paid, would no doubt have been taken up if the board had not ceased to issue them six months ago. After addresses from other gentlemen the meeting terminated with a vote of thanks to the chairman.

An extraordinary general meeting of shareholders in the Suburban Village and General Dwellings Company (Limited) was held at the Whittington Club on Saturday afternoon last. A new board of directors, four in number, has been formed, with Mr. W. G. Habershon, the well-known architect, as chairman. The secretary, having read the new prospectus of the company, Mr. Habershon said that he hoped better days were dawning for the company. When he had been informed that the interests of a large number of working men were at stake for want of some one to take up their cause he at once came forward. When he heard that £2,000 had been thrown into the sea by the former directors he thought that the best course to pursue was to start the company anew. He went to the Ecclesiastical Commissioners, and offered to stand in the place of Mr. Vigers (a former director) in respect to the negociations for the Milkwood estate, situate between Herne hill and Brixton. After much quibbling and difficulty, he had secured the estate for the company on such eligible terms that if he had taken it on his own account he could have made £10,000 by it. As a professional man, he could assure the shareholders that this was one of the best estates in London, and he could not possibly have hit upon one more suitable for their requirements. Four railway stations were close at hand, and cheap workmen's trains were or would be started. He knew many of the leading employers of labour in London, men such as George Moore, Samuel Morley, &c., and he meant to interest them, and through them their *employés*, in the success of the company. He said that he had no need to go into the old balance sheet, although it was startling to find that of £2,865 10s. subscribed, about £2,500 had been lost. £1,000 had gone in advertisements. For all this money they had not a yard of land to show, and only 334 shareholders. In conclusion, the chairman urged those present to use all their energies in procuring some additional shareholders. Having secured the estate, upon which between 650 and 700 houses could be erected at once when the capital was forthcoming, the success of the company was certain if one or two thousand additional shareholders could be secured. Mr. Pite (Habershon and Pite) having laid before the meeting the plans for laying out the estate (which include a proposal for erecting a building for lecture and reading room, &c.), Mr. Fortescue, one of the new directors, and the secretary addressed the meeting, after which several shareholders put various questions to the chairman, which being answered to their satisfaction, they announced their intention to strenuously support the new directorate. A vote of thanks to the chairman closed the proceedings.

Our Office Table.

On Tuesday, Mr. Alderman Lawrence, the well known builder, was elected Lord Mayor of London for the ensuing year.

Dr. Aldis, medical officer of St. George's, Hanover-square, having written to the First Commissioner of Works with regard to the impure state of the Serpentine, Hyde Park, has received a reply to the effect that the present condition of the Serpentine and the best means of making and keeping it pure and safe are now under consideration, but that it is not intended to undertake any operations of magnitude until Parliament shall have voted the necessary supplies.

The No. 3 contract of the Thames Embankment *i.e.*, that for the short length between the Temple and Blackfriars Bridge), is progressing satisfactorily, the greater number of the piles for the cofferdam having been already driven, and some part of the puddling commenced. It is probable that the entire work will be finished within the time specified in the contract—viz., twelve months from the beginning.

The annual Social Science Congress commenced on Wednesday evening at Birmingham, the Earl of Carnarvon delivering the inaugural address. To-day (Friday) proceedings will be more particularly interesting to the building trade, as one of the papers in the Economy and Trades' Department will be "On a Proposed Bill for the Regulation of Trades' Unions." Papers on kindred topics will also be read by Mr. Mundella, of Nottingham; Mr. Gilliver, President of the Birmingham Trades' Council; Mr. Serjeant Cox, and Colonel Maude, of the Free Labour Registration Society. On Saturday the sewage question will be discussed by the Health Department. On Monday technical education will be the subject in the Education Department, and on the same day the Health Department will take up the question of water supply in large towns; and in the Economy and Trade Department plans for temporarily employing workmen in distress will be discussed. On Tuesday, the Health Department will have brought under its notice the sanitary condition of country villages.

The great clock at the Houses of Parliament, which has been performing with the greatest accuracy since it was first fixed in the clock tower eight years ago, is about to be stopped for a short time, for the purpose of being cleaned by the makers, Messrs. E. Dent and Company, of the Strand, in whose charge it remains.

On Monday morning two houses at Low Town, Holly Hall, Dudley, fell with a loud crash. They were situated at the end of a ruinous row of buildings, in what is called Buggs Gutter, a part of the town thoroughly undermined by the neighbouring pits. Two aged women and two men were seriously injured.

The *Scotsman* understands that the house in Kinnesswood, Kinross, where Michael Bruce, the poet, was born in 1746, and where he died in 1767, and which has been for years roofless and falling into decay, has been purchased by some gentlemen who have resolved to restore it as far as possible to its original condition.

A public meeting was held on Monday evening last at Cleveland-hall, Fitzroy-square, in furtherance of the objects of the Artisans' Club and Trades' Hall Company. It is proposed to build or lease a hall, in the central part of London, capable of holding at least 1,000 persons seated, with library, reading room, and refreshment rooms attached, for the use of trade, benefit, and other societies. The shares are £1 each, payable by instalments of 2s. 6d. per month. Up to the present time 250 shares have been taken up by 140 persons. As soon as 200 shareholders have been enrolled a meeting will be called to elect the directors. The Rev. Henry Solly and Mr. M'Cullagh Torrens, M.P. (who presided) strongly commended the objects of the company to the consideration of the audience.

It is stated that the Ancre Hotel, at Ouchy, Switzerland, where Byron wrote "The Prisoner of Chillon," and Shelley resided, has been so thoroughly restored that not a vestige remains of the rooms which the poets occupied. Even an inscription which the former cut in the stone window sill has been erased, and the house itself is no longer a Swiss château, but a flashy-looking modern hotel. Travellers are thus warned not to trouble themselves to visit the Ancher at Ouchy.

The name of "Faraday" has just been given to one of the streets of Paris. This tribute paid to the memory of a great chemist by a foreign Government cannot but be gratifying to the English mind.

The Prince of Wales has consented to lay the foundation stone of the University of Glasgow, and is expected to visit Glasgow for that purpose on the 8th instant.

Church restorers will probably be extremely interested in the following advertisement extracted from a Staffordshire paper:—"Old Church, Hanley.—To be let or sold, a front pew under the organ gallery. Will seat seven persons, and commands a view of nearly the whole congregation."

"A Lover of the Isle of Wight" draws attention to the sad state of neglect and decay that is so visible in the rooms of Carisbrook Castle. While the building itself bids fair to hold out for a long period against the ravages of time, it is suggested that a trifling outlay would stay the progress of decay in some of the old apartments.

A French chemist, named Dodè, has been engaged for many years in perfeeting a new method of preparing looking-glass, and is said to have succeeded. In place of mercury he uses platinum, but so finely divided that his method is only half as costly as the ordinary one. The platinum is dissolved in nitro-muriatic acid, the excess of the latter being got rid of by evaporation, and the metal left in a state of chloride, and to this is added a certain quantity, not stated, of essential oil of lavender; the platinum immediately abandons the aqueous solution for the essenee, which holds it in suspension. Small quantities of litharge and borate of leao are then added, and this mixture is laid on the glass by means of a brush. Finally, the glass is placed in an annealing furnace, which is heated to redness, the litharge and borate of lead are melted, and the platinum adheres firmly to the surface of the glass. It is stated that for the application of the new method any kind of glass may be used, even bottle-glass, for the platinum causes all faults to disappear, and, which sounds more extraordinary still, that glass thus prepared is transparent, and may therefore be used for windows. It is difficult to imagine a glass at onee transparent and reflecting.

The Freneh papers eomplain that a painting on wood by Albert Durer in the ehureh of St. Gervais, Paris, is in danger of destruetion from negleet, and asks that steps may be taken for its preservation. Such a thing in England would be nothing out of the eommon, but it is unusual with the French, who generally destroy more by restoration than negleet.

The finanee eommittee of a parish not many miles distant, while checking the accounts of their road surveyor, were lately eonsiderably surprised at an item, "For Schoolmaster, £6." Unable to eonceive the neeessity for a schoolmaster in eonnection with bloeks of granite or other road materials, an inquiry was instituted, when it was diseovered that the road surveyor was unable to make out his own accounts, and so had engaged a schoolmaster to assist him, eharging the expense to the parish.

The photographie mission sent by the North German Federation into Upper Egypt, under the direetion of Dr. Dumichen, to take photographs of a series of antique monuments and inscriptions, lately left Cairo on board the "Aigle," which navigates the Nile under the flag of the Confederation. The first halt was made at the ruins of Memphis, near Sakkarah, and at that place, in presence of the French Egyptian antiquarian, Mariette-Bey, and the Federal Consul, Dr. Nerens, the subterranean tombs were suceessfully photographed by aid of the magnesium light. The mission proposed to leave for Thebes shortly after.

The working men of Exeter have established a board of arbitration and conciliation between masters and men. It has been agreed that the board shall ar ibrate on any question relating to wages, working rules, and any other matters that may be referred to it from time to time by employers and employed, and by conciliatory means interpose its influence to prevent and settle any dispute. The board consists of six employers and the same number of *emplnyes*. In ease they eannot agree an umpire is to be called in to settle the dispute.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

36 G. MUDGE. Improvements in Adjustable Lock Furniture. Dated January 4, 1868.

This invention consists of a knob fitted with movable collar and loose pin to work on the ordinary square spindle, a rose fitted with a bush or lining, and a plate with studs, by the combination and arrangement of which the whole is securely and firmly fixed to the door, or otherwise, without screw or thread of any kind whatever.—Patent abandoned.

78 W. E KENWORTHY. Purifying Drains and Sewers. Dated January 8, 1868.

This inventon relates to means of purifying drains and sewers by extracting and burning all the noxious gases therein contained. This result is accomplished by connecting pipes to the drains or sewers, which pipes are placed in communication with the furnaces of steam boilers suitably disposed. In this manner the gases are drawn up through the pipes from the drains and sewers by the furnace draught, whereby to effect their entire combustion in the said furnace, but should any of the gases still remain, they will be at once absorbed or taken up by the carbon or fine dust contained in the flues around such boilers.—Patent abandoned.

88 G. A. HEATH. Improvements in Sash Fastenings. Dated January 9, 1868.

This invention relates to an improved sash fastener, whereby the windows to which it is applied may be more thoroughly secured than hitherto. It consists of a double bolt, the prongs or bolts of which when the window is closed, are caused to project from the pulley stile on either side of the parting bead, and take into suitable recesses made in each sash, so as to prevent their being raised or lowered.—Patent abandoned.

92 J. LEWTAS. Improved Appabatus for Holding and Releasing the Cords of Venetian and other Blinds. Dated January 10, 1868.

For holding and releasing the double cord of a venetian blind of the ordinary width the patentee attaches to the top rail a small frame having a stationary rod or wire for carrying three pulleys, and another rod or wire for carrying two levers or catches The double cord for raising or lowering the blind passes over two of the pulleys, and over the two levers, and over the third pulley is passed a single cord connected to a cranked wire, or its equivalent, for acting on the levers. When the single cord is loose, the double cord can be pulled in either direction, and raise or lower the blind, and when the single cord is pulled the levers are turned so that their ends press the double cord against the top of the frame, thereby effectually holding the cord, and preventing any change of the blind; when the blind has to be raised or lowered, the double cord is pulled to turn back the levers for removing the pressure, and then freedom is given to the said double cord.—Patent completed.

119 C. A. WATKINS. Improvements in the Manufacture of Ties for Painting and other Brushes to be called the Soho Tie. Dated January 13, 1868.

Here the inventor manufactures the ties in the following manner:—On a conical chuck or mould turned to the required dimensions, and slightly greased, he winds string, or other suitable material, until the proper length is obtained; the string is then fastened by loops or knots in the usual way; the two ends are passed under the first turn and left sufficiently long to project beyond the binding of the brush for which it is intended, for the purpose of securing them to the handle, or other convenient part thereof. The string is next coated with glue, varnish, or other adhesive material, allowed to dry, and removed from the mould; it is now ready for use, and may be slipped on the brush at any time it is required The string may be wound on the mould by hand, or by causing the mould to revolve on an ordinary lathe mandrel —Patent abandoned.

142 J. EGGLETON. Improvements in the Manufacture of Bellows Regulators for Water-Closets. Dated January 16, 1868.

This invention consists in making bellows regulators of simple construction, and of materials of such a nature as to prevent their getting out of order, and being affected by damp or liability to decay. These regulators are to be attached to the lever of the valve in the usual way, and are to be constructed entirely of brass and india-rubber. The spindle or rod which runs through the centre, and the plates top and bottom, are of brass, and the intermediate or bellows portion of india rubber; this combination forms an air valve.—Patent abandoned.

148 J. WOOD. Improvements in Windows. Dated January 16, 1868.

This invention relates to an improved construction of windows, whereby the window sashes or frames may be conveniently removed from the cases for cleaning the glass panels, or other purposes. It consists, essentially, of a metal box, bracket, or guide fixed to the window case at about the height of the centre of the top frame, and in the line of the ropes of the lower sash. This bracket or guide is constructed with flanches, between which the rope runs, and these are of such depth that the groove in the lower frame may pass over them; attached to the bracket is a lever projecting far enough to allow the window lines to pass behind it, the lever being actuated by an arm which is pressed upon by the batten rod of the window. When the batten rod is removed, and the lower frame is taken out, the rope which is attached to a hook in the frame is removed, and the lever which is attached to the box bracket prevents the weights from running down. The parting rod, instead of being made in one piece, as at present, is made in three pieces; the upper and lower piece is fixed, but the central piece, which is a little larger than the height of the top sash, is hinged on the inside of the window case, so that it can be pushed into the case, and allow the upper window frame to fold down inside of the window. This is effected by fixing a metal bush a short distance from the wooden sill. In the bush a circular hole is formed, and a slit made on the top side to admit an oval or oblong pivot which is attached to the bottom of the sash. When the sash is lowered, the pivot enters the circular opening in the bush, and acts as a hinge on which the window is folded down to the inside. To prevent the noise occasioned by the sashes when subject to the action of wind or other causes, spiral springs covered with leather or other substance are inserted into the outer side of the sashes; these press against the case so that the sashes are continually forced inwards, and the recoil of the window when acted upon by the wind is prevented.—Patent completed.

152 T. NASH. Improvements in Stoves and Fireplaces. Dated January 16, 1868.

Here the patentee constructs stoves and fireplaces with the smoke consuming and combustion arraegements here inafter described. At the back of the stove or fireplace he has a hot air chamber or receiver which extends downwards in the direction of the ash pit (as illustrated in the drawings). This chamber or receiver is in direct communication with a hollow piece forming a passage of circular or any convenient section; or the stove or grate may be cast or made in such manner that the passage is thereby formed therein, such passage opening into the top of such chamber or receiver, and the chamber or receiver itself opens at its upper part to the chimney. The soot door, instead of being provided with a smaller door, as in ordinary register stoves, has, at or about the same place, an opening which may be fitted with a door valve, and into which opening is fitted the tube or hollow piece forming the passage, as aforesaid, and this tube or passage curves over, or is carried down, dipping into the aforesaid hot air chamber or receiver. The effect of these arrangements will be obvious.—Patent completed.

155 F. POSTILL. Improvements in Kilns or Ovens for Burning or Baking Bricks, Earthenware, &c. Dated January 16, 1868.

The patentee claims the described improved construction of kilns divided by permanent division walls into a number of straight sided firing chambers, constituting separate kilns, surrounding a chimney, with which they communicate by means of separate flues, each chamber or kiln being made to communicate with the one adjoining by means of a flue situated near to the outer walls of the kilns, the introduction of fuel being effected through vertical fuel apertures in the roof of the kiln, substantially as described and illustrated in the drawings.—Patent completed.

Trade News.

TENDERS.

Battersea.—For the erection of a boys' school at Battersea:—

Cooper	£1120 0
Jackson and Shaw	1107 0
Thornton	1090 10
Lathey Brothers	1027 0
Bass	960 0

Finchley.—For the erection of a pair of villas at Fortis Green, Finchley, N., for the Rev. Charles Room. Mr. William Waymouth, architect, 12, Moorgate street, E.C. Quantities supplied:—

Fish	£2590
Axford and Whillier	2515
Webb and Sons	2380
Henshaw	2378
Colls and Son	2376
Foster	2333
Cooke and Company	2272
Merritt and Ashby (accepted)	2139

Havant (Hants).—For assembly-rooms, for Mr. C. Longcroft. Mr. R. W. Drew, architect. Quantities not supplied:—

Deacon	£1720
Stallard	1387
Tear	1343
Carrols	1127

Hemel Hempstead.—For building new infirmary, alterations to tramp wards, and water supply. Mr. G. Alexander Smith, surveyor:—

B. E. Nightingale	£1786
Joseph Harris	1734
J. and W. Savage	1629
Charles Chappel	1603
Alfred Wilkins	1584
Henry George	1480
J. Loveday	1479
W. Sear	1475
W. B. Humphrey (accepted)	1295

London.—For erecting an additional story on Mr. John Cooper's wool warehouse, New street, Bishopsgate. Mr. Herbert Williams, architect, 52, Old Broad street, E.C. Quantities supplied by Mr. Charles Reilly:—

King and Sons	£3851
Conder	3785
Barnsley and Sons	3768
Brass	3647
Ashby and Horner	3650
Browne and Robinson	3550
Piper and Company	3498
Ashby and Sons (accepted)	3456

Middlesborough.—For alterations to No. 6, Sussex street, Middlesborough, for Mr. Thomas Dunn. W. H. Blessley, architect. Quantities not supplied:—

H. Chapman	£865 0 0
W. Oliver	859 5 0
J. Johnson (Acklam-terrace)	852 7 6
C. Thomas	793 5 6
Thomas Wilkinson	785 6 6
J. Ingram and Son	785 0 0
Barron and Robinson	777 0 0
J. Johnson (Marton road)	774 0 0
W. Jameson	772 10 0
J. Rushford (accepted)	772 0 0

Redcar.—For the erection of two houses, Redcar, for Mr. J. Harrison and Mr. J. H. Webster. Mr. W. H. Blessley, architect. Accepted tenders:—

	No. 1.	No. 2.
Picknett and Wynn, Bricklayer, Plasterer, Mason, Carpenter, and Joiner	£705 4 0	£597 12 5
J. Livingstone, Plumber, Glazier, and Gasfitter	95 16 0	89 10 6
Robert Preston, Slater	32 10 0	42 5 0
H. Cockton, Painter	10 12 0	10 0 0

Woodford (Essex).—For the erection of a house and offices for Mr. H. F. Barclay. Messrs. Hooper and Lewis, architects:—

	For house, &c.	Fencing and Gates.
Sharpington and Cole	£2578	£ 90
Killby	2434	115
Egan	2316	110
Morter	2287	120
Hedges (accepted)	2240	118

COMPETITIONS.

India.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Eaton (Norwich.)—For designs for new suburban church. Messrs. Hewitt and Capon, London and Norwich.

ST. MARY CRAY (Kent).—October 8.—For the erection of a new parsonage house. Mr. Christian, architect, 8a, White all-place, London.

BARROW ON SOAR, NEAR LOUGHBOROUGH.—October 5. —For restoration of church Messrs Stevens and Robinson, architects, 45, Friargate, Derby.

MONTGOMERY.—October 15.—For the erection of new wings and other additions to the county gaol. S. W. Poundley, county surveyor, Kerry.

SOUTHEND (Essex) —October 8.—For the erection of a tavern. Mr T. W. Iron, architect, St. Helens terrace, Mile End road.

CAMBERWELL.—October 6.—For the purchase, collection, and removal of dust, &c., in the parish of St. Giles. G. W. Marsden, Vestry Hall.

WEST COWES.—October 19.—For the erection of proposed baths at Cowes. Mr. Woodman, architect, 17, Prince Albert-street, Brighton.

STOURPORT (Worcestershire).—October 19.—For altering and reconstructing a bridge over the River Severn. W. Talbot, clerk, Kidderminster.

COUNTY OF CARMARTHEN.—October 21.—For certain alterations and additions to the county gaol. Clerk of Peace's office, Llandovery.

GREAT NORTHERN RAILWAY.—October 6 —For 100,000 rectangular sleepers, 8ft. 11in. long, 10in. by 5in. H. Oakley, secretary, Terminus, King's Cross

ROMFORD (Essex).—Local Board.—October 10.—For construction of 1,660yds. of oval sewer. Two 8-horse power boilers and centrifugal pumps, &c. A. H. Hunt, clerk.

LICHFIELD.—October 23.—The Bishop's Palace.—Repairing, altering, and enlarging the above-named building, and for adding a chapel to the same. Rev. F. Thatcher, the Palace, Lichfield.

NORTHAMPTON WATER WORKS.—October 18 —For a covered reservoir, 160ft by 150ft. by 17ft. deep. Alexander Milne, architect, 2, Gold-street, Northampton.

PROPERTY SALES.

SEPTEMBER 21.

AT THE MART.—By Messrs. Foster —Freehold estate, with residence, known as Buckhurst Lodge, with farms called Buckhurst Wood and Pennybridge, containing about 194 acres, situate on the high road from Mayfield to Wadhurst, Sussex—sold for £7,360.

SEPTEMBER 22.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold two unfinished residences, Nos. 9 and 10, Florence villas, Feltham, Middlesex, term 90 years from 1862, at £15 per annum—£580.

Leasehold residence, known as Acorn House, Stoke Newington, with stabling and grounds of about 1¼ acres, term 27 years unexpired, at £45 per annum—£500.

Leasehold residence, 15, Somerford grove, Stoke Newington, let at £34 per annum, term 42 years unexpired, at £4 12s. per annum—£285.

Two policies of insurance for £1,000 each, effected with the Eagle Insurance Company on the life of a gentleman aged 58 years—£305.

By Messrs. Broad, Pritchard, and Wiltshire —Leasehold three houses and shops, Nos. 259, 261, and 263, Kingsland road, together with premises in the rear, and seven cottages, and plot of land in Wilmer gardens, annual value £000, term 70 years unexpired at £100 per annum—£3,500.

SEPTEMBER 23.

By Messrs. Bray and Webb.—Leasehold residence, No. 1, Albion terrace, Albion road, Stoke Newington, annual value £55, term 99 years from 1847, £7 10s. per annum—£510.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Aylward, Fair-street, Horsleydown, bricklayer, October 7, at 12—Charles Golsby, London Colney, bricklayer, October 12, at 1—William Henry Knapton, Stationroad, Camberwell, gas engineer, October 10, at 12—William James Parker, Rye lane, Peckham, brick agent, October 10, at 12—John Tapper, Lillington-street, Pimlico, and Wandsworth, builder, October 10 at 12 - Joseph Baker, Toddington, Bedfordshire, plumber, October 12, at 11—Wilham Burnham, High Wycombe, Bucks, builder, October 9, at 11—John Dungey, Myddelton street, Clerkenwell, gasfitter, October 9, at 12—Thomas Hughes, Dartmouth Villas, Lewisham, builder, October 10, at 11—John Owen, Bournemouth, builder, October 9, at 1—John Powell, Stracy-road, Forest gate, builder, October 9, at 11—William Richards, Oxford terrace, Upper Holloway, builder, October 12, at 11—Thomas Shakespeare, Latchmere-grove, Battersea, engineer, October 9, at 1—Thomas William Taylor, Colchester and Wivenhoe, carpenter, October 9, at 1—John Henry Tozer, Caledonian-road, King's cross, carpenter, October 10, at 12—George Warriner, Bedford-row, engineer, October 9, at 11.

TO SURRENDER IN THE COUNTRY.

John Finning, Pinhoe, Devon, builder, October 12, at 11—William Henry Jackman, Haylands, near Ryde, builder, October 10, at 11.30—Ambrose Lomax, Gorton, contractor, October 14, at 11—William Lunn, Balderton, Notts, bricklayer, October 14, at 12—Joseph Ryan, Llanelly, mason, September 30, at 11—George Wilson Rylance, Tyldesley, near Manchester, nail manufacturer, October 9, at 11—Thomas Baxendale, Eccleshill, slater, October 9, at 9.30—William Beck, Newbold Verdon, Leicestershire, bricklayer, October 8, at 3—Thomas Gibbs Jenkins, Liverpool, builder, October 9, at 3—John Thomas, Oxton, Cheshire, builder, October 7, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 8, T. Fleming, Greenwich and Southsea, builder—December 8, L. Lee, Kentish Town-road, stonemason—December 8, G. K. Geyelin, Bridge-avenue, Hammersmith, and Argyle square, King's cross, civil engineer—December 10, G. Webb, Old Kent-road, builder—December 10, E. Myers, Camden road, engineer—October 9, T. Dove, Marske, Yorkshire, builder—October 16, A. Fisher, Tunstall, plumber October 15, J. Crossley, Burnley, painter—October 14, J. Labram, Northampton, builder—December 11, G. Lapthorn, High street, Poplar, joiner—October 23, P. Patton, Middlesborough, stonemason—October 23, R. Illingworth, Little Horton, builder—October 14, J. Roseby, Appleby, mining engineer—October 21, S. Downs, Beeley, Derbyshire, stone dealer—October 9, J. Oliver, Everton, builder October 10, R. Thomas, Perran-Ar-Worthal, Cornwall, surveyor—October 15, W. J. Arnold, Tunbridge Wells, builder.

PARTNERSHIPS DISSOLVED.

Todd and Co., Thirsk, joiners—Ogden and Beddows, Little Bolton, builders—Marshall and Taylor, Manchester, engineers—Jones and Co., Newland, Gloucestershire, brick manufacturers—Grimshaw and Co., Openshaw, builders—Hempsted and Co., Grantham, engineers—Illingworth and Yates, Bradford, Yorkshire, builders.

DIVIDENDS.

October 7, J. Warren, South Retford, builder.

DECLARATION OF DIVIDENDS.

W. Stevenson, Wednesbury, builder, div. 1s. 5d.—J. Outram, Burton-upon Trent and elsewhere, timber merchant, div. 1s. 7½d.—C. Howell, Liverpool, slate dealer, div. 1s. 4d.

SCOTCH SEQUESTRATIONS.

William and William Robertson Donald, Paisley, engineers, October 1, at 1.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, rawback, 1s.

Teak .....load	£11	0	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12 0
,, yellow pine..	3	0	4	5	Finland	7	0	8 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0 0
Quebec Oak, white..	5	0	5	10	Gothenburg, yellow	8	0	9 10
,, birch.....	4	0	5	0	,, white	8	0	9 0
,, elm	4	0	4	10	Gefle, yellow.....	9	0	10 10
Dantzic oak	4	0	6	0	Soderhamn	9	0	10 10
,, fir	2	15	3	15	Christiania, per C., 12 ft. by 3 by 9 in. yellow	11	0	13 0
Memel fir	3	0	4	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	12	1 0
Riga.....	3	0	3	3				
Swedish	2	0	2	8				
Masts, Quebec red pine	4	10	6	10				
,, yellow pine..	4	10	6	0	Pumice Stone pr ton	6	0	8 0
Lathwood, Dantzic, fm	6	10	7	10	OILS, &c.			
,, St. Petersburg	8	0	9	10	Seal, pale....per tun	36	0	0 0
Oeals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	89	0	0 0
					Cod	38	0	0 0
					Whale, Sth. Sea, pale	37	10	0 0
Quebec, white spruce	13	0	20	0	Olive, Gallipoli.....	68	0	73 0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	53	0	55 0
Yellow pine, per reduced C.					Palm, fine	39	10	40 0
					Linseed	31	5	34 0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	33	0	0 0
2nd do.....	11	10	12	10	Cottonseed.....	31	0	38 0

METALS.

IRON:—					
Welsh Bars in London ....per ton	6	5	0	6 5 0	5
Nail Rod ..... do	7	10	0	7 12 6	
Hoops..... do	8	6	0	9 0 0	2½
Hoops, Single ..... do	8	0	0	9 0 0	
Staffordshire Bars... ..... do	7	6	0	7 15 0	
Bar in Wales ..... do	5	10	0	6 0 0	3
Nailrods ..... do	7	10	0	7 15 0	2½
Foundry Pigs, at Glasg. No 1 .. do	2	12	3	2 17 6	net.
Swedish Bars ..... do	9	17	6	10 10 0	2½
COPPER:—					
Sheet & Sheathing, & Bolt ....per ton	79	0	0	2 2 0	
Hammered Bottoms ..... do	97	0	0	0 0 0	
Flat Bottoms, not Hammered .. do	83	0	0	0 0 0	
Cake and Tough Ingot ..... do	1	0	0	3 0 0	3
Best Selected ..... do	77	0	0	85 0 0	
Australian ..... do	77	10	0	0 0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0 0 7½	
LEAD —					
Pig, English .....per ton	21	5	0	0 0 0	
,, Spanish Soft ..... do	18	10	0	0 0 0	2½
Shot, Patent ..... do	22	10	0	22 15 0	
Sheet ..... do	20	0	0	20 15 0	5
White ..... do	27	0	0	30 0 0	
TIN:					
English Block .....per ton	95	0	0	0 0 0	
do Bar ..... do	96	0	0	99 0 0	2½
do Refine ..... do	97	0	0	0 0 0	
Banca ..... do		0	0	97 0 0	nett
Straits ..... do	92	10	0	92 0 0	
ZINC:—					
English Sheet .....per ton	25	10	0	26 10 0	2½
Devaux's V. M. Roofing Zinc .... do	25	0	0	0 0 0	
* And 5 per cent. discount if laid upon the new system					
STEEL:—					
Swedish Reg. hammered .....per ton	15	0	0	15 10 0	5½
Swedish Faggot ..... do	0	0	0	0 0 0	
SPELTER:—					
On the Spot .....per ton	20	0	0	0 0 0	
QUICKSILVER .....per btl	6	17	0	0 0 0	
REGULUS OF ANTIMONY					
French ..... ton	43	0	0	0 0 0	

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 9, 1868.

HOW FAR CAN NATIONALITY BE ATTAINED IN ART?

THIS is a day of ethnology, or, as some writers on art have called it, ethnography; and we believe, at the British Association, much eloquence has been expended in making the term anthropology. Ethnology, in its prehistoric and other stages, is a favourite study of the day, and the curious world is busy in developing itself by pangenesis and other processes from an anthropoid origin. It is not surprising if this turn in the public mind again gives prominency to the question of nationality in art, which, as we lately pointed out, has occupied the pen of a writer in "St. Pauls," who deems it absurd to speak of Gothic as English architecture.

There is to a certain extent a lurking fallacy in the rejection of Gothic, and yet there is a true aim in the rejection of imitations of the past, Corinthian and Ionic, Byzantine and Italian—that perpetual copying of the dead which stands in the way of living art. We ought to be in a condition to obtain an architecture distinctive of the Victorian era. True, but the writer has forgotten one ethnological fact, so far as art and architecture are concerned—that all art is development. If we ever succeed so fully as to determine with regard to the bone and flesh of man that there are distinct races obtained by creation or pangenesis from several pairs, and even if we acknowledge racial peculiarities of idiosyncrasy, we shall still come to a lesson taught by the earliest fragments of art, whether from the bone caves of Auvergne or the lava-hidden houses of Sautorin, that all art, as all knowledge, is but the accumulation of the inheritance of mankind, transmitted from generation to generation, perhaps not according to lineal succession, but with the occasional disinheritance of a series of heirs, still keeping the mental patrimony in the human family.

However far we go back we find savages, it is true; but as yet we trace back civilisation or culture ages and ages before the historic era. We talk of Greek, of Ionic, of Corinthian art, but how far was Greek art Greek, or was Ionic in its essence Ionic? The theorist believes in it on the faith of his school books; but we have traced portions of Greek art back to Egypt and Assyria; and what were Egypt and Assyria—oldest mothers of arts—but themselves the transmitters of older empires, dimly suggested to us by the discoveries of the linguist or philologist or the conformity of weapons and objects of skill? We no longer know what is original, hardly what is characteristic; we complain of the mixture of styles in London, but what did the purist say in Miletus, or Ephesus, or Samos, or the older critic in Babylon? How Greek is the ornamentation of a Greek vase! and yet the Greek vase is not Greek. Under the Greek cities of Cyprus, with their Greek vases, are now found the Phœnician cities, with Phœnician vases and Phœnician inscriptions. In those remarkable objects found at Sautorin, dating from a time before the volcanic cone was divided, there are vases which could never have been Greek, with a Greek ornamentation, as in the vases of after ages, and foliage disclosing an eye for form and a love of beauty when material was rude and skill was mean. The French archæologists fancy these vases were imported, and the produce of a flourishing seat of manufacture and commerce.

Foliage such as has been just referred to is commonly repeated in our buildings to this day. It is an ancient bequest of no specified era; and so it is with regard to much of the elements of art, and new and distinctive inventions are but fresh adaptations. The main body of art may be regarded as common to all countries and all ages, the distinctive features, however striking to us, are in amount subordinate, and yet nothing is so true as the dictum of the writers on this subject, that we can tell the age of buildings by their style, or determine the race of men by their architecture. This within its limits, for we do not stand alone in adopting anomalous architecture; others have done it before us, and there are many influences besides those of race, even where race is known, which determine the characteristics of architecture.

We recognise the eye for beauty in the Ionian and Greek, and we call Ionian art Greek art, and the Ionians Greeks, and, nevertheless, there is no safe reason for believing the Ionians to be Greeks or Aryans rather than Iberians or Caucasian Turanians. We cannot even tell whether it is more likely the love of beauty was communicated by the Ionians to the Hellenes, or by the Hellenes to the Ionians. There are so many influences besides race, as political dominance, but particularly community of religion or language. This may be well studied in the case of Norman architecture, with the adoption of which race had much less to do than is assumed.

Community of religion will influence forms. It must have influenced the temples and burial towers of the fire-worshippers throughout the East, as the cross has influenced Christianity, though we are not sure the cross is an original Christian emblem. Wherever the temples have been sanctuaries for treasure there will be a provision for keeping treasure, and so throughout each detail. One class of worshippers must have the means of lustration, and the Mussulman mosque must have water made to run either from a stream, an aqueduct, or a reservoir. Domestic manners also greatly influence. Where the woman is secluded the form of the house is affected; there are separate apartments, a separate house, or the suppression of the guest rooms of the husband. The greater or less reserve of the women will influence the arrangement of the bedrooms. An English, a Mussulman, or a Hindoo woman cannot live in the same kind of rooms as Ionians and Greeks, who cluster together, and with whom each sitting-room in a house is a bed-room. On the other hand, structure will influence habits. The houses or mud huts of the Egyptians with two rooms are the same as those of their forefathers, and under a different religion this is accompanied with greater freedom of women than among some other Mussulmans.

What is distinctive under such circumstances among the upper classes has little distinction among the poor of all nations. The Irish lived in one room of a mud hovel till lately, on the same condition as poor savages—poorer than the negro, who provides a hut for each woman. The poor labourer in London, Paris, Constantinople, Cairo, and New York must pig with his family in one or two rooms of a large house, as did the needy Roman citizen, who tenanted his apartment in an *insula*.

Thus, there being much common under like circumstances at any epoch, so even, with regard to what is distinctive, much of that is inherited or borrowed. The leading idea is borrowed—of the Hellenic from the Egyptian, of the Ionic from Assyrian or eastern sources, of the Roman from the Etruscan. The modification of Byzantine, which became Anglo-Saxon, Norman, Lombard, and mediæval in its various fashions, is Germanic even in Spain, as distinguished from those modifications which were under Latin influence, passed through Renaissance, and culminated in Italian. It is not, therefore, surprising that, notwithstanding the influence of Italian and its retroversion as Classic in this century, the tendency in this country should have now set so strongly towards Gothic, for it is in this direction the racial influence is to be traced. Classic and Italian in their new shapes are altogether foreign, and Gothic excites greater sympathy. This certainly suggests an explanation, and, if a true one, it also illustrates the tendency of the future.

Taking our share of the inheritance of culture, we must, according to our varying disposition, accept a portion of Classic and Italian as we accept Homer and Dante, but their influence will be affected by the other mental influences of the day. There can be no doubt the Classic taste in England has been greatly modified. It has its hold on the educated classes in well-defined acknowledgment of its claims, but it is its supremacy and its relative position which have suffered. The useful knowledge movement, strangely enough, did not dethrone classics, but confirm them. University College School and King's College School have become as classical as any offspring of the middle ages. Part of this influence, we think, may be traced to the greater value assigned to the English as a nation. We were, a generation ago, quite willing to accept the acknowledged supremacy of the Greeks and the Romans. It may be that the boasting of our American cousins has helped to cure this. In showing the grandeur of the States beyond anything the world had yet seen, even the Phi Beta Kappa rhetoricians were compelled to put Greece and Rome on a lower level. We have been insensibly led to estimate the greatness of the States and of England by a truer standard, and Rome has consequently sunk and Greece been eclipsed. The direct government of India has compelled us to acknowledge that we possess an empire beyond the might of Rome, and the possession of another empire and continent by our kindred in the west eclipses the achievements of Genghis or Timur.

We must not omit as an influence the rising reputations of Watt, Adam Smith, Bentham, Trevithick, Cook, and so many men whose value was not appreciated in their own recent generation, and who are now recognised as benefactors of mankind, putting us on a level with the greatest heroes of antiquity. The progress in our nations of mechanical triumphs has also given us a higher and independent measure of our own capacity. Precisely in the degree that this has taken place has the Classic influence become relatively smaller. Thus, Holland has as great a dominion as in the last century, but England, France, and Prussia have grown larger, and Holland is, therefore, now insignificant. All has favoured the growth of a national sentiment, of a love for old traditions, and thereby of mediæval art, of a love for our own language, of the study of Anglo-Saxon and mediæval English, and of the teaching of English as a great branch of education. If mediæval sympathies have favoured mediæval tendencies in religious matters, we doubt whether they have produced any permanent or rooted effect, and in the period of transition, which has set in, ritualism must take its form and model from the dominant influences.

The causes enumerated have led to the adoption of the mediæval styles as English, but they cannot be regarded as giving them any permanent sanction to be accepted as the art of the country and the age. The tendency is decidedly to seek something English in architecture and art generally, as we have attained it in literature, incorporating what we have inherited from the ancients, and what we can advantageously apply from foreigners, and yet appropriating this according to our own means and our own views.

What we shall do under these circumstances he must be a clever prophet who will find out. The writer in "St. Pauls" and some others seem to think because we have a greater command of glass, porcelain, and iron we must seek our style from such materials, as if we are to abandon marble, stone,

and brick, because we have got further resources. As yet there is no evidence of such abandonment, but on the reverse a tendency to use marble and stone to a greater extent. As to materials we have by no means reached our limit. Gilding is, it may be noted, more freely used in common with other applications of colour, but the resource of electroplating with silver, copper, &c., has been by no means so fully turned to account as it may be. Copper has become a much cheaper metal than it has long been, and the newly adopted metal aluminium is but in the begining of its career, costing, it may be, as much an ounce as in a short time it will for a pound. Nationality will to some extent be dependent on national manners. Ritualism or the disposition for decoration allowed for, there must still be the Protestant element to come into operation. Flats will come into favour, but the manners of the people will yet give a preference to self-contained houses. If we knew that art had come to its term of gestation, we should know what it had to produce, but dependent as the future is on so many influences, political and moral, the results of events remote, unfulfilled, or not yet arrived, it is impossible to give a shape to the progeny of art hereafter. We shall go on essaying, effacing, correcting, and venturing afresh till that supreme day when all shall know an era of art is on us, to be registered in all time.

CITY SAUNTERINGS.

ALTHOUGH, as we stated in our last notice of City buildings, little is at present being done, there is no better field for the observation of the student of architecture than the City presents. Commencing our saunterings at Moorgate-street and proceeding along London Wall, nothing of interest will be seen except Great Winchester-buildings, close to the Broad street Station. These offices are light, though without iron supports, and the carving is particularly well executed. The design is not remarkable. The station next claims attention. It is the most picturesque of all the London stations, as that at Paddington is the most elegant, and that at Cannon-street the most hideous. Proceeding up Broad-street and passing through a large ill-designed structure, known as Palmerston-buildings, finished about three years ago, but not yet half occupied, Bishopsgate-street is reached. A handsome Gothic building, called Crosby House, joins the house just passed through on the right hand. This is a very successful application of Gothic forms to City architecture, and is well worth half an hour's study. A few doors further on is the National Provincial Bank, handsomest of modern City buildings, with its fine groups of statuary and delicate bas-reliefs. Crossing Bishopsgate-street and turning into Gt. St. Helen's, some interesting old brick houses, bearing the date of 1646, will be observed, and also the picturesque porch of carved woodwork of the Church of St. Helen's. The carving of the doorways of the old brick buildings, though of later date, is very good. On entering St. Mary Axe several new warehouses will be seen. Brown's-buildings, No. 9, shows that iron supports need not be ugly. No. 54, immediately opposite, by Messrs. Parr and Strong, scarcely 12ft. in frontage, is a model warehouse, though a pointed instead of a circular headed arch would be an improvement. The flaps, which are of oak, do not appear to be varnished. The ironwork is ample and of good design. The gable is towards the street, a growing fashion by the way, or rather a revival of an ancient one. No. 34 in the same street is an ambitious warehouse, a little over-carved, but with very deep reveals, the entire thickness of the wall, in fact. The lower story is an arcade of three arches, which could scarcely be improved. The water pipes, in the Venetian style, are excellent. To this building, as to many others, it is difficult to assign a style. The ground floor, or basement as it would be architecturally termed, is certainly Venetian in character, but the upper stories are not, and the gable, which is in corbie steps, in the Scottish style, contradicts every other feature in the façade. There are also over the three topmost arches rings of black, red, and yellow brick, spoiling the effect of the whole by introducing variety of colour, which is not distributed over the other portions of the elevation. Almost opposite are three or four curious old houses that we cannot easily reconcile with our ideas of modern London. There is nothing more quaint in Wych-street. In Camomile-street, close by, Mr. H. Fuller is superintending a large warehouse, at present in an unfinished state. The openings in the gable are not arched in the true sense of the word, the heads being nearly in the form of two sides of an equilateral triangle. The lines coincide with those of the gable, but the effect is decidedly bad. Contrast, not coincidence, is the thing which is wanted. By a short cut through Billiter-street, where there are one or two new buildings of no great merit, we reach Seething-lane, passing the church at the corner of Hart-street where Pepys narrates, between his entries of resolutions to give up drink, that he went to hear the children sing. In this lane are two large and comparatively new buildings, the one by Mr. P'Anson, and the other by no one in particular, although more than one architect of repute furnished designs. At the end of Seething-lane is the warehouse in Thames-street, by Messrs. Finch, Hill, and Paraire. It will not add to their reputation, though there is a certain amount of originality about it. The very quaint red brick warehouse in Eastcheap, by Mr. Roumieu, was fully described in a previous number, but it will bear a second view. The metal work is of exceptionally good design, and the doors are the best of similar character in all London. The projection of the hoods to the windows is excessive, and perhaps there is more decoration than is becoming in a building intended for commercial purposes, but the work is thoroughly well done, and the carving is excellent. At the corner of Lombard and Gracechurch-streets is the elaborate building of the City Offices Company—we presume by the Messrs. Francis. The carving is as good as the design is bad. The building is conspicuous, but not striking. Here was a noble site for a cleverly designed work. Being now so near the Mansion House, the new portion of the Union Bank claims attention. It is by Mr. Hardwick. It is set back from the line of the street, and is encumbered by the building at the corner. It is as worthy of its situation as it is creditable to its architect, that is to say, it does scant honour to either. This portion of the City—the neighbourhood of the Bank of England—is not to be lightly passed over. Lothbury teems with handsome edifices—the Imperial Bank, Mr. G. S. Clarke's Venetian building at the corner of Tokenhouse-yard, the Auction Mart in the Yard, and the London and Westminster Bank. The Alliance Bank and other buildings in Bartholomew-lane, which is really a wide street, are amongst the best specimens of architecture to be found in London. In Throgmorton-street, Mr. J. G. Cole has recently finished a handsome building, presenting several peculiarities. The style is palatial rather than Palladian; and if polished red granite can ever be used externally with advantage it is in this instance. The pilasters supporting the first floor, or *piano nobile*, are of this material, as are the quoin stones and architrave to main cornice. The panels beneath the windows of the upper stories are filled in with polished Irish green marble where most architects would have put a wretched *pseudo* balustrade. The reveals of the windows are enriched, and most properly. It is rare to find architects who remember that in most streets, but especially in a narrow one, it is the reveals that are longest in sight of the passer-by. Few pause in front of a building, but we have a side view for an appreciable space of time. In such cases the reveals and returns should be ornamental rather than the front. Mr. Cole has adopted the custom prevalent at Genoa of using considerable decoration in his soffit architecture, those parts, in fact, which in a narrow street catch the eye. The continuation of the carved caps as a support to the architrave is an unpardonable mistake. A large building is in course of erection, immediately opposite, for the Drapers' Company. It has only reached the level of the first floor. It is of considerable frontage. In Cheapside, close to Bucklersbury, Messrs. Tillot and Chamberlain have superintended a building, Nos. 76 and 77, for Messrs. Hobbs, Hart, and Co., the great locksmiths. It is a plain Palladian structure of three stories, having engaged Corinthian and Ionic columns, with an extremely poor cornice. Now the Orders are the Orders, and should be used properly or not at all. This front is a caricature of the Orders and a travestie of Palladio. Anciently Cheapside was called Chepe, but that is no reason for making it in the present day nasty. Buildings like this bring discredit on a noble style at a time when its lovers have much to contend against. In Old Jewry, immediately opposite, Old Jewry Chambers are worth looking at. If not absolutely good they are not positively bad. As the Guildhall is so near, it will be well to take a look at the oak carved work now being placed at the east end. The noble east window, one of the best specimens of modern stained glass which the century has produced, is always worth a visit. It may strike the observer as something unaccountable that so wealthy a Corporation as that of the City of London should allow the hideous west window to remain for a day. He will also marvel that the grotesque figures of Gog and Magog, of no real antiquity or venerable associations, should not long since have been chopped into firewood. Distinguished foreigners, entertained at Civic banquets, must wonder what manner of men can they be who retain such barbaric images. It is is doubtful whether the proprietors of Rosherville Gardens would accept them as a gift. Now let us take Queen-street as far as Thames-street, and pause at Queenhithe, where some enormous warehouses are nearly completed. They are best seen from the river, but they were better unseen. In close proximity, within a few doors of Mr. Burges's spirited warehouse, they show to little advantage, and are certainly examples of what to avoid. The river front is varied, not decorated, by coloured bricks, more or less eccentrically disposed. There is no doubt that a wharf warehouse presents many difficulties, but we never knew a building of any merit which did not. That these difficulties can be successfully overcome, Hubbuck's wharf is a proof. We now come to the British and Foreign Bible Society's house, at the back of Doctor's Commons, passing the still standing tower of St. Mary Somerset, with its many pinnacles. From the river the Bible Society's house is very conspicuous. It is a very large and lofty building of four stories. The style is palatial, with some striking peculiarities. Mr. P'Anson is the architect. There is much in this work that is bold and even original, but there is still more that is weak and common-place. The front is divided into bays by pilasters of slight projection. The capitals of these pilasters support the *bed-mould* of the cornice without the intervention of frieze or architrave. This is as contrary to all rule as it is opposed to all reason. There can be no possible excuse for such an arrangement, especially as the upper story forms a division of itself, having an ornamented string supported by carved caps of minor size. These should have been the true caps, and the upper story should have no pilasters whatever. The cornice is somewhat insufficient, but it might pass. The hip knobs on the roof contribute

much to its effect, but the little balls on the dormers should be removed. The chimneys are successful. The west front is decidedly the most pleasing. The best description that can be given of this building is that it is what is technically called a *coup manqué*. In short, it has missed excellence. Five minutes of sound advice, while the elevations were in pencil, would have rendered the British and Foreign Bible Society's house an ornament to the metropolis; the absence of the advice, or the indisposition to receive it, has dowered the City with another example of what "might have been." Adjoining this building some extension of the offices of the Court of Probate are in progress; they seem to be of no particular pretension. We are now at Blackfriars, where the bridge is making rapid progress. The arch nearest the Middlesex shore is in place; the piers and abutments are worthy of observation. Here we take leave of the reader, hoping that the new street from Blackfriars to the Mansion House, the demolitions for which we have passed in our saunterings more than once, will be worthy of the metropolis, and that the intersections of the principal streets may be adorned with suitable buildings. In laying out a city the corners of the streets are the strong points! Let us, at least, hope that in Cannon-street and the Poultry we may have nothing to deplore in that particular.

SYMBOLISM.—IV.

THE idea in architectural symbolism being that it should be a monitor and instructor, it were too much to expect that in the earliest buildings erected by man, it should, even in its barest rudiments, be called into play. These buildings were for shelter simply, and, as substitutes for the caves, rocks, and overhanging trees, the natural haunts of the troglodytes, were doubtless of the plainest description. Their plan and outline, if at all the fruit of design, were such as were suggested by convenience. Their materials were the readiest to hand. The theory has been commonly held that the Gothic style, in its pillared aisles and groined ceilings, is imitative of the forest avenue with its interlacing branches overhead, amid which heathen and even Christian worship was once celebrated; and the same plea has now and then been suggested for the Classic peristyle. But, not to say that Gothic in all its features is comparatively recent, that the Greek pillar in its plainest form was borrowed from Egypt or Assyria, and that the special imitation here claimed is not properly of the nature of symbolism, we may confidently conclude that the use of pillars instead of massed material as a support for the roof is more consistently explainable in another way.

For the Assyrian and Egyptian architecture, in its great constructional outlines, no symbolism is claimed. The Egyptian pillar, which the Doric in its simplest state almost literally copies, was itself, in all probability, a descendant of the plain wooden post—for the most primitive erections were of wood; and all pillars, Egyptian, Grecian, Roman, and Gothic, have descended from this parentage. The wooden post itself had its prototype in the growing tree, and the first roof its prototype in the spreading branches and foliage which gave protection from sun and rain.

But the groining of a Gothic roof has a history which excludes the idea of nature-copying. The practice of spanning the area of a building with an arch of masonry for roof had its birth at a date anterior to the Gothic arch; and it was found that the semicircular Roman arch, by reason of the great power of its lateral thrust, was inconvenient, expensive, and dangerous. The next step would seem to be the adoption of the transverse semicircular arch, which divided the roof tunnel in the line of its length, economised power and material, distributed and gave various balancing directions to lateral thrust, and presented, in the intersection of the arches, the first specimens of groined work, and, as some will say, the first specimens also of the Pointed arch. It was only needful that the Pointed arch should be substituted for the Roman further to increase strength, economise material, diminish the stress on the wall, and at the same time offer scope for the development of elaborate groining, such as is witnessed in Westminster Abbey. The resemblance to an avenue of trees, at best most imperfect, is simply accidental; the real reason is one of construction. We fear, therefore, that pillaring, arching, and groining possess nothing of a designedly imitative, to say nothing of a symbolical nature.

The plan of the transept Gothic church is of course highly symbolic and meant to be so. The form of the cross, long used in personal and interior architectural decoration, was here with exquisite appropriateness observed in the very foundations, as well as in the whole superstructure of the church, giving a happy variety of outline to the otherwise too uniform roof and lateral walls, and a great addition of constructional strength. It was probably this last consideration of augmented strength, where the transept walls more than supply the place of the most massive buttresses, which led the old architects, as in Salisbury Cathedral, to depart from the simple plan of the cross by introducing two transepts. In this particular instance utility and effect were more studied than literal adherence even to the sacred emblem of the faith.

The imagination has often sought, and not without success, for some symbolic meaning in that chief feature of a complete Gothic church—the spire. Must not an erection so aspiring and so beautiful have been intended to be suggestive of the mounting upwards of the worshipping mind to the skies? The whole service within tends to carry thought and heart heavenward; religion itself came thence, and conducts thither. What more natural, therefore, than that the spire, mounted on tower, gradually tapering and losing itself in mid-air, should have been intended to be symbolic? Beautiful fitnesses, even great discoveries, have been supplied unintentionally. So it has been here. The sharp Gothic roof was no doubt designed to cast off rain and snow in a northern climate. The Gothic spire is simply an exaggerated form of the pointed roof, and its germ is found in the pyramidal roof of the campanile. This at first was comparatively depressed, as still seen in some of the very ancient churches of Germany, but it by degrees became more and more sharpened, until at last, in obedience partly to the idea of beauty and partly to that of utility—for it served to inform at a distance of the locality of the Christian temple—it assumed the dimensions of the finely pointed spire. The fact that very old structures, as at Thun, in France, at Gelnhausen, in Hesse, Worms, and other places in the Rhine country, are of this low pyramidal description, and that the high slender spire proper is certainly of a much later date, should satisfy us as to the historical growth of the structure, whatever the difficulty in tracing the different steps of progress. The loftiest spires carry up with them all the features of the turret roof; the oldest frequently are four-sided, like the roof. They have their gablets and dormer windows like the roof—in some cases, as at Lichfield Cathedral, these lucarned openings are carried up in successive stages, and little windows are sometimes seen piercing the spire into light open work all the way up to the finial—a graceful feature especially prevalent in the churches of Britanny, as, *ex gr.*, in the splendid cathedrals of St. Pol de Leon and Quimper.

On the whole, the symbolical intent ascribed to the Gothic spire must regretfully yield to a more commonplace origin—that, namely, which contemplates the æsthetic and the useful. Piety, however, has the right, now that the structure is a recognised fact, to clothe it with whatever attributes of an ideal kind it pleases, if thereby its own edification is promoted.

As to general plan, structures, whether civil or religious, in the Classic styles, do not seem to have any symbolic meaning in them. They were simply quadrangular or circular areas for certain uses, protected and supported by walls, with projections supported by pillars, in the shape of porticoes and arcades, to afford a cooling retreat from the sun. As already remarked, we cannot say that the pillars themselves were really imitative of nature, although probably copied in the first wooden structures from trees. The real reason why walls, which themselves are the chief supports of buildings, are ornamented with pillars and pilasters, which as such are no support, is that they formed an essential portion of Greek architecture, and that we, in borrowing the whole, have borrowed these its comely parts. They *represent* nothing. In a multitude of cases they support nothing. A plain wall would answer the same purpose. But they are graceful to the eye; they relieve by variety what would otherwise be monotonous surface; they have venerable associations, and belong to a past which we, with all our genius, education, and civilisation, are conscious we cannot, in this particular of stone-massing, outrun or surpass; and so they live, and are worshipped, although elements of a style unsuited to our climate and to the exigencies of our social and public life.

DOING WORK BY PIECEMEAL.

"NEVER do things by halves," is one of our standard national mottoes, and if it be regarded as a dereliction of duty to manage business in this manner, what must be thought of carrying on work by piecemeal? Yet we are, as a people, very prone to execute work in a lazy, dilatory style, instead of bringing the greatest possible amount of energy and activity to bear upon the job in hand. The repainting of Westminster Bridge furnishes us with a case in point. It is about six weeks since operations were first commenced upon the arch nearest the Middlesex shore, and at present the fourth arch is barely completed. At this rate, by the time the whole bridge is painted, it will be necessary to begin again, as the first arch will be in the same state as it was previously to repainting. Even now it has a dingy appearance in comparison with the one most recently painted. It is a lamentable sight for a frequent passenger in the boats to witness day after day half-a-dozen men or so patching away at one solitary arch, instead of six out of the seven being occupied simultaneously by a gang of men, and the whole painting completed in as many days as it will take weeks to accomplish. One might almost imagine that the contractor intended making a perpetual job of it, and had calculated with mathematical precision the exact period it would require for the portion of the structure first repainted to become dirty again, and had thus timed the duration of the process to suit. By these means he would succeed in making the bridge "evergreen."

From the bridge we naturally find our attention directed to the new landing-places, particularly that situated in its immediate vicinity. For weeks this particular example has been allowed to lie idle, although the sheds and ticket boxes have been long since completed. There it floats, rising and falling with the advancing and receding tide, in every sense a veritable "dummy." The wrought-iron bowstring girders, intended for connecting the piers with the shore, still occupy their old uncomfortable-looking position, where they appear to be so balanced as to be ready to drop down at the slightest touch. With respect to these girders it is difficult to imagine why there should be so enormous an amount of material in them.

Instead of being designed for the traffic of foot passengers one would imagine they were intended for railway purposes. The sectional area of the angle-iron diagonal bars is sufficient for a girder of three times the depth. In fact, as these girders are on the bowstring principle, with the loading on the lower flange, and altogether transferred to the upper flange or bow by the vertical double angle-irons, there is little or no strain upon the diagonals.* This is one of the distinguishing features of the bowstring girder compared with the regular Warren or lattice type. There is very little doubt that the footway from Westminster Bridge to the Temple was opened a little too soon. It would have been a preferable plan to have completed the landing piers, their connection with the shore, and the approaches, and finished the paving and lighting before throwing the path open to the public. As it is, it has been one continual scene of unloading flags, riveting up girders, laying down pavement, and putting up hoarding ever since the premature inauguration, to the great annoyance and discomfort of the passers-by. There appears to have been a complete want of system in the management of these various works, and the patchwork principle has demonstrated itself strongly. The little episode of the Metropolitan Board of Works and the railway company waiting for each other, and thus occasioning much delay, reminds one of the notorious "Flushing expedition," which gave rise to the following stanza :—

> The Earl of Chatham, with his sword drawn,
> Stood waiting for Sir Richard Strachn ;
> Sir Richard, longing to be at 'em,
> Stood waiting for the Earl of Chatham.

While upon this subject it might be asked what is intended to be done with the long piece of earthen slope in the neighbourhood of Westminster landing pier. Those who have walked along the path are aware that at a short distance from the bridge the pathway becomes divided, the portion nearest the river wall running downwards to the landing-place, and the other portion rising towards the bridge. Consequently, there is a slope extending from the upper pathway to the lower, the height of which varies from nothing at the junction or division of the pathway to its maximum height, when it reaches the steps leading to the pier. At present this slope consists of earth, and presents a most unsightly and incongruous appearance, its dirty colour contrasting strongly with the light tint of the massive granite walls it is surrounded by. Are trees to be planted on it, or is it to be hidden by a wall of some kind ? Failing everything else, we would suggest that, as the contractor for painting the bridge has his hand in, he might give it a good coat of colour. It will require some time yet to observe how the paving of so large an area of made ground will answer, but there is one point that demands attention, and that is the drainage of the footpath on the south side of the river. The water lies in large pools upon it after every heavy shower, which results from the circumstance that the path is not sloped off similarly to its fellow on the opposite shore, but is nearly on a dead level.

* We find since this article was written that the new Westminster pier was at last opened to the public about two days ago.—Ed. B. N,

NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

THE twelfth annual congress of this association opened on Wednesday week, at Birmingham, under the presidency of Lord Carnarvon. The meeting has been of more than average interest, some of the papers read in the various sections being of great value.

POLLUTION OF RIVERS.

In Section III. (Health), on Saturday last, Mr. Rawlinson read a paper on "River Obstructions and Pollutions by Manufactories." He said the growth of trade and commerce and the increase of river pollutions had been simultaneous. Was this necessary ? The area of England and Wales was about 50,380 square miles, or 32,243,200 acres. He divided England into east, north, and west. On the eastern side there were 22 rivers having a combined area of 27,000 square miles: south, 12 rivers, and 5,000 square miles ; west, 22 rivers, and 18,400 square miles. The Aire and Calder, having a combined area of 794 square miles, were the seat of the woollen and worsted trades. The Mersey and Irwell were the seat of the cotton trade. The greatest volume of pollution proceeded from the former, the reason being that wool required washing and cleansing. Rivers were obstructed by mining and iron-making operations, as millions of tons of solids were tipped into the adjoining streams to be removed by floods, to the serious injury of property below. Ashes from steam boilers were thrown into streams and rivers by hundreds of thousands of tons per annum. The pollution of the Yorkshire and Lancashire waters by manufacturers had in some districts proceeded so far as to have limited any extension of the trade, and the increase of pollutions towards the sources of streams had destroyed trade below, as water could not now be obtained for either washing or dyeing. Towns polluted rivers and streams by sewage, which, added to refuse from manufactories, made a compound "thick and slab," scarcely coming within the meaning of the word fluid. The remedy for river obstructions and pollutions must be national. Conservancy boards must be established, one which shall be official and general, others which shall be especial and local. There may be a subdivision of large river areas and a combination of small river areas. Conserving action should have no county, parish, township, or municipal restrictions as to boundaries. The casting into rivers and streams of all solids should be strictly prohibited. All works liable to obstruct streams and rivers should be under the jurisdiction of river conservators. Trade pollutions should be as far as practicable prevented. Refuse was usually useful material in the wrong place. There was no refuse from gas-making which was not commercially valuable. Much that was now termed refuse in manufactories, print works, dye works, chemical works, &c, might probably be found to be valuable. Town sewage was proved to be valuable when used in agriculture. One main restriction might at once be general and imperative—viz., solids must not, as now, be cast into running waters and rivers.

THE DRAINAGE AND SANITARY CONDITION OF BIRMINGHAM.

Mr. Brooke Smith read a paper on "The Disposal of the Sewage of Birmingham." The chief points in Mr. Smith's paper are contained in that read by Mr. Fowler. Mr. Smith describes with some minuteness the sewage works at Saltley.

Mr. W. Fowler, jun., read a paper on "The Sewage of Birmingham." The sewage is discharged by two main sewers into the Tame at Saltley. The total dry weather flow is about 18,000,000 gallons per day, from 10,000,000 to 11,000,000 gallons of which pass along the River Rea main. These sewers were opened about 1853. At that time the Tame was comparatively pure, but when the sewers were opened, it became and has continued a pestilent, foul, and abominable nuisance, injurious to health, and offensive alike to the sense of sight and smell. In consequence of some legal proceedings the corporation constructed large filtering tanks, and made a branch to the canal, to carry away the mud eliminated from the sewage. The process of pumping the soft mud direct from the tanks into the canal boats was, however, found to be practically impossible, because the mud in that condition could not be made available for manure, and the farmers could not deal with it until it had hardened. This mud was now being removed at the rate of about ten boatloads per week, and sold at the price of 20s. per boat to the farmers. Opinions varied as to its value, but Mr. Fowler's father had used it for several years with apparent benefit. The filtering process was ultimately abandoned as a failure, and the tanks are now only used as subsiding tanks. The condition of the Tame had been rendered less odious, but an indescribably horrible stench was emitted from the half-dried mud during removal. The inhabitants have long endured this without seeking redress, thinking that the nuisance was only temporary, but the time has arrived when united and determined action must be taken. Mr. Fowler gave instances of the deterioration of property and of the injury to health caused by these works. The recent experimental irrigation at Saltley, undertaken by the Public Works Committee, was a step in the right direction, though the land was too limited to develope the full capabilities of the soil as a means of purifying the sewage. The primary object in dealing with town sewage should be to purify the streams ; the secondary object to utilise the sewage. At least 1,000 acres of land would be required to deal effectually with the sewage of Birmingham. A sufficient quantity of suitable land might be found in the valley of the Tame. It would be rather costly, and the necessary works would require a large additional outlay; but the undertaking might be made to pay its way, or very nearly so ; and even should it prove otherwise—if the existing system of sewage was to be maintained—no other method of dealing with the sewage was practicable. The whole modern system of sewerage was in his (Mr. Fowler's) judgment a fatal blunder, adopted in a moment of national panic, and had not only entailed upon the country the most useless and wasteful expenditure which had, perhaps, ever been incurred in the pursuit of a fallacious theory, but had at the same time involved the wanton waste and destruction of fertilising elements of untold and incalculable value.

Mr. Thomas L. Plant read a paper on the public health of Birmingham. In ordinary seasons Birmingham was pre-eminent for salubrity over every other large town in the kingdom ; but during periods of high temperature and drought, Birmingham has suffered much greater mortality than other healthy towns. In the summers of 1867-68, the death rate of Birmingham advanced 30 and 50 per cent. beyond the previous quarters ; whereas in the same periods the mortality in London was raised very little, and in Bristol the public health had improved, instead of having declined. Referring to the water question, Mr. Plant suggested that it was no proof that the drinking waters had nothing to do with the bad health last summer, on the mere argument that the public have been drinking the same water at other seasons, or on the ground that the health of the borough has since improved, for the quantity of water drank in hot weather is considerably larger than under circumstances of moderate temperature. A sample of water of the Birmingham Waterworks Company, drawn direct from the main, was found by Mr. Alfred Bird to contain 5½ grains of organic matter in the gallon. Another specimen of water, drawn from a pump in Northwood-street, was found to contain less than one-eighth part of a grain of organic matter in the gallon. Here were two specimens of the waters in Birmingham, the company's containing forty-four times more organic impurity than the other.

In the discussion which followed,

Mr. Holland (Government Inspector) said he did not believe that the whole difficulty had arisen from the water-closet system. If they had no water-closets at all they would have two-thirds of nasty and useless fluid to dispose of instead of three-thirds of more nasty but useful fluid. Birmingham was in a most favourable position for disposing of its sewage if the authorities would boldly face the difficulty, and go far enough out. One of the causes of the impurity was the middens and privies with which Birmingham was covered.

Mr. Alfred Bird said that after analysing the company's specimen he drew a sample of the company's water in his own establishment, and on comparing it with that brought by Mr. Plant, he found that it was totally different. The company's water was purity itself compared with that brought by Mr. Plant. He wrote to Mr. Plant pointing out the difference in the waters, and suggested that Mr. Plant should collect six specimens of the company's water from different parts of the town, which he would analyse. Mr. Plant, however, was satisfied with the previous analysis. As an analytical chemist Mr. Bird urged that he would not publicly adopt the report of an analysis of any water unless he had collected the samples himself. Knowing that the water varied in different parts of the town Mr. Plant ought to have accepted his offer.

Mr. Rawlinson said it was quite possible to draw different samples of water from waterworks mains in any town, and yet it should be one and the same water, but under different conditions. If an engineer were not careful to arrange his mains so that there should be a constant level current through all the mains—if there were what were

called "dead ends," the purest water would be found to be foul and stinking. The samples spoken of might have been fairly drawn, but had not been drawn under proper conditions.

Dr. Farr said that Mr. Bird was not responsible for an analysis of the water supplied by the company, but it was Mr. Plant who was responsible for the collection. It was Mr. Plant who brought the charge, if any, against the company.

Dr. Alfred Hill, the borough analyst, said he was in the habit of analysing the company's water. Taking the average of thirty-one months, the total solid matter in an imperial gallon of water was a little over 30 grains, and the average of volatile combustible matter—commonly called organic matter—was 2·6. At different periods the water varied very much.

Mr. Clayton described a visit to the courts off Snow-hill, Slaney-street, Weaman-street, Potter-street, London 'Prentice-street, and other streets in that neighbourhood, and said that anything more disgraceful could not be imagined. The places visited were taken indiscriminately. The stench in some places was unbearable. There were reeking cesspits, the ashes flowing over into the courts, and privies without any seats to them. Let the Mayor inspect these places, and then say that an officer of health was not needed in Birmingham. They went into Balloon-street, where the ashpits not only overflowed, but extended halfway across the court before they were emptied. This was not merely a specimen of to-day, for twenty-five years ago the same state of things existed. A greater curse had never been brought into a town than the present system of sewerage in Birmingham. They had a long line of sewerage without a single ventilating shaft from beginning to end. Mr. Clayton strongly condemned the untrapped drains communicating with the main sewer, thus bringing pestilence into every house.

Dr. M'Adam (Edinburgh) said an inspection of some of the lowest localities in Birmingham did not impress him that Birmingham was worse in respect of cleansing and drainage than Edinburgh or Glasgow.

The Mayor of Birmingham said that the municipal authorities in various large towns, and particularly in Birmingham, had so far grappled with the subject that the duration of life in this country was increasing. In Birmingham £200,000 had been expended on their sanitary system within twenty-five years. It was now contemplated to dispose of the sewage, and 140 acres of land had been taken for that purpose. So far the result had been highly successful. At present it was only an experimental trial, but, if found as satisfactory as anticipated, the system would be largely extended. In disposing of the sewage, it must be remembered that there was a River Commission, and that the occupiers of land surrounding the town watched with vigilant care lest their health and comfort should be interfered with. At the present time there was an injunction in force to prevent the council from taking the sewage into the river. As to the shaft system for the sewers, what were they to do, except to take the gases into the open air, endangering the lives of the inhabitants?

Dr. Foster, on the question of scavengering, said that in London and Bristol scavengering was carried out in a most complete manner, and these were the two healthiest towns in England.

Mr. Rawlinson, in reply, first addressed himself to the question of trapping private drains, and applying ventilating shafts to the public sewers, strongly contending that it was foolish prejudice which prevented men having the public sewers ventilated into the streets, and yet allowed gases to accumulate and to permeate their own dwellings, causing incalculable mischief, disease, and death. Let them look at London, where the sewers were ventilated into the streets by thousands of shafts, and yet its death-rate was lower than any other town. Just in proportion as the sewerage system had been extended and the ventilation had been neglected, so had the death-rate in certain towns increased. It was the stupidity of people, who would not be taught what they were to do. They would not ventilate and let out the gas. His conclusions were practical and general. They were that excess of disease in the human being was not in the climate, the locality, the atmosphere, the water, or the change of seasons—these were the excuses; but it was within the four walls of their dwelling. He strongly urged the appointment of medical health officers, and that they should make themselves thoroughly acquainted with sanitary science.

Mr. Plant, in reply, said he did not comply with Mr. Bird's request to select six specimens of water, because if they had contained less organic matter, it would not have been a less fair test for the community than by taking a single specimen; and if they had contained more it would have been unfair to the company.

The President (Dr. Farr) closed the discussion. He said it appeared to him that the water supply of Birmingham was not satisfactory, and it might be well worth the consideration of the authorities of Birmingham to ascertain how they could get Birmingham supplied with water of the best quality. With regard to the drainage, they naturally looked to the large towns for something like a true solution of this difficulty. The only remedy appeared to him to get all these offensive matters upon the land, where they would be sources of fertility and wealth to the country.

In Section IV (Economy and Trade.) on Monday last, the question for discussion was, "In what manner can arbitration and conciliation be best applied in the settlement of disputes between employers and employed?" Mr. Mundella, of Nottingham, read an elaborate paper on

ARBITRATION IN TRADE DISPUTES.

Mr. Mundella, having briefly reviewed the rise, progress, and action of trades' unions, asked, Is it not desirable that some better means should be devised to arrive at the market value of wages than such barbarous expedients as strikes? "Strikes are to the social world what wars are to the political world. They become crimes unless they are prompted by absolute necessity." These are the words of Mr. Geo. Odger, one of the most intelligent trades' unionists of this country. The idea of Courts of Arbitration and of Conciliation, as a means of settling trade disputes, is by no means a new one. Such courts were established by law in France in 1806, and have been, with some modifications, continued to the present time, under the name of *Conseils des prud'hommes*. Their functions extend to every question that can arise in manufactures and trade, *except that of fixing a rate of wages*, which, however, when agreed upon between employer and employed, they can enforce. It must be borne in mind that these councils, having no power to fix a rate of wages, can only be appealed to for the termination of disputes; they can exercise no influence to prevent their arising. Also, that the right of combination has only been conceded in France so recently as May, 1864. During 1867, a bill was introduced by Lord St. Leonards for the establishment of "Equitable Councils of Conciliation." That bill now forms a part of the statutes of the realm; but Mr. Mundella does not anticipate from it those happy results for which its author hopes. So far as the scope of the act admits it may be useful, but only in the same degree as the "Conseils des Prud'hommes," for it is specially provided that nothing in the act "shall authorise the said council to establish a rate of wages or price of workmanship at which the workmen shall in future be paid." Its action can only be retrospective, and as no remedy can be effectual which does not provide for a future rate of wages, and as such future rate must entirely depend upon the mutual agreement of masters and workmen, and as such agreement can only result from a good understanding between the parties, it is not to legislation but to the good sense and good feeling of both that we must look for the effectual remedy. He had no faith in any arbitration by persons uniformed and uninterested in the particular trade they arbitrate for. Arbitration, to be effective in preventing disputes, must be the result of a system of open friendly bargaining in which masters and men may meet together and talk over their common affairs, openly and freely. Mr. Mundella then traced the circumstances which led to the formation of the Nottingham Board of Arbitration, and illustrated its operation, and the specific advantages derived from it. For 150 years before the formation of the local board the history of the Nottingham wrought-hosiery and lace manufactures is a history of contention, lawlessness, and crime. From 1710 to 1820 frame-breaking, rioting, and outrages against person and property were of constant recurrence. This deplorable state of things arose from disputes about wages and opposition to improved machinery. The progress of these improvements was for many years delayed by that opposition, and twenty to thirty years of the greatest depression and suffering accrued therefrom to the hand-frame knitters; and the amendment of their condition and their subsequent elevation were only effected by those very improvements in machinery which they had blindly and persistently done all in their power to retard. From 1820 to 1860 offences against persons and property diminished, but combinations were better organised and strikes increased. The workmen generally regarded their employers as their natural enemies, and the cupidity and oppression of some gave countenance to this idea. After a strike of ten or eleven weeks in one branch, in the autumn of 1860, the Board of Arbitration and Conciliation was originated. This was the third strike in the same branch that year. The branches of the trade not on strike supported this one in its resistance. After many weeks the manufacturers assembled to consider what steps should be taken to bring the strike to an end. There seemed to be a general feeling that there were but two courses open—either to submit to the demands of the workmen, or to stop all other branches, and to lock up the factories in order to deprive the men on strike of the support which had been afforded them. Happily there were some present at that meeting who, wearied with the constant strife and shocked at the social mischiefs accruing therefrom, suggested that conciliatory means should be tried. After much discussion the workmen were invited to meet the masters, and endeavour to come to some arrangement. This invitation was accepted, long discussions followed, and the strike was settled by mutual concession. But they did more than this. Determined to make an effort to prevent difficulties in the future, the Conference passed the following resolution:—"It is further agreed that, in order to prevent a recurrence of strikes, which have been so disastrous to employers and employed, and to protect the mutual interests of both master and workmen, a board of arbitration be at once formed, to consist of six manufacturers and six operatives, to which all questions relating to the wages of labour shall be referred. The decision of the said Board to be final and binding on all parties." This was signed by both parties. The workmen immediately elected their representatives by the universal suffrage of the members of their unions. The manufacturers called a general meeting of their own body and elected theirs. The number finally agreed upon was nine from each class, and on the 3rd December, 1860, these eighteen persons met together to carry out the proposed scheme. The first deliberations took place under great difficulties. There were no rules or precedents to guide them. Many of the manufacturers and workmen regarded the scheme with ridicule and distrust. As, however, about two-thirds of the employers were induced to give it a trial, and as the more intelligent of the workmen were of the same mind, they persevered. He did not say that the rules by which they had been governed were models of unerring sagacity; but he did say, for the encouragement of all those who desire to achieve the like happy results, that, judging from past experience, wherever men meet together with the honest desire to arrive at the truth and to do justice to each other, a good understanding is almost sure to follow. At the first meeting a president and vice president were elected, and a committee appointed to draw up rules. With mutual courtesy, the working men proposed a manufacturer as president and the masters a workman as vice-president, and this precedent has ever since been followed. The rules were produced at a subsequent meeting, and they have remained unaltered to this time. They are exceedingly simple and brief. In their progress they encountered difficulties, and made mistakes; but having steadily kept one object in view—that object the adjustment of all questions relating to wages in a friendly and amicable spirit—they had succeeded in conquering them all. They have had instances where employers have acted contrary to the decisions of the board, and two where workmen have refused to accept those decisions; but the steady adherence of the majority of both parties to their decrees had always, sooner or later, brought the recalcitrants back. And the Nottingham Board now governs the hosiery trade of Nottinghamshire, Derbyshire, and the north of Leicestershire, including Loughborough, and the number of persons employed in these districts cannot be less than 60,000. The number employed in the hosiery and lace trades, which are now under the same system, exceeds 100,000 persons. The articles manufactured in

the hosiery trade are exceedingly numerous and varied in character. All work is paid for by the piece. Since the foundation of the Board, all variations in prices, up or down, have been referred to it. The simple fact is, that the employers, who represent the buyers of labour, and the workmen, who represent the sellers of labour, sit down together and mutually bargain what price shall be paid for the commodity. It is very rare that the price originally proposed by either party is the price ultimately agreed to. Alterations or concessions are generally made on both sides, and the price once fixed is considered mutually binding. In order that no hasty decisions may be made against either party, a month's notice must be given before any change of prices can be discussed. Owing to the variable character of the trade, small differences and disputes are constantly arising. All such questions are, in the first instance, referred to a committee of inquiry, and are generally there settled. Should the committee not be able to agree, however, they are finally adjusted by the Board itself. When a question had been fully discussed, and they had not been unanimous, they had always said, "Don't let us vote; let us try to agree," and by mutual concession they had never left a meeting without having first agreed. Mr. Mundella's experience as president of this board for nearly eight years convinced him that nothing is more conducive to the success of a trade and the growth of kindly feelings amongst all parties engaged in it, than the existence of such a representative and legislative body as the one described. If the workmen of any branch conceive that they have grievances to complain of, a delegation may attend the board, in addition to the ordinary representatives of that branch, and lay the case before it. The Board had never met without settling at least half-a-dozen questions, which, if allowed to remain open, would produce irritation, and sometimes lead to strikes. The levy to the trades' union, which averaged 1s. to 1s. 6d. per week, and every farthing of which went in fighting the masters, is now only 1s. a year in several of the unions, for the needful expenses of the Board of Arbitration, the payment of the trade secretary and the delegates. The balance is saved to the workman, and is equivalent to a considerable advance of wages, without costing the master or the consumer one farthing. But, whatever may have been the material gain to all classes, the moral gain has been beyond all computation. The lace trade, which, if possible, has had a more embittered past than the hosiery trade, was the first to follow the example. They adopted the same rules, but appointed a retired manufacturer as umpire, in case of an equal vote, and they have worked through a busy time with marvellous success, and without once requiring the services of the referee. Boards are established at Leicester, two at Bradford, in the south of Scotland, in Derby, and several other places, and during the past month have been organised for the entire pottery district, for various trades in Manchester, and for the building trades of Exeter and Nottingham. In the last case only two employers out of more than 150 had withheld their signature. But what is of more importance, the great mining associations of South Lancashire, South Yorkshire, and the whole of Scotland, have given in their adhesion to this principle, and are prepared to meet their employers and arrange for bringing it into practical operation. Lord Elcho, the Earl of Lichfield, and other members of the Royal Commission invited him (Mr. Mundella), two months ago, to meet a number of the largest employers and leading trade unionists, with a view to forming an association to extend voluntary courts of arbitration throughout the kingdom. There is great work to be done, and work which will amply repay the labour and self-sacrifice it demands. Mr. Rupert Kettle has for three or four years worked in the same direction with great success. He has established courts at Wolverhampton, Leeds, and various other places, on a similar principle to those Mr. Mundella had described, except that he avails himself of the provisions of the 13th section of the 5th of George IV., cap. 96, which gives powers to enforce the decisions of Courts of Arbitration. Mr. Mundella did not pretend to say that the Nottingham plan is better than Mr. Kettle's; but having worked for eight years without having felt the need for the compulsory clause his sympathies are in favour of the voluntary system, more especially as Mr. Kettle has not found it necessary to have recourse in a single instance to compulsion; and if it were resorted to it would tend to destroy that harmonious feeling which the working of the plan has induced. Strikes have frequently arisen from mere misunderstandings, where hardly any money value is involved on either side. Sometimes it is the uncouth and dictatorial manner in which a reasonable demand has been made, and at others, the arbitrary refusal to listen to a courteous request, which has involved the parties in contention, and once in the heat of conflict the matter in dispute is forgotten in the strife for mastery. All this, however, is avoided where a properly constituted body meets at stated intervals to exchange ideas in friendly and courteous intercourse. Mr. Mundella did not advocate arbitration to the exclusion of other remedial measures, such as co-operation and industrial partnerships. But before these can be adopted a good understanding must have been brought about between masters and men, and arbitration may be introduced where they are difficult or impracticable.

On Wednesday, the concluding day of the meeting, several papers were read on the question of "Arbitration and Conciliation in the Settlement of Disputes between Employers and Employed." In addition to the papers read, the section was favoured by a statement, by Mr. Rupert Kettle, of Wolverhampton, as to the operation of the plan adopted in his district, which holds in reserve the power of appeal to law as a final means of enforcing the decision of a court of arbitration. The debate was continued with great vigour and ability. Special arrangements having been made to admit working men into the meeting, the section had the advantage of receiving information from varied classes. The section was very clearly in favour of the plans proposed by Mr. Mundella, and were averse to the introduction of legal measures for the enforcement of the decisions of the courts.

CEMETERY CHAPELS, BIGGLESWADE.

THE designs for these chapels are by Messrs. J. Ladds and J. M. Hooker, and were selected in open competition from about twenty other sets sent in. The chapels, lodge, fence, walls, and railing are being carried out by Mr. Howe and Mr. Twelvetrees, of Biggleswade. The contract price is £815. The materials used are white bricks, with Bath stone heads and sills to windows, and stone copings, with a few red brick bands and arches. The spire is 85ft. to top of vane, and each chapel will seat thirty-five persons.

THE ARCHITECTURAL ALLIANCE.

WE have received from the secretary a report of the meeting of the Alliance, held on the 2nd of July last, at 8, Montague-street, Russell-square, Mr. T. Roger Smith in the chair. In 1867, as our readers are aware, the meeting fell through in consequence of the absence of most of the delegates. From the report read this year we find that eight associations are in union with the Alliance, delegates from six of which were present at the meeting. It was resolved that in future the annual meeting should be held in the first fortnight in May instead of in July as at present.

The subject next considered was Mr. Hine's paper, proposing that the quantities should form part of the basis of contract as much as plans and specification, and that the architect should be responsible for them whether prepared by himself or by his surveyor, respecting which, after some discussion, it was resolved:—"That inasmuch as the bills of quantities are now generally tacitly received as the basis of builders' contracts in the settlement of their accounts, in the opinion of this meeting it would be more just, both to client and builder, as well as more satisfactory to architects, were the bills of quantities formally recognised as part of the contract."

A deputation from the General Builders' Association attended to propose that their society and the London Builders' should meet a committee of the Alliance and the Institute for the purpose of drawing up a model contract, and it was resolved:—"That the Alliance appoint their office-bearers as a committee to hear the representations of the General Builders' Association, and, in conjunction with any other bodies who may be interested, to endeavour to come to some agreement on the subjects submitted for consideration, and to report to the Alliance at its next meeting, or to the constituent societies at an earlier period."

Mr. Plevin's form of contract was then considered, and a resolution from the London Architectural Association against the scheme reported by Mr. R. P. Spiers, and it was resolved that the matter should not be discussed at that meeting. Mr. T. R. Smith, F.I.B.A., was elected president, Mr. T. C. Hine, vice-president, and Mr. T. M. Rickman, F.S.A., A.I.B.A., secretary for the ensuing year. A memorandum was then read by Mr. R. P. Spiers on "Architectural Education," recommending the issue of circulars to the various societies asking for information as to the facilities now existing for architectural education. This it was resolved to do, and the thanks of the meeting having been voted to the chairman the proceedings terminated.

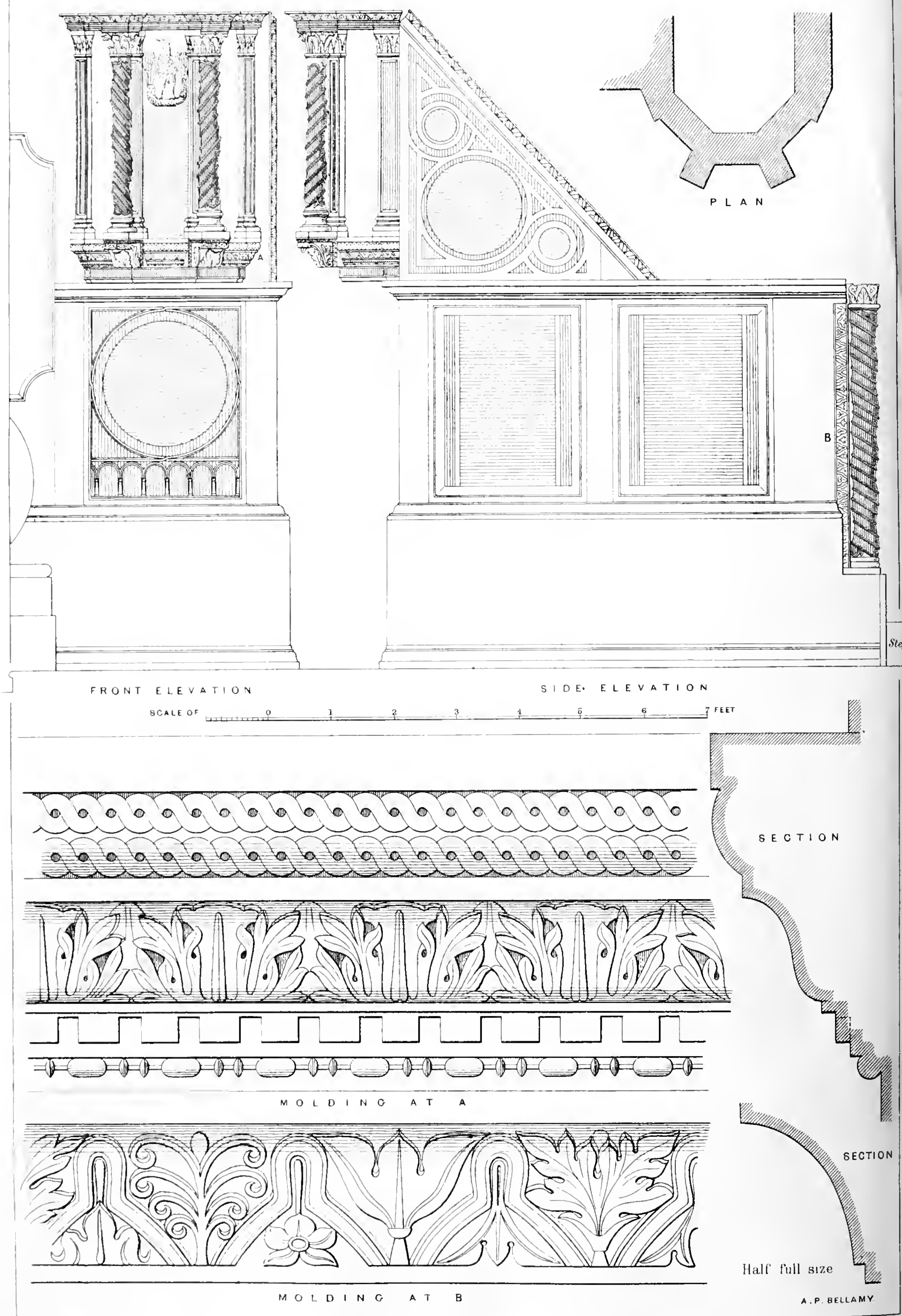
BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

IT is not quite two years since this infant institution was inaugurated by Alderman William Lawrence, M.P., at the public meeting held at the Bridge House Hotel, and on Monday evening last its success as a trade institution was established by the election of two pensioners on the Relief Fund. The chair was taken at 7·30 p.m., at a general meeting of the subscribers and donors at the offices, 14, Bedford-row, by Mr. S. J. Thacker, of the firm of Messrs. Holland and Hannen, and Thomas Stirling and Henry Earle, Esq., and Mr. Alfred Harris having volunteered to be scrutineers, the poll was opened. The result can be seen in our advertisement columns. Although so short a time has elapsed since its foundation, yet so well have the committee upheld the principles with which they started, and so confidently do they look forward to the future, that the election of Monday last may be looked upon as only an instalment of future successes. Throughout their probation the committee have been encouraged by the earnest example and presence at their meetings of their president, William Henshaw, Esq., who sent a letter regretting his inability to attend on this occasion. Although this is the first election and the first public success, it is not the first use that has been made of the funds, a grant having been made a short time ago to the widow of a builder's clerk, who was in urgent distress in consequence of his sudden death. The committee are now busily canvassing for votes for the next election at the Orphan Working School, Haverstock-hill, on behalf of one of the children of Mrs. King, one of the pensioners elected on Monday, and who is left with nine children unprovided for. Proxies will be most thankfully received by any of the committee, or by the secretary, at 14, Bedford-row.

The committee hope that their endeavours to get the institution at work previous to issuing their second annual report will meet with the approval of their trade friends and the public, who they hope will second their endeavours to promote the objects of the institution.

A committee of influential local gentlemen at West Cowes have formed themselves into a company for the purpose of building sea water baths at West Cowes, Isle of Wight, who state in their prospectus that, "in consequence of circumstances having arisen to cause the immediate removal of part of the bathing machines, and the remainder having to be removed at the end of the present season, it has become imperatively necessary that some other bathing accommodation for the visitors and residents should be provided." A site admirably suited for the purpose has been secured at the west part of the town immediately fronting the Solent, upon which they intend forthwith to erect baths of a superior description, the design being made with a view to future extension as occasion may demand. Advertisements have been issued to builders requiring tenders for the proposed works, and the directors purpose to complete the building in time for the bathing season of next year. In making this improvement to their town the directors of the West Cowes Sea Bathing Company appear to be actuated more by the laudable desire of supplying a long-felt want, and of increasing the attractiveness of the place, than by the anticipation of realising large dividends, although there can be little doubt, with sound management, the speculation will be a commercial success.

AMBONE S. MARIA IN ARACOELI ROME.



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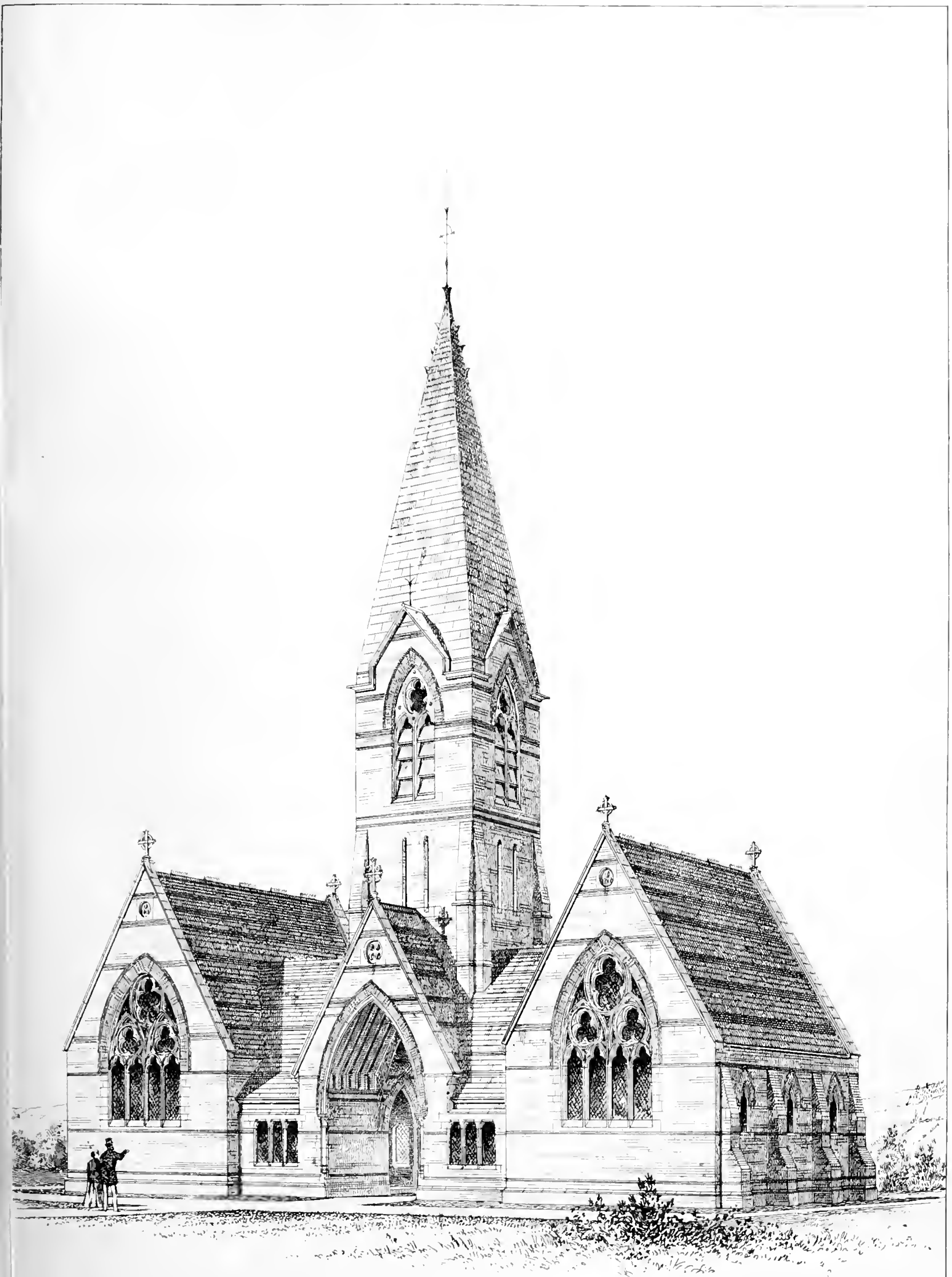

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Cemetery · Chapels, Biggleswade. — J. LADDS AND J. M. HOOKER, ARCHTS.

AMBONE, ST. MARIA, IN ARACŒLI, ROME.

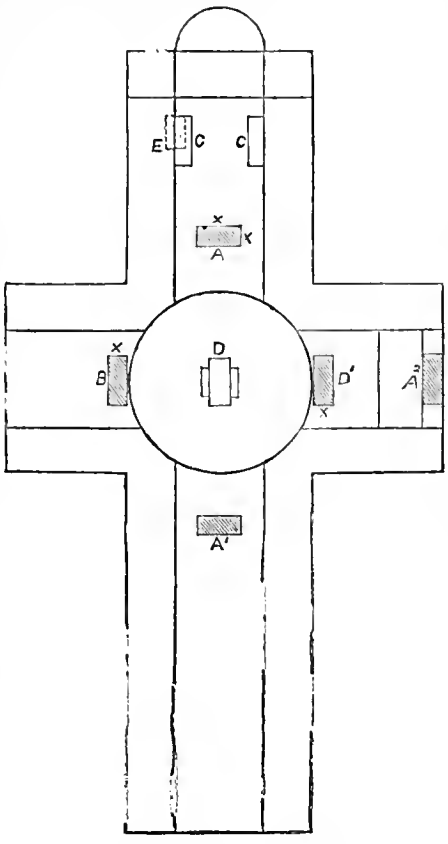
THE church of St. Maria, in Aracœli, in Rome, from which this ambone is taken, occupies the place of a former temple of Juno Moneta, and is situated on the Capitolium, ranking among the oldest and most interesting churches in the Holy City, being A.D. 980, dedicated to the worship of the Virgin.

There are two ambones at the angles of the intersection of the nave and transepts, this one being far the finer of the two, the material being white marble inlaid with mosaic, the prevailing colours being neutral tint, red, and gold. The circular panel, and one above it, in the front view, and the two oblong and large circular panels at the side, are of porphyry, the intervals between the billets round the twisted columns being also of mosaic. The two small circles at the side are of "verde antico." A few details of the carving which adorns it are given, the whole being the work of Laurentius and Jacobus Cosmas. A. P. B.

ST. PAUL'S, ITS QUOIR AND ORGAN.

NOT much excitement, it is to be feared, is to be got out of the merely temporary improvement of a cathedral organ, and many readers perhaps soon weary of so dull a subject; but when it is recollected that all our great cathedral churches are now at this present moment in a rapid state of change and transformation from what remained of their original state to one more suited, as it is supposed, to the present order of things both religious and architectural, it may be there are those who will be inclined to get over this weariness, and to think it well worth while to read and read on till our temples and their organs are in very truth restored, or safely left as they are—Westminster and St. Paul's restored, York Minster left peacefully as it is! Right gladly would I have said something on the nature and effect of the new "stops," tried for the first time last Sunday, now added to the Abbey organ, but it must be left to another opportunity, for the skill of the organist is such that he may *compel* them—the new "stops"—to blend with the *old* organ! In a few weeks we shall both see and hear, for these things take time to do.

In the meantime there is St. Paul's Cathedral to be entered, and, as I think, to be stared at with simple-minded and dumb amazement; no kind of language, however concentrated or diluted, can be expected to do even feeble justice to the work done or now doing in it. St. Paul's is perhaps the best—certainly the most complete—building of which great London can boast. The material of it is real *inside* as well as outside; it stands in the middle of this metropolis of the world, will remain, according to Lord Macaulay, after everything else is gone into lath and plaster rubbish, and is dedicated to the very noblest of human purposes, and has that within it which no other building in England possesses, so that it is well worth a little talking about and thoughtful consideration. We may at starting usefully call to mind a very singular fact connected with churches in these days, viz., that no one has yet proposed to "restore" (in the Gothic sense) any *Renaissance* building. No one has proposed to restore St. Bride's, Fleet-street, or St. James's, Piccadilly, or St. Paul's Cathedral. No one has proposed to found a society for the purpose of doing with all these buildings that which has been done for Westminster, and the Temple Church, and the still more unfortunate St. Bartholomew's, Smithfield. Why not? They are all of them better fitted for their present uses, and far more in harmony with the spirit of the times than the Gothic churches are. It is strange that this subject has not received some little attention; it is well worth it, and might have perchance saved some of the already destroyed or doomed City churches. But our present business is with St. Paul's, its organ and its quoir arrangements. We have added a rough block plan of the cathedral in order that the arrangements may be



BLOCK PLAN OF ST. PAUL'S.

perfectly and clearly understood—so much better than mere descriptions, however accurate.

First, then, it is to be understood that the great architect of this building would never, had he had his own way, have designed such a structure for "reformed" or Protestant uses at all. His mind was of too plain and practical a character for it. All Wren's buildings show that he began always by first asking himself and those for whom he worked what was wanted to be done in the proposed building? and how was it to be done? Thus in the first model of St. Paul's (now in the South Kensington Museum) the whole structure is designed with the intent that it should all of it be utilised and made available for the purposes of "prayer and preaching," but the existing structure is designed and modelled purely on Roman Catholic principles and the Roman ritual—indeed, just as much so as Westminster Abbey itself, and more so than St. Peter's at Rome. The whole of the east end of the church, with the exception of the aisles, is (or rather was before the absurd alterations) screened in closely by the stalls, two admirable iron gates (now, I suppose, destroyed) across which enrtains were drawn, and westward, close to the dome, by the rood screen or organ screen—indeed, as will be readily seen, precisely the same as at Westminster Abbey. This is very curious, as showing how powerfully the Catholic idea influenced the minds of men even in Wren's time. It is quite evident that there was but one idea in their minds as to what a cathedral and metropolitan church should be like, and Wren was compelled to bow to this idea whether right or wrong. Thus not more than a twentieth part of the whole building could be made available for "services." But one thing was accomplished which raised St. Paul's above every other building in England, perhaps in the world, viz., this, that the organ or rood screen, on which Wren was wise enough to boldly place the organ, stood in the best of all possible positions; it could not stand in a better for the effect of *sound*. Whatever the loss and inconvenience experienced in Wren's day from the fact of his being compelled to follow out the arrangements of a bygone time, certain it is that in placing the organ screen and organ where they were (A in the annexed rough block plan) he accomplished accidentally a musical feat perhaps never before equalled. The reader will observe that the screen on which the organ stands (or rather did stand, for both screen and organ are gone) is built immediately between the two westernmost arches of the sanctuary, as we have ventured to call it, the organ standing exactly in the middle of it, and that it is consequently at some little distance from the edge of the dome. I know nothing of mathematical acoustics, now so common an object of study, neither did Wren; but I feel quite sure that were the organ placed right under the dome or even midway between the central eastern supporting arch of it, the musical effect would have suffered, for the sound now has some little distance to travel before reaching the dome, in which and under which the whole of the wonderful effect manifests, or rather did manifest itself. If we imagine for a moment the air as it passes through and out of the pipes of the organ to be coloured, or that visible smoke instead of air passes, we shall readily see how the sounding air comports itself, and what it does, and where it goes, and how in the end it vibrates and trembles in the domical space and dies out or slowly falls into the great nave. The sound and musical effect of all this when the full organ ceased and a full chord of many pipes closed, leaving the vibrating air to do the work, was the very grandest of the very many of which music can so proudly boast. It would be easy to adduce a multitude of instances wherein this most beautiful effect was audible to all, but it would lead us too far into detail; but I cannot deny myself the satisfaction of instancing one special case wherein this triumphant musical feat did its work completely. It has never been heard in Westminster Abbey, for under the incubus of a "Precentor," it happens to be one of the expurgated. I refer to the anthem "The Heavens are telling," from the "Creation," one of Haydn's most happy thoughts, and especially to the close of it, the last two final bars, after the vocal part has ceased; the grand chords are separated by "rests," so that there is a measurable interval between each of the four chords which finish the composition; the notes are short, and thus it is that there is in these short notes and in the intervals between them the opportunity of displaying alike the powers of the instrument and the skill and vigour of the organist, and, what is to our present purpose, the marvellous result of placing the material instrument where its powers can be fully and perfectly manifested. If the hearer of this grand anthem has to thank the composer for having given him so rich a pleasure, it is equally certain that the composer himself might well have thanked the builder of the organ and the architect of the cathedral for having added to his musical thought that which he could never have expressed on his written page.* But, alas! this and so much else is at an end, for the spirit of modern improvement and alteration and "opening out" has been at work, and most thoroughly and effectually destroyed it and all human possibility of repeating it, for now

* I have thus ventured to instance this single effect of the power of a musical instrument when added to what is got from its position in a building, and the form, dimensions, and character of such a building as St Paul's, not because it was a solitary effect, or even an instance of the most useful one produced when the organ stood in its old place, but because it is enough to establish an important and hitherto unnoticed principle in church building, viz., that the *building is a part of the organ*, and the organ a part of the building. I might have said a great deal more, but when I simply add that in the old arrangement, when the organ was at A, the sound from it after the pipes were closed *always* filled the dome and the whole building, it will be admitted that the loss sustained is infinite.

the organ is put away well nigh out of sight and packed between the two piers of the sanctuary (E in the plan), the end arch being "opened out." It is impossible even to imagine a worse position for a large organ to occupy than that now taken up by this organ in St. Paul's, both musically and architecturally; for it will readily be seen that the instrument is literally packed in between the two massive piers, the top of it touching the arch over them, and the bottom of it actually *sunk* beneath the stalls, with the keys below the level of the singers in the quoir, so that the organist himself is literally buried alive! The dull stupidity of all this can surely never be surpassed. Of course the sound is fairly buried with him, not indeed as it would be if coming up from the vaults beneath, but as if packed up in straw and shavings. Fortunately this organ-moving mania is not like ordinary "restoration." *Restoration*, as it is commonly understood, is simply another name for *destruction*, but this organ-moving improvement is remediable, and the time will surely and certainly come when this organ at St. Paul's will be "restored," together with the screen on which it once stood, to the position where the architect of the cathedral and the voice of antiquity so judiciously and happily placed it. It is obviously impossible in a few sentences to do justice to so important a subject as this. Volumes have been written about St. Paul's, and engravings without number made of it, but we are now engaged with the *building* itself, and hope to be able to show that not only was the removal of the organ from its old place a fatal mistake, both musically and architecturally, but that an infinitely better arrangement for the "services" might have been obviously designed. C. B. A.

CLELAND AND MID-CALDER RAILWAY.—COMPLETION OF THE WEST-CALDER CONTRACT.

In a few months hence the Caledonian Railway system will embrace an additional line of something like thirty miles long, and one which cannot fail to prove a highly remunerative connection, while it will become the shortest existing railway route between Edinburgh and Glasgow. The two contracts, West-Calder and Dykehead, forming the Cleland and Mid-Calder Railway, are now both rapidly approaching towards completion. In length the West-Calder contract exceeds twelve miles and a quarter, commencing at the Oakbank Junction, on the present main-line near Mid-Calder, and terminating in the moss of Longford. This contract also includes a branch loop-line, which diverges from the main section at Limefield, traverses in a circuitous direction through various coal and shale works, and again forms a junction with the main section at the termination of the contract. On the above contract are seven large viaducts, upwards of thirty-one span bridges, various arched culverts, as also numerous heavy cuttings and embankments. The whole line is calculated immensely to improve the districts through which it passes. Emerging from the main system of the Caledonian Railway the new line passes through an exceedingly thriving agricultural and grazing district in the western division of Mid-Lothian, pursues its course among the rich mineral fields situate in the north of West-Lothian, and terminates near Hollytown, on the main line, in Lanarkshire. The few remaining portions of the works yet to be completed are being vigorously proceeded with under the superintendence of the eminent contractor, Mr. John Waddell, of Bathgate; the engineers for the company being Messrs. Blyth, of Edinburgh, while the engineering interests of Mr. Waddell are very satisfactorily conducted by Messrs. W. Robertson and Henry Cochrane.

WARMING BUILDINGS BY HOT WATER.

We have recently inspected a house warmed entirely by the improved hot-water apparatus of J. L. Bacon and Co. It was expressly built to demonstrate the efficacy of the principle of warming and ventilating by hot water, and to prove that the absence of fireplaces and chimney breasts and the presence of the pipes were perfectly compatible with all the requirements of comfort and good taste. A difference exists between Bacon's system and some others that are in use. The former employs wrought-iron pipes of a comparatively small diameter, not exceeding 1¼in., whereas a larger size is commonly employed. Upon the whole we give the preference to the smaller size for several reasons. They are more manageable, and can be bent and manipulated with greater facility. They also possess the great merit of allowing the temperature to be regulated with greater precision. They moreover, to use a technical phrase, enable "steam to be got up" within a much less period, and are therefore better adapted for the heating of bath rooms, conservatories, and other special apartments which do not require the maintenance of a constant y warm temperature. But the especial advantages claimed by Bacon and Co. are the impossibility of the temperature of the pipes exceeding a certain limit, and the perfect facility with which the temperature can be regulated by means of stopcocks in every *separate* apartment in the house. This delicate adjustment of the temperature is carried out by the use of coils or of branches, according to the superficial area to be warmed. We may consider this a little in detail. In the first place it is clear that the larger the area to be heated the greater must be the heating surface—that is, the greater the number of pipes. We may easily imagine an area of dimensions so limited that a single pipe laid around it would suffice for heating it to the desired temperature. But this would constitute a very exceptional case, and it is, therefore, the practice to increase the heating surface by arranging a coil or coils of pipes, which are connected with the main pipe, so to call it. Let us suppose now that the hot water is circulating throughout the coil, and, consequently, the temperature of the room at a certain corresponding height, and that it is desirable to lower it; by turning a handle, which acts upon the stopcock, the current of hot water is shut off from the coil and diverted into the main channel, by which it is conducted away. The heating surface being thus diminished, while the area remains constant, the temperature at once becomes lowered. When it is required to raise the temperature again, the handle is reversed and the current directed through the coil, which it traverses and heats before re-entering and passing off by the main channel.

In rooms of limited dimensions, where so large a heating surface as a coil may not be required, the same effect is produced by the introduction of what is termed a branch. It is nothing more than an additional length of pipe branching out of the main pipe, carried for a certain distance parallel to it, and finally rejoining it. By means of the stopcock this additional heating surface can be called into play or cut off from the current of circulation at pleasure. This arrangement is very ingenious, and the simplicity of its action can only be fully appreciated by those who have witnessed it, as we have done, in actual working order. There is no difficulty in laying the pipes in any existing dwelling. They may be placed along the wainscoting, coiled up in pedestals, or laid under the floor, and carried by the joists. In the house we visited, and to which we have already alluded, they were placed behind the skirting, which was of open trellis work, and had a very ornamental and pleasing effect. Mr. Bacon estimates that the highest temperature to which it is possible for his pipes to be raised is about 260 deg. Fah., which effectually prevents all chance of the ignition of wood or other substances by contact with them, even if they were placed in contact, which they are not. Professional men and the faculty generally have long since agreed in pronouncing the practice of partial warming, which is adopted in all houses where open fireplaces are used, as vicious and unhealthy, and especially prejudicial to the weak and infirm. Can anything be more absurd than to have a sitting room heated to a temperature of between 70 deg. and 80 deg., and the adjoining passages and ante-rooms indicating a degree or two below freezing point? Many people object to a fire in a bedroom, unless demanded through sickness, because it is alleged to be unhealthy, but the fact is that it is not the fire that is in itself unhealthy, but the ventilation being defective, it becomes so of necessity. It is a customary plan in many houses to have a stove in the entrance hall, but with this accessory, and with fires in every room in the house, it would nevertheless be impossible to ensure that uniformity of temperature which can alone be procured by the constant circulation of a heated liquid current. A certain length of piping, a small furnace either of brickwork or iron as may be most convenient, a limited supply of coal, coke, or wood fuel, and the casual attendance of an ordinary servant, are all that are wanted to adapt the hot water principle to any present or future dwelling or building. Messrs. Bacon and Co. have applied their principle to several palaces, churches, manufactories, and public offices, from the owners and occupiers of which they have received testimonials of indubitable authenticity.

ENGINE FOUNDATIONS.

That a firm superstructure is essential to the proper working of stationary engines is well known, but it does not follow that this knowledge is always used to good purpose. Circumstances arise, indeed, only too often, under which the securing of a good foundation by any ordinary arrangement is out of the question; and the engineer who lacks the experience and ability required to deal successfully with such cases never fails to disappoint his employers. Not many years since the various portions of an engine were always kept distinct from each other. Thus, a great beam was carried on side walls in no way connected with the cylinder; while the fly wheel was supported on plummer blocks absolutely independent of the rest of the machine. As a consequence, the easy working of the machine depended on the absolute and relative stability of different portions of the structure of the foundation, and the sinking or yielding of any one portion disarranged all the rest. To obviate such results large sums were expended on the construction of foundations for even small engines. If the ground were bad, piles were driven and excavations made to great depths, and the expenditure thus incurred very often succeeded the price of the machine proper. The introduction of self-contained horizontal engines did much to make matters better, but there is still plenty of room for improvement.

Under ordinary conditions a heavy base plate of cast iron bolted on stone blocks answers very well; but it is not certain that under any circumstances such a combination of stone and iron leaves nothing to be desired. If the engine be large, no single stone block can be obtained of proper dimensions, but when two or more are used there is always the chance of irregular settlement and consequent distortion of the machinery to be considered. The plan answers well enough where the ground is good; where it is bad it does not answer at all, or very imperfectly. To say that it is possible to design any one form of foundation which will be applicable to every type of engine under all circumstances is simple nonsense. The engineer must deal with his difficulties as they arise, and he can hope for no assistance from books, because books take no cognisance of engine foundations other than the stone or brickwork blocks ordinarily employed.

A case lately came under our notice where it is proposed to erect a steam engine to drive a rolling mill in conjunction with a water wheel. The only available place for the engine is immediately over the canal leading the water to the wheel. Under such circumstances it is manifestly impossible to erect any foundations whatever in the ordinary sense of the term. Stone blocks and cast-iron foundations are equally inapplicable. It is therefore proposed to carry the engine on two wrought-iron girders spanning the canal and firmly bedded at each end, and it is beyond question that the expedient will answer perfectly if the girders are made strong enough and the fly wheel carefully balanced.

It is to such applications of wrought iron that we wish to direct attention. By the aid of girders of this material engines can be carried as safely on an upper story as on a ground floor, and under any circumstances the weight and strain of the machinery can be transmitted across treacherous ground to solid foundations. A very ingenious application of the principle came under our observation some months since. An eminent firm of engineers in Kent had occasion to construct some heavy machinery for pumping out a dock. The circumstances were such that the cost of the pumping machinery was reduced to a minimum. The system of construction adopted was very simple and efficient. Two long and deep wrought-iron lattice girders were secured some 6ft. or 8ft. apart by cross girders, the space between being

great enough to admit a three-throw crank giving motion to three large pumps. Two steam cylinders were bolted, one on the top flange of each girder, and the girders also carried the crank shaft fitted with a pinion gearing into a spur wheel on the pump crank shaft. So far the whole was self contained, and ready to be put down at a moment's notice. When in place, the ends of the girder furthest from the engine and carrying the pump crank shaft projected over the dock wall. The pumps were supported on a stage below, and no special foundations of any kind were required, the girders distributing the weight of the machinery over a large surface.

In the application of this principle of distribution by the aid of girders consists the best method of dealing with these exceptionally difficult cases, which present themselves now and then to the mechanical engineer. As a rule, it is a mistake to spend money in piling and excavating and putting in brick and concrete piers to great depths. When very heavy pumping machinery, such as that at Abbey Mills or Crossness, has to be erected, the case is different, and although the use of girders may aid the engineer, they will not enable him to dispense in such exceptional cases even partially with deep and solid foundations. But generally speaking, it will be found that by combining horizontal engines with wrought-iron girders costly foundations may be rendered unnecessary although engines of very considerable power are employed. It is impossible to lay down any particular rule to be followed in carrying out this principle. Its success or its failure must depend on the tact, skill, and experience of the engineer. —*The Engineer.*

ARCHITECTURAL SOCIETIES.

The annual meeting of the Students' Class of the Manchester Architectural Association was held on Monday week, at the society's rooms, Lord's Chambers, Corporation-street. There was a good attendance, and much interest was evinced in the proceedings. The secretary's and treasurer's reports were passed, the latter showing a balance in favour of the society. Mr. Alley, jun., treasurer, and Mr. W. H. M. Ward, secretary, were re-elected, and Mr. Redford, A.I.B.A., was made the president, in lieu of Mr. Battye, who retired. The society has been in operation some time and has worked satisfactorily. It seeks to educate students in architecture in branches not ordinarily learnt in office routine. The construction class is held on Monday evenings under the supervision of Mr. Battye; the free-hand drawing class on Friday evening, directed by Mr. Redford; and the water-colour class on Saturday afternoon by Mr. Bagot.

The session of the Liverpool Architectural and Archæological Society commenced on Wednesday evening last with the president's inangural address. The subject for the students' competition this session will be a design for a row of ten 7 yard street houses of three stories; general plan and general design of the front to a scale of 10ft. to 1in.; the front of one house (with section of front wall) to be shown in a coloured elevation to a scale of 5ft. to 1in., with plans of each floor to the same scale. The materials to be restricted to bricks, tiles, and terra cotta. The drawings to be sent in to the council on or before Wednesday, February 3, 1869. The president also offers a prize of two guineas to the student members for the best "Study of Architectural Effect in combination with Landscape," the size of the drawing to be about 16in. by 10in.; the method of execution at the discretion of the competitors. The drawings to be sent in to the council on or before Wednesday, April 14, 1869.

The members of the architectural society of the Archdeaconry of Northampton held their annual meeting on Tuesday last. The report was read at the public meeting in the Townhall, Northampton, after which Sir Henry Dryden read a paper on "The Megalithic Monuments of Brittany." In the afternoon excursions were made to Queen Eleanor's Cross, and to a number of churches in the neighbourhood south and west of Northampton. Another public meeting was held in the townhall in the evening. Amongst the papers read were one on "Symbolism," by the Rev. G. Ayliffe Poole, and one on "The Use of Colour in the Ornamentation of Churches," by the Rev. F. Sutton.

The fourth and last general excursion of the Architectural and Archæological Society of Durham and Northumberland for the present year was held on the 24th ult., at Hamsterley and Witton Castle. Amongst the objects to which attention was drawn were the remains of an old Roman road running from the high end of Witton-le-Wear to a ford in the river below Hamsterley. On reaching Hamsterley the church was visited. The church is cruciform on plan, and consists of nave, chancel, north and south transepts, south porch, and modern vestry on north side of chancel. The whole edifice has been so much altered and defaced that it is very difficult to tell with certainty the dates of the different parts. The earliest portion is the south door or nave, which is Norman. Leaving the church, the party was conducted over Witton Castle. The ancient portion of the Castle forms a square, three sides being formed by a lofty embattled wall, and the greater part of the fourth side being occupied by the keep. The keep was erected by Lord William Eure, baron of Witton, in 1544, and presents the general features of the better class of pile towers so frequently met with in Durham and Northumberland. No trace remains of the chapel, but it is supposed to have stood on the south side of the keep. The new buildings erected by the present owner harmonise well with the ancient structure. At the entrance to the porch are placed two very beautiful early cross slabs, found on the site of Witton-le-Wear station, the railway cutting through what appears to have been an ancient Christian cemetery. After being entertained at dinner by H. Chaytor, Esq., the occupant of the castle, and several new members having been elected, the members of the society returned by rail to Bishop Auckland.

ARCHÆOLOGY.

A short time ago, says a correspondent of a Dublin paper, a number of articles of great antiquity were recovered from the bottom of a lake about three miles from Tullamore. There is an old tradition to the effect that there is a house at the bottom of a particular portion of the lake; and as, during the recent protracted drought, the water became very low, a search was instituted, and a dwelling, in a tolerable state of preservation, was discovered. There were found in it some plated armour, some old urns and daggers of a primitive make. Some of the articles bear inscriptions, which, however, have not yet been deciphered.

WATER SUPPLY AND SANITARY MATTERS.

The prospectus has been issued of a new Limited Liability Company for supplying Shoreham with water. The supply is proposed to be taken from a spring in the neighbourhood. The capital is fixed at £5,000. Mr. Wilson is the company's engineer.

A movement has been set on foot in Walton le dale and the surrounding neighbourhood having for its object the formation of a company for supplying the township with water. A spring has been discovered in the neighbourhood, and if the water (samples of which are now being analysed by Dr Farrol, of the medical department of the Privy Council) should prove suitable, the works will be at once commenced.

The *Medical Times and Gazette* hopes that the statement by Professor Frankland, in the Registrar General's weekly return, of the extreme impurity of the Southwark water will be inquired into by the Metropolitan Board of Works, or the Privy Council, or other authority. The total solid impurities in this water in September are said to have been as 39 parts in 100,000, against an average of 24 in the other Thames Water Companies. Moreover, it is said that much of the impurity was due to common salt. Had some Thames water from between bridges found its way into the reservoir?

Building Intelligence.

CHURCHES AND CHAPELS.

Lillington Church, Leamington, was reopened on Tuesday week. A new south side aisle has been added, the chancel arch has been widened, and an open stained roof has been substituted for the flat one in the chancel. The total cost has been £1,000, and the work has been executed by Mr. W. Ballord, of Lillington.

An encaustic painting by Mr. Cave Thomas, representing the dead Christ, was yesterday fixed in its position in the frieze of the cornice over the communion table in Christ Church, Marylebone. The crucified figure is seen nailed to the cross, extended on the top of an ideal Calvary, where angels, hovering, contemplate the wounds in feet and hands. For force of drawing, symbolical propriety, and local effectiveness this picture is said to deserve comparison rather with the works of French or German mural painters than with the few and unimportant attempts which have been displayed of late years on the walls of English churches.

St. Paul's Church, Clifton, was consecrated on Tuesday week. It is a re-erection of the building, which, it will be remembered, was destroyed in December last. With the exception of the outer walls, the tower, the spire, and the vestry, the church was wholly destroyed. Very few features of the old edifice are reproduced in the new one. The nave and chancel have been lengthened, and the roof of the chancel has been raised, and a new chancel arch, 40ft. high, has been erected, with shafts of red Mansfield stone. The shafts of the pillars supporting the nave arcade spring from moulded and carved bases standing clear of the seats, thus throwing the shafts into bold relief. In the windows, Geometric tracery has been substituted for Flamboyant. There is a richly panelled and carved reredos at the back of the altar. The panels have a ground of gold enriched with a red and blue diaper pattern, and they extend right across the chancel. Sculptured angels holding scrolls with illuminated texts appear above the panels, and a carved cornice of natural foliage completes the reredos, which is surmounted by a stone arcade with polished marble shafts and carved capitals. Messrs. Hansom and Son are the architects. The cost has been £6,000.

All Saints' Church, Scarborough, was consecrated by the Archbishop of the province on Friday last. The plan consists of nave, chancel, and south aisle, and the building is constructed mainly of red brick with sandstone dressings. Accommodation is provided for 900 adults, at a cost of about £4,000. Mr. G. F. Bodley, of London, is the architect, and Mr. J. Barry, of Scarborough, the contractor.

On Michaelmas day the church of St. Michael, Sopley, near Christ Church, Hants, was reopened, after restoration. The building is a cruciform church of Early English date, with Perpendicular alterations. The chancel has been renovated, the circular ceiling in the nave, which concealed a very fine Tudor roof, has been removed, the walls, stone pillars, and arches have been cleansed from many years' accumulation of plaster and whitewash, a new floor raised throughout, and the high old-fashioned pews replaced by open deal seats, stained and varnished. The work has been carried out from designs by Mr. E. Ferrey, by Mr. J. Tanner, of Sopley.

We learn that it is proposed to restore a portion of Tintagel Church, Cornwall—the north transept—in memory of the late Mr. John Douglas Cook, of the *Saturday Review*, who, by his own request, was buried there. The restoration (comprising a painted window "in memoriam") will be effected by his personal and literary friends.

Christ Church, Bessbrook, Co. Down, was consecrated on Tuesday by the Lord Primate. It is built in the Early English style, and comprises nave, north and south transepts, chancel, and tower. There are ten windows filled with stained glass, two of them being memorials.

The reopening of the Roman Catholic Church at Market Rasen took place on the 24th ult. The additions and alterations have been such as have left scarcely any trace of the old buildings, so that it may be called a new church. The architects were Messrs. Hadfield and Son, of Sheffield. The church consists of a nave and north and south aisles. The south aisle is terminated by a tower of the "saddleback" description, rising to a height of more than 70ft. It is crowned by a stone crucifix. At the east end, over the Lady altar, is a window representing the angel Gabriel appearing to the Virgin, from the works of Messrs. Lavers, Barraud, and Westlake, of London.

A new Wesleyan Chapel was opened at Ossett, Yorkshire, on Thursday week. The style is Classic, somewhat freely treated. The plan is a parallelogram, 90ft. long by 60ft. wide, the roof being in one span. The cost was about £4,500. Mr. Holton, of Dewsbury, was the architect.

On Wednesday week the foundation stone of a new Presbyterian Church was laid at Derby. The style is thirteenth century English Gothic, and accommodation is provided for 500 persons. The building comprises nave, side aisles, vestry, heating chamber, and other offices. The external walling will be of white Coxbeach stone, and the window tracery will be of Hollington stone. The pewing is of picked red deal, stained and varnished. The cost has been £2,150. Messrs. T. and H. Herbert, of Leicester, are the contractors, and Mr. J. Tait, of Leicester, is the architect.

On Friday last the new church of St. Augustine, Hagley-road, Birmingham, was consecrated by the Lord Bishop of Worcester. The design of the building is by Mr. J. A. Chatwin, architect; the builder is Mr. Partridge; and the whole of the sculpture is the work of Mr. John Roddis, of Birmingham. The exterior of the building is of Bath stone, with bands of Hamstead and plinth of Darley Dale stone; and the interior is faced with grey Bromsgrove stone. It is proposed to have a spire 230ft. high, the foundation for which is already built. The church will accommodate some 720 persons, and consists of nave, two side aisles, transepts, chancel, choir, and minister's vestry, organ chamber, and west porch. The centre window of the apse is filled in with stained glass, by Messrs. Hardman and Co; the subject is the "Crucifixion."

The foundation stone of a new Jewish Synagogue, to be built and endowed by Mr. Simon Magnus, merchant, Chatham, was laid by that gentleman on Monday last at Rochester. The building and house adjacent for the residence of the Rabbi form an extensive frontage in the High-street. The new synagogue will be from drawings of H. M. Collins, Esq., Queen-street, London, under whose superintendence the buildings are in course of construction by J. G. Naylar, builder, Rochester, and, with the sum appropriated for endowment, will cost £7,000.

BUILDINGS.

The guardians of St. Pancras have accepted the tender of Mr. Henshaw for the erection of their new infirmary at Highgate, for the sum of £36,000. They have also accepted Mr. R. Mann's tender for the erection of their new schools at Leavesden, Woodside, near Watford, for £37,545. Both buildings have been designed by and will be carried out under the direction of Messrs. Giles and Biven, architects.

On Saturday week the foundation stone of a new co-operative store and public hall was laid at Rawtenstall. The walls will be cased with pitch-faced coursed wall stone, relieved with moulded strings of dressed Longridge stone. Messrs. Maxwell and Tuke, of Bury, are the architects, their plans being selected in a limited competition. Mr. James Roberts, of Rawtenstall, is the principal contractor. The cost will be upwards of £6,000.

The second of the series of four relief offices assigned for the parish of St. Pancras has been opened. The first, in Compton-place, has already been described in these columns. The new offices are situated in Leighton-road, Kentish-town, and comprise apartments for the resident superintendent, coal and fuel stores, waiting room, committee room, relief room, bread room, labour yards, stone-breaking sheds, store rooms, oakum-picking sheds, and superintendent's offices. Mr. F. C. Robins, of Southampton-street, Strand, is the architect, and Messrs. Thomas and Sons the contractors. The cost has been nearly £2,000.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—H. L. G.—J. N.—M. and Co.—P. and Co. —C. S. J.—J. B.—J. W. (Cowes).—J. F. and Son.—J. T. —E. W.—J. F.—C. B. A.—T. C.—T. R. (with report).—J. Potts.—J. Gibbs (shall stand over till next week)—S. T. —J. L.—W. W.—C. S.—H. C.—G. G. H.—R. B.—W. H. M.

Correspondence.

BUILDING SOCIETIES.

To the Editor of the Building News.

Sir,—"Fair and Square," whose letter appeared in your issue of the 2nd inst., is, I think, scarcely entitled to the designation he has assumed. Though admitting himself "not sufficiently experienced," he makes observations unfavourable to building societies, and this he does from an acquaintance with *one* "prospectus" only. Would it not be better for "Fair and Square" to reserve his strictures until he is well informed, particularly as he avows himself "an advocate for building societies in principle?" "Fair and Square" also "*believes* that some societies pay less in professional fees than they charge," and this he denounces by the hard word "deception." If what "Fair and Square" "believes" should turn out to be true it is not intimated on whom "deception" is practised. If a borrower agrees to pay a certain sum for legal and survey fees to a society, and in consequence that sum is one-fifth or perhaps one-tenth of the amount usually charged, the arrangement made by the society with their professional officers can be no concern of his, while the professional gentlemen are surely able to take care of themselves. It does not seem clear, then, to whom the hard word "deception" is applicable.

As "Fair and Square" announces himself "an advocate for building societies" it is to be hoped that before he again addresses you he will thoroughly master the subject. If his lucubrations will bear the stamp of candour and intelligence he will merit the title he has taken, and even the thanks of all interested, and especially those of your obedient servant, A Director.

October 5.

Sir,—I am afraid you will think it time that this correspondence should cease, but before closing it I must beg the favour of space for one or two observations on the letters in your last impression.

I could almost be angry with "Fair and Square" for turning the tables on "A Director," whom I looked upon as my best friend in the controversy. His little plea for the societies was so *very* modest that it is with a kind of regret one sees it disturbed. With your correspondent "B. B." I have no contention. The society he refers to as willing to accept £36 per annum for 10½ years in repayment of a loan of £300—something *under* 5 per cent. on the annual balances of the principal—must satisfy the most exacting and scrupulous of borrowers. If he will kindly furnish me with the rules and particulars of the society he alludes to he will do me a service, and I will gratefully reimburse any charges he may be put to.

I might take exception to the tone of the last letter from "S. S." He says I am unfair in introducing the extract I gave last week, that it does not truly represent the working of the societies, and that it tends to mystify the discussion. I reply that the extract in question was cut from the prospectus of the Birkbeck Society, which is one of the best known of any; that it was reproduced in an article in "Once a Week," which adopted it as an exemplification of the principles of the societies in whose advocacy the article was written; and that it is, I submit, a clear and intelligible statement of that principle. Whether it mystifies the discussion I leave to your readers to say; it was inserted for a directly contrary purpose, and because I saw how inconvenient it was to argue on hypothetical illustrations. My question, "Do landlords reap, &c.," follows directly from a consideration of the principle there enunciated.

I have not the *Daily News* to refer to, but I am not clear that your correspondent is right in saying that Mr. Denton was referring to freehold houses. He was speaking of building operations in towns generally, and these, we know, are for the most part on leasehold tenures; besides, he speaks of the principal being repaid during the "period of duration," which seems to make for my view of the case.

After all, "S. S." must excuse me if I claim him as a convert. In his letter of the 22nd ult., he endeavoured to show that, by the aid of a building society, a house rented at £36 per annum could be purchased at a saving of £250. Now he says that a house yielding the average or a satisfactory return of profit can be so obtained by a tenant "without sustaining any pecuniary loss!"—I am, &c., E. Ingress Bell.

October 5.

Sir,—I have read with much interest the correspondence on this question, and with your leave I should like to ask your correspondents if they can explain why the "Temperance Land and Building Societies" can only afford to pay *depositors* 4 per cent. per annum, and require one month's notice to withdraw sums not exceeding £100, while the "Birkbeck Building and Land Society" pay their depositors 5 per cent. per annum, and all sums under £50 are repayable upon demand. I have for many years taken great interest in these societies, and would recommend all members of land and building societies to cut out the letters now appearing from week to week in your paper, and paste them in a book, as I am doing, for future reference. A Depositor.

THE WESTMINSTER ABBEY ORGAN.

Sir,—Being in a position to know thoroughly the organ at Westminster Abbey, will you kindly allow me a little space in your valuable journal to correct some of the errors of your correspondent "C. B. A.," respecting that instrument?

Firstly, then, in the notice of September 11, he says that there are a few pipes in the middle. I presume by that is meant the choir (called by "C. B. A." quoir) organ, which contains six stops, and is in itself a complete organ. Next comes "the final and fatal blunder" (to use "C. B. A.'s" expression), the swell organ. Here your correspondent falls into a great error, as the swell organ at Westminster Abbey is justly famed for its effectiveness. Previous to the dividing of the organ, I believe that the swell box did not open towards the nave, but towards the choir. The comparison of the old and new swell organ is perfectly ridiculous. Further on your correspondent says, "having got the new trumpet, and rid of the old one, which some may remember with dismay." To prevent any misunderstanding it may be as well to say that no trumpet stop has been taken out of the organ, but that of late it had unfortunately been the custom on special occasions to have the addition of a "cornet à piston." Probably this was the dismal old trumpet "C. B. A." alludes to.

Now we come to the September 25th number. Your correspondent here tells us that the whole series of pipes on the "two fronts of this Abbey organ" and the front of the choir organ are "shams." Out of the twenty-four front pipes of the great organ (that on the north side) the ten large ones and the three at the east side are speaking pipes. Five in one of the front small group speak, and the other group forms the door. The seven on the west side are "shams." The whole of the choir organ front are also speaking pipes. The front pipes on the south side of the nave are all "shams," as all the pipes of this organ are enclosed in a box, this being the swell organ. These also are not "wooden cylinders," but metal pipes. Next we come to the "pedal organ." It is well known that this part of the organ is exceedingly effective, the effect being not in the least destroyed by the horizontal position of the pipes—in fact, they are far superior to many 32ft stops that stand in a perpendicular position. I will here refer your correspondent to the work of Hopkins and Rimbault (a work quoted by "C. B. A."), where h will find that Mr. Hopkins speaks in more than one place most favourably of this pedal organ.

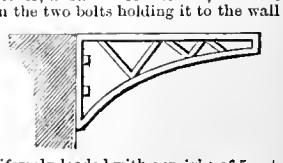
In conclusion, I cannot help remarking that I think it would have been well worth "C. B. A.'s" while to have made himself thoroughly acquainted with the instrument and positive facts, before committing such erroneous statements to paper. —I am, &c., C. S. J.

Intercommunication.

QUESTIONS.

[1052.]—EPICYCLOIDAL CURVE.—Would some of your numerous correspondents inform me what is the exact meaning of the term applied to the curve, and how it is described?—Draughtsman.

[1053.]—STRAINS UPON CANTILEVERS.—In an open-sided cantilever, as shown in the cut, what would be the strain upon the two bolts holding it to the wall supposing



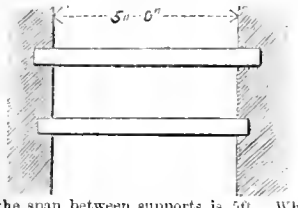
it to be uniformly loaded with a weight of 5 cwt. to the foot run, and the length to be 10ft?—Inquirer.

[1054.]—PAYMENT OF SALARY.—A firm employed a clerk at so much per week, the salary to be paid weekly, but the understanding being that a month's notice was to be given and received before the situation was rendered vacant, by either party. Instead of a month, the clerk received only a week's notice, and was dismissed at the expiration of that term. Has he any remedy against his employers, or must he put up with the treatment?—L. Z. O.

[1055.]—PRESSURE OF WATER.—I have to make a new sluice gate, and would like to know how I am to proceed to calculate the pressure of water against it. The height of the water is 9ft., and the breadth of the sluice gate 6ft. 6in. There is very little current in the stream at any time.—H. H.

[1056.]—COUNTY SURVEYORS.—Could any of the contributors to "Intercommunication" give me any information respecting the proper course to pursue with regard to an appointment as a county surveyor? Is there any examination to be passed, or are the appointments, like many other similar ones, dependent upon interest instead of ability and qualifications?—S. S. J.

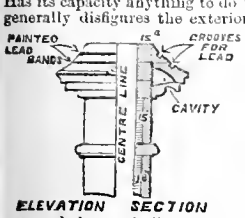
[1057.]—STRENGTH OF CAST-IRON BARS.—Is there any rule for calculating the breaking weight of cast iron bars, placed as shown in the cut? The bars are 4in. by



3in., and the span between supports is 5ft. What would be the safe proportion between the breaking load and the actual load each bar ought to have put upon it?—FITTER.

[1058.]—FILTERING WATER.—Will any correspondent inform me what are the best materials for constructing a filter on a large scale? I have seen charcoal, sand, gravel, and other mediums advocated, but am at a loss to determine which is the best adapted for the purpose.—RESERVOIR.

[1059.]—FACTORY CHIMNEY FLUES AND SHAFTS.—What diameter ought the flue of a factory chimney to be in comparison to the furnaces in connection therewith? Has its capacity anything to do with the blackness which generally disfigures the exterior of chimney shafts, commencing at the summit and continuing down frequently several yards? If not, can any of your intelligent readers inform me of the cause and its prevention? I have long thought that a better method might be adopted in securing those crowning stones of chimney caps which now require to be cramped, by encircling them instead with strong lead pipe (copper rope being expensive), as shown in the sketch. Will this prove a permanent and good holdfast, and would it be liable to be destroyed by the heat from the furnaces?—L. M.

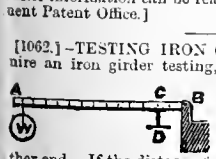


[1060.]—STATIONERS' HALL.—Would you, or any of your readers, kindly subscribe a little information in respect to entries made at Stationers' Hall? Have you to trust wholly upon the faith of your publisher in handing over and settling as to terms, date of publication, &c.? The form to be filled in, as far as I can see, compels this to be done before being able to make an entry? After having once entered, can it be transferred to any other person without again paying the usual entrance fee?—DODO.

[1061.]—LETTERS PATENT.—I have an invention I wish to patent; can any of your "Intercommunication" readers inform me the best method of doing so? and oblige —FITTER.

[Patents are granted for the whole of the United Kingdom of Great Britain and Ireland to inventors only; unless the inventors are resident abroad, in which case patents may be taken by another party as a communication. Not more than one distinct invention can be included in one patent. The cost of a patent for three years, including Government fees and agency (if an agent be employed, which is usually advisable, care being taken that a really respectable firm be employed), generally amounts to about £30. Prior to the expiration of the three years, the patent may be secured for four years further on payment of £53 3s., and may be prolonged for another term of seven years on paying before the expiration of the seventh year, £103 3s. The patent can be abandoned at any of the above stages. Fuller information can be readily obtained at the Government Patent Office.]

[1062.]—TESTING IRON GIRDERS.—Suppose I require an iron girder testing, which will be done in the manner shown in the sketch. Let D be the girder, A B a beam fixed at point B, resting on the girder, with W, a certain weight, applied at other end. If the distance from B to C is 2ft., from C to A 3ft., and the weight applied 2 tons, required the weight actually applied to centre of girder?—CAST IRON.

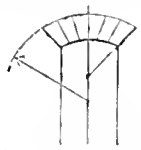


[1063.]—RAILWAY CARRIAGES.—Can any of your readers inform me where I can obtain detail drawings for modern railway carriages, &c.?—J. J.

[1064.]—POLISHED MARBLE AND GRANITE.—Can you, or any correspondent, inform me how to polish marble, granite, &c.?—L. L.

[1065.]—ALGEBRA AND ALGEBRAICAL WORKS.—Would any of your readers be so kind as to inform me those are the best works on Complete Algebra, and also Plane and Spherical Trigonometry, the price, and where published; and if it is necessary to have a complete knowledge of algebra before studying trigonometry, and to what extent? I have already a good work on algebra, by Kerly, but it is very old. I suppose there is a vast difference in the present system of algebra and that of nearly one hundred years ago. I have bought the first part of a work on "Stonecutting and Practical Masonry," which, I am told, is by Nicholson; but as there is no author's name on the book, and not being certain that I have Nicholson's, I would also feel much obliged to any of your readers if they could tell me if the work I have is by Nicholson. The one I have is published by T. Kelly, Paternoster row, and the date underneath the plates is 1848. Or can any of them recommend a better and more modern work on the same subject? I here take the opportunity of thanking "R." for recommending Gwilt's, which I intend to get; and also thank "Subscriber," and am sorry I am not at present in London to look at the copy which he has so kindly taken the trouble to inform me of.—STONEMASON.

[1066.]—CONSTRUCTION OF ARCHES.—Will some kind communicant, better up in construction of arches



than myself, say if the above arch is as strong as one with the ordinary arrangement of voussoirs would be? and oblige—F.

[1067.]—WHEEL AND CHAIN PUMPS.—Will some of your readers answer the following? Throughout a greater part of North America the cottages and small class houses are all supplied with wheel and chain pumps, which I have tested to work well, and answer the purpose even in a severe climate like that. Is there any firm in England who manufactures these ready for putting down? One of their chief merits is that any carpenter can put them in without the aid of a plumber or other class mechanic.—H. H., Great Malvern.

REPLIES.

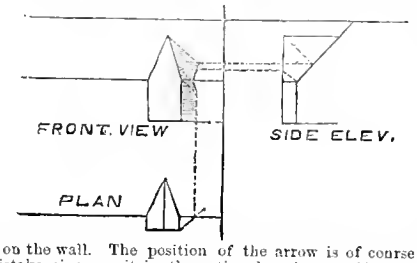
[994.]—LOAD ON CAST-IRON SKEWBACK GIRDERS.—If "Urgent" or "Cast Iron" would refer to my reply to "An Interested One," a week or two back, they will find the principle on which the strains on rectilinear beams are calculated fully explained. In "Urgent's" case, the formula $\frac{a \cdot d \cdot 26}{1}$ is applicable, as in all others; but "Cast Iron," evidently not knowing the principle on which the formula is constructed, is at a loss how to apply it. To find the breaking weight of "Urgent's" girder, divide the sectional area of the girder into two parts horizontally, the lower part being six times the area of the upper (the relative values of the power of resistance in cast iron to compressive and tensile strain being as 6 to 1). The line dividing these two areas will be the neutral axis, the point where the two strains cross, and consequently affected by neither. Having done this, find the centres of gravity of each area A and B, which are the centres of pressure, and take the distance between these two points for d in the formula, $\frac{a \cdot d \cdot 26}{1}$, a being the area of the lower part.—J. L—G.

[1022.]—AREA OF A FIELD.—I read the solution given by "F.," and my first question was—"What has the sixth side done that it should be dismissed from the figure?" He has evidently caught at a straw and defeated himself. I refer him to my letter of last week, for, instead of assisting, I see he needs assistance; and I thank him for specially noting that the method of obtaining the area given by him is not mine.—J. M'NAMARA.

[1022.]—"Young Surveyor" makes a mistake in saying that "the only object of field notes is to plot the survey made." The areas of fields are often required for the valuation of crops and other purposes, for which it is quite unnecessary to plot the survey. In such cases, as I said in my former reply, it is necessary that all the lengths required to throw the field or fields into triangles should be measured. —ANOTHER YOUNG SURVEYOR.

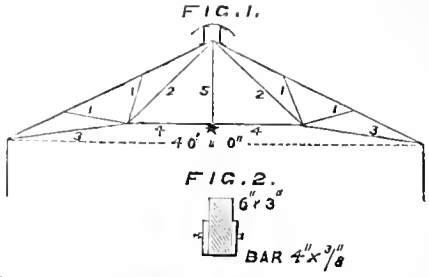
[1025.]—PROJECTION OF A SHADOW.—Will "Draughtsman" allow me to suggest that he will find all the information he wants in the work on "Sciography," of which an admirable notice appeared in the columns of the BUILDING NEWS of September 11.—P. P.

[1025.]—From the angles chosen in the diagram, it accidentally happens that there would be no shadow cast on the roof. I enclose a small diagram, in which the angles are altered, so that a shadow would be cast on the roof as well



as on the wall. The position of the arrow is of course a mistake, since, as it is, the entire elevation would be in shadow. The dotted lines explain the means employed to project the outline of the shadow.—E. S. B.

[1026.]—IRON AND WOOD ROOFS.—Having put up several roofs for engineering workshops intended for precisely the same purpose as that of "Iron *v.* Wood," I can give him the benefit of my own experience. The rafter should be made, as shown in Fig. 2, of timber, with a couple of iron bars upon each side bolted through by ⅞in. bolts. I would advise "Iron *v.* Wood" to discard the old timber truss altogether. The bars No. 1 may be of round iron, 1¼in. in diameter, and burned on to shoes of cast-iron, and united to the rafters by wood screws. Bars No. 2 should be of flat iron, 2½in. by ⅝in.; and those of No. 3 should be in pairs, as the strains upon these are double those upon the bars No. 2. The tie bar, 4, may be 2½in. by



⅝in., and the king rod, No. 5, is hardly needed, and may be 1½in. by ⅜in. I would suggest to "R. G." that he should get a proper design for his roof, and not put it up by rule of thumb, as it will cost him twice as much in the long run.—ENGINEER.

[1027.]—STEEL MAKING.—What "Tubal Cain" appears to require information upon is the difference between iron and steel. This, theoretically, consists in the presence of a certain amount of carbon in the steel, which does not exist in ordinary iron, either cast or wrought. The whole process of the conversion of iron into steel simply means adding to the iron a small percentage of carbon, which is accomplished, speaking generally, by piling up bars of iron alternately with thin layers of carbon, and working them up together. "Tubal Cain" should read some good work on the manufacture of iron and steel.—FER.

[1028.]—THE STRONGEST BRICKS.—The solid brick is much stronger than the perforated. In fact, the latter has very little strength, and should not be used where there is any probability of a heavy crushing weight being brought upon them.—ESSEX.

[1034.]—MEASURING ARTIFICERS' WORK.—There is an excellent little book recently published in Weale's Series on "Quantities and Measurements," by Mr. Beaton, in which I think "A. Beaver" will find all he requires.—STUDENT.

[1038.]—TOWNHALLS.—I can tell "Beginner" that the only "book" he will find on "townhalls" is to be found in an architect's office. He must learn by actual practice how to arrange the necessary accommodation for a certain number of people either in a townhall or a church. No book will give him the information he appears to require.—L. M.

[1039.]—LANDLORD'S TAX AND SEWERS' RATE.—I have read with much interest the dilemma into which "R. G." appears to have fallen; and, in the first place, as he admits that he has signed the agreement for the house which he occupies, let me assure him that he has no redress. In the second place, I consider him very lucky in not having to pay the sewers' rate. It is becoming the universal practice in London and the suburbs to charge the sewers' rate upon the tenant. I pay it myself, and have always done so. Let me now inform "R. G." that, suppose there was no agreement, which is not his case, the only tax which the landlord can be legally compelled to pay is the property tax. This can be recovered at any time by the tenant, should he ever have been made to pay it by coercion or through his own ignorance of the law. The landlord of "R. G." is quite right, and there is no doubt he knows it. —CLERK.

[1041.]—ANTS IN HOUSES.—"Edward Monson" will find the ordinary insect powder, to be obtained at any oil-shop, an effectual destroyer of ants.—H. L. G.

[1041.]—Some further remedies against the annoyance of these insects are suggested by various correspondents of a contemporary. "S. A. K." advises that the cupboards and other places invaded by the insects should be sprinkled with the liquid ammonia used by chemists, and known as "liquor ammoniæ fortis, S·0," "a substance most efficacious in killing black beetles." "A Past Sufferer" has found that if the places frequented by the insects are washed with a solution of alum they will soon disappear. "One who has been tormented with Ants" has found that they disappeared from his pantry after the spots frequented by them had been sprinkled with creosote. "Antidote," who writes from Liverpool, states that his house was overrun with ants during the past summer. He tried various remedies, but in vain, until a few days ago, when he put camphor in small bags, and placed them near the places most infested, and he finds that the insects are fast disappearing. "S. M. O." found that soft soap, mixed with a large quantity of water, smeared in all their haunts, had the effect of expelling them.

[1044.]—THE MEASUREMENTS OF HEIGHTS.—"Reader" will find the rule below will assist him in the use of the aneroid barometer. Assuming the height of the atmosphere to be 27,000ft.: Rule—As the sum of the readings of the aneroid is to their difference, so is 55,000 (or twice the height of the atmosphere in feet) to the elevation required. Example: To find the height of Fairlight Down, near Hastings—

Let the reading of the aneroid on the Marine Parade at Hastings	= 30.05	30.05
Do., on the Down	= 29.44	29.44
Sum	= 59.49	0.61 Diff.

∴ 59.49in. : 0.61in. :: 55,000ft. : 564ft. nearly.

—T. H., Ilfracombe.

P.S.—If "Reader" will send his private address, I will forward him a table, whereby he may see at a glance the heights corresponding to the depressions of the aneroid barometer. Temperature, 55 deg. Fah.; Lower Barometer, 30in.—T. H.

[1044.]—The following table, from the "Board of Trade Barometer Manual," by Admiral Fitzroy, will save "Reader" some trouble in calculating heights by the barometer up to 4,524ft.:—

Height in Feet.

31.0	0	30.0	862	29.0	1,753	28.0	2,675	27 0	3,623
.9	85	.9	950	.9	1,844	.9	2,769	.9	3,731
.8	170	.8	1,038	.8	1,935	.8	2,864	.8	3,829
.7	255	.7	1,126	.7	2,027	.7	2,959	.7	3,927
.6	341	.6	1,215	.6	2,119	.6	3,054	.6	4,025
.5	427	.5	1,304	.5	2,211	.5	3,149	.5	4,124
.4	513	.4	1,393	.4	2,303	.4	3,245	.4	4,223
.3	600	.3	1,482	.3	2,396	.3	3,341	.3	4,323
.2	687	.2	1,572	.2	2,489	.2	3,438	.2	4,423
30.1	774	29.1	1,662	28.1	2,582	27.1	3,535	26.1	4,524

The simplest rule I know is—As the sum of the columns (or the two readings of the aneroid) is to their difference, so is the constant number 52,000ft. to the approximate height. "Reader" must not expect to get correct heights by the barometer except by the finest instruments and repeated observations.—S. W. J.

[1047.]—COLOURING BRICKS.—Bricklayers use a solution of yellow ochre for colouring brickwork.—H. L. G.

[1048.]—THE BUILDERS' PRACTICAL DIRECTOR In answer to your correspondent "Sandyarms," I can let him have a copy of the "Builder's Practical Director," bound and clean, as I have two, and can spare one, and under prime cost, with 6s. 6d. for binding.—J. N., 44, Lloyd street, corner of Cooper street, Manchester.

[1048.]—I have a copy of the "Builder's Practical Director," with supplementary series, bound in one. I will dispose of it for 30s. It cost, I think, 48s., without binding. —Joseph Burnett, Fence Houses, Birtley.

[1048.]—"Sandyarms" inquires where he can obtain the "Builder's Practical Director." He may hear of one cheap by applying to J. B., No 20, Mill Thorne, Halifax, Yorkshire.

[1048.]—Envious gratulations to "Sandyarms" on his escaping so long the clutches of book-hawkers. He can obtain the work of any of them, or through any bookseller (by order), from the publisher, J. Hagger, 67, Paternoster row.—F.

WAGES MOVEMENT.

Work in Edinburgh is very brisk, considering the advanced season of the year; and masons' wages are rising, many of them asking and obtaining 6½d. and 7d. per hour.

With reference to the late operative bricklayers' strike in Liverpool, the annual report of the Master Builders' Association of that town states that they have been so far successful in resisting the demands of the men that the various works throughout the town are progressing favourably with non society men.

STAINED GLASS.

The north-east window in the nave of the parish church of Allensmore, Herefordshire, is now filled with stained glass. The subjects are the Resurrection and Ascension of our Lord, surmounted by the Paschal Lamb. The window is by Messrs. Clayton and Bell, under the direction of Mr. Benjamin Ingelow, architect, of 4, Carlton Chambers, London.

A stained glass window has just been placed in Holy Trinity Church, Sheerness. The subject is Christ bearing His Cross, with St. Paul and St. Peter on either side. The window has been executed by Mr. T. E. Merritt, of Rochester.

STATUES, MEMORIALS, ETC.

A statue is about to be erected on the great Turnplatz, in the Hasenhaide, at Berlin, to Father Jahn, the great apostle of gymnastics in Germany. All Germany is to contribute to the statue, in the shape of stones for the base.

A statue of James Watt was unveiled on Friday last at Birmingham, in the presence of a large concourse of people. It is from the studio of Mr. Munro; the size is larger than life, and it is chiselled from a solid block of Carrara marble. The figure rests on an unpretending plinth of freestone. The cost of it has been defrayed by public subscription, no small share of which was subscribed by the working men of Birmingham.

A monument to the late General Bruce is being erected in Dunfermline Abbey. It is an altar tomb, depicting in bas-relief on its panels the chief incidents in the journey to the Holy Land made by the Prince of Wales under the guidance of the gallant general.

A memorial brass has been erected in the chancel of the church of the Holy Trinity, Stratford-on-Avon, to the memory of the late Mr. F. W. Fairholt, F.S.A. At Mr. Fairholt's death the museum at Shakspeare's birthplace was enriched by a bequest from him of a great variety of valuable archæological gifts from his collection, which he had made during many years' labour. The brass is placed on the north wall of the chancel, a short distance from the poet's tomb.

BUILDING AND LAND SOCIETIES.

The seventh annual report of the Dover District Permanent Benefit Building Society shows that, notwithstanding the general depression of trade throughout the past year, the society's progress has continued, there being now on the books 1,623 shares as compared with 1,513 taken up last year.

The fourth annual general meeting of the Fortieth Starr Bowkett Building Society was held on Thursday week at the Grove-road schoolrooms, Holloway. The report and balance sheet were read by the secretary, from which it appeared that great success had attended the society during the past year. The number of shares issued is 1,114, held by 500 members. There have been twenty-six appropriations since the formation of the society, representing a capital of £6,500, of which sum £1,181 16s. has been repaid. The total receipts for the past year were £2,288 16s. The working expenses for the same period have been £77 6s. 3d., or about 3½ per cent. The report and balance sheet were unanimously adopted, and the directors and other officers for the ensuing year elected.

The sixty-fourth quarterly meeting of the Conservative Land Society was held at the Norfolk-street offices on the 6th inst., when the report of the Executive Committee was submitted, expressing their pleasure in meeting the share holders at the close of the sixteenth financial year, and at being enabled to make a highly gratifying return for the year ending September 30 last, the receipts for the year being £188,342 19s. 6d., and the grand totals £1,288,916 7s. 3d.; the total withdrawals, £328,984 19s. 6d.; the total sale of land, £583,650 15s. 1d., and the reserve fund, £12,153 2s. 9d. The estates allotted since the last report were Upper Holloway, Reigate (Red Hill), and Northampton. As intimated in former reports the land business heretofore carried on by the society will from the present period be transacted solely by the United Land Company (Limited), the respective boards, by co-operation, being in a position to extend materially their operations—the company by enlarging considerably the dealing in land, the society by increasing building and other advances. The four auditors to sit and report as to the accounts and balance sheet to be presented at the annual meeting early in December next were duly elected. The report concludes by the board stating that they will be now enabled to carry out to a much greater extent than heretofore the wholesome provisions of the Friendly Societies' Acts, and that it is impossible to over estimate the value of benefit building societies, socially and morally. The report was adopted and votes of thanks passed to the board. The following directors and members were present:—Viscount Ranelagh (chairman), Hon and Rev. W Talbot, Colonel Meyrick, Colonel Jervis, M.P., Henry Pownall, Esq., J.P.; James Goodson, M.P.; Mr. Currie, Mr. T. K. Holmes, Mr. Newcomen, Mr. Winstanley, Mr. C. L. Grunesen (secretary), Messrs. Goad, Wells, Russell, Farquharson, &c.

LEGAL INTELLIGENCE.

Important to the Building Trade.—Mr. Vann, solicitor, attended before Mr. Newton at Worship street on Tuesday on behalf of Messrs. Browne and Robinson, builders, of Worship street, who were summoned by James Vesch, a bricklayer, for the sum of £1 13s., wages due for work and labour done for them. A question of considerable importance to builders arose in this case, in reference to the liability of builders for the wages of the men employed by sub contractors under them. The complainant stated that he was engaged by a man named Elliott, who was pointed out to him as being the foreman of some works being carried on in St. John's-street road, Clerkenwell, and to whom he (complainant) had applied as a bricklayer, at 8d. an hour, to help build or "run up" a brick wall; on Saturday, the 19th, there was owing to him £1 17s. 6d., of which he received £1 from Elliott, who stated that he could not pay him more, as the firm (Browne and Robinson) had not sent him enough money. Witness worked on the Monday and Tuesday. On the Wednesday he went to Messrs. Browne and Robinson, and was informed by one of the clerks there that it was not the intention of the firm to pay him or the other men to whom money was owing on this "job," as Elliott was a sub-contractor, and, therefore, liable. In cross examination witness denied having heard that Elliott was a sub contractor for the building of the wall, but stated that he had been pointed out to him by the other men as the foreman of the works. Mr. Vann, in answer, contended that his clients were not liable, inasmuch as they had underlet their contract for that particular work to a Mr. Joseph Elliott, of Percival Cottage, High Bath, in Merton, Surrey, who had since failed to continue to carry on the work, and, moreover, had overdrawn his account with Messrs. Browne to the extent of £25. He produced a stamped agreement between Elliott and Browne, which was handed up to the magistrate. Mr. Newton then said he should not receive it as evidence, neither should he recognise any such contract, without Mr. Elliott was produced to swear to it, and he should put Mr. Vann to the strict proof of his defence, which he considered entailed a great hardship upon men like the present complainant, who, because Messrs Browne, to carry on work for which they had contracted, chose to underlet it to an insolvent builder, who was unable to pay the men working for him, were to go without their hard-earned money. Mr. Vann submitted that as Mr. Elliott had overdrawn his account by £25 Messrs. Browne were not to be made liable to any further extent. Mr. Newton did not know anything about Mr. Elliott—did not recognise him; and if Messrs. Browne chose to allow a person to draw more money than he had earned it was their own fault. The case was adjourned for a few days.

Our Office Table.

The Metropolitan Board of Works has accepted the tender of Mr. Wigmore for deepening, reconstructing, and improving the main sewers in Belvedere-road, Lambeth, at the sum of £24,500. The highest tender was £44,800.

The Scarborough Harbour Commissioners in March last advertised for designs for a new western pier. At a special general meeting last week, the first premium, of £50, for the best design, was awarded to Mr. Charles W. Whitaker, of 28, Woburn-place, Russell-square; and the second premium, of £30, to Messrs. Shelford and Robinson, Victoria Chambers, Westminster.

The surveyorship to the St. George's Hospital is vacant by the death of the late surveyor, Mr. Arthur Mee. A meeting of the governors was held on Wednesday for the purpose of meeting candidates, but no decision was arrived at, and another meeting will be held on Wednesday next, after which any gentleman who may have been proposed and seconded for nomination by two members of the Board of governors may canvass for support.

We regret to see it stated that Mr. E. Welby Pugin is at Malvern dangerously ill.

A singular contract has just been entered into with the city of Paris to buy up all the old paving stones for the purpose of shipping them across the Atlantic, where they are to be used to pave the principal thoroughfares of Buenos Ayres and Monte Video. Do some of our suburban vestries obtain their material from similar sources? One would almost think so from the state much of it is in.

With reference to the claim of Messrs. Messenger and Gundrey upon the Clerkenwell Guardian Board, which we referred to in our last, the clerk, at the last meeting of the body, brought up a report embodying the results of the search which he had been instructed to make through the minutes. From what ensued, however, as that functionary was about to read his report, it may be inferred that the guardians are at fault, and that Messrs. Messenger and Gundrey's claim is a legitimate one. Just as the clerk was about to read his report on the subject a guardian was observed to whisper with the chairman of the board, who immediately asked if it were desirable that the report should be read? whereupon the guardian who had been seen to whisper with the chairman said that he did not think the board should supply their opponents with information which might be used against them. He moved that the board should resolve itself into committee to consider the question. Mr. Mence (a guardian who seems to have something like fair ideas of justice) moved an amendment negativing this motion. He could not see what necessity there was for secrecy in the matter. "If Messrs. Messenger and Gundrey had a claim against the board why not meet it fairly and honestly?" The original motion was, however, carried by 8 to 3, and the board went into committee on the question, with what result has not transpired.

The Lundy Granite Company is being "wound up." The company started three years ago with a capital of £100,000; something like £80,000 of this sum has been called up and expended on the works, &c. The first working of the granite on the island was attended with considerable loss, from the softness of the quality of the stone; the quantity recently produced has been of a superior quality, and it is very probable that the work may go on again under another company, or the present one re-organised. The works are at present suspended.

On Tuesday night Mr. J. Scott Russell, C.E., F.R.S., delivered an address at the Birkbeck Institution, Southampton-buildings, upon the subject of technical education. Mr. M'Cullagh Torrens, M.P., occupied the chair, and there was a pretty large attendance. Referring to the subject of mechanics' institutions, Mr. Scott attributed their comparative failure in the country to the fact that they were deficient of the preliminary knowledge which was necessary for them to become popular. The great evil to be deplored was the low standard which, as a nation, we had been satisfied with for the education of our people. It was considered enough to constitute a public school if reading, writing, and arithmetic were taught within its walls. These things, however, did not constitute knowledge; they were merely the vehicles by which true knowledge was conveyed. The same error had been committed by other countries; but those countries had long since awoke from their error, while England still lagged behind. In Switzerland every man had a complete course of technical education calculated to fit him for the duties of life, and a similar state of things he desired to see brought about in England. It was the duty of their governors to help the advancement of technical education by providing them with the best masters and means whereby to acquire the requisite knowledge. Let the members of such an institution as the one he was then addressing bring the matter before the Government, and then perhaps the results which he desired to see might be brought about. The proceedings terminated with a vote of thanks.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

158 R. HEATHFIELD. Improvements in Machinery for the Manufacture of Nails and Tacks. (A communication.) Dated January 17, 1868.

Here the strip of iron or metal from which the nails or tacks are to be made is fed into the machine against a stop. The piece of metal to be made into a nail or tack

is cut off from the end of the strip by a fixed cutter, and a movable cutter having motion in a vertical plane. The movable cutter consists of two parts of unequal size, and having different ranges of motion. During the cutting off of the piece from the end of the strip, the two parts of the movable cutter move simultaneously, and constitute, virtually, one cutting tool. After the cutting off of the piece of metal the larger part of the cutter ceases to descend, but the smaller part continues to descend, and by its motion effects the carrying of the cut off piece to the gripping dies, and its delivery into the said dies for the purpose of being headed. This is effected in the following manner:—Under the smaller part of the movable cutter is a spring arm, and the cut-off piece of metal, on its separation from the strap, is held at the end to be headed between the end of the said smaller part of the movable cutter and the said spring arm, and on the descent of the said smaller part of the movable cutter is carried down between the gripping dies. By the closing of the said dies the cut-off piece is held firmly for the heading process. Before the approach of the heading punch the smaller part of the movable cutter rises, and the spring arm retires from the path of the heading punch by a horizontal motion, when the heading punch advances and heads and completes the nail or tack. On the retiring of the heading punch and opening of the gripping dies, the nail or tack is forced from the machine by a knocker off. The motions of the several parts described are all or mostly effected by cams on the principal shaft of the machine.—Patent completed.

166 J. M. NAPIER. Improvements in Apparatus for Cutting and Dressing Metals, Woods, and other Materials. Dated January 17, 1868.

The patentee claims, first, the application or use of edge tools (of the kind shown and described) with means or apparatus to give rotation or axial motion to the cutting edge of such tools, substantially in the manner shown and described. Second, forming or furnishing circular edge tools (of the kind shown and described) with a spindle or axis to which the tool is either fixed, or with which it is formed, in one piece, such axis or spindle being provided with bearing parts for the spindle to turn upon, substantially as shown and described.—Patent completed.

168 N. H. ROLFE. Improvements in Machinery for Cutting Laths. Dated January 17, 1868.

This invention relates to the manufacture of laths used for building and other purposes from continuous sheets of wood (as produced in scale board and veneer-cutting machines) into strips of the desired width to form the laths. The improvements consist in incising the logs of timber at given distances as they revolve in the veneer cutting machine. For this purpose the inventor mounts a self acting drum or roller over the logs of timber in the machine, the said roller being provided with a series of longitudinal projecting knives or cutters disposed radially thereon an inch or more apart, which are brought to bear on the wood in motion so as to produce lateral incisions on its periphery at the desired depth and distance apart before it approaches the cutting knife of the machine, which then severs the wood in the form of the lath or strip suitable for the purpose desired.—Patent abandoned.

175 B. T. MOORE. A New or Improved Apparatus for Protecting Water-Pipes from Injury by Frost. Dated January 18, 1868.

This invention has reference to the application to service pipes for supplying water to houses or other buildings, either by means of cisterns or tanks, or otherwise, of an apparatus consisting mainly of a cock, valve, or plug, so arranged that, when frost occurs, such cock, valve, or plug shall automatically close the communication between the main and the service pipe, and shall at the same time effect a communication between the latter and an open branch pipe, so as to allow the whole water contained at the time in the service pipe to escape therefrom.—Patent abandoned.

188 F. J. BAYNES. Improvements in Kitchen Ranges, which Improvements are also Applicable to other Cooking Stoves. Dated January 18, 1868.

The object here is to render the use of a comparatively small quantity of fuel effectual. In order to effect this, whilst the upper front bar or bars may be arranged as heretofore to "fall down," the lower front bars, or a portion of them, are connected together into a frame, which is capable of turning on centres at the upper end of it, so that the bars carried by such frame may be turned inwards to or about at a horizontal line, and in that position form a bottom to support a small quantity of fuel near the upper part of the range, and admit of the heat from such fuel passing freely and effectively under the "top plate" to the boiler on one side, and to the oven on the other side, and then, when it may be desired, to have a larger fire for roasting or otherwise; the frame with its bars may be turned down so that the frame of such bars may then hang in a vertical position to form the front of the fire with the fuel resting on the ordinary bottom bars, as in other ranges, or *vice versa*. This frame with its bars may be moved by a shifting lever handle passed into a socket or otherwise, and be held in either position by a drop, catch, or other suitable stop, and the action of the lever or other moving instrument may release the catch. By these means great economy of fuel may be effected.—Patent abandoned.

Trade News.

TENDERS.

Broxbourne.—For alterations and additions to the New Inn. Mr. Henry Ough, architect:—

Hearle	£781
Merritt and Ashby	760
Rivett	720

Norfolk.—For enlarging and restoring Denver church, Norfolk. Mr. William Smith, John-street, Adelphi, architect:—

	Oak seats.	Deal seats.
Bennett Brothers	£1623	£1450
Brown	1459	1348
C. Bennett	1450	1290
Drake	1398	1296

Chelmsford.—For new 7in. water main for the Chelmsford Board of Health. Charles Pertwee, architect and surveyor:—

	Labour. £ s.	Pipes. £ s. d.	Total. £ s. d.
Feli Christy, Chelmsford	210 0	605 2 0	815 2 0
Thornton ,,	150 0	656 0 0	815 0 0
Begg, Preston	—	607 12 6	—
Butterley Iron Co., Alfreton	—	615 10 0	—
Bugbird, Enfield	224 0	615 0 0	869 0 0
Reidy and Co., London	—	590 10 7	—
Weston, Lambeth	—	—	949 0 0
Everett & Son, Colchester	240 10	669 10 0	—
Deuce, London	—	—	1158 0 0
Dennis & Scruby, Chelmsford*	288 0	547 10 0	835 10 0
Walker, Chelmsford†	185 0	—	—
Graham and Son, London	—	603 5 0	—
Tice, Bloomsbury street	—	620 15 0	—
Tanner, Chelmsford	210 0	655 0 0	865 0 0
Bailey, Pegg & Co., Banksside	—	638 15 0	—
Chandler & Sons, Kennington	188 0	—	—
Wells, Smith, & Wright, Keighley	—	673 5 0	—
Cochrane & Co., Middlesborough	—	594 10 0	—
Newton, Chambers, and Co., Sheffield	—	620 15 0	—
Claridge, North, and Co., Bilston	—	582 2 9	—
Laidlaw & Son, Glasgow	—	563 0 0	—
Bower, St. Neots	—	547 0 0	—
Coleman & Co. Chelmsford	194 0	645 0 0	839 0 0
Roberts, West Bromwich	—	601 1 6	—
Warner and Co., Old Jewry Chambers	—	607 12 0	—
Stevens, North Croydon	173 0	607 17 4	800 17 4

* Accepted for pipes. † Accepted for laying same.

London.—For the erection of new premises for Messrs. Negretti and Zambra, at Holborn-hill F. W. Porter, Esq., architect. Quantities by Mr. James Williams:—

P'Anson	£9635
Carter and Sons	9570
Mansfield and Company	9099
Patman and Fotheringham	8985
Jackson and Shaw	8660
Conder	8599
Piper and Company	8597
Hill, Keddell, and Waldram (accepted).	8588

London.—For the erection of new Metropolitan Police Courts, Lower Kennington lane. T. C. Sorby, Esq., architect. Quantities by Mr. John Scott:—

Hill, Keddell, and Waldram (accepted)	£6986

New Brompton (Kent).—For the erection of a new Congregational church at New Brompton, Kent, for the Rev. J. Harsant. E. Habershon and Brock, architects:—

Manley and Rogers	£2620
Simpson	2523
Scrivener and White	2169
Naylor	1978
Nightingale	1972
Stump	1950
Falkner	1734
Wilkins	1700

Peterborough.—For the erection of a chapel. J. Wallis Chapman, architect, 14, Great Western-terrace, Westbourne Park, London, W.:—

Nightingale	£4567
Clark	4360
Thompson	4340
Harris	4210
Ward	4200
Fast	4199
Hobson and Taylor	4097
Moss	4000
S. and W. Pattinson	3950
Halliday and Care	3823
Marriott and Company	3580
Bell and Son	3506

Redcar.—For the erection of a Wesleyan chapel and schools at Redcar. Mr. J. Hunter, architect, Bolckow-street, Middlesborough. Quantities supplied. Accepted tenders:—

Scott, Bricklayer's and Plasterer's work	£519 0
Watson, Joiner and Carpenter's work	435 0
Lord, Mason's work	175 0
Harrison, Slater's work	97 14
Kershaw, Plumbing, Glazing, and Gasfitter's work	87 0
Cunningham and Company, Heating Apparatus, &c.	39 0
Guy, Painting and Staining	28 17

Stratford.—For erecting stores in Maryland-street, for the Stratford Co-operative Society. Mr. Henry Ough, architect:—

Pierpoint	£1150
Charlton	1030
Norton and Son	1024
Merritt and Ashby	995
Crabb and Vaughan	981
Hearle	976
Johnson	975
United London and Provincial Co operative Building Company	968
Knight and Dustow	949
Rivett (accepted)	892
Morter	889
Keepence	845

West Dumpton (Isle of Thanet).—For the erection of a new wing and alterations to Park Villa, for Mr. Sinclair. Mr. John R. Collett, architect:—

	New work.	Old work.
W. Osborne	£940 0 0	£197
Kelson	889 11 4	170
Duckett	882 0 0	167
Wade	812 10 0	117
Lawson	780 0 0	160
Elgan (accepted)	744 0 0	150

Woodford.—For erecting a detached villa at Woodford, for Mr. Branscombe. G. R. Noble, Esq., architect. Quantities by Messrs. Linsdell and Gillard:—

Rivett	£1793
Piper	1723
Hedges	1690
Hill, Keddell, and Waldram	1637
Perry (accepted)	1625

COMPETITIONS.

India.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Bletchingley (Surrey).—October 23.—For the erection of a new infirmary at the workhouse. A. R. Stenning, Mitre Chambers, 157, Fenchurch-street, E.C.

Montgomery.—October 15.—For the erection of new wings and other additions to the county gaol. S. W. Poundley, county surveyor, Kerry.

West Cowes.—October 19.—For the erection of proposed baths at Cowes. Mr. Woodman, architect, 17, Prince Albert-street, Brighton.

Stourport (Worcestershire).—October 19.—For altering and reconstructing a bridge over the River Severn. W. Talbot, clerk, Kidderminster.

County of Carmarthen.—October 21.—For certain alterations and additions to the county gaol. Clerk of Peace's office, Llandovery.

Lichfield.—October 23.—The Bishop's Palace.—Repairing, altering, and enlarging the above named building, and for adding a chapel to the same. Rev. F. Thatcher, the Palace, Lichfield.

Northampton Water Works.—October 18.—For a covered reservoir, 150ft by 150ft. by 17ft. deep. Alexander Milne, architect, 2, Gold-street, Northampton.

Southwark.—October 14.—For the erection of buildings at the rear of the workhouse of St. George the Martyr. J. H. Fitch, 13, Union-street, Southwark.

Westminster.—October 21.—For certain drainage works at St. James's Hall, Regent-street, W. G. Buzzard, Vestryhall, Piccadilly.

Portfield, near Chichester.—October 27.—For the erection of a new district church. G. Woods, Shopwyke House, near Chichester.

Sefton Park, Liverpool.—October 26.—For the supply and fixing of iron railing, gates, &c. J. Rayner, town clerk, Liverpool.

Sutton, Isle of Ely.—October 21.—For certain restorations of the parish church. F. Preedy, architect, 13, York-place, Portman-square, London.

PROPERTY SALES.

September 29.

At Garraway's.—By Messrs. Daniel Cronin and Sons.—Leasehold two messuages, No. 112, Pitt street, Peckham, producing £47 9s. per annum, term 33 years unexpired, at £6 4s. per annum—Sold for £245.

At Guildhall Coffee house.—By Mr Millar.—Leasehold house and shop, No 36, John street, Regent's Park, producing £60 per annum, term 53 years unexpired, at £1 per annum—£500.

September 30.

At the Mart.—By Messrs. C. and H. White.—Leasehold eight houses, Nos. 1 to 8, Thomas street, Rodney road, Walworth, producing £140 10s. per annum, term 49 years unexpired, at £16 per annum—£1,020.

Leasehold three residences, Nos. 8, 19, and 20, Doddington grove, Kennington-park, producing £108 per annum, term 27 years unexpired, at £15 per annum—£835.

Leasehold six houses, yard, stable, and buildings, Nos. 2 to 7, Ann's-place, Lant-street, Borough, producing £140 4s. per annum, term 97 years from 18.0, at £25 per annum—£650.

October 5.

At the Mart.—By Mr. Whittingham.—Freehold plot of building land, fronting the High road, Wimbledon—£140.

October 6.

At Garraway's.—By Mr. Fred. A. Mullett.—Leasehold residence, No. 11, Bentinck-street, Manchester square, annual value £120, term 40 years from 1860, at £20 per annum—£920.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Augustus Salem Dimsdale, St. Paul's road, Islington, builder, October 20, at 11—Arden Binkley, Sittingbourne, brickmaker, October 20, at 12—Henry Venthem, Chapel-street, Bedford-row, builder, October 22, at 12—Seth Benton, Finchley, builder, October 15, at 11—Alfred Pare Jones, Edgware-road, builder, October 12, at 1—Frederick Nash, Alton, plumber, October 12, at 12—Edward Phillips, Leighton Buzzard, timber dealer, October 15, at 1—William White, Poole, builder, October 15, at 12.

TO SURRENDER IN THE COUNTRY.

Jesse Bryan, Burton-upon-Trent, slater, October 19, at 11—Richard Court, Aston, near Birmingham, builder, October 21, at 12—Thomas Holmes, Tranmere, architect, October 23, at 2—William Playford, Woodbridge, timber dealer, October 19, at 3—Henry Mercer, St. Helen's, bricklayer, October 14, at 11—James Moody, Leeds, builder,

October 12, at 11—Godfrey Parry, Rhyl, painter, October 17, at 11—Henry Williams, Redruth, carpenter, October 14, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 23, J. Carver, Wellington, Salop, builder—November 17, W. Tyers, Nottingham, builder—November 3, C. Percival, Liverpool, paint manufacturer—October 20, G. Hanlon, Liverpool, civil engineer—October 22, E. Hanlon, Liverpool, civil engineer—October 23, C. Cochrane, Manchester, builder—November 4, J. Ashcroft, Atherton, nail manufacturer—October 22, H. Clarke, Burslem, plumber and glazier.

PARTNERSHIPS DISSOLVED.

Bellamy and Bland, South Normanton, brickmakers—E. and W. Buckingham, Holland road, South Norwood, builders—M'Intyre and Robinson, Newcastle-upon-Tyne, cement manufacturers—Parkin and Johnson, Bradford, builders—Wright and Son, Old Ford-road, brick merchants—W. and E. Passford, Nottingham, timber merchants.

DIVIDENDS.

October 27, J. Abbott, Manchester, builder—November 4, J. M'Kinnell, Brunswick square, ventilating engineer—October 15, C. Evans, jun., and T. J. Jones, Newport, Monmouthshire, timber merchant.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, rawback, 1s.

Teak .....load	£11	0	12	10	Archangel, yellow ..	£11	0	£12 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12 0
,, yellow pine..	3	0	4	5	Finland	7	0	8 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0 0
Quebec Oak, white..	5	0	5	10	Gothenburg, yellow	8	0	9 10
,, birch.....	4	0	5	0	,, white	8	0	9 0
,, elm	4	0	4	10	Gefle, yellow.....	8	0	10 10
Dantzic oak	4	0	6	0	Soderhamn	9	0	10 10
,, fir	2	15	3	15	Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir	3	0	4	5	yellow	11	0	13 0
Riga.....	3	0	3	3	Deck Plank, Dantzic,			
Swedish	2	0	2	8	per 40 ft. 3 in.	0	12	1 0
Masts, Quebec red pine	4	10	6	10	Pumick Stone per ton	6	0	8 0
,, yellow pine..	4	10	6	0	OILS, &c.			
Lathwood, Dantzic, fm	6	10	7	10	Seal, pale....per tun	36	0	0 0
,, St. Petersburg	3	0	9	10	Sperm body	89	0	0 0
Deals, per C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Cod	38	0	0 0
					Whale, Sth. Sea, pale	37	10	0 0
Quebec, white spruce	13	0	20	0	Olive, Gallipoli.....	68	0	73 0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	53	0	55 0
Yellow pine, per reduced C.					Palm, fine	39	10	40 0
					Linseed	31	5	34 0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	33	0	0 0
2nd do.....	11	10	12	10	Cottonseed.....	31	0	38 0

METALS.

IRON:—								
Welsh Bars in London ....per ton		6	5	0	6	5	0	3
Nail Rod	do	7	10	0	7	12	6	
Hoops, ...	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars....	do	7	5	0	7	15	0	
Bar in Wales	do	5	10	0	6	0	0	3
Nailrods	do	7	10	0	7	15	0	2½
Foundry Pigs, at Glasg. No 1 ..	do	2	12	3	2	17	6	net.
Swedish Bars	do	9	17	6	10	10	0	2½
COPPER:—								
Sheet & Sheathing, & Bolt ....per ton		79	0	0	2	2	0	
Hammered Bottoms	do	97	0	0	0	0	0	
Flat Bottoms, not Hammered ..	do	83	0	0	0	0	0	
Cake and Tough Ingot	do	1	0	0	3	0	0	3
Best Selected	do	77	0	0	85	0	0	
Australian	do	77	10	0		0	0	
Yel. Metal Sheathing & Rods p0	h	0	0	¾	0	0	7½	
LEAD —								
Pig, English .....per ton		21	5	0	0	0	0	
,, Spanish Soft	do	18	10	0	0	0	0	
Shot, Patent	do	22	10	0	22	15	0	2½
Sheet	do	20	0	0	20	15	0	5
Whits	do	27	0	0	30	0	0	
TIN: *								
English Block .....per ton		95	0	0	0	0	0	
do Bar	do	96	0	0	99	0	0	2½
do Refine	do	97	0	0	0	0	0	
Banca	do		10	0	97	0	0	nett
Straits	do	92	10	0	93	0	0	
ZINC:—								
English Sheet .....per ton		25	10	0	26	10	0	2½
Devaux's V. M. Roofing Zinc	do	25	0	0	0	0	0	

* And 5 per cent. discount if laid upon the new system

STEEL:—								
Swedish Keg, hammered .....per ton		15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
SPELTER:—								
On the Spot .....per ton		20	0	0	0	0	0	
QUICKSILVER .....per btl		0	17	0	0	0	0	
REGULUS OF ANTIMONY								
French ..... ton		43	0	0	0	0	0	

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 23, 1868.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.

A FEW short hours and the Leeds Exhibition will be numbered as a thing of the past. Five centuries of painting will be unloosed from its walls and will go back to their wonted places, where each can but tell its individual history; they will be broken links of a brilliant chain which has connected this nineteenth with that fourteenth century, reaching back from the days of Tennyson to those of Dante, and spanning over many changes of faith, of thought, of history, of habit, reflecting and recording each epoch as it rolls along. We cannot see such a collection dispersed without a pang of regret and without a fear that we shall never see its like again. The risk of damage prevents those who have once run it being willing to encounter it again, and the want of commercial success which has undoubtedly attended this Exhibition will form both a detergent and an excuse when another is attempted, and, as we look our last on the many fine works which for six short months we have had the pleasure of studying, our pleasure is tinged with the sorrow of parting, and the foreshadowing of the purposes of the building where all this beauty has been comes upon us.

We took much note of the earlier Italian German schools in our columns some time ago, and must now take a brief valedictory glance at the contents of the other galleries, remarking rather the tendencies of schools than the individual merits of its members. Our own English school seems to have sprung from that political and polemical union which the similarity of faith and fear of the Spaniard brought about between England and the Netherlands. The names of almost all the earliest representatives of art in England are of Low Country origin. Holbein, Antonio, More, Vandyke, Rubens, Lely, Gerbier, and Kneller painted and were honoured here, and the great portrait artists of that great portrait-painting country found favour and fortune both in England. Nor did they do only this, but they laid the foundations of that love of the art of painting in England which has grown with our national growth and made us the greatest picture-buying race in Europe—we do not say the most discriminating judges, or the wisest patrons: if so, we should do more than buy; we should found schools of painting and honour our artists, we should sit upon South Kensington and not be in a hurry to rise up again, and we should insist upon the Royal Academy of Arts being an institution deserving of its name. For these things we must wait till such a future when the memory of the Cole shall have merged into the ashes of the great, and when the holders of the proud finials of R.A. shall have been earned by artists whose chiefest honour is an atelier crowded by pupils, and be looked upon more as the consequence of having made a name than as a means of making money. We have faith in the good time coming, a faith strengthened by the pictures on these walls. We see how, from such small beginnings, the English school has grown into a young vigorous forest of untrained trees, sadly in want, it is true, of pruning and cultivation, each growing as it best can, uncared for or uncultivated, until it has risen so high as to require no care and become too stubborn to need or to heed cultivation, yet, in spite of all, producing much pleasant blossom and perhaps still more fruitful seed. In the English school past and present we note a steady progress in the love of truth and love of colour. We see the tricky and impossible draperies of the German school laid aside—Hogarth, Gainsborough, and Reynolds painting people as they were. We see the false piling up of rock, wood, and water, once yclept a classical landscape, pass away, and Constable sitting down in the quiet Suffolk lanes with a firm belief in Nature and a humble attempt to copy her. Later still, we see that truly great man whose memory is in danger of being buried under the indiscriminate praise of Mr. Ruskin. We see Turner leaving the false blacks and browns of the Dutch marine-painters who won his maiden love, and coming here to Leeds, working in the old ruins of Kirkstall, wandering thence up the valley of the Wharfe and over the rolling wolds of Yorkshire, studying and recording the frowns, the tears, the smiles of Nature, and teaching a lesson, then unlearned, that landscape art, to be good, must be true. It was the same tendency which the erring Morland recorded on his works; wrong as he himself was, his art was right, but he was too weak to obey its dictates, and though it was bad for the old bottle, the new wine was put into it. Yet luckily the wine was not lost. Wilkie and Mulready exemplified this vernacularisation of art which wrought so great a change—a change necessary to make art a living language, in which she could speak without the aid of a false interpreter, and a change which has indelibly impressed itself upon us. Haydon offered himself a sacrifice. Blake and Martin went mad. Barry and many another died in poverty and distress, because they could not see this tendency. They spake to the people in a language they knew not, and the people hardened their hearts against them, and their phase of art passed away. Thus was the love of truth growing. Meanwhile a new thing arose—no, not quite new—nothing is; but, after having slept a few centuries, the art of painting in watercolour awoke again, and at Leeds we could well and amply trace out how from tinted pen-and-ink sketches this art grew in England to that fine pitch it has now reached, or rather to which it culminated some time back, for of late years the tide has ebbed somewhat. Watercolour nowadays attempts to outvie oil in impasts, and loses its own soft transparency, for the loss of which no amount of body can ever compensate. It, too, commenced in greys and neutral tones, fearing to do more than indicate the hues of Nature, and never attempting to outrival them, but in both the oil and watercolour painters of the yesterday of art we find the love of colour coming in strong upon them, and, bursting down all the traditions of the elders, glows upon canvas and paper with gorgeous brilliancy. Take the early studies of Mulready and look at his latest works as examples. See, as we have done at Leeds, the low-toned brown efforts of John Philip, and his full luscious colour at the end of his days. Look at the quiet hues of Faed in his early works, and see how he has followed this present tendency. A tendency there is, perhaps a desire, amongst the younger artists of the day, to try and stop, but they too are young now, and the feeling will overwhelm them, and they will be brighter colourists than those whom they now condemn. We are becoming Venetian traders, almost republicans, but by no means of Spartan breed. The wealth, the love of luxury, the pride of the eye in them, as in us, found its chief vent in colour, and no doubt the pre-celebrated future New Zealander, with a Maori Murray under his arm, will draw a very pretty parallel between us some day in some antipodean BUILDING NEWS. Thus much we learn from our own school as exhibited at Leeds. In the modern French school we see how ineffectual were the labours of her earlier followers of Poussin and Claude, for, in spite of the labours of Joseph Vernet, no school of landscape formed itself in France. The labours of David and the classical tendency of the Consulate and the Empire threw France back from the study of Nature. She was not ambitious enough for them, and perhaps too modest; but with the overthrow of her military power came a truer mood. Her mediæval history was swept away. Her recent one was ignored, and nothing but the everyday life of her people was left to her, and hence arose this *genre* school of painting, which, in its very excess, now distinguishes France. How lovingly Edouard Frère wanders about amongst the peasants of Ecouen is shown by his charming little transcripts of their daily life, keeping his heart green with their children's joys and sorrows, and making us feel young again as we contemplate them. Daverger, his pupil, follows in his wake, and imitates his master in the closest manner, showing how much the scholastic principle of French art influences its artists. As another instance of this look at the works of Ruiz Perez, whom death has too quickly taken from us. See how closely he imitates his master, Meissonier—at least, approaches as near as anyone can to such incomparable finish.

We do not suppose that any picture was ever more highly wrought than that "Chess Players" of Meissonier here, painted at a time when his hand and eye were doing him their best service. It is a miracle of manipulation, and requires a microscope to develope all its beauties, but we should regret to see many such. We admire it in one man, but we should think it waste in many to spend so much life to do so little. It is this littleness which is the bane of French art just now, and the art of painting is not the only one which suffers from it. High finish, exact detail—exquisitely pretty and equally soulless—her painting, architecture, and literature are all alike, without one scintilla of poetry to light up any one of them; and, instead of diamonds, we have exquisitely finished paste. Her artists are very learned and very clever, but there are few of them who strike upon a deeper chord than pleasure. In Belgium we find more earnestness, and the works of Gallait make us thrill with emotion. Who can stand before that noble "Art and Liberty" and not feel his breast inflate, his heart beat quicker, nor find an emanation from that patriot face light up his own? or who can look upon that sad, stern scene where Counts Egmont and Hurn hear their death sentence without feeling how much liberty of conscience and religious freedom owe to their memory? In these works of his we forget the artist. Never do we say, "How did he get that effect?" or wonder "what do he that is." The artist, like us, forgets himself; his subject, not his art, is all he thinks of. Painting is but the vehicle of his mind, and so occupied are we with all he has to tell we never noticed how he told it. Great are Gallait's triumphs, but the greatest of all is his victory over the vanity of his art. Very different are the works of Leys; yet these two men are perhaps doing more for the foundation of a national school of art in Belgium, which one day may help Belgium to keep herself still a nation. The learned research of Baron Leys, and the inculcation of exactitude in study, form an excellent combination with the fervour of Gallait, and this combination we find impressing itself on Belgian art. We cannot pass by the works of a coming man, Alma Tadema, who, though a Dutchman, is a poet, a painter, and an archæologist. His works astonished us in Paris, and we are glad to meet them again here, and if Baron Leys had no other claim upon posterity they would venerate his memory as the tutor of Tadema.

German art is not represented in its higher walks—its chiefest efforts must be studied on the walls of its buildings, but in it we see a growing tendency to abandon the stilted academic and to study Nature more; whilst from the cold north come that mysterious combat of Tideman's, which so astonished us in 1862, and many low-toned, silvery landscapes from the fells and fiords.

Nearly three thousand paintings have claimed our notice in these nine galleries at

Leeds. Upwards of 600 artists—each a man above his fellows—have spoken to us from their walls, and have, we trust, spoken not in vain; but the lessons they have taught have, we hope, been learned by many, and will, we believe, be treasured long after their works have been dispersed. It is but on rare occasions that we can thus compare and contrast the works of the various schools, and these occasions should be made the most of and most deeply studied.

Although nine-tenths of the Exhibition at Leeds was devoted to paintings of such great interest, the other portion fell but little behind it, for we found a very fine collection of enamels, extending from the *champlevé* and *cloisonné* work of the thirteenth century down to the latest period of the translucent enamels of Limoges, and being particularly rich in the lustrous but somewhat gaudy works of the Court family. Few of them, however, were new to us: and, indeed, this remark applies to the whole range of objects exhibited in what is termed the Museum of Ornamental Art. Old friends are ever welcome, and though some of the objects here have appeared in almost every exhibition of the kind, from the first small essay in the rooms of the Society of Arts, in 1851, down to the recent loan collection at South Kensington, yet they are welcome still.

Ceramic art has been particularly well represented in the works of Wedgwood and the earlier works of the Yorkshire potteries; but of the ancient works of this class a small yet carefully selected series of Etruscan vases was the sole representative.

Early embroidery and needlework and fine examples of lace took back the mind, if not to the days of Penelope, at least to those of many similarly situated ladies in our early history, whose husbands wandered on their way home from the wars; and of the jewellery and personal adornments of the past there was a fair and interesting show. Still it was the grand collection of paintings which will make the memory of the Leeds Exhibition live in the minds of those who saw it; and it will be an era in the lives of many who have here for the first time felt how important a passage in this world's history is the record left by its pictures.

We have got all we can from them and therefore we ought to forget them, but we cannot do so, for though we are getting old and approaching the end of our fifteenth volume we have not yet learned some of the ways of the world, and therefore we cannot forget the labours and the kindness of those whom we have encountered at Leeds, and our last pleasing office is to record our appreciation of many ably fulfilled but unseen duties of its chief Commissioner, Mr. J. B. Waring, and his indefatigable assistant, Mr. Redford, who formed so goodly a collection; the intelligent care of Messrs. Saunders and Lefevre, the superintendents of the English and foreign galleries; and the erudition and painstaking zeal of Mr. James, the superintendent of the catalogue, and compiler of the biographical notices which form its appendix.

LONDON TERMINAL STATIONS.

BUILDINGS are of three kinds—buildings, structures, and perpetrations. Of the latter are for the most part railway constructions of every description. In an age boasting of its rapid improvements, and but too much inclined to underrate the achievements of yesterday, it behoves the critic to be careful that he be not carried away by the mere popular feeling of the hour. There is no doubt that we have reached a point where we attach undue importance to certain architectural works merely on account of their immense proportions. It has always been a mystery to us why mere size should impress reasonable beings in the way it unquestionably does. It is common enough to hear the expression, "Its mere size gives grandeur." If so, the gasometers at Whitefriars and King's Cross are grand; the floating dock "Bermuda," recently launched at the Isle of Dogs, is grander still. We are led to make these remarks from observation of the tendency of railway engineers to vie with one another in giving to their works a colossal character rather than one commensurate with their actual importance. Mr. A. builds a bridge or a station, Mr. B. caps it with a larger, Mr. C. surpasses both, and Mr. D. out-Herods Herod. The consequence of this rivalry, which is nothing more than the outward expression of the sentiments of that eminent firm, We, Us, and Co., is that the metropolis is permanently disfigured by structures of gigantic size. We should be glad to know, for instance, what the Thames has done that its banks should bear such structures as the termini of Charing Cross and Cannon-street, or that its bosom should be spanned by the bridge leading to the latter—without question, regarded from every point of view, the ugliest bridge in the world. It was, indeed, an evil hour in which the South-Eastern Railway Company gained permission to obstruct by their Cannon-street Station the beautiful view of St. Paul's which used to be obtained from London Bridge. It is bad enough that railway companies should have the monopoly of traffic, but it is worse that they should have the monopoly of the prospect and the power to mar the beauty of the metropolis. It is idle to plead the exigencies of traffic. The stations having most traffic are the most elegant; at all events, the least pretentious. To begin with the most elegant, let us examine the terminus of the Great Western at Paddington. It is in three spans, crossed by two transepts, an arrangement which gives it intricacy and picturesqueness, and conveys an idea of something approaching to comfort, if such a thing can possibly exist in connection with a railway terminus. The girders are pierced in the web with various devices; the columns are light and of Moorish character, and the whole is airy and elegant. The bases of the columns deserve particular attention, and we may here remark that, in the opinion of many excellent judges, the Moorish style is the very best that can be adopted for iron architecture. The Classical Orders are exclusively for stone. Even the slender Corinthian or Ionic shaft, in iron, is manifestly a sham, and our common sense rebels against it. How, then, is it with the stout Doric column with its massive capital? An example of the Doric column in iron may be seen in the Cannon-street bridge. It is a thing which once seen will not be soon forgotten. To revert to Paddington, the supports to the roof are in the way of nobody, the ventilation is perfect, and the roof is so low that it does not obtrude itself upon the neighbourhood; if it did it would not be an offensive object. While Paddington terminus exists let no one say that any other must be either huge or hideous. The late I. K. Brunel has the credit of the design. The construction of the Ark or the building of Solomon's Temple might with equal propriety be attributed to him. The real author is practically unknown, but Mr. Brereton is acknowledged to have been Mr. Brunel's right-hand man as regards ironwork, but the exact share of praise he deserves for the design we are unable to determine.

From the most comfortable let us pass to the most comfortless of the London stations, viz., Victoria. This must certainly be intended only for temporary use, and with this hope we will dismiss it. A goods shed, a barn, or a brickfield are scarcely subject for architectural criticism. Charing Cross is the station next in order. This is one of the monstrosities which it seems to be nobody's business to interfere with while in progress, and everyone's duty to condemn when completed. It is very long, very wide, very high, and very hideous. The walls afford capital accommodation for advertising boards, and this is the utmost that can be said in its praise. Were the walls lower and the roof a complete semicircle it would have been less offensive, but as the former are of immense height and the latter segmental the effect is, whether seen from within or without, about as bad as can be conceived. It is, indeed, rivalled by the Cannon-street Station, and it is difficult to award the palm of supreme ugliness to either without doing wrong to both. Perhaps the best way of settling the matter would be to decree a palm to each, as was done with regard to the champion's belt, when contested for by Messrs. Sayers and Heenan some lustre and a half ago. That this immense height was a positive disadvantage we ourselves were witness on the occasion of the fire which last year did so much damage, and which the fire engines could not reach from the platform. The large span is not justified by the plea of freedom from obstruction as to columns for support of two or more smaller spans, inasmuch as the platforms are both here and at Cannon-street encumbered with lampposts, which are to all intents and purposes as much in the way as a column to support a girder. Neither is it justified on the score of superior ventilation. We consider both these stations positively ill-ventilated, and with this we dismiss them. Crossing the bridge and passing under the line, the departure platform of the South-Western Railway is soon reached. This station has the peculiarity of being on a curve. It is in three spans similar to those at Paddington, and the lamps are suspended, not set upon standards. There is no pretension to elegance or ornament, but it accommodates its traffic, is well ventilated, and does not offend the eye, and this is more than can be said for a great many buildings in the metropolis, whether railway works or other. Neither Blackfriars Station nor Ludgate-hill are termini properly speaking, but both are worth looking at. If they have no great merit they are not needlessly obtrusive. They are on a high level and cannot choose but be high, but the station itself above the platform is as low as is consistent with its purposes. The excessive use of bricks of different colours is, however, to be deplored, and we could have wished to see buildings of less fanciful architecture at the ends of such noble bridges.

The London Bridge terminus of the London, Brighton, and South Coast Railway is now completed. The outside, or rather the front on St. Thomas-street, does not display any architectural talent, though it betrays some considerable effort. The interior is in two spans, the one segmental-headed and the other consisting of a plain ridge roof at right angles to what may be called the main span. The effect is certainly bad, and we cannot see any necessity for such an arrangement. The columns supporting the roof are certainly larger than is required, and the bases are perfectly ridiculous from their size. The designer evidently does not look on columns as an obstruction to a platform, nor do we. They separate people into two lines and prevent jostling; they form spots where people can harbour and exchange a few words without being elbowed, and where a bag or parcel can be temporarily deposited with less risk than on the open platform. The ventilation of this station is perfect, though the roof is so low that it cannot be seen from without. Broad-street Station comes next in order. The visitor will be struck by the extreme lightness of the interior. It seems as though the limits of iron construction had been reached in this building. It is in two spans, and is well ventilated. The columns are like those at London Bridge station, clumsy as to the bases—the worst fault a platform column can have. There are eight lines of rails. The roof is low, but the ventilation is perfect; semicircular openings are left on each side near the plate. The exterior is superior to that of any other London station, and exhibits considerable taste. Thence to King's Cross by the Metropolitan train at Moorgate-street is but a step. Here we see an instance

of the explosion of a too readily adopted constructive principle. For a long time the circular ribs, built up in the laminated method, and consisting of five two-inch planks bolted together, have been losing their shape. In other words, they have sunk at the crown of the arch, and at the present moment the travelling scaffolding is fixed in its place for their repair. There is no doubt that engineers can do wonders; but how anything short of removing the ribs one by one and replacing them with others of iron or some better construction of timber can render the roof safe we do not at present see. This station has eleven lines of rails. We now come to the Midland Station, opened on the 3rd of the present month. In its present unfinished state a fair opinion of its merits can scarcely be formed. The construction is excellent, the diagonal rib being especially adapted to resist strain of wind or racking, to which, however, but for its overgrown size it would never be exposed. The front, by which we presume is meant the hotel, is in course of construction, designed by Mr. G. G. Scott. Judging by the character of the work on the ascent from the Euston-road, we do not expect much. The parapet of a thoroughfare for foot passengers should present no sharp angles, no delicate corners, no crafty mouldings inviting wanton injury. This parapet is an ingeniously devised out-door museum of all these objectionable features.

With a glance at the old Euston-square station of the London and North-Western Railway we will bring this paper to a close. It was built when railways were almost in their infancy, and may be said to consist of a *propyleum*, a hall, and a statue to Stephenson, with many lines of rails on either side. This station is, perhaps, too low, but we are not aware that complaints are made regarding the ventilation. There is really no valid excuse for erecting the immense spans of roof without which the present race of engineers deem no station complete. We think we have satisfactorily shown that neither the requirements of ventilation nor the demands of enormous traffic necessitate enormous roofs, and we have in vain sought for a justification on any other grounds for the growing custom of employing them.

PREPARATION OF OIL PAINTS.

At the present time chemists and philosophers acknowledge the existence of about sixty bodies or substances to which they give the name of elements. The bestowal of this term upon them implies that all the efforts of human skill, all the power of science, the fertility of invention, and the resources of the laboratory and the workshop have been unable to separate them into any components. Adopting the atomic theory, one of their molecules might be truly said to be one and indivisible. To the various combinations of these elements quantitatively and numerically are due the existence and formation of every natural substance that is to be found, and which in contradistinction may be appropriately called compound bodies. These latter may be divided into two separate classes, which are constantly confounded, and concerning which erroneous opinions are commonly entertained. A mixture, in the strict chemical sense of the word, is not a compound body unless the union of the component parts is attended with a mutual affinity stronger than that produced by mere mechanical means. As an example we may take alloys, which are not simply mechanical mixtures but *bona fide* compound bodies, the separate elements of which possess a strong chemical affinity for each other. It has also been proved that the different paints employed in the decoration and preservation of timber, iron, and other constructive materials, are not simple mechanical mixtures of oil and mineral substances but true chemical compounds, and endowed with that closeness and intimacy of union that invariably attends similar combinations. Recently, M. Hugoulin, holding a scientific appointment in the French navy, has turned his attention to this subject, which would otherwise possess little interest or importance were it not that it may be rendered of great benefit to the industrial arts. By conducting the preparation of paints upon a chemical rather than a mechanical principle, it is stated that they may be manufactured in any quantities in a very short space of time, and in a simple and economical manner, which would dispense with the greater portion of the heavy and expensive machinery at present required.

The French navy has ordered this new process to be examined and reported upon by a special commission, but as the result will affect the public equally well as the Government, M. Hugoulin has made no secret of the matter, and anyone may readily satisfy himself of the fundamental principle upon which this new process is based. Make a small cake, of a very fluid constituency, with some water and a certain proportion of any of the following ingredients:—White zinc, minium, or lamp black. Add to this cake a quantity of linseed oil, the proportion of the latter depending upon the ingredient employed. If zinc be used the proportion of oil will be thirty-two parts to one hundred, if minium only five and a half, and for lamp-black one hundred and ten parts will be required to one hundred of that substance. The mixture having been made it should be well stirred with a spoon or a spatula, and after a few minutes the oil will be found to be chemically united with the mineral substance, and the water to have separated and float upon the surface. This circumstance is manifestly due to the principle of "elective affinity," by virtue of which the mineral substance leaves the water and unites itself to the oil. The water having been drawn off, the cake is then consolidated and pressed something after the manner in which butter is made. The process can only be applied to certain mineral substances, among which chrome yellow is included, but it appears that those minerals to which it is applicable are those principally used in the manufacture of oil paints, as practice has demonstrated their efficacy as protectives and preservatives for timber and iron exposed to the action of the weather.

Although the experiment we have mentioned is sufficient to indicate that the chemical theory is the correct one upon which to base the manufacture of oil paints, yet it might be asserted that it is but an experiment and incapable of receiving that extension necessary to constitute it a practical success. A little reflection will prove that this would be an erroneous view to take of the process. It is equally adapted to a small as a large scale. It would be impossible, and at the same time undesirable, to enter in our columns into the details of the proposed new system of manufacture, but a brief outline will suffice to show the practicability of the intended operations. If we imagine the colour or mineral substance after being finely powdered, mixed with a large quantity of water, and then passed through a fine sieve or strainer of silk, there will remain upon the sieve but a very small quantity of the colouring matter. This residue, whenever after successive strainings it may have accumulated in sufficient quantities, can be repulverised in a mortar and ultimately utilised.

One of the chief advantages claimed for the sieve or strainer is that it arrests and separates from the pigment many foreign substances, such as small pieces of wood, timber, and other materials. This is not completely accomplished by the cylinders and machinery used in the ordinary manufacture of paints. The foreign particles are cut up very small, but they are not crushed, and the consequence is that, when the paint is applied, after a short time asperities and blisters rise to the surface, occasioning much disappointment to the workman and damage to the appearance of the work. The mixture, after passing through the strainer, is deposited in a tank, reservoir, or receptacle of some sort, where it may remain, if desirable, for some months. After drawing-off the greater part of the water, the proper proportion of oil is added, and the mixture thoroughly agitated. The result is that the cake commences to form, and is precipitated to the bottom of the receptacle. It is then pressed to drive out the remainder of the water, and although a very little may permanently remain, yet it will not affect the value of the paint or injure its application. In fact, it rather assists it in this respect than otherwise. The various and successive steps of the whole process may be summed up as follows:—The action of the water facilitates the minute division of the mineral substance or colouring matter; that of the strainer arrests all foreign particles and impurities, while the extreme degree of division to which the mineral has been brought favours its ultimate combination and chemical union with the oil. By virtue of its specific gravity the newly formed pigment, insoluble in water, separates spontaneously. It should be borne in mind that in its original state lamp-black will not mix with water, but the mixture may be successfully accomplished by previously treating it with a small quantity of alcohol. Also, grey zinc must be perfectly dry when undergoing pulverisation, or it will get sticky and clog, instead of being reduced to powder. This arises from the fact that a partial and incomplete oxidisation is set up by the presence of any damp. Viewed in a hygienic light, this method of preparing oil colours is superior to that in ordinary use, as it in a great measure obviates all danger arising from lethal emanations, against the baneful influence of which the workman in vain closes his mouth and covers his nostrils.

BRICKMAKING IN AND ABOUT MANCHESTER.

In April last the Manchester Society of Architects appointed a committee of their members to consider and report on the methods of brickmaking in that neighbourhood, and to make suggestions with the view of obtaining better bricks than those in general use. The committee have now issued their report. Their inquiries led them especially to investigate the following points in connection with brickmaking, viz.:—1, regularity of shape; 2, uniformity of size; 3, the size to be recommended as a standard; 4, uniformity of material; 5, density; 6 and 7, power of absorbing and retaining water; 8, methods of manufacture; 9, price.

Best stock bricks are described as generally being all that could be wished for as to colour, shape, and regularity of quality, and the report in these particulars is more specially directed towards improvements necessary for the production of a better class of common bricks. Preference is given to machine-made rather than to hand-made bricks for ensuring regularity of shape. They alone combine the qualities of true and parallel surfaces and general rectangularity, though they seldom maintain a good arris. Hand-made bricks are almost all defective in the above requirement, a large proportion being warped, bulged, rough-faced, and with very irregular arrises, principally arising from indifferent tempering of the clay, neglect to pick out stones, the use of so soft a material in moulding that it becomes distorted in handling, the rough surface of the drying ground, want of protection in drying, and the haphazard modes of burning. To the method of manufacture is also ascribed the want of uniformity in size. It is suggested as obvious that different-sized moulds should be used for different kinds of clay, so as to produce bricks, when burned, of uniform size. The introduction of machinery without graduating the

Table 1.

Showing average size and weight of bricks, with quantity of water absorbed. The results are the averages of several specimens of each kind by total immersion.

Description of brick.	Contents in cube inches.	Weight.	Weight per cube foot.	Water absorbed by total immersion.		Percentage of water absorbed to the volume of the brick.
		lb. oz.	lb.	oz.	cube. in.	per cent.
Common hand-made, ten samples from various crofts near Manchester	103·5	6 9·25	109·75	11·6	2·05	19 38
Builders' Association, machine-made	140·12	8 15·5	110·6	19·67	34·0	24·26
Platt's machine-made.....	116·01	8 4·5	123·39	12·5	21·6	18·6
Hutchinson's machine-made.....	114·85	7 15·5	120·00	9·875	17·0	15·0

Table 2.

Rate of absorption, the bricks placed on edge in ¾in. depth of water.

Description of brick.	In ¼ hour.	In 1 hour.	In 2½ hours.	In 14 hours.
A particularly good brick from Bradford, near Manchester, absorbed of the total quantity (8¾ oz.), which it took up ultimately.....	per cent. 44	per cent. 56	per cent. 70·6	per cent. 100
Builders' Association brick (20¼ oz.), ditto.	30	55	85	100
Platt's light-coloured (12¼ oz.), ditto	41	75	98	100
Hutchinson's machine-made (8¼ oz.), ditto. (Saturated in 38 hours.)	33	36·4	59	75·75
A good hand-made brick from Hulme (8 oz.), ditto	47	59	68·75	90·5
A good hand-made brick from Collyhurst (14⅜ oz.), ditto.....	40·75	64·4	95 0	98·4

Table 3.

Showing the actual quantity of water absorbed per cube foot of brick at stated intervals, the bricks being placed ¾in. on edge in water.

Description of brick.	Weight per cube foot, dry.	Contents.	Quantity of water absorbed per cube foot in				Full saturation.
			¼ hour.	1 hour.	2½ hours.	14 hours.	
	lb.	in.	oz.	oz.	oz.	oz.	oz.
Platt's machine-made ...	123·157	117·00	73·85	132·93	177·24	180·93	180·93
Builders' Association do.	114·6	136·4	76·014	139·35	218·54	253·38	256·54
Hutchinson's ditto	118 75	111·64	3· 69	46·43	58·042	96·73	127·62
Bradford, near Manchester, hand-made	111 65	100·6	64·41	81·58	103·056	145·99	150·29
Hulme ditto.....	113·69	95·6	67·78	85·85	99·41	131·013	141·6
Collyhurst ditto	112·94	100·4	103·26	163·5	240·95	219·55	253·86

Table 4.

Rate of drying at about 65 deg. temperature.

Description of brick.	In 4½ hours.	In 1 day.	In 2 days.	In 3 days.	In 4 days.	In 5 days.	In 6 days.	In 11 days.
The Builders' Association brick had lost of the total volume it had absorbed (20¼ oz.)	per cent. 8·6	per cent. 32·1	per cent. 50·6	per cent. 69·1	per cent. 81·4	per cent. 86·4	per cent. 00·1	per cent. 96 3
Platt's light-coloured (12¼ oz.)...	4	31·7	61·2	75·5	81·6	85·7	89·8	96
The hard Bradford brick (8¾ oz.)	8·57	42·9	68·6	78·0	81·0	82·9	—	94·3
Hutchinson's brick (8¼ oz.).....	—	50	63 6	72·7	76·4	78	82	82
Collyhurst brick (14¾ oz.)	3·4	30·5	54·2	74·6	81·3	86·4	89·8	91·5

sizes of the moulds would not prevent the production of large bricks of open clays from full-sized moulds, which are preferred by certain classes of builders. The committee consider it a question for consideration whether stiff clays might not be rendered more open by mixing a more loamy clay or breeze with them, as is done in London and the Midland Counties.

The size recommended for bricks when burnt, so that all shall be uniform from wherever procured, is 9in. by 4⅜in. by 2 13-16th inches, or 110¾ cube inches. This size would not be too large or heavy for a bricklayer to handle, and would be such that two brick breadths should, with the mortar joint, equal one length and three thicknesses with the joints the same. 1,000 of such bricks, exclusive of waste, would set exactly 11 yards of 9in. brickwork. The cubic contents of bricks at present made in the vicinity of Manchester range from 94in. to 115in., averaging about 104in. Platt's bricks average 116in.; the samples submitted to the committee by the Master Builders' Association, 140in.; and Hutchinson's, 115in.

Want of attention, besides causing irregularity in size, is also the cause of non-uniformity of material. More careful sorting out of stones, &c., more careful casting and tempering, are necessary to improvement in this respect. With regard to density, while it is desirable that appreciable hollows should not exist in the texture of a good brick, still the materials should not be so compressed as entirely to exclude air, thereby rendering its proper burning difficult and making it heavy in proportion to its cubical capacity, thus becoming expensive in carriage and the cause of outlay where structures require the support of iron beams, or for arching. The committee found the bricks of the Builders' Association compare well in this respect; the weight of a cube foot being 109¾lb. Platt's bricks weighed 123 1-3lb., and Hutchinson's, 120lb.

Tables Nos. 2, 3, and 4, above, show the relative values of different bricks with regard to their power of absorbing and retaining water. Of course the brick which imbibes the least moisture, and that the most slowly, and which parts with it most rapidly, is the most desirable, not only on account of non-penetration of rain, but also for its comparative immunity from injury by frost. From the tables it will be seen that the position of the different sorts as to quantity absorbed in a quarter of an hour, two hours and a half, and fourteen hours was almost uniformly thus:—1st, Hutchinson's (absorbing least water); 2nd and 3rd, hard bricks from Hulme and Bradford; 4th, Platt's; 5th, Collyhurst; and 6th, Builders' Association. In testing the facility of drying, the bricks, after being saturated, were left at a natural temperature. In the first four hours and a half Platt's and the Collyhurst bricks lost only about half of what the others had done. In four days all were nearly equal, and after that the Builders' Association bricks and Platt's surpassed the rest.

The present system of burning common bricks by so-called "close fires," where the bricks are interspersed with layers of fuel, is very objectionable and wasteful, beside causing distortion and inequality of colour. Platt's and Hoffmann's systems are spoken of as the best, but the expense consequent on the adoption of either is stated to be beyond the means of most brickmakers.

The conclusions arrived at as the results of the experiments are:—

That bricks of good quality should be of a uniform size (say 9in. by 4 3-8in. by 2 13-16in.), and should weigh at the rate of about 110lb. per cube foot, or about 7lb. each. They should be rectangular, with true faces, and only the sides and ends need be smooth; the arrises should be sharp and straight. No print sinking on either face. They should not absorb, when saturated, above 20 per cent. of their bulk of water, and should absorb it reluctantly, and part with it with facility at ordinary temperatures. They should be uniformly burned, and have a metallic clang when struck together. They should be tough and "pasty" in texture, and not granular, so as to require repeated blows to break them rather than one single hard blow. Superiority in this respect will cause the bricks to retain their entirety and sharpness of their arrises in carting and handling.

Hand-made bricks, as at present made, cannot be relied upon for complying with the above requirements. With regard to machine-made bricks, Platt's process does not appear to the committee to be practicable in the neighbourhood of Manchester for the production of common bricks. The bricks submitted by the Builders' Association comply with the majority of the qualifications, but should be made smaller; and their granular texture, as well as the friability of the arrises, point to the necessity of some improvement in the tempering of the clay. The bricks made by Hutchinson's process seemed to the committee the best. They were, however, as stated, somewhat heavy, and the process requires some improvement to secure greater rectangularity and uniformity of burning.

GOSSIP FROM GLASGOW.

(From our Correspondent.)

WHATEVER may be the value of the Lord Clyde statue as an expression of British art, the results otherwise cannot fail to be satisfactory to the subscribers. The amount contributed was, with its interest, £2,350 0s 3d.; and after £1,200 were paid for the figure, £398 7s. 2d. for the foundation and pedestal, and some indefinite sum for petty expenses, there was left a balance of £656 16s. 10d. Of this £94 10s. were presented to the secretaries, city architect, and treasurer's clerk; 5s. per pound was returned to the subscribers, and the remainder was given to the Royal Infirmary.

Speaking of sculpture, I may mention that our fellow citizen, Mr. Ewing, has been honoured by the Prince of Wales with a sitting for a bust.

At the annual meeting of the directors of the Andersonian University our eminent local architect, Mr. Rochead, was elected the trustee representative of art.

On the 17th inst., at Jamestown, in the Vale of Leven, there was laid, with full Masonic honours, the foundation stone of a small worship house in connection with the Kirk of Scotland. The style is Gothic, and the building is divided into nave and aisles. Over the entrance is a spire rising 130ft. from the ground level. The building measures 60ft. by 48ft. within, has a gallery on each side, and one in front of the pulpit, and is seated for 900 persons. Three windows behind the pulpit are to be filled with stained glass, the gift of gentlemen in the district. The artificial lighting will be by a "sun-light," with seventy

burners, and the heating by hot water pipes. The estimated cost is £2,500, of which Mr. Orr Ewing, the Lord-Dean-of-Guild of Glasgow, has contributed one half, and Mr. Smollett, of Bonhill, a relative of the poet and novelist, £250. The architects are Messrs. Clarke and Bell, of Glasgow.

The foundation stone of a mission church, in memory of the Rev. Dr. Robertson, of Glasgow Cathedral, was laid on the 15th inst., by his successor, the Rev. Mr. Burns. This building is also in the Gothic style. It is seated for 600 worshippers—500 in the area, and 100 in the gallery. The cost of the building is £1,800, and of the site £1,100. Of this amount about £1,600 have been contributed by the cathedral congregation and by friends of Dr. Robertson. The architect is Mr. Barclay, of Glasgow, a gentleman who has in Gothic architecture shown considerable fertility of invention, although some of his detail is somewhat crude and immature. However, freshness is as welcome as it is rare; refinement in detail will be certain when judgment is appealed to by experience.

Certain of the Glasgow architects, having failed to obtain a special charter, have been licensed by the Board of Trade as a limited liability company under the designation of "The Glasgow Institute of Architects." Some new architectural society, if the profession is to be really represented, has become a necessity, for in the present many of the leading men, such as Rochead and Burne, are conspicuous only by their absence. The objects of the newly licensed company are:—1. The advancement of the art and science of architecture. 2. The consideration and discussion of all subjects and questions connected, directly or indirectly, with the profession of architects, and the concentrated expression of opinion upon the same. 3. The elevation of the attainments, the promotion of the efficiency, and the protection of the interests of the architects of Glasgow. 4. The establishment of a uniform rate of charge by the members for professional business, in cases where no special agreement as to remuneration is made by the parties. 5. The doing all such other things as are incidental or conducive to the attainment of the above objects. And the qualifications of members are:—1. Persons who have served for six years at least as apprentices or assistants with members of the institute, or with persons eligible to become such. 2. Members of other architectural institutes, associations, or societies. As regards the *objects* of the company, every one of them have been at least *professed* by the existing "society," and, as regards the *rules*, the one is admirably adapted to defeat the purpose of the other. In the first place, there is a door that can be passed by only a minimum of six years' study, and in the second, there is a door standing wide open to admit such as may be mere members of other institutes and societies. One "object" of the company might have been to weed the "profession" of all who had not served a regular apprenticeship. With such a rule as rule 2 the architectural profession is in Glasgow as it was.

On Thursday, the 8th, Glasgow was almost literally in "full feather" on the occasion of the Prince and Princess of Wales's visit for the purpose of laying the foundation stone of the new University buildings. There were feathers (Prince of Wales's) everywhere, and in almost every conceivable material. Triumphal arches, flags, banners, Danish crosses, and evergreens were abundant. Architecture was hung with "decorations," and smothered by upholstery. The street decorations were lavish in the extreme. The Prince was presented with the freedom of the city, and for that purpose, he, accompanied by the Princess, was led from Stirling-square (its poverty half hidden by festoons of green leaves and folds of red calico) up back stairs, and through dark, dingy, low-crowned, and irregular passages, into that really dainty place to set before a prince, the City Hall. This *monstre* box, which had defied the genius alike of such a master in colour as D. R. Hay, and of such an adept in form as Alexander Thomson, had just before the royal visit undergone a mild course of white lead, turpentine, ochre, and stencil plate, and this, with a copious draping of the inevitable scarlet cloth, in some degree fitted it for "the expectancy and rose of the fair state." Glasgow must, ere long, have a city hall worthy of the "second city of the empire"—a building dignified without, elegant within, and in a central situation. Of late, the *utile*, rather than the *dulce*, has been receiving attention. The very poorest dwellings have been supplied with water exhaustless in quantity and unrivalled in quality. Way has been made for pure air and the light of day, and now, with plans and estimates at hand, the disposal of the town sewage is being considered. The route of the procession was four miles in length, and of course at intervals there were "grand stands." Notwithstanding the great number of these temporary erections there was not a single accident.*

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE Institute's session for 1868-69 is about to commence. The ordinary meetings, which begin at eight o'clock, will be held on the following Monday evenings:—1868.—November 2, 16, 30; December 14. 1869.—January 4, 18; February 1, 15; March 1 (special general meeting of members only, for the award of medals and prizes), 15; April 5, 19; May 3 (the annual general meeting of members only), 24; June 7, 21. The ordinary meetings of council take place at seven o'clock on the Monday evenings appointed for general meetings. The council also meets before every special meeting.

The volunteer architectural examinations are held in the second and third weeks in May. Applications for examination and all preliminary work must be delivered on or before March 10, 1869. Copies of revised regulations (which will apply only to 1869) together with course of examination, list of books recommended, copy of questions used in the last examination, list of medals and prizes for 1869, regulations for the Pugin travelling studentship, &c., may be had on application to the Assistant Secretary at the Institute, price 2s. or 26 postage stamps. All drawings and essays sent in for the prizes offered by the Institute must be delivered on or before January 31, 1869. The election of candidates for the Pugin travelling studentship will take place on February 15; last day of application, January 31, 1869. The meetings of the district surveyors' board of examiners are held on the last Friday in the months of January, April, July, and October, to examine persons desirous of obtaining certificates of competency to perform the duties of district surveyors. The sessional papers of the Institute can be procured by the public and by members at the rooms of the Institute, 9, Conduit-street, at the following prices, viz.:—1862-63, non-members, £1 1s.; members (one extra copy), 10s. 6d.—1863-64, 1864-65, 1865-66, 1866-67, and 1867-68, non-members 15s., members 7s. 6d. Copies of transactions of former years, viz, from 1853 to 1862, can also be had on application to the Assistant Secretary. The *conversazione* will probably be held towards the end of June or beginning of July.

The library is open to members from ten to five daily (on Saturdays from ten till two), between October 18 and August 30 (excepting the Easter and Christmas weeks), and on the evenings of Monday, Thursday, and Friday during the session, from seven to ten.

John P. Seddon, Honorary Secretary.
Charles L. Eastlake, Assistant Secretary.

GLASGOW ARCHITECTURAL SOCIETY.

THE annual general meeting of this society was held on Monday evening, J. Honeyman, jun., Esq., the President, in the chair. The annual report, which was read, was adopted, and the following gentlemen were elected office-bearers in the society for the ensuing year:—President, Campbell Douglas, Esq.; Vice-Presidents, Angus Kennedy, Esq., James Steel, Esq.; Hon. Secretary, William M'Lean, Esq.; Hon. Treasurer, James Howatt, Esq. Mr. Campbell Douglas, the newly-elected President, delivered his inaugural address. After congratulating the society on its present satisfactory condition, as evidenced by the report, he proceeded to review its progress under the direction and influence of its previous presidents, especially eulogising the conduct of Mr. Alexander Thomson, who, he said, was one of the few existing architects who stamped his individuality on his work, and from whose studio there never issued a design which did not bear the mark of great study and the evidence of considerable genius. He stated that when the letter of the committee reached him, in a distant part of Scotland, proposing to nominate him for the presidency, he at once wrote, advising that the society should again select Mr. Thomson. He wished to decline for himself the honour, but, since it had been pressed upon him, he would do all in his power for the advancement of the object common to them all.

He would, therefore, say to all architects that unless their work was studied patiently, earnestly, and with a sincere love for the work, it would never be satisfactory, or command the admiring attention of any well-informed critic. It was a great misfortune both for the man and the community—so far as art was concerned—when he had more to do than he could personally overtake. There were many people—perhaps the great majority—who would think such a statement nonsense. If their supreme object were to get a commission on the value of the buildings for which they were architects, then the more extensively they were employed the better; but he would comfort all true lovers of pure and noble art by telling them that if they could support life, and honestly pay their way, and have a mind refined by culture, and had made friends for themselves with the nobility of the past, in the world of letters and the world of art, and could thereby appreciate all that was beautiful, whether past or present, they might be content to labour in comparative obscurity, and could afford to let the patronage of the ignoble go past unsighed for. Again, if an architect's work were not studied with due regard to mass and detail, those who could understand it would very soon discover that not only had the work lost all individuality—which was the very essence of art—and, chameleon-like, had merely assumed the colour of the day that might be shining in the darkness of his place of business; but it would be found to be either full of crudities, or of such repetitions constantly cropping out in that and other buildings, as would destroy its art character. It would be unpardonable presumption in him to venture on anything like direct criticism on some of the later buildings of living architects, but he had very decided opinions on the merits and demerits of many of them; and he would gladly point out their defects, as they appeared to him, but for two reasons—first, all kinds of artists were, rightly or wrongly, supposed to be swayed by such unworthy jealousy of each other that it would be scarcely possible to get one's criticism considered fair and unbiassed; and, secondly, even supposing the criticism just, it would stir up feelings of ill-will, and be a fruitful source of discord. He desired, however, earnestly to insist that good architecture was just like good painting, good sculpture, good music; it was seldom that what was the best struck them at the first as being so. It ought to gain upon them, as they had opportunities of knowing it, like the qualities of a desirable friend, which were seldom apparent to a bowing acquaintance. If there were anything good at all in a building, it would generally be a reflex of the mind of its designer; if not, it was like an image in a twisted mirror, untrue and bad. There ought not to be any thrusting obtrusiveness, but a very modesty that would only be discovered by its blushes. There must be dignity and worthiness, so that a little accidental forgetfulness could be passed over in the general repose; there should be nothing superficial or shallow; let it be broad and deep, where they could see the lights and shadows of life, that invested all existence with interest; it must be considerate, and not offend its poor neighbours by its goodly apparel; it might be all that is admirable, and yet not proud; and it must be elegant and refined, though not necessarily costly. Now, if the buildings sinned in this way, what should we say of those who originated them? Either they were ignorant men, or they yielded to the temptation of making much money by doing bad work, as there were more people who like bad architecture than good. These men should leave off preaching on stone; their sermons were so bad. There were plenty of respectable trades where they might realise ten or twenty times their present income, and in pursuing which they would not corrupt the public taste, and dishearten real artists who are working carefully and perhaps unheeded. In the grand new buildings of their University, whose foundation stone was laid the other day by the Prince and Princess of Wales amidst the enthusiasm of the people, he would hail with joy the possible establishment of a Chair of Architecture. He could conceive nothing that would be of greater use to art, or more likely to make study a branch of liberal education. Within late years the number of

* To be concluded in our next number.

professorships has been largely increased; and under the impulse of its west-end life, in purer air and healthier influences, it might not be Utopian to hope that this want might be supplied. Thanking them for giving him the opportunity of so addressing them, and assuring them of his deep interest in all that concerned their professional well-being, he would say there was plenty of work before them all, in city improvements and sanitary improvements, which were but the fulfilling of the second great commandment, with all of which the artistic element, for which he had been pleading that evening, might go hand in hand. And so, all doing the duties that lie before them diligently, humbly, and thoroughly, they would in every-day life be so far preparing themselves to go up to the great city built without hands, whose foundations were all precious stones, and her gates pearls.

ST. JOHN'S CHURCH, TORQUAY.

THE illustration of this church appeared in the last number of the Building News. The church is being built by degrees to take the place of a poor modern building of nondescript design. The design is by Mr. G. E. Street. The first portion built was the chancel, with aisles and sacristies. This is built of Ham Hill stone and local limestone, and is vaulted throughout with flying buttresses. The east window is by Messrs. Harris and Marshall, from the design of Mr. E. B. Jones. The reredos has a sculpture of the crucifixion. The north aisle of the nave, and the north clerestory, are also completed. The old building still, therefore, opens into the new chancel at the east end, and into the new aisle at the north. It is, however, we believe, hoped ere long to carry the work on to completion. There will be a tower at the south-west angle of the church.

THE JUNIOR CARLTON CLUB.

THE Junior Carlton Clubhouse, lately built in Pall-mall, near the Army and Navy Club, has another frontage in St. James's-square. It was designed by Mr. David Brandon, the architect, and built under his superintendence, at a cost of £40,000, by Messrs. Lucas Brothers. Its interior is conveniently arranged. On the ground floor is an entrance-hall, 27ft. by 23ft. 6in.; a reception-room, 29ft. 6in. by 20ft. 6in.; a morning-room, 89ft. by 27ft.; a smoking-room, 28ft. by 29ft. 6in.; and a principal staircase, 30ft. by 23ft. There is a second staircase and attendants' rooms, with an entrance in St. James's-square for members who have bedrooms. On the first floor is a members' coffee-room, 90ft. by 27ft., divided by a plate-glass screen from a strangers' coffee-room, 27ft. by 27ft.; a house dining room, 28ft. by 20ft. 6in.; and a library, 40ft. by 29ft. 6in. There is another serving-room on this floor. The height of these stories is 20ft., except where the mezzanine occurs on the north side. On the second floor are two billiard-rooms—one 27ft. 6in. by 27ft., the other 29ft. by 21ft.—the secretary's offices and bedroom, and a second smoking-room for visitors. The remainder of this floor and the floor above are occupied by eighteen bedrooms, which will be let to members of the club. The topmost story provides accommodation for about fifty male and female servants. Under the ground floor and above the basement a mezzanine story is formed, having six dressing and bath rooms, with separate corridor and staircase; the steward's office, still-room, housekeeper's room, and stores. In the basement are the kitchen, 40ft. by 29ft., and the scullery, 25ft. by 17ft., which are continued up to the ground floor, giving a height of 19ft.; a servants' hall, butler's pantry, plate-closet, kitchen, clerk's office, cook's room, kitchen-maid's room, larders, steward's room, wine-cellar, and dispensing-cellar. Outside, in the vaults under the pavement in St. James's-square, are cellars and larders for different stores.

NEW DIRECT ROUTE FROM ISLINGTON TO THE CITY.

A PLAN long since projected for the opening out of a direct route from Essex-road, Islington, to Moorgate-street, is at length on the point of being realised. The northern section of the proposed new thoroughfare is a fine wide street called Packington-street, extending across what were once the Britannia-fields from Essex-road to the Regent's Canal. Crossing the canal bridge (which is to be widened), the route proceeds along Shepherdess-walk to the "Eagle Tavern," City-road, and St. Luke's workhouse, which stand at opposite corners. Here the barrier which has extended across the thoroughfare for so many years will be removed, and the boundary wall of the workhouse grounds will be set back a considerable distance, making Shepherdess-walk of one width throughout. Crossing the City-road, and proceeding citywards, the route will be continued along Bath-street, the southern end of which has been widened by setting back the wall of St. Luke's madhouse to a line ranging with Alleyn's almshouses. Crossing Old-street the whole length of Bunhill-row will be traversed, and, Chiswell-street being reached, a short cut through Type-street and Moor lane will bring the new route to a termination opposite to the Moorgate street station of the Metropolitan Railway. The project has often before been mooted, but business is evidently meant this time. The Bath-street section was opened yesterday (Thursday) with some little ceremony by the vestries of the several parishes interested. Mr. Vulliamy, the arbitrator appointed by the Metropolitan Board of Works, and Mr. Clutton, the arbitrator appointed by the parish of St. Luke, have agreed on Mr. John Shaw, of Christ's Hospital, as arbitrator between them in the matter of determining the value of the strip of land taken from St. Luke's workhouse for widening Shepherdess-walk. The cost of widening Shepherdess-walk will be defrayed by the Metropolitan Board. This and the Bath-street section of the route have hitherto presented the greatest obstacles to the advancement of the project. These surmounted, a great local want will be met.

GROTESQUES.

THE grotesque sketches which are published in this week's number aim chiefly at economy of work. In the majority of the designs the bulk of the material is left square, form and expression being produced by scooping, sinking, and chamfering. No. 1 is an ornamental stop to a chamfered angle. The grotesque figure in this should project sufficiently to act as a gargoyle. This is intended to be worked in stone. Nos. 2, 3, 4, 5, and 7 are for timber brackets or bracket endings, and in these the *square manner* is more fully shown. No. 6 is a gargoyle or angle figure. Nos. 8 and 9 are intended for iron standard heads. One thing, which is partly illustrated by the sketches, I would like to call attention to, and that is the variety of ways in which "eyes" may be simply and economically represented conventionally. In this group, I think, there are seven methods shown, and these only touch upon and by no means exhaust the number of treatments possible of the subject. The eyes, and, indeed, all the other features, are susceptible of an infinite variety of manipulative treatments, which would enhance the interest of the subjects in a proportionable degree to the variety and success of the handling. The Building News for April 3 of the present year contained a sheet of grotesques, and in the article which accompanied it a few leading principles were mentioned by which the designer of grotesques should be guided.

J. M. S.

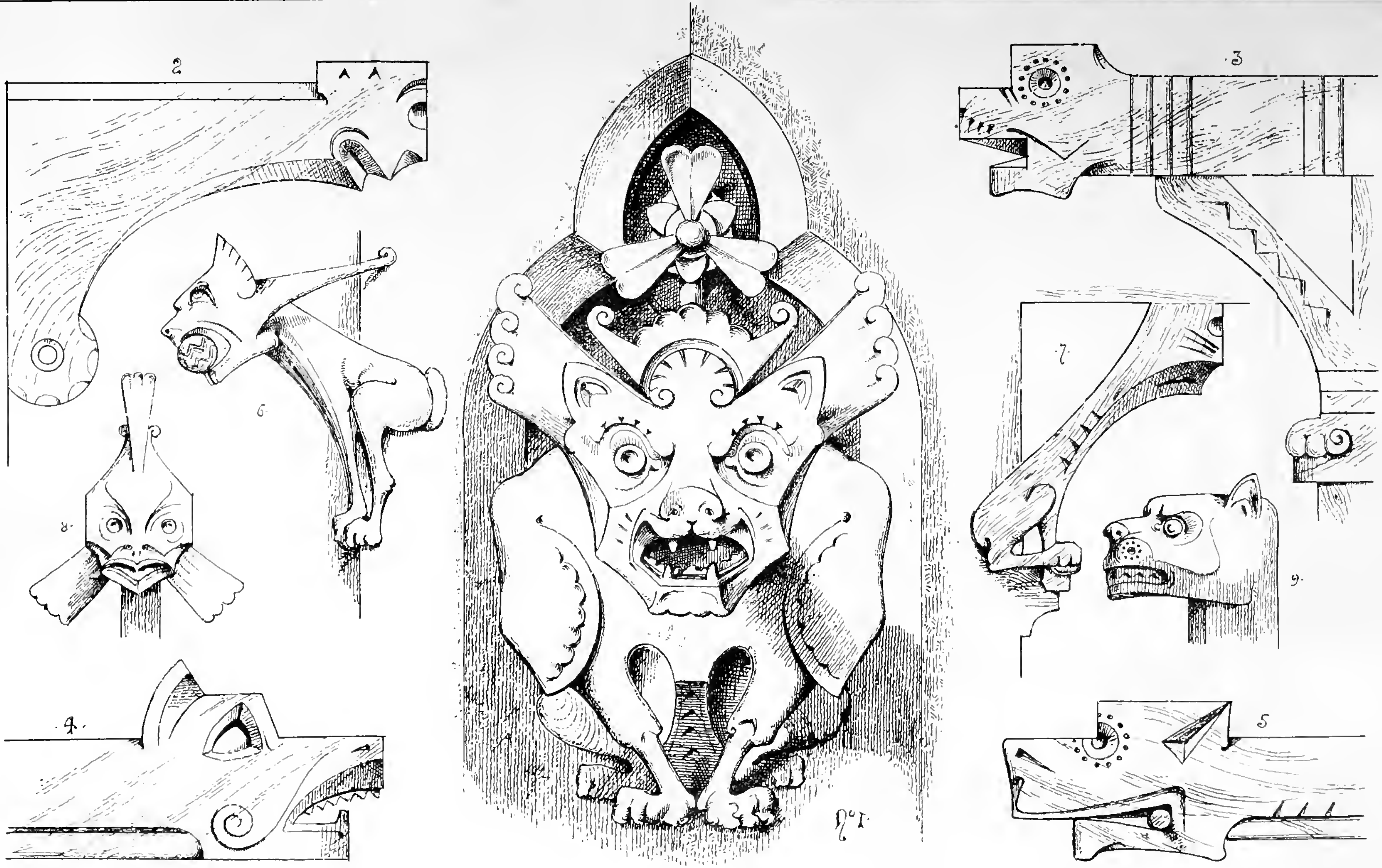
METROPOLITAN DISTRICT RAILWAY.

THE section of this line between Westminster Bridge and Gloucester-road, Brompton, is progressing satisfactorily, and will probably be opened by March next. In another year from then it is expected to be advanced under the whole length of the Thames Embankment to Bridge-street, Blackfriars. Three or four years, however, will probably elapse before the "inner circle" recommended by Lord Granville's committee can be completed by carrying the line on to Tower-hill to join the eastern extension of the Metropolitan line from Moorgate-street. When the improvements in Palace-yard were decided upon by Her Majesty's Commissioners of Works, Lord John Manners insisted upon the company at once making that portion of the line lying between Bridge-street and the Westminster Palace Hotel. This portion has been finished since February last year. Now, however, the line is being extended on the one hand through Westminster to Brompton, and on the other under the Embankment to Blackfriars. There will be a station at the foot of the Clock Tower for the accommodation of M.P.'s. Between the Broad Sanctuary and the Broadway there will be a station. From the Broadway the line passes through Emmanuel Ground to the Victoria Station, opposite to which will be another station. Passing beneath Eccleston-place, the next station reached is Sloane-square. Leaving Sloane-square, the line continues in a north-westerly direction through Chelsea to the Brompton-road, which is crossed a few yards eastward of the "Admiral Keppel." This would be an admirable point for a station, being so near to the South Kensington Museum; but the station is not to be here, but further on, in the Old Brompton-road, at the corner of Onslow-crescent. From this station the line will continue until Gloucester-road is reached. The portion of the line between Paddington and Gloucester-road was, as we have already announced, opened on the 1st inst. Wherever practicable, the line is carried through open cuttings. Throughout the whole course of the line the contractors found a bed of gravel. A vast number of houses of a wretchedly squalid and dilapidated character, in the neighbourhood of Tothill-street, have been demolished for the purposes of the line. The company intends devoting some of its surplus lands, however, to the erection of workmen's dwellings.

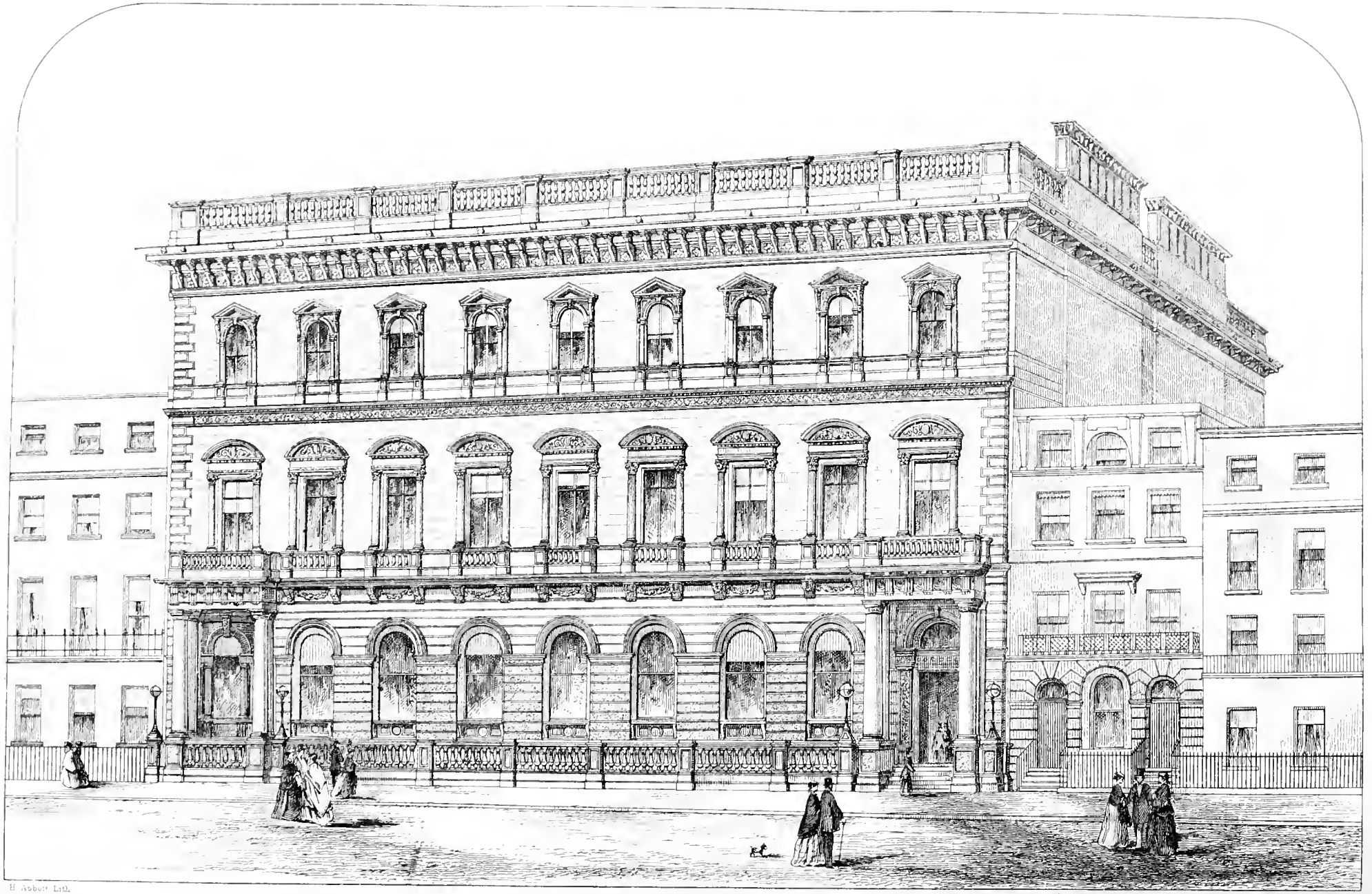
THE NEW FINSBURY PARK.

THE inhabitants of North London have received with considerable dissatisfaction the announcement of the Metropolitan Board of Works, offering for sale for building purposes 20 acres out of only 131 acres acquired for the formation of the park. The act of Parliament passed in 1857 gave to the Board power to acquire 250 acres, and granted permission for 20 acres to be disposed of. The Board have only acquired 131 acres, and yet wish to sell 20 acres of land, situate on the best frontage of the park. On Monday evening a very large meeting, under the presidency of Mr. Torrens, M.P., was held at Myddelton Hall, Islington, to take public action in the matter. A resolution was moved by the Rev. W. B. Mackenzie, "That this meeting views with great surprise and regret the course contemplated by the Metropolitan Board of Works to dispose of a large portion of the ground already purchased, and positively required, for the purposes of the Finsbury Park; and feels certain that if the intention of the Board be carried out, the object of the legislature will be frustrated, a great injustice will be inflicted upon the inhabitants of the borough, and the usefulness and beauty of the park, as a place of public resort, will be materially and permanently injured." Mr. Alfred Walker seconded the resolution, which was supported by Mr. Alderman Lusk, who was received with warm applause. In the course of his remarks Mr. Lusk said that, as the London of to-day would be a very different place from what it is if it were not for the parks preserved to it in bygone times, so the London of the future must be provided for in its outskirts; for as its vast population increased there were increased necessities for abundance of fresh air and such breathing-places as these parks afforded. He declared that it was a mortifying thing that the 250 acres which the House of Commons gave to Finsbury should, by the action of the metropolitan local representatives and the Board of Works, be cut down to 131 acres; but it was unbearable that this reduced plot should be curtailed by having its frontages sold for building sites. It was shown that the west-end parks amounted to 831 acres, that Regent's Park had 403 acres, Victoria Park 280, Battersea 230, Greenwich 170, and it was maintained that at the least Finsbury was entitled to the 131 acres of which the present park consists. The resolution was adopted by acclamation, and other steps taken to press upon the Metropolitan Board of Works the injustice of curtailing the park. The meeting authorised other steps to be taken failing the efficacy of this memorial, and the proceedings terminated with cordial thanks to the chairman and his colleague for attending.

A movement has been set on foot in Winchester for improving the dwellings of the poor. It is proposed to take the building lately occupied as the county hospital, and, after effecting certain alterations to let it out in tenements. A company on the limited liability principle is to undertake the matter.



Grotesques by J. Moyr Smith



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The Junior Carlton Club, Pall Mall.—Mr DAVID BRANDON, ARCHITECT.

THE RESTORATION OF ORGANS.

WHEN I began these notes on the present deplorable condition of the organs in St. Paul's and Westminster Abbey I certainly had no idea that the subject, important as it is, would have created so much interest as it has done, and which is proved by the letters of correspondents about it; still less could I have thought we should have to encounter subjects so profound as are indicated in "H. H. S.'s" letter of last week. My simple object was, and is, to show, as far as I can, the mistakes that were made, both musically and architecturally, by those who so hastily and unthinkingly advised and carried out the alterations both in the positions and arrangements of the organs in the two cathedrals. I do not know which is the best organ in London, but it will be acknowledged readily that that in the Temple Church, now so lost, is a particularly fine one, and that there are pipes in it singularly sweet and beautiful not to be heard elsewhere. The Westminster organ, good as it may be, cannot be considered quite worthy of the place it occupies, while the organ at St. Paul's, when it stood in its old place, was so out of repair and order that I have heard Mr. Goss more than once declare that he could hardly play on it. But in the face of all this I thought that this organ, however played, *always* sounded more musically, clearly, and deeper than all others elsewhere; and it was impossible to avoid the conclusion that it was all, or in great measure, owing to the *building* it was in and the place in that building which it occupied. This consideration leads naturally and obviously to a few thoughts on the acoustical properties of buildings, and will show to the simplest what infinite advantages there are in large and solid buildings, as far as their musical properties are concerned; and will, at the same time, be a reply to some of the objections made to the views advanced even by so eminent a person as M. Thalberg.

It is a very difficult, if not impossible, thing, to explain in words, however carefully selected, a *sound* of any kind, most of all a musical sound. It is not an *echo* in the usual and common meaning of that word. An echo is a *reflected* sound merely; but what I referred to as taking place, and as heard in St. Paul's, was what is sometimes called, when applied to rooms, "resonance;" but even that term does not explain it clearly, and unfortunately there is no single word in the language that does so. What really takes place is this. In a common church—as in St. Sepulchre's, close to St. Paul's, which is an ordinary parish church, closely pewed, and with heavy galleries, and with floor covered with matting, and walls thickly coated with paint, to say nothing of curtains and lined pews—an organ pipe, or chord of pipes, when filled with sound by the air passing through them, of course fills the whole church with sound during the whole time the air is thus passing and while the valve or valves are open, but the moment they are closed the sound ceases and comes to a dead stop, like the sound from the blow of a hammer on a table; there is no *echo*, or resonance, or sounding air, even when the full organ is at work in a "Bach" fugue or Handel chorus; there is not the slightest trembling or sound in the air after the final note or chord has ceased. The whole music is over the moment the fingers of the performer leave the keys. Not so in St. Paul's or even Westminster. An organ pipe, when the organ was in its old place, if sounding but for one second, the key being simply struck with the finger, of course ceased to sound in the pipe at the end of the second, or instantly the finger was raised from the key; but the sound did not end here as in a common church, for the sound from this single pipe, though it was but a small one, filled the whole cathedral—*i.e.*, the air held the sound for a longer or shorter time—and thus was the note held on for some seconds, the sound trembling in the air. Indeed, simply a *cathedral effect*, to be heard nowhere else, and peculiar to a cathedral, and especially characteristic of one. What thus happened on the sounding of a single pipe was, of course, increased, and deepened, and intensified with a chord of pipes and a full organ; and I contend that nothing could possibly surpass the magnificence of it. Not only was it a thing in itself worth all preservation, but it added, as I before said, to the thought of the composer that which he could never have written, or, indeed, even have imagined; for there are things in nature beyond all power of mere human thought and contrivance, and this is one of them. If this cathedral of St. Paul be worth the money and time and skill it cost as a mere empty work of art and architecture—and most people will agree that it is—then I contend it is all a hundredfold increased when it enshrines so wonderful a combination of musical and mechanical invention and skill as an organ; and yet more so when such instrument is found capable of realising and making evident to the ear the finest and most glorious thoughts of those who have been gifted with the rare and precious faculty of musical composition. In this way, therefore, it was that the building and organ, and the position of the organ in it, helped the composer's work; and it is difficult to find words to describe the dulness of those who did not perceive it, and who so blindly and thoughtlessly marred it all, or, as in Westminster Abbey, destroyed it altogether. It is here to be observed that in St. Paul's the whole effect was produced solely by the building *as a part of the organ*, and from the unequalled position of the organ in it, while in Westminster—from causes which would take us from the present subject to try to explain—the whole of the work was done through the consummate skill of the organist and the mere position of the organ in the centre of the screen. Surely this important subject is worth a little consideration at the hands of those who have done all this mischief, and surely, too, no mere question of expense in such places as St. Paul's and Westminster should be allowed to stand in the way of the putting back in their time-honoured and proper places those organs.

I do not know how I can reply in detail to the objections that have appeared to this proposed "restoration" of cathedral organs. To do so would take up some considerable time and space, but surely it is hardly necessary, for what can well be said to anyone who affirms that an organ is "subsidiary to sound," except to own that it is. Or what can be said to one who tells us that the "piers" of St. Paul's are "not massive," or that the organ is not now "buried," when the top of it had to be cut off to get it under the arch? Why, to have got this organ fairly under the arch where it now is, it must have stood on the floor of the church, thus to give it proper head room! Be it recollected, too, that it is not only the position of the instrument close under the arch, but its absence from its most suitable and most lucky place near the dome, and with a clear air space above it. What, again, does it matter what Wren thought about it? If he had not the fine sense to give way cheerfully to Bernard Smyth, who really understood it all—and to him, therefore, be the credit of the good work—there were those who compelled him, and such ought there to be nowadays. Wren was a wilful man doubtless, and loved his cathedral, as I do, but he would have loved it more if he had patiently listened to the sublime effects Bernard Smyth's genius, equal to his own in its way, added to it.

I must add, as it is a curious subject, that on referring to the full score of the "Creation," I find, as was to be expected, that "H. H. S." is totally in error in supposing that Haydn had added a violin movement expressing the effect of a sustained sound *after* the full band or organ had ceased. "The wonders of His work" are the last words of this magnificent anthem, and the final word "work" occupies half a bar's length, while the instrumental accompaniment to it occupies but a quarter of a bar's length or one-half of it, so that the vocal part runs into the instrumental "rest," whether that instrumental part—and this is the present question—be a full band, consisting of many instruments, as trumpets and violins, or simply an organ. The "rests" are the same, and it was during these rests or pauses that the beautiful effect I spoke of told so finely. Nothing can be simpler than it is, but it takes a good deal of skill and vigour to do it well, and certainly half the sublimity of it goes and is lost in a place like Exeter Hall, where all sound ceases with the instruments, and where there is no resonance or *air sound*, as there always is more or less in a cathedral, but nowhere so finely as in St. Paul's. What is, therefore, to be said to M. Thalberg? Surely he would not prefer Exeter Hall to St. Paul's!

C. B. A.

MEDIÆVAL DOOR FASTENINGS.

(FROM OUR SPECIAL CORRESPONDENT.)

BIRMINGHAM.

THE Loan Collection of Mediæval Metalwork from South Kensington, now on view at the Free Library in this town, is naturally exciting a good deal of attention among the manufacturers in the great "toy-shop of Europe." In it is displayed the progress of industrial art through many centuries and in many climes. Enamelling, chasing, embossing, carving, casting, moulding, and every other process of artistic metalwork is here set forth to perfection. In many instances the modern products of Birmingham compare not unfavourably with the Flemish or Italian workmanship of the dark ages, but in some departments, so far as regards fine art, the old time is far above the new. Perhaps this is nowhere more conspicuous than in connection with door fastenings, locks, hinges, knockers, and bolts, articles in which nowadays we are too apt to sacrifice ornament for the sake of utility, instead of following Mr. Ruskin's advice, and combining both virtues in a happy medium.

Among the locks of mediæval workmanship which most attracted my attention were the following:—Specimens of eighteenth century (French) lock: front of chiselled iron, with *applique* floriated scrolls, very elaborately entwined. On either side of the keyhole escutcheon is a dolphin, looking menacingly, as if to scare the possible intruder and protect the portal from violence or fraud. *Serrure de Tabernacle*, sixteenth century (French), is a delicately chased specimen of wrought iron; the centre or hasp is ornamented with figures of the Eternal Father, the Virgin, and St. John, under a richly wrought Gothic canopy. It is noticeable that the Gothic tracery on the face of this lock is built up of pierced plates riveted together, and giving the effect of moulded tracery. A Flemish lock, seventeenth century, has an architectural façade for the front plate, a design which is perhaps more curious than useful. Keys of eighteenth century German work are very elaborate. A chamberlain's key of office, for example, in gilt bronze, had inserted in the bow a lion rampant, surmounted by an electoral crown. Another bore the chaste device of the *fleur de luce*. Twisted stems, floriated scrolls, and interlaced ornamentation present a strange and humiliating contrast to the plain, straight keys of the present day.

Other specimens of door furniture were equally elaborate on the continent during the fifteenth and sixteenth centuries. A bronze cinque-cento Italian door-knocker attracted my attention. It is a pleasing and graceful composition of syrens and *amorini*, or "little Cupids," and is attributed to that worthy descendant of Tubal Cain, Giovanna di Bologna. This grand old artist in metal was one of those immortal workers who sat

down to construct a lock for city gate or cathedral door just as Raphael would sit down to a *Madonna* which should attract the reverent admiration of ages to come. Elihu Burritt, "the learned blacksmith," has somewhere well observed, "The artist mechanic of that age was moved by the same impulse and in the same direction as Raphael. The religious enthusiasm of the time inspired him with the same devotion to his work, and he threw his whole heart, mind, soul, and body into it. If the great Italian painter presented to the world his 'Assumption of the Virgin,' he fixed his eye and heart upward in the wake of the same glory. He, with his steel pencils, chisels, and drills, would do something in the same line. And he did it. His idea was rude and material, but his sentiment was honest and clear; and let no one of this later age of light blame him for his conception."

Whether the artistic genius of mediæval times will ever be displayed in modern door fastenings seems problematical. At present our locks and keys certainly appear in strange contrast by their plain—not to say uncouth—appearance, with similar productions of the dark ages. Instead of being ornaments, they are too often objects of deformity upon our doors, and in mortice locks more especially we seem to carry out Lord Palmerston's well-worn version of the Latin proverb, "Artis est celare artem." An absorption of the countless domiciliary lock-shops of South Staffordshire into a few large and well-organised factories, together with a wholesale application of machinery, would quite revolutionise the trade in respect of art workmanship by relieving the artisans of their drudgery, and rendering them freer to exert their ingenuity in the higher branches of handicraft. This, however, must be a work of time. Meanwhile, we may hope that Longfellow's injunction to art-workmen may resemble in its influence a true poet's echoes :—

> In the elder days of art
> Builders wrought with curious care
> Each minute and unseen part,
> For the gods see everywhere.
> Let us do our work as well,
> Both the unseen and the seen,
> Make the place where gods may dwell
> Beautiful, entire, and clean.

ARCHÆOLOGY.

The scientific investigations among the graves of the ancient Britons, which, at intervals, for three years past, have been carried on by the Rev. Canon Greenwell, of Durham, and other archæologists, upon the Yorkshire Wolds, have been resumed, and are occasioning much interest. Two large barrows have been examined, both of which have proved prolific in remains, and have yielded results of a valuable nature, some of which have hitherto not been previously observed. Barrow No. 1 was 66ft. diameter and 2ft. high, formed of earth and chalk rubble. Three burnt bodies were found, and at the centre of the barrow a grave was dug into the rock N.W. by S.E., being 8ft. 6in. by 4ft. by 3ft. 10in. deep. In the "filling in" of the grave, some teeth and various bones of a disturbed human body, with three pieces of urn and a piece of jet were found—doubtless the remains of a primary interment, disturbed by the digging of the grave for a later burial. At the bottom of the grave was the body of a man lying on his left side, at the south-east side, with head to south east, the body contracted. In front of the head was a fine pierced stone axe hammer, the edge of which was touching the face, the handle having been held in the right hand. The edge had never been intended for cutting, it being carefully squared, more like a modern thin edged hammer. The weapon or implement is a splendid example, has clearly never been in use before it was interred with its owner. Closely adjoining this grave was another, N.E. by S.W., the two being united by an excavated passage 2ft. wide. The second grave was 6ft. by 4ft. 6in., and a few inches shallower. At the north east end was the body of a woman, contracted, the head to north east, the two burials therefore facing each other. The second barrow was 70ft. in diameter, and only 1ft. 6in. in height, of the same formation, and containing similar remains to those above described.

On Tuesday, as the workmen were engaged in excavating the ground for the foundation of the new Temple Hall, they discovered a portion of a gilt door of the fourteenth century, the gilding and the stonework being in excellent preservation. The ancient relics were taken care of, and are now in the possession of the principal foreman of the works.

The Rev. E. Kell has, during the last few weeks, uncovered two rooms and the wall of a third room of the Roman building discovered at Cowes in 1861. The Roman building, the entire of which has now been uncovered, was about 70ft. in length by 13ft. 6in. in breadth, and consisted of five rooms in a line. The two rooms at the west end had tesselated pavements of a common kind, made from tiles. The third, or middle room, had the remains of a fireplace, and from the relics of pottery, bones, oyster shells, bill hook, knife handle, &c., was a kitchen, or eating-room. The fourth room had the relics of two or three querns, by which the corn for the inmates was ground. The fifth room was similar to the third. It exhibited signs of fireplaces, and a considerable quantity of crockery, Samian ware, bones, and shells. The building had been consumed by fire, and a large amount of burnt materials was discovered in this room.

Building Intelligence.

CHURCHES AND CHAPELS.

The opening of a new Catholic Church at Windsor, dedicated to St. Edward, King and Confessor, took place on the 15th inst. with much ceremony. The church, a substantial building of Heath stone, when finished, will hold a congregation of 600; its cost is estimated at £4,000, which will be defrayed by voluntary contributions. Mr. Berkley is the architect.

On Wednesday week Dr. Ullathorne, the Roman Catholic Bishop of Birmingham, laid the foundation stone of a new church at Swinnerton, near Stone. The new church will be built from the designs of Mr. Gilbert Blount, of London, and its cost will exceed £4,000. The style of the church will be that of the transition between Early English and Decorated. It will consist of chancel, with aisle, tribune for the family at the hall, sacristies, porch, and belfry. The erection of the building has been entrusted to Mr. Heveningham, builder, of Wolverhampton.

A new Wesleyan Chapel is commenced at Varteg, near Pontypool, Monmouthshire. It has gallery, vestries, class rooms, stoves, &c., and accommodates nearly 400 persons. Mr. E. A. Lansdowne is the architect, and Mr. Henry Parfitt the builder.

On Saturday last the memorial stone of Christ Church, Windhill, near Bradford, was laid by the Lord Bishop of Ripon. The building, which will cost £4,200, exclusive of spire, is from the designs of Messrs. Andrews, Son, and Pepper, of Bradford. The body of the church is 75ft. long by 56ft. wide, the plan consisting of nave and two side aisles.

On Thursday week a new iron church was opened at New Wandsworth. The interior, with its side arches and clustered columns, its lofty open timbered roof, its stained glass windows, and its plastered walls, presents an appearance as comfortable as that of a brick or stone building. Accommodation is provided for 500 persons, and the entire cost was under £3 per sitting. Messrs. F. Morton and Co., of London and Liverpool, were the contractors.

At a meeting of the Committee of the Carlisle Diocesan Church and Parsonage Building Society, held on Wednesday week, grants in aid of building and restoring churches were made to the following places, all in the county of Cumberland:—Plumbland, Aikton, Blackford, Cotehill, Gatesgill, and Warwick.

BUILDINGS.

On Friday Mr. Edward Nathan, president of the Manchester Jews' Schools, laid the foundation stone of a new school in Derby-street, Cheetham-hill. The building will be erected from the designs of Mr. E. Salomons, architect, by Messrs. Cochran, Parker, and Co. and is intended for the accommodation of 700 children.

At Braughin, Herts, a new school has just been opened. It is built in the Gothic style, with red bricks and white brick dressings; the roof is high pitched and slated. The cost was about £400, the contractor being Mr. T. Ginn, of Puckeridge.

New gas works are to be erected at Maryport, Cumberland, at a cost of £8,000. The plans have been prepared by Mr. Flintoff, C.E., of London.

Mr. Whitaker, surveyor, of Tiverton, has prepared plans for a new public hall over the Higher Market in Queen-street, Exeter. The hall will be 150ft. by 100ft., and will seat from 3,000 to 4,000 persons. The estimated cost is £5,500.

On Monday week the new Turkish Baths were opened at Brighton. The building was illustrated and fully described in the Building News of December 13, 1867.

TO CORRESPONDENTS.

Notice.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—M. T. S.—H. and Co.—C. H. and Co.—J. S.—J. M. S—M. D.—G. R and Co.—I. F.—W. B. and Co.—C. S. J.—I. C. S.—I. I. C. and Co.—W. H. C.—I. H.—W. B. R.—C and Co.

J. Roe.—Intercommunication is not meant for "exchange" purposes. Your communication is simply an advertisement, and can only appear as such.

Builder had better consult a lawyer.

Brickbat.—We cannot insert your question, as we cannot read your writing.

Correspondence.

CATHEDRAL ORGANS.

To the Editor of the Building News.

Sir,—Will you allow me to remark that the intention of my letter of October 9 was merely to correct the errors of your correspondent "C. B. A.," and to state the truth? I anxiously look forward for the "enlightening views" of "C. B. A.," and hope that among his suggestions we shall have something fresh.—I am, &c.,

C. S. J.

ORGANS ON SCREENS.

Sir,—Circumstances have prevented my taking earlier notice of the very extraordinary assertion of your correspondent "C. B. A.," that the practice of placing organs on choir or rood-screens has the sanction of "antiquity." I think he is mistaken. The old views by Hollar of the interiors of Lincoln Cathedral and Old St. Paul's (see Dugdale's "Monasticon" for the former, and Dugdale's "St. Paul's" for the latter) distinctly show the screens without the decoration of any organ on them, and in the views of the choirs of both those cathedrals the organ is shown in each as being on the north side of the choir over the stalls. Westminster Abbey organ, too, was formerly in that position, as I have seen it thus represented in a print I once saw of the interior of the Abbey taken some time in the early part of last century. The organist of the Abbey also told me, a few weeks since, that the organ used formerly to stand on the north side of the choir, over the stalls, before its removal to the screen.

There are a few organs abroad on the rood-screen, but they are very few indeed. I believe there is one in a church at Bruges, and I have seen one at Antwerp so placed, in the Church of St. Jacques, but this organ is divided, much like the Westminster Abbey organ, so as to spoil the view from west to east as little as possible. In Spain, too, where there are solid screens and enclosures enough and to spare (which would charm "C. B A."), there are generally two organs of the largest size in the choirs; but they face each other, north and south, and do not stand on the great screens in the centre of the naves of the churches. In Toledo Cathedral there are three monster organs, two in the choir, as usual, facing each other, north and south, and a third large one over the door of the south transept.—I am, &c.,

Western Organ.

London, October 20.

ST. PAUL'S ORGAN.

Sir,—It might have been supposed that the subject upon which "C. B. A." has favoured us with his opinion was of sufficient interest to warrant its discussion in moderate language and upon a basis of ascertained fact. Neither of these desiderata appear to influence your correspondent, whose onslaught on Mr. Penrose and the large organ is manifestly founded on prejudice or deficient information. We are now told that the new organ is thrust up against the wall, close to the roof, where the swell is only heard by the birds outside, and the tone utterly lost. Now I will venture to say that never was there a more reckless statement, or one more removed from truth than this. The swell, so far from being "lost," is one of the most effective known, and the whole

organ is generally acknowledged, in musical circles, to have the grandest effect all over the building, and one unsurpassed by any organ in the kingdom. It is not "close" to the roof, as anyone may see for himself; but I speak from knowledge of the facts when I say that the top of the swell box is 20ft. from it; the swell organ itself 30ft. below, and the great organ 45ft. below it. So much for its being close to the roof; but why "C. B. A.'s" consternation and dismay at seeing an organ placed against a transept wall? Surely he would not have it *away* from the wall, leaving a useless space behind? Are not organs placed against transept and nave walls abroad? Look at those at Notre Dame, Rouen, Cologne, &c, the latter a transept organ, and who but your highly sensitive correspondent would feel dismay at an arrangement which ordinary mortals think the best possible? As to architecture being spoiled, the thing is absurd. Where can an organ be placed without hiding something? Whether at the side or on the screen it must obstruct some view, and architecturally in a more objectionable manner in the latter case than any other. Moreover, a church is made for some other purpose than to be merely gazed at, and therefore the æsthetic must, if needs be, give way to the utilitarian. The much-abused Mr. Penrose and his coadjutors had a definite task before them—i.e., to impart some life to a cathedral which possessed little interest in a religious point of view hitherto, by adapting it to the requirements of a large congregation and hearty choral worship. It requires more cogent reasons than the taunts and ridicule of "C. B. A." to convince the public that they have been unsuccessful, or to convince those gentlemen themselves of the propriety of restoring the old organ to the screen, so happily done away with, I trust for ever.—I am, &c,

ECCLESIOLOGIST.

P.S.—"C. B. A.'s" reference to the "crane to lift something" fairly puzzles me. What *can* be the meaning of this witticism?"

BUILDING IN CONCRETE.

SIR,—With respect to "H. R.'s" letter, which appeared in the BUILDING NEWS of September 4, I beg to say that the wall he has built looks very well, but his house has fallen down. By what I have seen no practical man would have passed the work. If he had used Robin's cement, and had the proper gravel, and had made his walls 18in. on the first floor, 14in. second floor, and then his 1ft. walls, it would have stood. By the gauge it appears to me to be about half and half, but the main result of his failure is the use of the wrong gravel and not good cement.—I am, &c,

October 16. W. MAY, JUN.

SIR,—As you have taken some interest in building houses in concrete, you will, perhaps, be glad to have some account of a house that was lately commenced in that material at Twickenham. It appears that this structure, which was intended for a large and handsome mansion, has by some means come to grief. As an engineer who has had, perhaps, more experience than any other in constructing houses in concrete, I have been instructed to professionally examine the works and report on the cause of their apparent failure. I accordingly went to Twickenham one day last week and made a careful survey of the works. I was informed on the ground that the foundations were defective—that is, the soil was loose and sandy, and that the walls sunk in consequence. Owing to the large quantity of *debris* I was unable to verify by personal observation the correctness of this statement; but, as there was no difficulty in accounting for the accident by the evidence above ground, it will not be necessary to insist very strongly on the defective nature of the foundations.

I found the four outer walls of the mansion, and also a long inner wall, carried up to nearly 40ft., without a single joist or binder of any kind. These walls were only 12in. thick, and were pierced with a larger number of openings than I ever remember to have seen in any walls of the same thickness and superficies. The cement employed appeared to me some of the very worst that had ever come under my notice in a pretty wide experience. Some of the window openings were unusually large, and I could not find that any precautions had been taken to strengthen the arches over them.

Now, I have carried up in concrete 12in. walls, over 40ft. high without the least sign of weakness, but I have invariably carried up the cross walls simultaneously with the external walls, and have always built in the iron joists as the walls rose, thus well tying all parts together. And last, not least, I have always been particular in using none but the very best cement. If these precautions had been taken instead of the reckless system that was adopted at Twickenham I have no hesitation in saying that such an accident could not possibly have happened. I may also add, that I found a vertical pipe (I presume for the conveyance of rain water) was carried down one of the outer angles of the building, thereby much weakening a part that ought to be one of the main stays of the structure. Several other minor defects and errors in construction might be pointed out, but I do not wish to trespass too much on your space. I will, therefore, conclude by saying that in my opinion the cause of the failure is to be attributed mainly to the improper manner in which the works were carried on, and to the bad quality of the cement used.—I am, &c., W. E. NEWTON, C.E.

66, Chancery-lane, October 21.

[We have seen the building, and can say that the facts, as stated by Mr. Newton, are quite correct (with the exception of his statement as to the bad quality of the cement, the truth of which we had no means of ascertaining). We were as much surprised as he was at the absence of joists or any ties for the walls, and at the large openings for some of the windows. We believe that to these causes the fall of the building may in a great measure be traced; at any rate, it has not as yet altered the opinions we have before expressed regarding the use of concrete.—ED. B. N.]

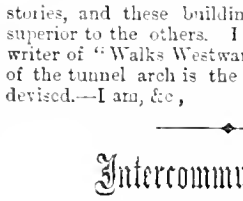
WALKS WESTWARD—STATION BUILDINGS.

SIR,—As a subscriber to your paper since the commencement, I think I may indulge in a few lines on the subject of the Metropolitan District Railway Stations. I consider the remarks in last week's journal too hard upon the architecture of the stations. We all know the great difficulty in working for a company and shareholders of a railway. They care little or nothing for architecture or taste, therefore ignore high art designs as foolish and expensive. They say we only want sheds, not architectural structures, as the company will not go to the expense. Now, under such circumstances, can any one employed as architect show his powers of design after receiving such instructions? I certainly say, No. From what I have seen of these stations, I consider they are well built, are of good proportions, and most convenient for their purpose: besides it is known by the profession that a small depth and frontage for a one-story building is a difficulty to get over when economy is the essential point. The Victoria and the Gloucester road are of two stories, and these buildings are most certainly superior to the others. I cannot agree with the writer of "Walks Westward" in saying the form of the tunnel arch is the ugliest that could be devised.—I am, &c, ALBERT EDWARD.

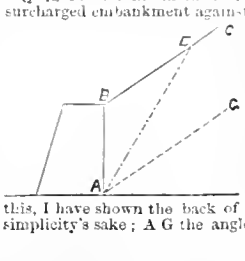
Intercommunication.

QUESTIONS.

[1079.]—SIZE OF GIRDER.—Can any of your readers inform me what size girder is required under the following circumstances? I am about to erect a warehouse which will be loaded with rather heavy goods. It is 40ft. long, and 15ft. 6in. wide, in the clear. As 15ft. 6in. is too long a bearing for the joists, I propose to insert rolled iron girders at distances of 10ft. apart, and so place the joists the longitudinal way of the building. It will appear as sketch. What size should the girder be?—INIGO JONES.



[1080.]—RETAINING WALLS.—I am much obliged to "Q. E. F." for his method of finding the pressure of a surcharged embankment against a retaining wall. I cannot see, however, how the line A C in his sketch can represent the natural slope of the earth or angle of repose, as that is evidently B D, which is the slope of the embankment when it is formed, or what it will become afterwards by the action of the weather. In the sketch I give with this, I have shown the back of the wall to be vertical for simplicity's sake; A G the angle of repose parallel to the slope of the embankment; A E a line bisecting the ∠ B A G; B A E therefore being the portion of the embankment to be retained. How is the moment of the pressure B A E found? and how or at what point does it act against the wall? When B E is level with the top of the wall the moment of the pressure is = tang.² ∠ B A E × weight of a cubic foot of the earth × $\frac{A B}{2} \times \frac{A B}{3}$. How must this equation be altered to suit the case of B E sloping upward at any ∠ ϕ with the horizon, or ray at *n* to I?—X. Y.



[1081.]—GEOMETRICAL TRACERY.—I should be much obliged if any of your correspondents would kindly tell me where I could get a book that would show the principle of setting out geometrical tracery. I want to know how the centres are got.—G. R., Carpenter.

[1082.] LIQUID GLUE.—Will any reader tell me a good recipe for making liquid glue?—R. JOHNSTONE.

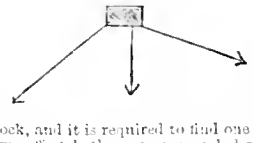
[1083.]—WATER SUPPLY.—Would any of the readers inform me how I can calculate the quantity of water that can be obtained from gathering grounds? I suppose that there are no springs or streams, but that the whole supply must be procured from the rainfall.—WATERWORKS.

[1084.]—REGULATING TIMEPIECES.—It has long been a puzzle to me to know what is meant by regulating timepieces or setting chronometers by the sun. I have a capital transit instrument, and believe it is by some observations of the sun that the matter is managed, but am at a loss to know how to proceed. If some of your "Intercommunication" contributors could set me in the right way to work I should be greatly indebted to them.—VERAN.

[1085.]—LAYING WROUGHT IRON JOISTS.—I am putting down some floor joists of a tee section, as represented in the cuts. Which way ought I to place them so as

to have them as strong as possible? Should they be laid in the position shown by 1 or by 2? They are 10ft. in length. What would be a safe load for one uniformly distributed over the whole length?—CARPENTER.

[1086.]—RESOLUTION OF FORCES.—Being a student of mechanics, I met the other day with a problem that I am unable to solve. Can any subscriber give me a helping hand? There are three (see drawing) acting upon one block, and it is required to find one that will produce the same effect both in power and direction as the three.—STUDENT.



[1087.]—SUPPORT FOR FLOORING.—Will "S. Lewis" or any of your correspondents help me out of the following difficulty? I want to add strength to a floor which is supported by timber beams, which are not considered sound. I wish to learn whether brick arches would be preferable to timber trussing? If so, what sort of arch would be strongest, and what the best way to construct same so as not to put too great a pressure on the side walls? The span would be about 20ft., and the height 11ft. I want to keep head room next side walls.—CLERK OF WORKS.

[1088.]—BOOKS.—Can you or any of your readers recommend a good work on the art of water colouring and shadowing; also a good dictionary on arts and science?—A STUDENT.

[1089.]—COLOURING DRAWINGS.—Will any of your numerous correspondents kindly inform me the best method to lay water colours on drawing paper without causing the paper coloured to crease?—INQUIRER.

[1090.] PERSPECTIVE.—Will any of your able correspondents kindly furnish me with a rule for determining the angle to which the arms of a "centrolineal" should be opened, assuming that the distance of the vanishing point and the position of the two pins are fixed? I have never met with a solution of this problem in any perspective book.—T. W. W.

REPLIES.

[1022.]—AREA OF A FIELD.—I most humbly apologise to "F." for having so evaded him, as I am sure in his calmer moments he would not have written things so easily disproved. He asserts that A F and F E are in the same straight line, and yet most unfortunately for himself he confesses that the distance from A to E is not equal to the sum of those two lines by about 2ft. Then, I ask him, is it possible to have between two points two distinct straight lines of different lengths? It is absurd. Again, he says that in the figure (September 18) the points A F E are in one straight line; but if he puts a straight edge to them he will find it a funny straight one—similar perhaps to the barrel of the gun warranted to shoot round the corner. And, as a further proof that they were not intended to be in a straight line, I call his attention to the previous figure (September 4), where it is shown in a more exaggerated form. Now, to assist his argument, he calls up "W. E. B.'s" letter, and because the figure is there divided into three triangles I am to acknowledge it five-sided; but, on the other hand, "R. L. B." divides it into four triangles, thus indirectly allowing six sides; while if "F." will turn to the next solution—that by "Another Young Surveyor"—he will find the two lines, A F, F E, are taken as two sides of a triangle. Surely, after this, he cannot call the figure five sided. I have one thing more to tell him, and that is,

his solution (October 2), of which he boasts, is wrong. I tried over his triangle C, and found it to be—not 85995 square feet, as he declares—but exactly as "R. L. B." has it; and, without going any further, I concluded his work was untrustworthy, and not only his work but his method also. He must be aware that there are 272¼ square feet in a perch. In conclusion, let me tell him he has evidently tried to screen his bad cause under shelter of a volley of abusive language and small wit.—J. M'Namara, Stratford-on-Avon, October 17.

[1054.]—PAYMENT OF SALARY.—Unless "L. Z. O." had a written agreement respecting the month's notice, he has no redress, as an employer can always dismiss an employé by giving him notice for the time equal to the intervals at which he pays his salary. Under the circumstances, "L. Z. O." could be dismissed at once if a week's salary were given him.—C. C. P.

[1063.]—RAILWAY CARRIAGES.—If your correspondent on the subject of railway carriages would communicate with me, I should be happy to furnish him with all that he requires.—T. Prescott, 287, Hyde road, Manchester.

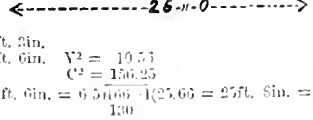
[1070.]—PARTY WALLS AND PARTY FENCE WALLS.—The legal interest of adjoining owners in a party fence wall is different from that in a party wall. There is no Act of Parliament which gives power to a building owner to raise a party fence wall without the consent of the adjoining owner, notwithstanding the many instances in which such power has been exercised under the supposed authority of the Metropolitan Building Act. To put the law concisely in the words of an eminent barrister—"If it can be ascertained what portion of the site of a party fence wall belongs to each house, the owners and lessees of the houses respectively will be entitled to build on such parts out of the wall as stand on the sites belonging to their respective houses; but if the separate ownership of portions of the site of the wall cannot be ascertained, the wall would be considered as belonging to the two parties as tenants in common, and neither would in that case be entitled to build on it without the consent of the other."—Purlin.

[1070.]—The legal interest in a party fence wall, if really "party," belonging jointly to the houses, is, I apprehend, the same as in a party wall, with the same rights and conditions; but a party wall is not always "party," even when it separates two buildings, but is sometimes in law an external wall. In like manner, a party fence wall may belong entirely to one house. "B. T." must make sure of his interest in the wall, and may then serve his notice upon the adjoining owner, pull down, build on half or all, as he may desire.—Lough.

[1073.]—WALLS OF BUILDINGS.—"R. P." will do well to use common sense, and not try to adopt too many rules in his practice. It stands to reason that a wall 80ft. long, unless well tied in with either cross walls, partitions, or joists, will require to be thicker than one only 20ft long. I think I may safely recommend him to adopt the thicknesses given in the tables of the Metropolitan Building Act, 1855.—Lough.

[1073.]—The question put by "R. P." is of some interest, as it touches upon the stability of long walls. It is often considered that the length of a wall has little or nothing to do with the calculation of its strength, and in determining the stability of retaining and other walls that dimension is theoretically neglected. But practically, it is very carefully taken into account, as the introduction of counterfoils and buttresses sufficiently points out. The usual increase of thickness in the lower stories of buildings is at the rate of half a brick whenever the length exceeds 65ft.—A. S. T.

[1074.]—RISE OF AN ARCH.—The following rule will, I think, supply "Carpenter" with the information he requires:—Let V = versier or rise of arch; C semi-chord or half span; R radius. Then $\frac{V^2 + C^2}{V} = R$. Example:

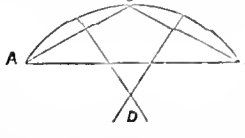


V = 3ft. 3in.
C = 12ft. 6in. $V^2 = 10.51$
$C^2 = 156.25$

2 V = 6ft. 6in. = 6.5)166.76(25.66 = 25ft. 8in. = radius.
130
368
325
431
390
410
390
20

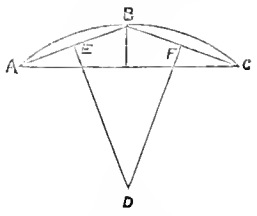
Geo. W. Usill.

[1074.]—"Carpenter" will find the following method both simple and accurate: Having fixed the point C equidistant from the extremities A and B, and having a rise



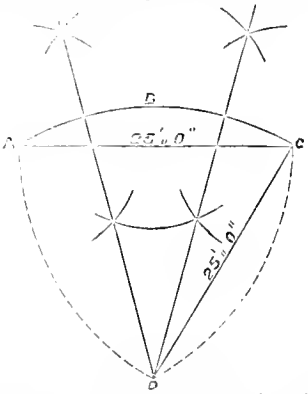
as required, join A C and C B. Bisect these lines by perpendiculars, which on being produced will meet at D. D is the centre of the circle, and of course the length from D to either of the points A C B is the length of the radius.—J. M'Namara.

[1074.]—The following answers "Carpenter's" question:—Join A B and B C. Bisect the lines A B and B C and draw from points of bisection two lines at right angles to the lines A B and B C. Then the point of contact obtained



by the production of these lines will be the centre from which the arc A E C may be struck.—Baby.

[1074.]—Bisect the points A B C; continue the bisecting lines till they meet at D, and the distance from those points to D is the radius. "Carpenter" and architects' assistants (architects themselves having little to do with it) may do



well to note that a pretty safe guide for the radius of an ordinary segmental arch is equal to the width of opening. In this particular instance it is correct, each being equal to 25ft.—H.

[1074.]—If "Carpenter" will multiply half the span by half the span, divide the rise, then add the rise and half the quotient; this will be the length of radius rod required. To illustrate what I mean, say an arch of 8ft. span by 2ft. rise—

Half span 4 0
4 0

Divide by rise 2)16 0 feet.
8

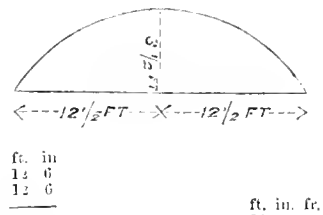
Add rise 2

Halve it 2)10

5 feet,

which is the length wanted above arch. For arch in diagram, 25ft. 8in. is the length.—E. H.

[1074.]—"A Carpenter" asks a method to calculate the radius of a circle, the span and rise of an arch being given. The correct and simple rule is this:—Square one half the length of the span and divide it by the rise, to which quotient add the rise, one half of which is the radius required. The following is the illustration from the given dimensions:—



ft.	in.		ft.	in.	fr.
12	6				
12	6				
3½	150	0	12	0	3
4	6	3			4
13)156		3 (12ft. 6in. 3fr.	48	1	0
13			3	3	0
26			2)51	4	0
26			25	8	0
13)06(0					
12					
13)36(3					
39					

Or by Decimals.

12.5
12.5
625
250
125
3.25)156.25(48.08
1300
2625
2600
2500
2600

48.03
3.25
2)91.33
25.665 feet.
12
7.980 inches.

Thus the radius = 25ft. 8in. very nearly.—Robey Carpenter, Land Surveyor.

[1074.]—Divide the square of half the span by the rise of the arch; add this divisor to the quotient, and half the result will be the required radius. See Euc. III., Theorem of Equal Rectangles under the Segments of Intersecting Chords.—R. Johnstone.

[1074.]—"Carpenter" may find the radius of his arch by the following method:—Add to the square of half the chord the square of the versed sine, divide the sine by twice the versed sine, and the quotient will be the radius of the circle. In the example given—12.5 × 12.5 = 156.25 + 10.56¼ = 166.81 ÷ 6.5 = 25ft. 8in., the radius required.—R. C.

[1074.]—The radius of his arch is 25.66ft. The rule is, to square half the span and divide that by the versed sine or rise, and to the quotient add the versed sine, which will equal the diameter, half of which is the radius.—Another Chip.

[1074.]—In answer to "Carpenter's" question, the simplest method of ascertaining the radius of an arch, the span and rise being given, is to multiply half the span, 12ft. 6in., in itself; before multiplying, reduce the feet to inches, and multiply inches by inches; when the half of the span is multiplied, divide the product by double the rise, 6ft. 6in., reduced to inches, then add half the rise, 1ft. 7½in., to the remainder, and the product, 25ft. 3½in., will be the radius required.—G. W.

[We have also received answers to this question from "W. H. R.," "F. W. A.," "W. J. Dray," "D. O. E.," "Howell Howell, Neath," "Arthur Carpenter," and "Henry Hopkins, Banbury." The answers inserted were in type before those not inserted were received.—Ed. B. N.]

[1075.]—LIMITS OF DEVIATION.—I am sorry for "Farmer," but there is no help for him. The company can run the line wherever it pleases, but once having determined it, and sent the plans in by the end of next month, they cannot trespass beyond the limits of deviation without getting a new act, and seeking for what is termed a deviation. The limits of deviation are 100 yards upon each side of the centre line in the open country, and 10 yards when the line runs through towns or land continuously built upon.—Engineer.

[1077.]—CONTENTS OF SPHERES.—Under the supposition that by a part "A. B." implies a segment of a sphere, I give him two formulæ. 1. To three times the square of half the diameter of the base add the square of the height, and multiply this sum by .5236 × the height: *i.e.*, $(3 \times 4^2 + 2\frac{1}{4}^2) \times .5236 \times 2\frac{1}{4} = (3 \times 16 + 5.0625) \times 1.1781 = 53.0625 \times 1.1781 = 62.513$ cubic inches, nearly. 2. From three times the diameter of the sphere (9⅜in I believe) take twice the height of the segment, and multiply the remainder by .5236 × the square of the height: *i.e.*, $\left\{(3 \times 9\frac{3}{8}) - (2 \times 2\frac{1}{4})\right\} \times (.5236 \times 2\frac{1}{4}^2) = (28.125 - 4.5) \times .5236 \times 2\frac{1}{4}^2 = 23.625 \times .5236 \times 5.0625 = 62.023$ cubic inches. He will see from this that the two results differ, but so slightly as to be practically imperceptible. To say 62¼ cubic inches will, I suppose, be sufficiently accurate.—J. M'Namara.

[1077.]—To find the solidity of a segment of a globe:—To three times the square of the radius of its base add the square of its height; and this sum multipled by the height,

and the product again by .5236 will give the solidity. Thus: $4^2 \times 3 + 5.0625$ square of height = 53.0625 × 2.25 height = 119.390625 × .5236 = 62.5129312500 solid inches.—W. L. Lightfoot, Aberdeen.

[1077.]—Rule.—Three times the square of the radius of the base, add the square of its height, and this sum multiplied by the height and the product again by 5236 will give the solidity. Height 2¼in.; diameter of the base, 8in; radius, 4. $4^2 \times 3 + 2.25^2 \times 2.25 = 119.390625 \times .5236$ gives 62.5310125 solid inches, the contents of the segment of the sphere.—J. K. R.

[1077.]—The following is the general mathematical rule for finding the solidity of a sphere:—From three times the diameter of the sphere take twice the height of the segment, multiply the remainder by the square of the said height, and that product again by .5.36 will give the solidity of the segment. The diameter of the sphere is formed by considering the vertical section of the solid as the segment of a circle, and first finding its semi-diameter, as in my reply to 1075 in the foregoing. If "A. B." should want his question solved at length in figures, I will do it for him in my next, and, if necessary, investigate and demonstrate the rule. It is the shortest I have seen in twelve years' experience.—Robey Carpenter, Land Surveyor, and author of "Double Entry Book keeping Modernized."

[1077.]—To find the contents of a segment of a globe, "A. B." must multiply the square of the radius of the segment by 3, add the square of the height, multiply by the height, and the product multiplied by .5236, will give the desired content.—W. J. Dray.

[1077.]—To three times the square of the radius of the segment's base add the square of its height; and this sum multiplied by the height, and the product again by ·5236, will give solidity.—F. W. A.

BUILDING AND LAND SOCIETIES.

Operations have at length been commenced on the Milkwood Estate, Loughborough Park, Brixton, the property of the Suburban Village and General Dwellings Company. As briefly reported in a recent impression, the company has lately come under new management, and its success is regarded as certain. There are to be 650 houses erected on the estate, each to have a garden. The houses are to be in price from £200 upwards, payment to be made in the shape of rents extending over fourteen years. Mr. Habershon (Habershon and Pite) is the chairman of the board of directors.

The officers of her Majesty ship "Topaze," at present stationed off the South American Western Coast, are about to erect a monument to the memory of Alexander Selkirk on the island of Juan Fernandez.

WAGES MOVEMENT.

The masons' strike still continues in Aberdeen. Both parties seem determined to try their strength. Some hands have left town, but the great bulk of them are still hanging about. About 400 struck work, and about 130 remained in. As trade is still slack, the masters having no thing pressing, they may hold out for some time yet.

At a meeting, on Wednesday, the Bradford master builders determined on giving the notices for amended trade rules, as decided at the annual meeting of the General Association at Liverpool.

The masons of Liverpool and Manchester have given notice of their intention to commence work at eight o'clock on Mondays and seven o'clock on other mornings.

STAINED GLASS.

On Saturday last two stained glass windows in memory of the late Duke and Duchess of Rutland, erected in the Knipton Church, Yorkshire, were completed. That in memory of the Duke is of three lights, representing the raising of Lazarus, the Good Samaritan, and Abraham offering up Isaac. The window erected to the memory of the Duchess is of two lights, and represents the raising of Dorcas.

Two more stained windows have been inserted in the east end of the church of St. Teresa, Dublin, completing that end of the building. They are from the studio of Messrs. Early and Powell, of Dublin, the subjects being the espousals of the Blessed Virgin and the transverberation of St. Teresa.

A new stained window has just been inserted in the first bay of the north chancel aisle of St. Nicholas Church, Newcastle-on-Tyne. The window, which has been designed and executed by Mr. G. J. Baguley, of Newcastle, is of four lights, in the Perpendicular style. The subjects are our Lord's agony in the Garden, our Lord bearing the Cross, the Entombment, and the Marys at the Sepulchre. The subjects are surmounted by a Gothic canopy, and the top of the window is filled with simple tracery.

A memorial west window is about to be inserted in North Tawton Church, Devon, to the memory of the late vicar. It is the work of Messrs. Beer, of Exeter. The style is the Decorated, in four lights. The subjects are the six acts of charity.

Mr. Frederick Drake, of Exeter, has just completed a subscription window for the east end of the north aisle of Highweek Church, Devon, in memory of the late incumbent. It is a Perpendicular window in three lights. In the three upper panels one design, Christ blessing little children, is carried out with much detail and circumstance, and the three lower panels represent Faith, Hope, and Charity.

LEGAL INTELLIGENCE.

At the Thames Police Court, on Thursday week, Mr. Edward Pontifex, the proprietor of some white lead and chemical works at Millwall, was fined £5 for having used a furnace which did not consume its own smoke. Mr. Pontifex had been three times previously convicted.

Important to Plasterers.—At the Clerkenwell County Court, on Tuesday week, the cause of Fisher *v.* Crispe was heard. Mr. Boydell appeared for plaintiff, and Mr. Popham for defendant. Plaintiff, a plasterer, had contracted to plaster two houses belonging to defendant at £14 10s. each. While the work was in progress defendant sold one of the houses, and, according to plaintiff's account, directed him to do some extra work required by the purchaser of the house. Plaintiff did the work, but when he received the money on his contract a dispute arose as to the balance (£3 4s. 6d.), and defendant refused to pay it, stating that the charge was excessive.—Mr. Boydell called for the production of the contract.—Mr. Popham produced it, but objected to its use as evidence, as it was not stamped.—His Honour (R. H. Bagshawe, Esq., Q.C.,) on inspecting the document, observed that it was only signed by the plaintiff. Had the defendant also signed it the objection would have held good, but it would not in this instance, as the Stamp Act required the signature of the person sought to be charged. He would, however, take a note of Mr. Popham's objection. The items of the claim were then examined. The plaintiff produced a bill with the items in detail, but the defendant objected to the document as being different from the original claim. The original claim was then put in, and this differed so materially from the subsequent one that His Honour refused to hear any more, and nonsuited the plaintiff, with costs.

Defrauding Dust Contractors.—John Watson, John Simonds, and Richard Thompson, "flying dustmen," residing at Back-road, King-land, were charged at the Clerkenwell Police Court by Mr. Robert Dunham, inspector of nuisances to the parish of Islington, with collecting the ashes from the house No. 25, Norfolk-road, Islington, they not having been employed by Mr. Henry Dodd, the contractor for the removal of dust from that parish. The offence was committed so far back as the 24th of September last, but owing to the prisoners giving false addresses they could not be served with the process of the court, and hence their apprehension. The prisoners were seen on two occasions to remove the dust, and at the house above named the constable made them desist and go away. The prisoners denied in the most impudent manner that they were the men who removed the dust, but said they knew who did. The magistrates ordered each of the defendants to pay a fine of 40s., and 4s. costs, or in default to be kept to hard labour for one calendar month. The prisoners were locked up.

An Architect's Bill.—Jones *v.* Knight.—This was an adjourned case, in which defendant, an inhabitant of Ryde, disputed the balance of a bill of £13 3s., for drawings, surveyings, &c., as an overcharge, £10 having been paid into court. Plaintiff said the item in dispute included two sets of drawings of the premises in the Arcade, which he had been ordered by Mr. Urry, defendant's solicitor, to prepare for him. He followed his instructions implicitly, and on sending him the drawings he said they were useless, and he prepared others, which answered the purpose desired. He had, of course, charged him for the first set, which was included in the item of £5 5s. Defendant said he had not given orders for the plans to be prepared; the first he heard of it was when he received them from his solicitor, Mr. Urry, saying they were useless. His Honour said if he employed a solicitor it was at his discretion to act and order where necessary. Mr. Urry said he never gave orders for particular plans. He gave Mr. Jones instructions to prepare three plans of the three changes the premises had undergone. The plans were for the purpose of illustrating a case to the counsel in a cause now pending between Mr. Knight and Mr. Hughes. The plans first sent to him were not what he wanted, and he told plaintiff they were not, saying at the same time that they were rubbish. The plans he afterwards received were what he wanted. Mr. Hooper submitted that if plaintiff did not properly prepare the drawings he was not entitled to charge for them, but His Honour thought it would depend upon from what cause they were useless whether he ought to charge or not, and a Mr. Ball, surveyor, of Lond n, having given evidence as to the charge being moderate for the work done, he gave judgment for plaintiff.

Our Office Table.

Mr. Street is engaged in the repair of Bolton Abbey.

The chairman of the Associated Arts Institute has issued cards for a *conversazione* at 9, Conduit-street, Regent-street, on the 31st inst.

In a discussion that ensued at the meeting of the Islington vestry on Friday last, on the question of providing a steam road-roller for the parish, a striking proof was adduced of the economy that would accrue from such a step. In October, 1867, a piece of the road extending from Highbury-corner to Park-street was rolled experimentally. Not a single load of broken granite has since been laid down there, and the road is uniformly hard and smooth. On the other hand, from October, 1867, to August, 1868, no less than 747 loads of granite have been thrown upon the road from the "Cock" at Highbury to the "Angel" (exclusive of the part which had been rolled). Under this treatment the road has been either almost impassable for loose granite, or "lumpy" from its uneven consolidation. The road-roller is to be adopted.

Dr. Ballard, Medical Officer of Health for Islington, has, in accordance with the fifth section of the Artisans' and Labourers' Dwellings' Act, reported upon the condition of some of the dwellings of the poor in that parish. Parsell's-court, in the High-street, contains places, according to the report, not fit for human habitation. The report will be discussed at the next meeting of the vestry.

The Metropolitan Board of Works, deeming it desirable that their works along the new street from Blackfriars to the Mansion House should be carried on under the same management as those of the Metropolitan District Railway Company, made arrangements whereby the company have undertaken the formation of the sewer and subway at the same time as their railway up to the point where the railway and street will diverge, for the sum of £22,000. The portion of the sewer and subway to be so constructed by the railway company is that to the east of St. Andrew's-hill, while that portion west of Chatham-place is included in the Thames Embankment Contract No. 3, but there remained an intermediate space of about 700ft. and a short length of vaults, the execution of which has been given to Mr. Webster, at the rates of payment specified in the schedule of prices attached to his contract for the portion of the Thames Embankment from the Temple to Blackfriars Bridge, at the estimated cost of £10,000.

The Architectural Association will hold a *conversazione* at 9, Conduit-street, on Friday evening, the 30th inst.

A correspondent writes to ask when he may expect a further instalment of the "Architectural Society's Dictionary of Architecture?" We heard a short time back that it was in future intended to issue it yearly at Latter Lammas.

Three newly-built houses in Holloway-road, London, suddenly fell down on Sunday forenoon about half-past seven o'clock. The way in which houses are nowadays "run up" reminds one of the story of a Yankee in Paris, who, being at an hotel, tilted his chair after the manner of his countrymen, but overbalancing himself and falling against the wall of the apartment, went clean through it into the street. Archæologists find the domestic architecture of our ancestors a profitable study, but future generations will hardly derive equal satisfaction from the cheap houses of these days.

At a meeting of the St. Pancras Guardians Board on Thursday week, Mr. Culverhouse was elected Clerk of the Works for the infirmary at Highgate. There were five candidates.

A company is being formed in Plaistow having for its objects the erection and maintenance of a new town or public hall.

The approach road from the corner of Hatton-garden, Holborn, to the new market at Smithfield, will shortly be opened in its entirety. The new road crosses the Farringdon-road, the level of which is being raised slightly. One half of the road (that from Holborn to Farringdon-road) was opened some months since, and the remaining half (that from Farringdon-road to Smithfield) is now being paved, and will shortly be completed. This road is in a line with the road bounding the northern side of the new meat market, and, when complete, it will present one unbroken line from Holborn to Charterhouse square. Steps are being taken to carry it through Charterhouse-square into Aldersgate-street.

The Temple Gardens, the pride of the citizens of London, in about a week or a fortnight, it is expected, will outvie all previous years so far as the display of autumnal flowers is concerned. The green sward in both gardens is now in first-rate trim, and the many thousand pompones and crysanthemums are beginning to show flower. How very many other open spaces there are in the metropolis where the good example of the Templars might be imitated with advantage!

An address has been presented to the Emperor Napoleon by about 100 influential noblemen, M.P.'s, and other gentlemen, praying his Majesty to support the project of a submarine tunnel between England and France.

The council of the Architectural Museum announce the near completion of the premises in Bowling-street, Westminster, and invite the subscribers to the institution to call and inspect the new home for the collection about to be removed from South Kensington. The fund subscribed has been exclusively devoted towards defraying the cost of the actual building. It is now exhausted, and £1,000 more is required to pay the balance due to the contractor. The two shops in the front of the building have been let at a rent which will cover the ground rent payable by the council.

The works on the Milkwood estate, Brixton, which has become the property of the Suburban Village and General Dwellings Company, have been commenced. The surveyor has been engaged during the past week in marking out the roads, the Ecclesiastical Commissioners having given formal possession. It is proposed to erect on this estate about 650 houses, each to have a garden. Plans have been prepared, and when the estate is completed it will be a great improvement to the neighbourhood. The houses are to be in price from £200 upwards, payment to be made in the shape of rents, extending over 11 years.

New docks are in course of construction at Lynn. When finished, they will occupy an area of 7½ acres. The works are being carried out by Mr. Lawrence, the amount of the contract being £86,000. The front or river wall is carried down to the solid clay, rises to low water mark, and is constructed of large blocks of béton, weighing three tons each. The béton is composed of sea shingle, sand, Portland cement, and lime, mixed with water. Above low water mark the wall is carried up in brickwork. The entrance to the docks will be through a lock chamber 50ft. wide. The interior of the basins will be lined with concrete blocks. Mr. [illegible], C.E., is the engineer.

The Masborough Burial Board held a meeting on Saturday for the purpose of examining the competing designs for the proposed new cemetery. There were eleven competitors, residing in various parts of the country. The choice of the Board ultimately fell upon the designs of Messrs. Blackmoor and Mitchell Withers, of Sheffield and Rotherham, the estimated cost of carrying out which will be £1,500. The total expense of the new cemetery is expected to be from £3,500 to £4,000.

A *procès verbal* bearing witness to the completion of the works for rebuilding the grand cupola of the Church of the Holy Sepulchre at Jerusalem, in conformity with the protocol of September 5, 1862, was signed on the 26th ult. between the Governor of Palestine and the Consuls-General of France and Russia.

A correspondent, correcting a contemporary, who stated that the organ of St. Nicholas, Fribourg, was the largest in the world, gives some details of the best known large organs, which may interest those of our readers at present following the organ discussion in our columns. The Fribourg organ is said to contain but 64 stops, and about 4,500 pipes, and is not a powerful instrument, although it contains some good "solo" stops. The following instruments, among others, exceed it in size, viz.:—The Lucerne, 70 stops; Weingarten, 66 stops; Ulm, 100 stops; Stuttgart, 70 stops; Rotterdam, 92 stops; St. Mary's, Lübeck, 82 stops; St. Eustache, Paris, 68 stops; St. Sulpice, ditto, 100 stops; Notre Dame, ditto, 86 stops. I may also mention the three great organs at Hamburg, and the following in England:—Doncaster parish church, 96 stops; York Minster, 69 stops; Leeds Townhall, 85 stops; Alexandra Park, London, 87 stops; and St. George's Hall, Liverpool, 100 stops and 8,000 pipes. The latter instrument, by Willis, of London, is the largest and most complete organ in the world, but will be outdone by that (also by Willis) now being made for the Hall of Science and Art, South Kensington, which will possess 111 stops, and have pipes of burnished tin 40ft. long in front.

An experiment in the ventilation of mines by G. Goibal's new patent fans has lately been made at a colliery in the South Staffordshire district. The workings of the pit at which the trials were made are very deep and extensive, and the coal is of a fiery character. It is satisfactory, therefore, to learn that by the new method "it only took about twenty seconds to increase the ventilation from a state of nearly stagnation to that of 600,000 cubic feet per minute." The experiment was in every way a success, and we trust that the invention is destined to reduce to a minimum the worst risks to which our miners are exposed.

A company commenced two years since the irrigation of a large tract of land in what are called the Landes of the Pontlong, near Pau, in the Pyrénées, and a visit of the Emperor the other day has produced an account of the results obtained to the present time. Of the two thousand five hundred acres belonging to the company, one-half have this year produced fine crops of hay and grain, while the remainder are still covered with fern and reeds intermixed with grass, which affords poor nourishment for cattle during only about two months in the year. It would be satisfactory to know at what expense and in what manner this important reclamation has been effected, for few countries are without waste lands which require some similar treatment.

Trade News.

TENDERS.

Chiselhurst.—For the erection of a villa residence and stables at Chiselhurst, Kent, for Owen Edwards, Esq. John Tarring, architect, 69, Basinghall-street, E.C.:—

F. Saunders (accepted)	£3100

Darlington.—Darlington Union Workhouse. Mr Charles J. Adams, A.R.I.B.A., architect, Stockton-on-Tees. Quantities supplied by Messrs. Linsdell and Gifford, Gresham-buildings, City:—

For the whole of the works

Keswick	£15,167	9	6
Robson	14,927	0	0
Bellerby	13,916	14	2
Simpson	13,603	0	0
Sanderson	13,575	19	6
Johnson	12,872	0	0
Robinson and Marshall	12,310	5	0
M'Cormick	11,799	0	0

Lowest separate tenders.

M'Cormick, Brickwork, Plastering, Masonry	£6039	0	0
Wharton, Slating	771	6	8
Johnson, Plumbing, Glazing, Smith's work	1585	0	0
Garget, Joinery	2 08	16	4
Dryden, Painter	322	9	9
	11,696	12	9

The tender for the whole of the works by Mr. M'Cormick at £11,799 was accepted.

Durham.—For the erection of a new Masonic Hall, Old Elvet (City). T. C. Ebdy, architect:—

Punshon, Mason and Bricklayer	£973 0
Hutton, Carpenter and Joiner	340 0
Rule and Son, Slaters	48 4
Almond, Plumber and Smith	135 0
Mole, Plasterer	137 0
Maggison, Stainer and Glazier	61 14

London.—For pulling down and rebuilding house and shop, No. 11, Crotubie's-row Commercial road, E., for S. G. Frost, Esq. Mr. G. F. Payne, architect. No quantities:—

Searle	£505
Vickers and Harding	563
Moyl (accepted)	452

Durham (County).—For the erection of St. John's church, Holmside, to seat 150 adults. T. C. Ebdy, architect:—

Kell, Chester-le-street, Masonry	£376	10	0
Sanderson, Carpenter and Joiner	300	0	0
Rule and Son, Slaters	66	4	0
Laidler, Plumber and Smith	60	13	0
Hodgson, Stainer and Glazier	37	13	8
Wilkinson, Newcastle, Plasterer	43	10	0

Kirkleasham.—For the erection of Kirkleasham Free Schools. Mr. Charles J. Adams, A.R.I.B.A., architect, Stockton-on-Tees:—

Messrs. Shafto and Barry (accepted)	£3833

Leavesden.—For schools. To be executed in Burham bricks:—

Till	£48,540
Kirk and Parry	47,150
Higgs	46,560
Kirk	44,900
Chappel	44,350
Nicholson	43,750
Manley and Rogers	42,645
Webb and Sons	42,265
Henshaw	41,600
Mann (accepted)	38,845

Lewisham.—For erecting the new church of St. Mark's, Lewisham. W. C. Banks, Esq., architect:—

Mansfield	£13,250
Piper and Wheeler	12,578
Jackson and Shaw	12,559
Gammon	11,396
Naylar	10,793
Myers	10,587

London.—For rebuilding No. 35, Great Portland-street, W. Messrs. Bird and Walters, architects. Quantities supplied—

M'Lachlan	£1122
Kelly Brothers	1116
E. Brown	1099
Newman and Mann	1090
Williams and Son	1083
Ebbs and Sons (accepted)	1077

London.—For additions and alterations to 33, Beech-street, Barbican, for Messrs. Harris and Sons. John Belcher, architect and surveyor:—

Bottomley	£360
Bird	305
Fairhall and Weeks	302
Perry	291
Vickery (accepted)	270

London.—For the erection of a warehouse, workrooms, &c., at 4, Little Portland-street, for Peter Robinson, Esq. W. A. Baker, Esq., architect:—

F. Saunders (accepted)	£2720

Ramsgate.—For building two ale stores at the brewery, for Messrs. Thomson and Wotton. Mr. B. Adkins, architect:—

Goodchild	£1977
Cricket	1663
Belsey	1638
Wilson	1408
Epps	1195
Sollitt (accepted)	1187

Southend.—For tavern for the Commonwealth Land, Building, and Investment Society. Mr. Iron, architect:—

Johnston	£1485
Gunn	1475
Lake	1410
Wood	1393
Kilby	1335
Heard	1325
Crabb and Vaughan	1289
Wicks, Bangs, and Company	1250
A. and J. Smith	1247
Hobern	1235

St. Mary Cray (Kent).—For parsonage-house:—

Hollins	£1875	0	
Hill, Clayton, and Hobbs	1779	8	
Wright	1745	0	
Keys	1700	0	
Vaughan	1400	0	
Francis (accepted)	1375	0	
Smyth	1125	0	

Stockton-on-Tees.—For the erection of a villa, exclusive of boundary walls, stabling, and glazing, for R. Gray, Esq., Stockton on Tees. Mr. Charles J. Adams, A.R.I.B.A., architect, Stockton on-Tees:—

Messrs. Fletcher, Brickwork and Plastering	£445	0	
Bowman and Bouron, Mason	78	0	
J. Cooke, Joiner	397	0	
J. Atkinson, Painting	40	10	
J. Ibbetson, Slating	63	0	
M. Pearson, Plumbing and Smith	91	10	

Stockton-on-Tees.—For the erection of nine houses at Stockton-on-Tees, for R. H. Appleton, Esq. Mr. Charles J. Adams, architect, Stockton-on-Tees. The tenders submitted by the following contractors have been selected:—Maggison, Brickwork and Plastering; Bowman and Bouron, Masonry; Spiers and Middlemiss, Joinery; Messrs. Hind, Plumbing and Gasfitting; J. Ibbetson, Slating.

Watford.—For erecting a pair of semi detached cottages at Watford, Herts, for Thomas Dracott, Esq. Mr. Frank E. Thicke, architect:—

				Extra white facings.
Waterman (error)	£412	0	0	... £ 8
Allen	320	0	0	... 10
Cripps	317	0	0	... 13
Harley (accepted)	285	1	6	... 12

COMPETITIONS.

India.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

Melbourne, near Derby.—For designs for a new Wesleyan chapel. Mr. W. H. Adcock, Melbourne, near Derby.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Portfield, near Chichester.—October 27.—For the erection of a new district church. G. Woods, Shopwyke House, near Chichester.

Sefton Park, Liverpool.—October 26.—For the supply and fixing of iron railing, gates, &c. J. Rayner, town clerk, Liverpool.

Hastings.—November 16.—For the purchase of ashes, cinders marine stores, and refuse of every kind. G. Meadows, clerk, Local Board of Health, Hastings.

Leicester.—October 28.—For the construction and erection of a treadmill. E. L. Stephens, borough surveyor, Corporate Offices, Silver street, Leicester.

Mold and Denbigh Junction Railway.—November 2.—For the completion of the above railway, and for the erection of passenger stations. J. Broughall, secretary, Shrewsbury.

Greenwich.—October 28.—For laying down granite kerb and Aberdeen dressed granite cubes. E. W. James, clerk to the Board of Works, Greenwich.

Northampton Waterworks.—October 27.—For constructing a covered reservoir. A. Milne, 2, Gold-street, Northampton.

St. Sepulchre, London.—November 2.—For warming this church with hot water. W. Fowler, vestry clerk.

Colchester (Essex).—November 6.—For erection of officers' quarters, &c. Commanding Officer, Royal Engineers' office.

Spilsby (County of Lincoln).—November 7.—For alterations and additions to the house of correction. Clerk of the Peace, Spilsby.

Wisbeach.—November 4.—For making and fixing about 54ft. elliptical cast iron culverts. W. Adams, C.E., Wisbeach.

Owlerton, near Sheffield.—November 4.—For the erection of a new church. Messrs. Blackmoor and Mitchell, Withers-street, James-street, Sheffield.

Tunbridge.—November 2.—For the erection of a villa. Mr. S. Cooper, 10, Lawrence Pountney-lane, E.C.

For the erection of gasworks for a village 50 miles from London, and for laying gas mains and services to same. Mr. A. Verey, St. Margarets, Herts.

St. Ives (Huntingdon).—November 3.—For tenders for the sewerage of the union workhouse. E. A. Wallingford, Clerk to the Guardians.

Dover Union.—November 6.—For the erection of new buildings, &c., for the infirmary. W. Cross, Clerk to the Guardians, Buckland.

PROPERTY SALES.

October 7.

At the Mart.—By Messrs. E Fox and Bousfield.—Leasehold residence, known as Thanet Lodge, Tulse hill, Surrey, let on lease at £65 per annum, term 98 years from 1838, at £12 12s. per annum—Sold for £1,060.

Leasehold residence and stabling, known as Harley Villa, Tulse hill, let at £70 per annum, term 96½ years from 1839, at £11 4s. per annum—£800.

Leasehold residence, No. 19, Gloucester crescent, Regent's Park, let at £60 per annum, term 72 years unexpired, at £10 per annum—£660.

Leasehold three houses and shops, Nos 63, 65, and 67, Caledonian road, King's cross, producing £110 per annum, term 66 years unexpired, at £24 per annum—£1,330.

By Messrs. Debenham, Storr, and Sons.—Two policies of assurance for £100 each in the Scottish Widows' Fund and Life Assurance Office, on the life of a gentleman aged 50 years—£40 each.

October 8.

At the Mart.—By Messrs. Beadel.—Freehold estate situate in the parishes of Thundersley and Laindon, Essex, comprising a farm known as Thundersley Lodge, with residence, gardens, orchard, cottages, homesteads, and grass, corn, and marsh land, the whole containing 421a. 3r. 30p.—£11,300.

Freehold and copyhold estate known as Diggins Farm, in the parishes of Willingdale Doe and Beauchamp Boothing, Essex, comprising a residence with stabling, homestead, buildings, and 167a. 2r. 15p. of land—£5,800.

Freehold house with two shops, situate in High street, Brentwood, Essex, let at £10 per annum—£550.

Copyhold farm, known as Lyers, in the parish of Willingdale Doe, Essex, comprising a farmhouse, homestead, buildings, two cottages, and 38a. 2r. 28p. of land—£1,070.

Copyhold two cottages and 6a. 0r. 34p. of land, in the parish of Willingdale Spain, Essex—£250.

A £100 share in the Chelmer and Blackwater Navigation Company—£30.

By Messrs. C. C. and T. Moore.—Leasehold three houses, Nos. 5 to 7, Bohn street, Edward street, Mile end, producing £54 12s. per annum, term 87 years, ground rent £7—£275.

Leasehold two houses, Nos. 11 and 12 Cologne street, Mile end, producing £36 8s. per annum, term 87 years at £7 per annum—£200.

Leasehold two houses, Nos. 23 and 24, William street, Cannon street road, and two houses, Nos. 2 and 3, Humber court, in rear, producing £79 6s. per annum, term 34 years, ground rent £10 per annum—£415.

Leasehold five houses, one with shop, Nos. 100, 102, 104, 106, and 108, Cornwall street, St. George's East, producing £82 5s. per annum, term 22 years unexpired, at £5 15s. per annum—£280.

Leasehold residence, No. 12, Alfred street, Bow road, annual value £32, term 35 years, ground rent £4 13s. 6d. per annum—£220.

Leasehold house, No. 1, Walter street, Portland street, Stepney, annual value £28, term 50 years, ground rent £2 per annum—£270.

Leasehold two houses, Nos. 5 and 6, Ann street, Green street, Stepney, producing £46 16s per annum, term 55 years unexpired, ground rent £6 6s per annum—£285.

Freehold two houses, Nos. 45 and 75, West street, Devonshire street, Mile end, producing £41 12s per annum—£400.

Fee farm rent of £ , arising from No. 140, Aldersgate street—£60.

By Mr. Newbon.—Freehold residence, No. 9, Stockwell common—£5,600.

Freehold residence, No. 8, South place, Albion road, Stoke Newington green, annual value £50—£650.

Leasehold premises, No. 31, New Gloucester street, Hoxton, let on lease at £28 per annum, term 63 years from 1823, at 8s. per annum—£295.

Leasehold house and shop, No. 32, New Gloucester street, let on lease at £24 per annum, term and ground rent same as above—£230.

Leasehold residence, No. 178, St. Paul's road, Canonbury, annual value £50, term 83¼ years unexpired, at £8 8s. per annum £460.

Leasehold residence, known as Alma Villa, Tollington road, Holloway, let at £52 10s per annum, term expiring in 1932, at £5 16s. per annum—£700.

By Messrs. J. and R. Kemp—Leasehold three houses and shops, Nos. 5, 7, and 9, Westminster road, producing £86 per annum, term 18 years unexpired—£1,015.

Leasehold business premises, No. 39, Marchmont street, Brunswick square, let at £70 per annum, term 37¼ years unexpired, at £13 13s. per annum—£585.

OCTOBER 9.

At the Mart.—By Mr. W. W. Mason.—Freehold property, known as the Stourmouth Brewery, Wingham, Kent, with two malt houses, stabling, residence, plant, goodwill, &c., also a hop plantation, two public houses at Margate, and a residence and cottage at Dover—£3,570.

OCTOBER 12.

At the Mart.—By Mr. Whittingham.—Freehold building land, fronting Hindman's and Upland roads, Peckham rye, in 46 lots. Lots 263 to 307 comprised previous sales. Lot 308 sold for £40; lot 309, £49; lot 10, £40; lot 326, £39; lots 345 to 352, £40 each.

Freehold building land situate at Hornsey, in 66 lots—from £60 to £250 per plot.

OCTOBER 13.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer.—Freehold residence, with coach house and stabling, and meadow land containing about seven acres, situate at Claygate, Surrey—£3,000.

OCTOBER 15.

At the Mart.—By Messrs. Ellis and Son.—Freehold plot of building land, situate in Dennett's road, Peckham—£740.

OCTOBER 16.

At the Mart.—By Messrs. Norton, Trist, Watney, and Company.—Freehold estate known as Juniper Hall, situate in the vale of Mickleham, Surrey, comprising a residence with stabling, cottages, park, &c., containing nearly 50 acres, also a leasehold plantation, containing 4a. 2r. 13p.—£19,000.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Robert Gooch, Hertford road, Kingsland, plumber, October 30, at 12—William Holdom Kimmins, Finchley, brick merchant, November 3, at 12—John Henry Lance, Croydon, builder, October 30, at 12—John Moore Smith, Cornhill and Stratford, Essex, architect, November 3, at 12—Valentine Cooper, Lewisham, builder, November 3, at 1—Thomas Graves, Winstanley-road, Battersea, builder, November 4, at 12—George John Moor, Aylsham-road, Old Kent road, plumber, November 4, at 2.

TO SURRENDER IN THE COUNTRY.

Charles Beech, Charles Tharme, and John Atkins, Hanley, timber dealers, October 28, at 12—William Briggs, Halifax, bricklayer, October 30, at 10—Richard Chapman, Cleethorpes, joiner—Thomas and William English, Peterborough, painter, October 31, at 12—William Shelton, Stonesby, Leicestershire, lime burner, October 26, at 11—Samuel White, Keyworth, Notts, joiner, October 28, at 10.30—James Broad, Bristol, builder, October 30, at 11—William Down, Hastings, bricklayer, October 31, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 11, J. Evans, West Ham, builder—December 18, J. H. Tozer, King's Cross-road, carpenter and joiner—December 10, J. C. Wilson, Lime-street, City, engineer—November 13, J. Moody, Leeds, builder—November 13, N. Gaunt and J. Sowry, Bradford, Yorkshire, iron and steel merchants—November 16, H. Mercer, St. Helen's, bricklayer—November 3, A. Lomax, Gorton, contractor—November 10, T. Baxendale, Eccleshill, slater—December 7, J. H. Wilson, Amble, Northumberland, tinner and plumber—November 11, W. J. Bowen, Tottenham, builder—November 11, J. F. Kent, Thornton Heath, carpenter and builder—November 13, W. Sexton, York place, Barnsbury, joiner—November 13, J. Hoar, Smith-street, King's-road, Chelsea, carpenter—November 20, J. Buck, Bath street, Poplar, master plasterer—December 1, T. Shakespeare, Latchmere grove, Battersea, engineer—December 3, T. Potterton, Balham-hill, builder—December 4, C. Mills, Dockhead, contractor—December 1, J. Owen, Bournemouth, builder—December 3, C. Saunders, Leytonstone, builder—December 4, G. Newton, Brighton, builder—October 30, W. Hampshire, Huddersfield, builder—November 26, W. H. Jackman, Haylands, Hants, builder—November 5, H. Williams, Redruth, carpenter and builder.

PARTNERSHIPS DISSOLVED.

Hardy and Hopper, Newcastle-upon-Tyne, timber merchants—Lacy and Flexman, Broughton-street, Battersea, builders—Simpson and Co., Stockton-on-Tees, builders—Phipps and Hay, Bath, architects—W. and J. C. Kemp, Exeter, timber dealers—Charlton and Co., Newcastle upon-Tyne, plumbers.

SCOTCH SEQUESTRATION.

David Smith, Glasgow, civil engineer, October 28.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

		£	s.	d.	£	s.	d.	
LEAD:—								
Pig, English	per ton	21	5	0	0	0	0	
,, Spanish Soft	do	18	10	0		0	0	2½
Shot, Patent	do	22	10	0	22	15	0	
Sheet	do	20	0	0	20	15	0	6
White	do	37	0	0	30	0	0	
COPPER:—								
Sheet & Sheathing, & Bolt	per ton	78	0	0	80	0	0	
Hammered Bottoms	do	81	0	0	0	0	0	
Flat Bottoms, not Hammered	do	81	0	0	0	0	0	
Cake and Tough Ingot	do	70	0	0		0	0	3
Best Selected	do	75	0	0	76	0	0	
Australian	do	77	0	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	6¾		0	7	
IRON:—								
Welsh Bars in London	per ton	6	10	0	6	15	0	3
Nail Rod	do	7	7	6	7	10	0	
Hoops	do	8	5	0	9	0	0	
Hoops, Single	do	8	0	0	9	0	0	2½
Staffordshire Bars	do	7	7	6	7	15	0	
Bar in Wales	do	5	15	0	6	0	0	3
Nailrods	do	7	7	6	7	10	0	2½
Foundry Pigs, at Glasg. No 1	do	2	13	3	2	17	6	nett.
Swedish Bars	do	10	10	0	10	10	0	2½
TIN:—								
English Block	per ton	95	0	0	0	0	0	
do Bar	do	93	0	0	99	0	0	2½
do Refine	do	97	0	0	0	0	0	
Banca	do		0	0	97	0	0	
Straits	do	92	10	0	93	0	0	nett
ZINC:—								
English Sheet	per ton	25	10	0	26	10	0	2½
* Devaux's V. M. Roofing Zinc	do	27	0	0		0	0	
STEEL:—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
SPELTER:—								
On the Spot	per ton	20	0	0	0	0	0	
QUICKSILVER	per btl	6	17	0	0	0	0	
REGULUS OF ANTIMONY								
French	ton	43	0	0	0	0	0	

* And 4 per cent. discount if laid upon the new system

TIMBER, duty 1s per load, drawback, 1s.

Teak ... load	£10	10	12	10	Archangel, yellow ..	£11	0	£12	0
Quebec, red pine	3	5	4	15	St. Petersburg, yel..	10	0	12	0
,, yellow pine..	3	5	4	8	Finland	6	5	8	0
St. John N.B. yellow	0	0	0	0	Memel	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	0	9	10
,, birch	3	15	4	15	,, white	8	0	9	0
,, elm	4	0	4	17	Gefle, yellow	9	0	10	10
Dantzic oak	4	5	5	10	Soderham	9	0	10	10
,, fir	2	15	4	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	10	10	13	0
Memel fir	2	15	3	0					
Riga	2	15	3	0					
Swedish	2	2	2	8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	1	9
Masts, Quebec red pine	4	0	6	10					
,, yellow pine..	4	10	6	0	PUMICE STONE pr ton	6	0	8	0
Lathwood, Dantzic, fm	5	10	6	10	OILS, &c.				
,, St. Petersburg	7	10	8	10	Seal, pale....per tun	36	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	100	0	0	0
					Cod	37	0	0	0
					Whale, Sth. Sea, pale	38	0	0	0
Quebec, white spruce	13	0	18	0	Olive, Gallipoli	68	0	73	0
St. John, white spruce	13	0	15	0	Cocoanut, Cochin, ton	52	0	55	0
Yellow pine, per reduced C.					Palm, fine	44	5	45	0
					Linseed	30	5	34	0
Canada, 1st quality	17	0	18	10	Rapeseed, Eng. pale..	33	0	0	0
2nd do	11	10	12	10	Cottonseed	29	10	37	0

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 30, 1868.

THE INSTITUTE OF BRITISH ARCHITECTS.

THE session of the Institute will be commenced with the ordinary general meeting, to be held on Monday evening, November 2 next, when the president, Mr. Tite, is expected to deliver the opening address, of which we need only say in anticipation that grateful recollections of his previous similar favours will ensure him a large and attentive audience. The members will reassemble after the recess, and will no doubt have abundant matter for discussion in the comparison of notes made in holiday rambles during the glorious summer and autumn of this exceptionally fine year. The "Transactions" will probably record many gleanings of impressions of architecture ancient and modern, at home and abroad, for as the quaint structures of Moscow supplied a description with illustrations from the graphic pen and pencil of Mr. I'Anson in the last volume, so, we understand, the next is likely to be enriched with recollections from Algeria, a ground of which also little has been previously known, by another valued and frequent contributor to the same pages. The indefatigable and zealous honorary secretary for foreign correspondence, Mr. T. L. Donaldson, is also expected to bring back with him from the pilgrimage on which he is now bound—to the East and the Holy Land—much that will prove of general interest, for though the route he is pursuing can hardly be termed untrodden, nor the earnest and loving spirit with which he will survey the scenes of sacred tradition be deemed novel, yet keen architectural eyes like his will perceive and garner something at every stage which is daily passed unheeded by travellers less specially endowed in such respect. In the meantime he has left his folio in the hands of Mr. C. C. Nelson, one whose experience and ability enable him amply to fulfil every duty to which he can be called, so that the Institute is not likely to suffer by the prolonged temporary absence of their active officer.

While, however, all will gladly welcome such foreign information, it should always be borne in mind that, as Mr. Seddon, the honorary secretary for home duties, has constantly urged, the "Transactions" of the Institute of British Architects should rather chronicle English works, and that in their pages the principal buildings of the day in this country should be both described and illustrated. As the Institute numbers now among its members so many foreign architects, and lays itself out for them, they may naturally look less for necessarily hasty and superficial remarks upon the antiquities and buildings with which they are familiar than for information as to what we are doing ourselves in our own land.

Another most valuable donation of books by the president will, we learn, be announced at the opening meeting. This, following his munificent gift of £500 for the purchase of books during the last session, cannot be otherwise than suitably received. The librarian, Mr. S. Kershaw, who, by the way, has been recently appointed to the honourable post of librarian at Lambeth Palace by the Archbishop of Canterbury, the hours of attendance at each post being arranged compatibly, is engaged upon the revision of the catalogue of books belonging to the Institute, and though we have called attention to the fact before it will bear repetition, that the library is now one of the most valuable and complete in existence as regards works on architecture, and we trust it will become correspondingly appreciated and studied.

In matters bearing upon the welfare of the profession, although it cannot be denied that the Institute has already done much, and is not chargeable with want of vigour or vigilance, much still remains to be done. In these days of reform, architects as politicians must look forward, not backward. One of the cries of the day, echoed on every hustings, is that for education, and it is one which needs to be raised loudly for architectural students as for others. Whether the provision for such be the especial business of the Institute or not, thus much is certain, that it behoves that body, as the first in position and established by charter, to take hold of everything that affects the interests of the members of the profession. If the education of the rising members be not its own concern, it is nevertheless its duty to learn whose concern it is, or should be, and to agitate till it is attended to. It was a sorry report given at the last annual general meeting as to the voluntary examinations that sufficient students had failed to present themselves to undergo them. It is clear that there is a fault somewhere, and the council in their report have pledged themselves to endeavour to amend what is wanting if they can discover it, and if it be the lack of some available recognition of the proficiency of those who pass creditably, let the students say so, and they may feel tolerably certain of the redress of any grievance they can point out. This is a subject the Architectural Association should consider well and advise the Institute upon. Failing any such step, should the disinclination among students to avail themselves of the advantages offered continue, it can only be attributed to their own apathy, and the Institute must perforce wait until another succession of them show a more anxious interest for their own welfare and improvement. Some time since an insufficiently considered scheme for some general system of education was brought forward under the auspices of Mr. Scott, and a committee of members of the Institute and several other bodies was formed for its consideration, and, as far as we can learn, the scheme was relegated to its proposer to be put into a more tangible shape. Nothing has since been heard of it; the committee has died a natural death, or become unconscious of its own existence. At the instance of Mr. Burges, the council of the Institute was during last session called upon to revive it, and the doing so will probably form an early and prominent position in the list of its agenda for the session. It may be desirable to learn, in the first instance, what may be the issue of the efforts of the Society of Arts in the direction of the establishment of a general scheme for technical education, in which the wants of the architectural profession, as of others, have been considered. The committee of that society having had Mr. Seddon and Mr. Spiers as representatives of the Institute of Architects and of the Architectural Association to assist them in their deliberations, their report has been issued and adopted by the society, and we presume the matter will not be suffered to rest there. It is, we imagine, in the direction of this or some other more powerful influence than its own, that the Institute must work, for it is evident that it does not itself possess the means to establish what the profession requires. The mere setting on foot drawing classes or courses of lectures—steps however desirable in themselves—would be simply palliatives in the stead of such a system as is demanded.

Another subject of vast general interest is, we understand, under the consideration of more than one member with the view of bringing it forward for discussion. It is that of competitions. The architectural profession is the only one which voluntarily submits to—nay, even covets—a system so degrading, and if anything could be done by the Institute to correct the evils which arise from it, great would be the boon it would confer. One example of which we have just heard will suffice to show its tendency. An architect of wide reputation for the erection of model buildings for the poor, finding himself unable to evolve successfully from his own consciousness the accommodation he was asked for, offered a premium of £5 for others to solve the problem for him, and, availing himself of the ideas thus economically obtained, is trading with them with a success which can hardly be called deserved. If such be the treatment that one professional man can deal to his brethren, what can they expect at the hands of the public, who are not less acute at discovering the use of an engine placed at their command, and who are bound by no feeling of etiquette or consideration of mercy?

Of course if moths will singe their wings in the candle they are quite at liberty to do so, nor need it matter to others whether the flame be from costliest wax or but a farthing dip. But in this case while injuring themselves they injure the profession as well, and if any means of restraining their suicidal ardour can be contrived it will surely be the interest and the duty of the Institute to carry it into effect. One of the most important works hitherto effected by the Institute, and by which it has earned wide and grateful thanks from the members of the profession, was in laying down fair and proper rules for the regulation of architects' charges. Although open to abuse, as everything else is, and liable to be taken exception to by employers, it is really remarkable that they have never hardly been challenged; certainly in no instance that we are aware of have they been set aside. They have been admitted as equitable in courts of law. They have been taken as precedents by provincial and American societies of architects—sometimes without due acknowledgment, seeing that but few additions, omissions, or emendations have been proposed in any such imitations of them.

ON THE SHADOWS OF SOME COMING EVENTS.

WE are not bitten with the prevailing mania, nor are we going to discourse much prophecy on the elections. Our purpose is the rather to quietly consider some of the art tendencies of the present day, and from the change which is going on around us to prognosticate the course most likely to be beneficial to the true student of the arts. That coming events do cast their shadows before them would somewhat imply that such events must be marching from the light, not to it, but, without questioning the exactitude of the simile, we will accept it in its popular form, and accord to it its popular meaning. In order, therefore, to best make out the nature, shape, and quality of the adumbrating substance, we shall study carefully all its shortening shadows, and, that we may know their true intent and import, must use that true mirror of the future, the past. No thoughtful observer of the architecture of the present can fail to remark the change which is taking place in its characteristics, nor fail to see that the ultra mediævalism which has somewhile been blindly trying to lead the blind has now fallen somewhat into the ditch, and is struggling to escape therefrom. With its still closed eyes it is groping after something solid, occasionally seizing it, but for lack of having its eyes opened, not recognising it when within its grasp. It will be instructive to trace the rise and progress of this past tendency, in order that we may see how the future is coming on, and lay some foundation for a scientific knowledge of æsthetic change and transformation.

Just about a hundred years ago a clever scholar rather than a learned man got tired of that political life so many just now are anxious to taste the bitterness of. He did a very unusual thing in those days, but, alas! a very common one since—he built himself a neat Gothic villa, and, being a man of taste, a lover of the arts, and still more, a fashion-

able talker on them, Strawberry-hill Gothic, both in literature and art, became the rage—quite the correct thing in fact; and though everybody could not build Gothic villas, yet everybody had a chimneypiece, and the newest things in the newest style thereon were fearfully and wonderfully made. Beckford followed afterwards, and then came Scott, and the public mind was thoroughly turned into the old forgotten channel. Then arose the first of the Pugins, John Britton, and a host of other illustrators of the past art history of the Middle Ages, and then followed, alas! the re-producers. Instead of learning the spirit of the lessons taught, they but repeated by rote. Because a thing had been done for one purpose and done well, it was supposed to do so much better for another now, and the consequence was it didn't. Then grew up the thinkers, and there are many now amongst us, but the evil was and is—they thought only how to translate modern ideas into mediæval art, and they have found that mediæval art is not elastic enough to hold them. Indeed, it is somewhat amusing to note how the exceptional circumstances and expedients of the past have become the types and generalities of to-day. Occasionally the true mediæval architect could not get that chief glory of his art, wall space, and then, because he had not strength enough to resist his arches, he used lintels, solid tympana, and such other expedients as he could; sometimes he could not have a buttress, and he was forced to lose his much-loved shadow, but all these excisions were very much of the nature of surgical operations to him, and never did he undergo them willingly. His art could not survive such frequent shocks, and when the time came that all these glories were to pass away it laid down its head and died. If we examine the present tendencies of the Gothicist we shall see that of all the chief beauties of mediæval art they are debarred the use; and a lopped, maimed, castrated representative is all they can produce. Nor can this poor Frankenstein of theirs speak plainly; it tries to be vernacular, and only reaches the "Gadzooks" and "I'fakins" of Mr. Harrison Ainsworth, nor tells its story better than it did under the hands of the too much abused Batty Langley. Was he not eclectic? and is not that good? Indeed, we think in many respects he was much less culpable than some of his revilers who have so much less invention: he sinned and called it sentiment, they sin and call it principle; the one perhaps was foolish, the other most certainly is false. Taking the experiment of revived mediævalism as a whole, a dispassionate and reflective observer must read its own handwriting on its own wall, and, weighing it carefully in the balance, finds it wanting. He sees it endeavouring to absorb the elements of inconsistent styles, to graft on its old stock scions of incompatible growth, and these attempts are to him so many foreshadowings that its days are numbered, and it behoves him to see whence comes its successor.

When the change of habits, of thoughts, and sentiments which were inherent to feudality took place in the fifteenth century, when new habits, thoughts, and sentiments replaced them, mediæval architecture died, and had more peaceful times succeeded in Europe, that which we call Elizabethan architecture would have refined itself and become in time as pure as it was imaginative. But the fates were against it; wars and rumours of wars were everywhere, and the fruits of Peace withered. Still, from the experiments then tried we learn somewhat of that which is coming, and, even now, whilst the pseudo-mediævalism of to-day is slowly dying, we see creeping into the works of the newer men who think a somewhat similar tendency. Instead, however, of seizing upon the late and debased Roman characteristics which formed the nucleus round which the Renaissance of England, Flanders, and France grew, we find them choosing with care and discrimination the refined details of the best days of Greece, blending it with the vigour and structural truth of true mediævalism, and finding in this union something which will express the sentiment of the day. The best works of the best men of France show this tendency greatly, and even in the works of our most rigid mediævalists we find it making way. As in the early essays of the Strawberry-hill days, so in ours, the little ornaments which surround our daily life, the papers on our walls, and the furniture of our rooms bear witness to the change in the current of popular taste, and shadow forth now as then the substance which is to follow. The works of our painters indicate the same change, too, and the growing fame of Leighton and Moore, and the tendency to classic arrangement in the works of Calderon, Yeames, and many others, prove how quickly the tide of mediævalism is ebbing, and indicate the current which will influence the succeeding flow. We would call, therefore, the attention of all the younger members of the profession to this coming change, and urge them to prepare for its advent by directing the course of their studies to the almost forgotten works of Greece and Lycia. Nor should they confine their studies to these alone, but examine carefully the modern works in that budding style to which our neighbours have already given the name of Neo-Grec—Greek on reasoning principles—and we trust they will bear in mind the latter. "Take the mixture, you can't do better," is the stock advice of most doctors, and one we would impress upon the young aspirants to the delusions and disappointments of architecture, but it must be the mixture. Let them note how and why revived mediævalism failed and avoid the error; let them strive to translate the ideas of the day, not into a dead but in a living language—a language, perhaps, containing root-words of many an older one, but having the more interest, the more force, and a stronger mental hold upon us for that very reason. Let them carefully watch the changes that are taking place around us, guarding against the danger of mistaking the shadow for the substance, but noting its growth and increase, and we have no doubt but that they will soon find the solid truth which flings it. Their study time is now, and if they rightly use it they will in days to come thank us for having thus early turned their attention to those coming events which already cast their shadows before them.

PRIZE DESIGNS.

FROM the time when the wily Goddess of Discord, indignant at not receiving a "card of invitation," threw down among the wedding guests the fruit of the Hesperides, competitions have ever been attended with jealousy, dissatisfaction, and vexation. All comparisons, however fairly and impartially they may be conducted, must, in proportion as they reflect credit upon the one party, bring at least disappointment to the other. It is no wonder, therefore, that they are "odious," and the epithet may be dated from the invidious inscription upon the golden apple, *detur pulchriori*. If we are to credit the records of heathen mythology it may be shrewdly guessed that the Trojan shepherd was, although less mercenary, equally corruptible as his modern successors, and that the prize offered to him in reality influenced his judgment and determined his selection. It is true that the claims of the fair rivals were pretty evenly balanced, and that there was just cause for hesitation, but the insidious promise held out to him by the laughing Queen of Love was an irresistible temptation to the youthful arbitrator. He accordingly earned the gratitude of the one and incurred the anger of the others, and the events that followed his decision are recorded in the only real epic poem that has been ever written.

It might be asked, Is it possible to decide a competition, and fulfil the motto *detur digniori*, to the satisfaction of all the competitors, or to the satisfaction of any but the successful candidates? The first question must be answered in the negative, but we think the second admits, in many instances, of an affirmative reply. Undoubtedly, where the candidates are numerous, there will be a large number who will be disappointed and dissatisfied solely because they are not successful, and, although their designs might be almost below contempt, yet they are so conceited that they are equally blind to their own defects and the merits of others. At the same time there are many who, though they naturally hope and wish for success, yet honestly desire to see "the best man win." These are also the very men who, we believe, will invariably be found to possess qualifications far superior to those of their rivals included in the former category. The remonstrance of the author of a rejected design is frequently not treated in the manner it should be, nor does it receive that attention due to it. This arises from two causes. In the first place, it is unwarrantably assumed that because his design was rejected therefore he is only actuated by jealousy and misplaced resentment against those more fortunate than himself; secondly—and this cause is a very true one—that the judges having committed themselves to a choice, whether bad or good, are bound to stand to it, and, therefore, ignore, or endeavour to smother, any endeavours that may be made to expose their partiality or their incompetence. The best-tempered man, the most diffident and modest, one who is more ready to allow the claims of others than to insist upon his own, even when they are superior in merit, feels bound to remonstrate against a decision wherein the incompetence of those entrusted with the arbitration becomes glaringly manifest. It is difficult to determine whether partiality or incompetence predominates in the majority of instances connected with prize designs and open competition. We may, perhaps, be accused of making a wholesale accusation against parties placed in the position referred to, but this is not the case. We willingly admit that there are exceptions, but confess with regret that those exceptions are rare. Can anything be more absurd for the members of a local board, a vestry, or other corporate body to constitute themselves judges of professional designs? Imagine men who have passed their lives in trade, not upon a mercantile but a much more humble scale, getting up in the presence of a surveyor, a man, perhaps, of unquestionable education, ability, professional knowledge, and experience, and propounding what they consider the merits of any particular case, utterly regardless of the ignorance they display, the absurdities they give utterance to, or the anomalies they propose. Yet, as a rule, it is men of this class to whose judgment—or we should say misjudgment—the sanctioning and carrying out of large and costly works are entrusted. It is they who advertise for competitions, pronounce upon the merits of the designs sent in, select the successful candidates, and award the premium.

The numerous letters we receive relative to the subject of competitive designs prove that the statements we have made are substantially correct. It is not to be supposed that all the authors of rejected designs are actuated by unworthy motives in publicly proclaiming their protest against the award of the judges. In fact, in very many instances the impartial reader can easily satisfy himself of the truth and force of the allegations put forward, and the experienced critic can readily detect from the tone of the communication by what motives the author is actuated. The truth is, that the whole system of competitive designs is conducted upon a false principle. The annexing mottoes to drawings and plans is a mere sham; the competitors might just as well put their name and address boldly in one corner. The error lies in the fact that even supposing the designs are submitted to

a disinterested and competent party, those who have the awarding of the premium are in reality acquainted with the names of the various candidates and the designs previously to his decision. A far better plan would be to have designs sent in anonymously, to let the examiner mark upon the back those which he considers deserving of the premium, and, after they had all been publicly exhibited, to let the candidates come forward and each claim his own design. Or an equally effective method would be to have a tracing made of a small portion of the designs to which the premiums had been awarded, and, after each competitor had claimed his own design, to identify the successful ones by means of the tracings. Whatever may be advanced to the contrary, it cannot be denied that there is an utter disbelief in the *bonâ fide* nature of all competitions of the class to which we allude. If one has any interest, or can make any with the authorities at head quarters, well and good, but if not, the intending candidate had better leave the affair alone, as it will simply result in loss of time, loss of money, and the gain of much disappointment and chagrin. Premiums have frequently been awarded to the authors of designs in which the actual conditions laid down in the public advertisement and private instructions have not only been uncomplied with but actually violated.

There is another and a flagrant weakness to which members of local boards, vestries, committees, and other prize-awarding bodies are peculiarly liable. It is a fondness for pretty pictures. An old hand at competition would never think of sending in purely working drawings, although the elevation in a good set of working plans gives a perfectly fair and honest idea of what the intended structure will really resemble. But the man who would be unable to distinguish in a working drawing an arch bridge, from one designed upon the horizontal principle would be able to discourse in a most edifying manner upon the different types of bridge construction when they were presented to his view through the medium of perspective, high colouring, deep shadows, blue skies, fleecy clouds, and, should the circumstances of the case permit of it—oh! lucky chance for the competitor—the clearest and most transparent water that ever flowed. There are no doubt many descriptions of architectural designs which absolutely require to be shown in perspective in order to display at one *coup d'œil* the relative proportions and general appearance of the structure. But even in these instances, the landscape, the rural or the urban accessories are very much overdone; sometimes they are developed to such an extent as to completely eclipse the real object of the drawing. The question will naturally arise, If these are the usually received opinions upon this subject, how is it that so many designs are always sent in, and so many competitors respond to the call? It would be difficult to give an exact reason. Young professional men who are striving to get on consider that they ought not to lose a chance. Others who have more time than business upon their hands decide upon sending in plans, and others, again, indulge in the delusive hope that true merit may after all be successful. Rejected candidates and disappointed competitors must inevitably accompany the selection of one or more to the exclusion of the many, but there is no necessity that they should impute and be able to justly impute unfairness, partiality, and incompetency to those upon whose shoulders rests the onus of proving the truth or falsehood of the imputation.

PETROLEUM FUEL.

A GLANCE at the large amount of space occupied by the intended fuel for locomotives and steamers is a sufficient proof that we have hitherto not succeeded in applying the principle of *multum in parvo* to these particular examples of mechanical invention. There are evidently two methods by which the storage room necessary for producing a certain amount of steam power during a given time may be diminished. The one consists in an economical construction of the machine itself, so that a smaller quantity of fuel will suffice for the generation of a given force, and the other in reducing the actual cubical contents of the fuel without at the same time diminishing its capabilities as a source of motive power. With respect to the first of these methods the ingenuity of mechanical engineers may be said to be exhausted, and, although some trifling improvements may yet be introduced, it is extremely improbable that the consumption of fuel per horse power will be brought within limits narrower than those to which it is now reduced. It is to the second, therefore, that we must look towards effecting a diminution in what might be termed the dead weight of all locomotive machinery. Hence there have been numerous attempts made to prepare artificial fuel in which the calorific element is utilised to a maximum and the percentage of the waste is a mere fraction. Recently the liquid form has been substituted for the solid, and petroleum, creosote, and other combustible fluids have been experimented upon with various degrees of success. France claims to be among the first in the endeavour to solve this important problem. About a month ago the Emperor travelled a distance of fourteen miles upon the footplate of a locomotive employing as a fuel petroleum oil. The production of steam was effected by burning a current of the oil, supplied by a pipe, upon a brick furnace, the quantity of the fuel being regulated by a small cock. In appearance the oil was a little viscous, and closely resembling in some of its properties the fixed oils of olive and colza. The application of mineral oils to fuel purposes was considered a success when tried on board the "Pueblo," a vessel belonging to the French navy. Both in our own country and America numerous attempts have been made to obtain an effectual and economical fuel from petroleum oil, but many obstacles have hitherto interposed to prevent the completion of the desired result. The complicated nature of many of the apparatus, the danger that might possibly arise from the mixture of superheated steam with the vapours of the oil, and other practical details not easily surmounted, have yet to be vanquished before a general opinion can be given in its favour. It is evident that steam vessels will especially benefit by the employment of petroleum oil fuel, since it will enable them to spare so much more space for the reception of cargo, and will also expedite their voyages by obviating the necessity for their stopping at the various coaling stations along their route.

THE RIGHT OF PROSPECT OVER OPEN GROUND.

THE recent decision of Vice-Chancellor Malins in the case of Potts *v.* Smith, 16 W.R., 892, involves in our judgment, says the *Solicitor's Journal*, a principle of some interest to owners and occupiers of houses in the suburbs of London and other increasing towns, with reference to such persons' enjoyment of the light and air derived from open spaces. The plaintiff, it seems, had taken a lease of a plot of building land situate in Cromwell-road, Kensington, and erected on part of it a house for his own occupation, while the remainder of the plot was surrounded by a wall seven feet in height and converted into a garden. Ere long, the defendant, who was occupier under the same lessor of an adjoining plot of land, was minded to convert it into a mews, and he ran up a wall along the plaintiff's garden wall to a height of 23ft. thereby shutting out the plaintiff's prospect in that direction over the adjacent ground. This was the injury complained of. The plaintiff moved to restrain the defendant from allowing the wall in question to remain of the height to which it had been carried, and rested his case for relief mainly upon the covenant for quiet enjoyment entered into with him by the lessor, which, as he contended, was binding on the defendant, whose title was also derived from the lessor. But the Vice-Chancellor declined to take this view of the case, and dismissed the bill without costs, adopting what we take to be the general opinion that the usual covenant for quiet enjoyment expresses little if anything more than is implied by the demise itself. It extends, in fact, only to defects in the title of the covenantor (Hunt *v.* White, 16 W.R., 478), and not to such acts as the interruption of the lessee's prospect by the lessor, or those holding or claiming under him. The case accordingly resolved itself into the simple question (it being agreed that there was no breach of covenant in the case) whether a man has any right, by any building he may erect upon his own land, to interfere with the access of light and air to his neighbour's house, in the absence of any covenant binding him expressly or by implication not to do so, or reservation in the deed of grant under which he holds his property.

The rule of English law upon this subject we believe to be that the owner of any plot of land, whether building land or not, has, in the absence of covenant or reservation, an absolute unqualified right to erect what buildings he pleases upon the whole or any portion of his land, building up to the very extremity of it if he pleases, nor can he complain when his neighbour exercises the same right in his own case. If he wishes to qualify or restrict his neighbour's right of building up to the edge of his property he must procure a covenant or reservation in that behalf. In short, except by express contract, the right of every owner of the soil to build up to the edge of his boundary cannot be restricted as a general rule. There are, of course, exceptions to the rule, in cases of restrictions on building established by statutory enactment, particularly in or near towns and near national works of defence. But with these exceptions we need not detain our readers.

"Free as air" is a common expression, and yet not true as applied to the enjoyment by persons of the air (and light) that come to them across the land of others. No man in England has or can have at common law an absolute right to any light and air except what come to him from above. To lateral or horizontal air and light he is not entitled. This may seem a paradox, yet it may pass for an assertion—somewhat broad, perhaps—of the existing law in the subject. In this respect our law differs from the civil law, in that the former does not recognise the right of prospect as existing or capable of acquisition by prescription over the land of another. This was held in Aldred's case, 9 Rep., 58b, on the ground, according to Wray, C.J., that a prospect is a matter of delight and not of necessity. Where you desire to retain the enjoyment of the prospect of an open space, or the access of light and air to your windows from property which is not your own, you must see that your right is established by a reservation in your favour, or covenant on the part of the owner of the land over which your prospect extends. To the operation of mutual covenants and reservations of this kind, and not to any fancied prescriptive rights of prospect, are we indebted for the squares and open spaces which it is the fashion to call the "lungs of the metropolis." Among the Romans a servitude of prospect did exist, and any, the least, interference with a neighbour's view was held to give him a ground of action—see an allusion to this in Cicero *De Oratore* i., 39. But this is not our law, as we have already shown, and we repeat that to prospect—*i.e.*, side light and air—a person is not absolutely entitled. Though he may have enjoyed for twenty years uninterruptedly the full benefit of the prospect over and the light and air coming from his neighbour's land, enjoyed them because his neighbour has not chosen to build on his land and exclude them, yet at any time his neighbour may build up to the line of demarcation and cut off his prospect, partially or altogether, and no claim of his to retain the prospect, based on prescription only, will be admitted. The loss of prospect is a sentimental grievance only, for which our law affords no remedy, and putting, of course, grants and reservations aside, his right of action does not arise until he can show that his light and air are seriously interfered with by his neighbour's buildings. A serious diminution of the supply of light and air, to the manifest inconvenience of the plaintiff, must be shown, or the court will not interfere. In Back *v.* Stacey, 2 C and P, 466, a case tried at the Norfolk assizes, 1826, Best, C.J., told the jury to distinguish between partial inconvenience and a real injury to the plaintiff in the enjoyment of the premises, and that there must be a substantial deprivation of light sufficient to render the

house uncomfortable in order to entitle the plaintiff to their verdict. This case has ruled cases of its class ever since. It was cited with approval in Dent *v.* the Auction Mart Company, 14 W. R., 709, L. R. 2 Eq., 238; and in Calcraft *v.* Thompson, 15 W. R., 387, Lord Chelmsford, C., said that the case had been approved by eminent judges and lifted out of the sphere of a mere *nisi prius* decision. So, too, in Roberts *v.* Macord, 1 Moo. and Rob., 230, Mr. Justice Patteson told the jury that the mere use of an open space of land for twenty years, for a purpose of which light and air were essential, did not preclude the adjoining owner from building on his land so as to obstruct the light and air. These and other such cases led to the now universally admitted rule that the court will not interfere to protect ancient rights, except where the injury is material. It is enough to refer the reader to Clark *v.* Clark, 14 W. R., 115, L. R. 1 Ch., 18, and Dent *v.* the Auction Mart Company.

We have already seen that the shutting out of a pleasant prospect gives no right of action. From the principle that we are of necessity entitled to none but vertical light, it follows that no person can claim an absolute right either for himself to see out of his property or for others to see into it In Smith *v.* Owen 14 W. R., 422, the court refused to restrain a person from obstructing the view of passers-by into his neighbour's shop, on the principle that a man has no positive right to look out of nor have others look into his windows. A similar case was Butt *v.* Imperial Gaslight Company, 15 W. R., 92, L. R. 2 Ch., 158, where the erection of a gasometer, which impeded the public view of the plaintiff's signboard and workshop, was held to be no ground for an injunction. To open a window overlooking your neighbour's ground so as to disturb his privacy is no ground of action, according to the dictum of Mr. Justice Blackburn in Jones *v.* Tapling, 12 C. B. N. S., 842; and in Attorney-General *v.* Doughty, 2 Ves. Sen., 452, which was a suit to restrain the defendants from building a wall so as to intercept the prospect from Gray's Inn Gardens, Lord Hardwicke is reported to have said, "I know no general rule of law which says that building to stop another's prospect is a nuisance. It depends upon a particular right—a right, it may be observed, depending on grant or covenant, and not to be prescribed for."

CORROSION OF IRON STRUCTURES.

AT a meeting of the American Society of Civil Engineers the following paper was read by William J. M'Alpine, C.E.:—

Formerly it was assumed that iron was subject to a rapid corrosion when immersed in water, or exposed to the alternations of the water and the atmosphere, and the every-day experience of constructors seemed to confirm this opinion. Wrought-iron bolts in wooden dams, and similar places, and in works wholly under water, frequently rapidly oxidise. Cast-iron water pipes in city streets are frequently found greatly corroded; and cannon shot, immersed in sea water for half a century, and sometimes less, have been found with the mass of the metal entirely changed from iron into plumbago, or deeply pitted by oxidation

During the earlier discussions of the subject the inquirer was frequently staggered in his belief in the generally received opinions by finding both wrought and cast iron which had been immersed many years but slightly oxidised, and wholly unchanged in its structure.

The cannon of the "Royal George," which had been submerged half a century, when first taken out, were so soft that the metal could be cut with a knife, but immediately hardened on exposure to the air, and were again fired. Some muskets and cannon, sunk in Lakes Erie and Ontario during the war of 1812, were, forty years afterwards, found to be but slightly rusted.

An iron steamer, the "Aaron Manby," which was launched in 1822, and kept in constant use for twenty years, was carefully examined, and no signs of corrosion found; and, ten years later, it is stated that she had required but small repairs for the whole period.

William Fairbairn also cites many cases where iron ships, which had been ten to fifteen years in salt water, showed no corrosion. This subject was much discussed in England in 1850, and the unexpected absence of corrosion in wrought-iron ships, even on the interior surfaces and iron parts, was then attributed to the vibration of the metal, as was noticed on comparing the amount of the corrosion of railway bars in the track with those aid outside of it.

Plumbago was obtained from cast iron immersed in acidulated water in 1822, and, forty years later, Dr. Calvert produced the same result by placing it in sea and foul water.

A dozen years earlier Mr. Mallet reported his well-known experiments on the corrosion of different kinds of iron in pure and foul atmospheres, and in clear, foul, acidulated, and salt waters, and arrived at the following general conclusions:—

That iron exposed to water holding air in combination corrodes on the surface either uniformly or in places, by rust or by the conversion of the iron into plumbago, and that corrosion depends upon the want of homogeneousness of the surface, or in its density or hardness, or in the combination of the carbon with the iron.

This subject was very thoroughly discussed by some of the most eminent engineers of the London Society in 1862, and numerous cases were cited both of corrosion and its absence in iron under water, and the cause explained.

The examples then stated, and numerous others, showed that cast iron of a particular description corroded rapidly, or changed its structure by a few years' immersion in foul or salt water, while other irons were entirely unaffected when exposed in the same way for twenty, thirty, and forty years. In the same structure, as in the case of the iron gates of the Sheerness dock, three pairs of gates had resisted the action of salt water for forty years, and a portion of the fourth pair, put in several years later, had been much softened and injured by its exposure.

Several of the leading engineers instanced numerous cases of square cast-iron piles, standing partly in and partly out of salt water, and a portion alternately wet and dry at each tide, which, after periods of eighteen, twenty-four, and thirty-one years, and intermediate periods, showed no signs whatever of corrosion or change—"the square angles of the iron were as sharp as when they left the foundry."

Mr. Simpson, the past president, said that in his practice he used great care in the selection of the iron, and such iron was practically incorrosive. The members stated that wherever this corrosion or decomposition had occurred it was wholly due to the quality of the iron. The engineer has, therefore, only to select that of a proper quality to ensure durability. My own experience and examinations, so far as they reach, confirm these opinions.

Cast iron, to resist corrosion to its greatest extent, should be as hard as the case will admit, of an even, close grain, and with the carbon combined, and not in the form of graphite. Impure soft foundry iron will corrode rapidly; close-grained grey iron of an even texture will resist corrosion in the most exposed places without sensible injury, and white iron of good quality may for all practical purposes be considered as imperishable in such situations. Care should also be taken not to place iron in contact with other metals, so as to produce galvanic action.

It is well known that many cast-iron water mains have corroded greatly, not only externally but internally. In the latter case the oxidation sometimes takes the tubercular form, where the rust is collected and aggregated in hard knobs.

In the early manufacture of water pipes they were often made from the worst quality of metal; it could hardly be called iron, but was a composition of cinders, sand, scoria, and iron of the softest kind, loose-grained, and in large crystals; indeed, precisely such a mixture as would offer the least resistance to corrosion.

Water pipes, placed in the streets of the city in earth alternately wet and dry, and saturated with mephitic gases from sewers and gas pipes, are exposed to corrosion more than under almost any other circumstances, and if made of the material just stated will be destroyed, where those of a proper quality of metal would endure a very long time. The internal corrosion, however, where the iron is exposed only to the action of pure water and a small amount of air in combination, will not occur to any appreciable degree if the iron is of the proper quality.

The strength of cast-iron pipes of the usual thickness is so far beyond the pressure of the water and occasional percussions that the manufacturers seem to think that the weakest metal will answer; and the engineers have not yet, in their specifications and inspections, required enough care in the selection of the metal best calculated to withstand corrosion.

The death of Herr E. Hildebrandt, the celebrated landscape painter, is announced from Berlin.

ST. CHAD'S MIDDLE SCHOOL, DENSTONE, STAFFORDSHIRE.

THE first stone of these buildings was laid on Thursday with great ceremony by Canon Lonsdale, in the absence, through illness, of the Marquis of Salisbury. These schools are a branch of the College of St. Nicolas at Lancing, and will be in connection with it for the purpose of educating and boarding at the cheapest possible rate—viz., at £30 a year—the children of the middle class of the great towns in the neighbourhood, such as Manchester, Nottingham, Stafford, Burton, &c. The building stands on a magnificent site, commanding the valley of the Churnet and Alton Towers, and the great Weaver Hill, and it is close to the Rocester Station on the Derby and Leek Railway.

The buildings will be arranged for 400 boys, with a training school for masters combined with the school, as at Hurstpierpoint. The general plan takes the form of the letter H, there being two quadrangles, opening the one to the east, and the other to the west. The quadrangle which looks towards the west is that which is now in course of erection, from the designs of the College architects, Mr. W. Slater and Mr. R. Herbert Carpenter. The style of architecture adopted is a rather severe type of Early Pointed Gothic, treated in rather a more ornate manner in the principal buildings, such as the chapel, dining hall, great school room, &c.

The material used for the outer walls is Alton stone, in random-coursed work, with bands of red Alton stone. The walls are hollow, the inner thickness, as well as all the inner walls, being of brick made on the ground. The roofs will be covered with brown tiles. The contractor is Mr. Bromwich, of Rugby, and the clerk of works, Mr. Beckensall. The ultimate cost of the building will not be less than £50,000.

The dimensions (inside) of the western quadrangle, or "Lonsdale Quad" as it will be called, in memory of the late bishop of the diocese, are 211ft. long and 160ft. wide. The eastern or "Chapel Quad" will be about 160ft. square.

The central cross block of buildings includes the great school room, 100ft. long and 35ft. wide. It has a lofty open-timber roof; the height from the floor to the ridge of it is 62ft. Below this, on the ground floor, is the principal entrance in the centre, a large boys' day room, class room, visitors' and porter's lodge. The school room is reached at the south end by a wide staircase. A cloister on the ground floor, 10ft. wide, joins the two wings.

Each of the wings is 211ft. long and 40ft. wide, with additional projecting blocks at the western end. These wings are about 65ft. high, and are in three stories. The lower story of the north wing has seven class rooms, with a cloister 8ft. wide along its entire length. The two stories above have each two dormitories 104ft. long and 17ft. wide, with large lavatories attached. At the western end of this wing is the head master's house and its offices, besides masters' rooms on the several floors.

The south wing is of the same general dimensions, but on the ground floor there is a gymnasium 125ft. long and 17ft. wide, and eleven small rooms for the masters' training school, also the boys' library, 30ft. by 27ft., and master's library, 26ft. by 22ft. They have a cloister connecting them with the second master's house and chaplain's rooms. The dormitories are the same as on the other side, each for 50 boys, and adjoining each dormitory is a junior master's sitting and bedroom, and a sick room.

The general height of these wings is about 65ft. The lower end is somewhat higher, and is finished by pyramidal roofs with stone dormers rising into them.

At each of the inner angles of the quad (where the wings join the central building) is a lofty tower with a tiled spire. The height of these is about 90ft. They are to contain the tanks for the water supply, and are so placed and arranged as to prevent the possibility of any spread of fire. The towers are simple and massive; the upper stages are corbelled out on bold arched corbels.

The wings of the chapel quad are not yet commenced. The chapel itself will form the southern side. It will be apsidal, and of grand and lofty proportions, with an ante-chapel opening into the cloisters. The campanile will stand on the north side near the apse, and will be massive, lofty, and simple in outline. The upper stage will be octagonal and finished by a low stone spire. The dining hall will join the northern wing. It will be 100ft. long and 35ft. wide, and entered from the cloisters by a grand staircase. It will have a

lofty open timber roof. Under the hall will be rooms for the masters' training school, music rooms, and other rooms for occasional use. The kitchens and offices will form, together with the laundries, engine house, workshops, gas house, &c., a separate quadrangle to the north of the general building.

The works are being rapidly pushed on, and the whole of the foundations and basement of the "Lonsdale Quad" are put in, and the building itself is rising some 2ft. or 3ft. above the ground. Great care was required with the foundations, the soil being a mixture of clay and shale, with a sharp fall in some places to the west. This portion of the work was, therefore, executed by a schedule of prices, the contract commencing at the ground line. The contractor is Mr Brogwich, of Rugby, and the architect's clerk of works is Mr. Beckensall.

BRADFORD HOUSE OF RECOVERY COMPETITION.

(From the *Leeds Mercury.*)

ON Saturday the plans prepared by Messrs. Lockwood and Mawson, of Bradford and London, Messrs. Andrews, Son, and Pepper, of Bradford, and Mr. E. Birchall, of Leeds, the architects selected to compete, were thrown open to public inspection at the Infirmary. The instructions issued to the architects were that the general arrangement of the hospital should be that known as the pavilion or block system, and on this arrangement they have been prepared. Messrs. Lockwood and Mawson present two handsome designs, the one Gothic and the other Italian, both of which look costly, but it is stated they could be brought within the amount fixed upon. Their designs illustrate the pavilion principle, developed in two modes of arrangement, both with the pavilions on lines from north to south, and, therefore, with east and west aspects to the wards, as recommended by the best authorities. The buildings are two stories in height, and it is shown how the pavilions can be reduced to one story, but, however desirable this may be in a sanitary point of view, the architects state that it would unquestionably be attended with extra expense. Each ward, to contain twelve beds, would be 60ft. long, 25ft. wide, and 16ft. high, with 24,000ft. cubical contents, allowing 2,000ft. to each patient, and also a private ward, containing nearly 3,000 cubic feet. A one-story building is included in the design, separated from the main structure, to contain ten persons of each sex. Whether the wards were constructed either one or two stories in height, accommodation would be found for 60 patients. The architects state their opinion that "£100 per bed is sufficient for the costs of the sixty patients provided for in the design, or the sum of £6,000" for the structure, and the separate building, for twenty patients, they estimate at £50 each, making an extra sum of £1,000. Mr. E. Birchall's design is Gothic, two stories in height, with the administrative department in the centre, and the wards at either side, connected with the central building by corridors. He gives accommodation for 52 patients, the wards on either side of each story for 12 patients, who have each rather more than 2,000 cubic feet of air, and a small ward is shown, capable of accommodating one patient. The wards run nearly north and south, to obtain the most light and air. Mr. Birchall states that there is nothing of outward show in his building, and that it is simple in design. He considers that it could and ought to be built at a cost of £100 per bed, but thinks that the sum might advantageously be raised to £150 per bed. He has also furnished a plan showing the wards one story in height. The selected design, by Messrs. Andrews, Son, and Pepper, is treated in a different manner from the others. Their first design shows a two story building, but in their second the wards are only one story. The architects state that the building has been designed on the exterior as cheap as is compatible with the appearance of a public charity, their great aim appearing to have been utility, and the desire to afford the most complete accommodation for all the departments connected with the specific character of the hospital. In the centre of the front pile of two stories, which partakes somewhat of the Gothic in style, is the administrative department, where apartments for the board room, the waiting room, the surgeon, matron, and other officials are located. The front faces to the north, and affords a pleasing aspect in the direction of Undercliffe. The convalescent wards are placed right and left of the centre, in sufficient proximity, and far enough removed from the administration to prevent any fear of contagion. The acute, or fever hospital wards four in number—two for males and two for females—are in the rear, and on the south side of the administration, each ward having a south, east, or west aspect, and shut out from the north. The wards are each 60ft. long, 25ft. wide, and 16ft. in height, lighted by five windows on either side, the space between each ward being three times their height, and they will each accommodate twelve patients. The wards will be warmed by Pierce's patent stoves, Sheringham's ventilators and other means being used to secure a proper supply of fresh air, and the top of each window fitted with fixed open louvres of glass. The wards are attached by closed corridors, of wood and glass, roofed with slate, and another corridor leads from the administration. The convalescent wards are divided, so that the patients can be separated according to the nature of the disease from which they are recovering. Great attention has been paid to drainage and other appliances essential to the peculiar character of the hospital. Each patient will have more than 2,000 cubic feet of air space, the walls of the wards will be covered with cement, the floors of oak, the roof and window frames of iron, the material used being chosen for its non-absorbent character. The mortuary, post-mortem room, ice-house, and other necessary outbuildings are detached. Sixteen patients can be accommodated in the convalescent, and 52 in the acute, wards, and the cost of the building will be about £110 a bed, or £8,000. The cost per bed could be reduced were the acute wards erected in proportionate size to the administration, the latter, as well as the convalescent wards, being in excess in regard to size in proportion to the other parts of the building. Should it be proposed at any future time to enlarge the acute wards this could be effected by lengthening them, and it would not necessarily increase the cost of attendance, as the nurses required for the smaller would be sufficient for the enlarged wards.

THE ORNAMENTATION OF IRON.

THE *Mechanics' Magazine* has an article on this subject, in which it says that since Zimmerman, of Berlin, began to make his exquisite iron castings, many things both useful and ornamental have been produced in cast iron. But iron being so liable to rust, it is desirable to protect it from the influence of the atmosphere. This is usually effected by means of a bronze paint. The bronze paint used to coat the Berlin castings is made of ferrocyanide of copper, which forms a rich brown paint with a metallic lustre. The ferrocyanide of copper is easily made in the following manner:—A solution of sulphate of copper is taken and to it is added gradually a solution of ferrocyanide of potassium, when a brown precipitate will be produced. This, when mixed with a suitable vehicle, is used as a basis for all the different-coloured bronzing, whether yellow, green, or brown.

The French use the green bronzing very much, which may be produced in the following manner:—When the ground has been produced with the above paint, and before it is quite dry, it is dusted over with copper bronze powder, and allowed to dry thoroughly, and then the loose powder is brushed off, and the article is polished; it will then appear like bright copper. The only thing required to produce the green tint is to wash the articles gently over with a solution of acetate of copper, and allow it to dry gradually. When perfectly dry, the higher parts of the article must be rubbed with a piece of clean rag to cause the brown copper colour to appear. The article will then look like a bronze which has become green by age. The common brown bronze is produced by brushing the above bright copper-coloured bronze over with black lead; and the pale or yellow bronze is produced by using yellow bronze or brass powder in place of the copper powder above referred to. Those who wish a more solid and durable bronze than bronze paint and powder will produce, coat the iron by electricity with copper or brass, and produce the different colours by the same means as those used to colour the copper and brass colours produced by the powders.

An easy method of coating cast iron with copper is that of M. Oudré, who first coats the cast iron with a metallic paint, and then electro-deposits copper upon it in a bath of sulphate of copper. A modification of his process is sometimes used—a brass powder being used instead of copper powder. This brass powder is produced in the following manner:—Equal parts of copper and tin are melted together, and when cold the alloy is powdered in a mortar and sifted; this can easily be done, for this alloy is as brittle as glass. This powder is mixed with the ferrocyanide of copper paint, which makes a very good conducting surface, and takes the copper well in the sulphate of copper bath, and the paint adheres very firmly to the iron.

For brassing iron the method is not quite so simple. For brassing direct on the iron the iron is required to be scrupulously clean, or the deposit will not adhere; but the easiest way is first to coat the article with copper by Oudré's process, and then, after thoroughly rinsing it in clean water, transfer it to the brassing solution, which is formed and worked in the following manner, according to Morris and Johnson's process:—Dissolve 1lb. of cyanide of potassium, 1lb. of carbonate of ammonia, 2 oz. of cyanide of copper, and 1oz. of cyanide of zinc in 1 gallon of water, and work the solution at 150 deg. Fah., with a large brass anode and a powerful battery. To increase the copper in the deposit add cyanide of potassium, or increase the heat. To increase the proportion of zinc add carbonate of ammonia, or lower the temperature. We have tried this method of depositing brass, and have found it a very good one, but the electrolytic processes are very little used for bronzing, because they are more difficult, consequently more expensive.

MEGALITHIC MONUMENTS.

SIR HENRY DRYDEN recently gave a lecture before the Architectural Society of Northampton, on the Megalithic Monuments of Brittany. Sir Henry stated his belief that it was due to the peculiar promontorial position of Brittany as a part of France that so many of these ancient remains had been preserved. The part in which he had been at work with Mr. Lukis was Quiberon. Of megalithic monuments there were four kinds—*menhirs*, which meant tall stones or pillar stones; *dolmens*, or chamber tombs; *circles*, of the three principal of which Sir Henry exhibited drawings—the circle of Ménec, the circle of Kairverin, and the circle of Kerlescant, and the monumental lines of Erdeven, the principal part of which was near Carnac. In dealing with these monuments a difficulty sometimes arose from the use by the French of the same word to denote a different thing. Thus what we called a cromlech the French termed a dolmen, and what we called a circle they called a cromlech. Sir Henry strongly advocated a systematic survey of these old ruins, as they were fast being destroyed. He did not intend to say anything about the dolmens, as Mr. Lukis had written much about them. The lines about Carnac were all he should describe. Of these he had only planned part. Some of the sets of lines had circles at their heads, others had not. Kerlescant had one which was not placed symmetrically with regard to the other, and Kairverin had no circle, and he did not think it ever had, as in other cases the circles were on the highest grounds, but in this case the lines went up to the point, and the ground began to sink directly after. The enlightened owner of Kerlescant was carting it away as fast as he could, and since his (Sir Henry's) plan was made, the greater part had been removed. Ménec consisted of eleven lines—in his opinion, all that ever existed. Erdeven also, he thought, consisted of eleven lines. He exhibited a drawing representing the circle of St Pierre, of a diameter of 180ft. Ménec was nearly one mile long, but Kairverin was the longest of them all. St. Barbe was only 900ft. in length but it was not exactly known if that had ever been completed. He believed that it had been, and at the top of it there was no circle now, but three enormous blocks, whether part of a circle or not he could not say. The circle of Ile Lanic was on a small island, about a quarter of a mile from the coast, the whole of which was covered with fragments of Roman pottery. Its diameter was 165ft. All writers who had mentioned these lines had treated them as if they were so many parallels, and some authors had favoured the hypothesis of their having existed for the purpose of serpent worship; that, however, he did not believe. In the case of every set of lines the head was wide and the tail small. The stones began by being some 8ft., 9ft., or 1 ft. in diameter, and decreased in size till at the end they were not more than 4ft., and none of them were set with mathematical regularity. The Great Menhir Locmariaber was

67ft. 5in. in diameter, and when it broke the two fragments oddly fell in opposite directions, as shown in his diagrams. In one dolmen a gold collar had been found, and that fact had resulted in greater damage to the monuments than the ravages of 200 years. In reply to some questions, Sir Henry stated that in many of the *dolmens* Roman statuettes, coins, &c., had been found, and he further stated that in Constantia, Algeria, there were thousands of dolmens only a few feet high. Some of them were 8ft. high, 17ft. wide, and 65ft. long.

STEAM ROLLERS FOR METROPOLITAN ROADS.

THE question of having steam rollers in metropolitan parishes has made (says the *Parochial Critic*) two steps in advance during the past week. At Islington a very full vestry gave the subject their attentive consideration, and though they did not like to bind the hands of the Highways Committee, to whom the consideration of the matter was to be referred, the speeches were generally in favour of a steam roller being either bought or hired for the use of the parish. Mr. Elliott, who brought forward the motion, set forth very clearly the experience of the parish in road-rolling. Out of 70 to 80 miles of road in Islington, only some 5 or 6 are cubed, and the making and keeping of the roads in repair costs some £30,000 a year. In a parish so circumstanced the present question assumes increased importance. If a good heavy roller were used Mr. Elliott believed some £6,000 per annum, would be saved, independently of other advantages. The most important part of Mr. M'Adam's discovery was that the material should be rolled so as to form one solid mass, and it was strange that they had got into the habit of leaving out this most important process. It was like playing "Hamlet" without Hamlet. From the books he found that 747 loads of granite had been spread from the "Angel" to the "Cock," at Highbury, yet of that immense quantity not a load had been required on that part of Upper-street where the roller had been tried in October, 1867. This practical result outweighs a thousand theories The vestry accordingly referred the matter to the Highways Committee to examine and report.

The same subject was discussed at the St. George's Hanover square Committee of Works. The surveyor, Mr. Tomkins, at the request of the vestry, prepared an elaborate report of the comparative cost of rollers by steam and horse-power. This report, of which we gave an abstract at the time, was postponed from the 26th of August, and now came on for consideration. The vestry have already sanctioned the use of steam power, but the great expense, £760, for one of Moreland's, £530 for one of Aveling and Porter's steam rollers, still deters them. The charge for mere hire of the roller would also be very high. After a long discussion the vestry could not make up their minds to incur the large outlay, and adjourned the question for a month. The surveyor, in the meantime, is to see what terms he can make with Messrs. Aveling and Porter. The present is an excellent opportunity for the parishes of Islington and St. George's to combine for the purpose of purchasing a roller. Surely £500 is not a large investment, when £5,000 can be saved by it. If the two parishes have not work enough to keep the roller in constant use, the Paddington vestry and the Westminster Board of Works are willing to hire it. This would further diminish the outlay, which would thus hardly amount to £200 for each of the purchasers.

GRANITE ARCHITECTURE.

A MATERIAL like granite, says a writer in the *Athenæum*, should be moulded in quite another manner from that which is proper to soft stone, as to which, to put it on the lowest grounds, we may say that the cost of working anything so hard as granite dictates such a difference, if the eye is not to be offended by the appearance of labour wasted and texture and surface misunderstood. The apt treatment of granite is in rounded contours and with extreme breadth, such as suggests immutable repose in design, which the Egyptians employed so widely for their monumental works. One would say that the veriest tyro in architecture would surely go to the Egyptians to study the best treatment of vast surfaces and long sweeps of architectural engineering in such an obdurate and monumental substance as monotonously grey granite. A true student would as surely do this as he would go to the Gothic architects for the right treatment of sandstone, with its lively colour and its facility for working in delicate and elegant contours. Unfortunately, the engineer of the Embankment has given to a material and a subject which are Egyptian in vastness, horizontality and character, certain mouldings and rich and broken surfaces, which are, if anything, Gothic in many of their details and questionably Palladian in their general aspect or composition. We do not like balusters in any position, but it is possible to make them less inelegant than those of Somerset House without departing from the ruling contour of these models. The balusters of the embankment are, without regard to the material in which they are wrought, inferior to the model, and sin needlessly against the nature of granite in being richer or more broken in their outlines than those which were wrought in tractable freestone by Sir William Chambers. Surely this was a grave error. Grand as is the design of Waterloo Bridge, it would have been grander if the balusters—which are ugly even in their details—had given place to a lower and solid parapet, like that of London Bridge.

A larger application than the above of principles which, for convenience sake, we call Egyptian, and which the commonest sense recognises as the sole principles which are apt to granitic architecture, enables us to judge of the embankment in its broadest features and chief lines of composition. In these, the same lack of repose, of magnitude of elements, and of gravity, appear, as in the details to which we have referred. A wall of stone banding a river, and running in so long a sweep as any of the vistas of the embankment affords, would seem to require that the horizontal elements of its nature should be left to express themselves grandly, as they would surely do if left alone, or with as little interference as convenience might admit. The artistic eye recognises in a moment the superiority of the solid parts of the parapet in this work over those where the before-named balusters have been admitted. In the former, the work is at its gravest and soberest. The treatment which has been vouchsafed there is obviously the most apt, and so much of repose and horizontality, so much of largeness of features as the designer permitted, are to be found in the plainer lines of the enormous wall. Here the principles to which we have referred are educed by comparison of parts.

That simplicity which we desire, that breadth which is proper to structures of this class, and still more in works of this material, needed emphasis to be given only to parts which are serviceable—*e.g.*, the landing-places—and of obvious necessity. Except for these, the desirable simplicity and breadth should have been unbroken. There should have been few buttresses rising from the water, and measuring the wall in trivial spacings. The piers on the parapet, even if it had been solid throughout, should have been few and far apart. There should have been no balustrades; and if the solid parapet received mouldings at all, they should have been such as a bold, deeply-hollowed scotia would supply if incised in one long line from end to end of the wall. Either such an ornament as this, or its equivalent, a great torus, or roll moulding, would, if well studied in their contours, have sufficed to give grandeur and monumental dignity, where all sandstone mouldings are strikingly unapt and wastefully costly. We shudder to think of the price of granite balusters, which, if they had been carried along the whole parapet of this vast river-wall, would have been something prodigious. Putting cost aside, and assuming—which is gratuitous—that an open parapet was a necessity, the worst, commonest, and ugliest sort of that thing is the balu-traded parapet. The order of balustrading which has been adopted here has not even the merit of resembling that which already exists on Somerset House and Waterloo Bridge.

BISHOP PERCY'S BIRTHPLACE.

THE birthplace of Bishop Percy, and the residence of his grocer-father and grocer-grandfather, at Bridgnorth, has been restored by a member of the trade. It is situated, says *The Grocer*, in a street called the Cartway, and is the only vestige of the old town that remains from the memorable fire that resulted from the siege of Bridgnorth Castle by the army of Oliver Cromwell. It is of picturesque appearance, having five pointed gables, and constructed of solid beams of oak, and partly of masonry, similar in character, but far more beautiful, than Shakspeare's birthplace at Stratford. The apartments are of great altitude, being between ten and twelve feet high, and in its day it must have been considered a mansion of some importance, although until recently falling into a sadly dilapidated state. About twelve months since it was purchased by Mr. Benjamin Allen, grocer, of Camden-street, Birmingham, a gentleman of antiquarian pursuits, and a native of Bridgnorth, who has effectually and judiciously restored it. He felt that in restoring the house he would be paying a tribute to the memory of the author of "The Reliques of Ancient English Poetry," and the only literary man born in Bridgnorth. In one apartment of the house is a stone, on which the following inscription is cut in relief:—"Except the Lord Bvild the OWSE The Labovrers thereof evail not. Erected by R. For, 1580." Mr. Austin has placed an inscription on the beam over the first-floor windows (in Elizabethan characters), "The Old House, A.D. 1580;" and on the beam over the shop and house-place, "Bishop Percy born here, 1727." The shop is of very large dimensions, being 15ft. by 18ft., and it has been, till within two years, always connected with the grocery trade. It is now an ironfounder's mart.

THE WELSH SLATE TRADE.

THE difficulty experienced by consumers in obtaining the execution, within a reasonable time, of their orders for slates has long been a subject of remark, yet it is acknowledged that at many quarries certain descriptions of slate remain for months unsold (owing to the desire to execute some particular order) which could be readily brought into the market and sold at a profit. This arises from the impossibility of producing without waste slate, except by making whatever size the blocks will cut into, loss at all times attending the use of blocks of larger size than that absolutely necessary for the making of the slate required. As the sizes, therefore, of slate manufactured at every quarry entirely depend upon the nature of the blocks quarried, and as it is impossible to control the size of the blocks, so it is equally impossible to manufacture slates of the size immediately required by the consumers: this obliges quarry owners to hold their make of slate for months while they accumulate a sufficient quantity of each size and quality (about sixty classes) to execute their orders; and, as the blocks when quarried must be at once riven into the slate they are fit for, or would otherwise not rive at all, this is often the work of from six to twelve months, during which time they have to pay their wages and many other expenses in cash.

To effect a sale monthly many of the quarry owners have, says the *Mining Journal*, expressed their willingness to sell to a company (as middleman or factor) all their monthly make at a very large discount off the tariff prices, as the monthly realisation of their entire stock will enable them to extend their quarries and produce a larger supply, which would be of enormous advantage to themselves and a great boon to the public, the demand for slate being so greatly in excess of the quantity the quarry owners can produce, and which has been the cause of raising the prices of slates steadily for the last ten years, during which period they have advanced 30 per cent. The object of the company will be to bring the entire make of all the quarry owners doing business with them into their one depôt at Bangor, and there to sort them ready for delivery to the consumers. Supposing, therefore, only twelve quarries were delivering, the accumulation of slates of any particular size would it may be assumed, be twelve times as rapid at the depôt as at any individual quarry, so that orders which given to a single quarry could not be executed in less than a year could be executed by the company in a month. There are about forty distinct quarries from whom the company could buy slates; but take only half of them to begin with, that half would each give on an average 250 tons of slate per month. The average price from the published tariff is about 45s per ton. The company's depôt at the railway station, Bangor, is exactly in the centre of the two largest slate quarries in the world, and also of the numerous other quarries which constitute Bangor the slate market of the kingdom and ever must it is thought keep it so. Customers and stock are

there face to face; there is perfect railway communication with every district in the kingdom, and orders for slate can be executed immediately, while any individual quarry would require many months to accumulate them. It appears, from the experience of the manager of the largest quarry in the world (near Bangor) that the promptitude with which payments are made in the slate trade is remarkable; in their enormous transactions (turning over nearly £500,000 a year) they have not, during the last three years, lost a single penny by bad debts, and that in the same concern during the last thirty years a fraction of one penny in the pound has covered all the bad debts made.

TECHNICAL EDUCATION IN THE POTTERIES.

IN connection with the Art, Scientific, and Literary Institute at Burslem, the birthplace of Josiah Wedgwood, in course of erection as a memorial of the great potter, two meetings were held on Friday last, attended by Mr. C. B. Adderley, M.P., Mr. Beresford Hope, M.P., Mr. G. Melly, M.P., and other gentlemen. At the first meeting Mr. Hope, who originated the idea of making the building a monument of the manufacture which Wedgwood made famous, as well as a memorial to the "Father of the Potteries," described the new building (the first in England in the construction of which ceramics enter so largely) as a remarkably successful experiment in ceramic architecture, and as a graceful specimen of its own graceful style. Mr. Melly presided over the evening meeting, and much of his opening address was devoted to technical education, which, he said, was now a vital necessity to England if she wished to retain any of her superiority in trade. In Prussia there were 11,000 pupils receiving instruction in science and art. In Sweden there was a constant increase in the number of pupils, and the manufacturers of the window frames and doors, whose arrival in England had raised the cry for technical education, were pressing their Parliament year by year for increased facilities for carrying on national art schools. In Norway there had been no very great increase in technical education, though the manufacturers were in favour of its extension. In America, where they would expect technical education to have taken a firmer root than even in England or Germany, the State had confined itself to a grant of 195,000 acres of land for the purposes of technical education. Comparing England with the countries named, said Mr. Melly, we are bound to admit that though in the matter of art England lagged not far behind, in respect to technical education we are a long way behind other nations. Mr. Beresford Hope then delivered an address on art education, and the application of art to every-day life; and Mr. J. C. Buckmaster followed with an able and practical speech on technical education. A resolution was passed pledging the meeting to support the Wedgwood Institute, and to establish technical education classes in connection with it. The memorial building will be formally opened next Easter with an art exhibition. The cost of the building will be £9,000.

QUADRATURE OF THE CIRCLE.

IN former days mathematicians devoted much time and labour to the question of determining the ratio of the diameter of the circle to its circumference. Archimedes found that it was nearly as 7 to 22, and this ancient solution is still very useful for ordinary purposes. Later researches brought it at length to such a point of precision that it would be idle to seek any further, the ratio being as a unit to 3·1415926, with a continuation of 120 decimals more. It follows, then, that any attempt to make the diameter go exactly into the length of the circumference, or to represent their ratio by an exact fraction, is simply ridiculous. As such a solution, were it possible, would enable us to make a square containing the exact surface of a circle, this problem is commonly known under the name of quadrature of the circle. At last week's sitting of the Academy of Sciences, says *Galignani*, the perpetual secretary announced that a newspaper had recently revived an old story to the effect that the Academy was in possession of a considerable sum bequeathed to it as a reward for any person who might discover the quadrature of the circle. He, therefore, suggested the propriety of again publishing the decision the Academy came to in 1775, of never more devoting the slightest attention to the solutions that might be sent in of the following problems:—The duplication of the cube, the trisection of the angle, perpetual motion by means of a machine, and the quadrature of the circle. It justified this course as regards the latter, by remarking that many weak-minded persons, utterly ignorant of mathematics, and labouring under the impression that large sums were ready to be handed over to them in case they succeeded in solving that problem, devoted their time to it, utterly neglecting their regular business and the interest of their families, and even occasionally losing their reason by following such a vain pursuit. M. Bertrand stated that the belief in the promise of large prizes by the Academy for the solution in question had been propagated by very serious works. The "Biographie Générale," for instance, had stated that M. Rouille de Meslay had left the Academy 120,000f. for that purpose. He stated that in the eighteenth century an inventor of the quadrature actually summoned D'Alembert before the Parliament in order to recover that sum.

GENERAL BUILDERS' ASSOCIATION.

THE following circular has been issued to all the Local Associations of the General Builders' Association on the proposed notices to be given for amended trade rules:—

"You are aware that at the Annual Meeting of the Association, held at Liverpool on the 8th inst., it was decided that each Local Association, in whose district the trade rules did not provide for payment by the hour and the formation of arbitration and conciliation courts for the settlement of trade rules and disputes, or contained provisions against the use of quarry-worked stone, or machinery, should give the requisite notices for the adoption on the 1st of May of new rules. A special committee was appointed for making the necessary arrangements for giving these notices. At a meeting of that committee, held at Bradford, on Wednesday, the 21st. inst., I was instructed to send you the following suggestions:—

"The Committee think that it is very desirable that the notices should be as similar and as simultaneous as possible. They, therefore, recommend that you should immediately call your Association together, and get authority to send notice to the workmen of those branch trades that require it, to the following effect—of course altering it in any way you may require:—

"Name of Town.....
"Date .....
"To the Operative.....

"We, the Master Builders employing Operative.....in.....do hereby give you notice that we require the following alterations in the Trade Rules now in force in this District:—

[Where the hour system is in force this ¶1. paragraph is to be omitted. Where quarter time is not mentioned in the rules, strike out "and quarter time."]

"¶ I.—The rules relating to the reckoning of time, and quarter time, and the payment of wages, are to be abrogated and rescinded, and in lieu thereof the following is to be the rule:—

"RATES OF WAGES.

"That the following shall be the ordinary rate of wages for skilled operatives. Superior and inferior workmen to be rated by special agreement.

[* Alter this word to suit each branch trade to whom notice is sent.]

"* Bricklayers, the men who have hitherto been paid per week, shall be paid per hour.

[Where no such rule or custom exists, this II. paragraph is to be omitted.]

"¶ II.—Any rule or custom forbidding or interfering with the employment or use of machinery or machine-worked materials, is to be abrogated and entirely done away with.

[To be sent only to the operative stone masons.]

"¶ III.—Any rule or custom forbidding or interfering with the introduction or use of stone worked at the quarry, or anywhere else than the place where it is to be used, is to be abolished and done away with.

[Where Arbitration and Conciliation Courts are already established, this may be omitted.]

"¶ IV.—That all trade rules, disputes, demands, and differences shall be settled for the future by conciliation or arbitration, and proper courts shall be constituted for the purpose.

"And we hereby further give you notice that we are prepared at any time, upon six days' notice from you, to meet you and publicly severally appoint our arbitrators, and mutually select the umpire. And we are willing to leave to the decision of this Arbitration Court, thus appointed, not only all future settlement of trade rules and disputes, demands, and differences, but also the settlement of all matters contained in this notice, *and in the notice received from you.*

[If no notice has been received from the men, leave out the words in italics.]

"And we hereby further give you notice that we require the alterations contained in this notice to come into force on the 1st day of May, 1869, or on such other day as is mentioned in the existing rules as the day upon which new or altered rules shall come into force.

"Signed, on behalf of the Master Builders. .....

"The marginal notes will give you directions how to vary the form of notice to suit the circumstances of your locality and the various branch trades. In case you have no rules existing, it is desirable that you should give a notice for rules, and include in them the rules above given.

"I must call your particular attention to the fact that if your existing rules require you to give six months' notice, you will have to do so on or before the 31st of this month, to secure the adoption of the new rules by the 1st of May next year. In some cases notice has to be given still earlier. There is, therefore, now no time to be lost.

"The Committee think that the notices had better not only be sent to the various recognised Societies in your district, but also that they should be printed and posted up in the yards and workshops of each master in the locality. You had better also send a copy to each architect in the town.

"When you have given the notices, will you be so good as to send me a copy of each of them? I have sent a copy of this Circular to the Chairman of your Association, and beg that you will see him as soon as possible. I have also sent one to each member of the General Committee resident in your district. A. MAULT, *Secretary.*

ROTHERHITHE SICK ASYLUM COMPETITION.

FOR some days past the drawings for this competition have been on view at the Vestry Hall, Russell-street, Bermondsey. The accommodation to be provided is for 500 patients. The buildings are to be on the pavilion principle, so planned as to be easily capable of extension, and they will be in blocks of not more than three stories. There were five competitors, namely:—

Name.	Votes.	Estimate.	Motto.
George Legg.....	1	£35,000	Humanity.
George Elkington	0	32,000	Hope on Work on.
Ernest Turner...	9	29,000	Serio.
C. H. Cooke.....	0	28,000	Faith.
Giles and Biven	3	27,000	Experience.

The design of Mr. Ernest Turner, of 44, Bedford-row, was selected. Estimated cost, £29,000. The only exception to the conduct of the competition is that the instructions *ask for estimates*, and fix the remuneration at £900 inclusive, thus ignoring the established principle of payment by commission on cost.

Passengers in St. James's Park may have lately observed some workmen employed in the demolition of an ugly-looking chapel not far from the India Office. This edifice formed part of a mansion, now the office of the London recruiting district, which formerly was the residence of the notorious Judge Jeffreys. The entrance of the mansion is from Duke-street; but as a mark of favour, King James II. granted Jeffreys permission to throw out a flight of stone steps leading to the park; these still remain and distinguish the house from the others in the same row.

HOW TO ARRANGE AN ORGAN.

IT very frequently happens that when great fault is found with anything, especially in matters artistic, and however fairly it may all be put, it is but too common to reply to the fault-finder, "Why do you not suggest something better." This is rather unfair, for a man may be a very able critic and apt at finding out the faults of a picture or a building without being a painter or an architect, or able himself to paint a picture or design a building. But I wish to say in this place especially, once for all, that I do not attempt criticism, *per se*, for love of it, or for care about it, but with the simple object of putting some things, as far as I can, a little straight. In the present case no one will dispute the fact of the position of the organs of Westminster Abbey and St. Paul's—to say nothing at present of the Temple Church—being at least doubtful, awkward architecturally, and destructive musically, and it would seem to be enough to point this out; but I hope and wish to do more than this, viz., to show *how* things may be bettered, and what good and sufficient reasons there are for making the attempt. To find fault is not to make perfect, but it is the first step to it. With this purpose, therefore, in view, we propose to hint at a somewhat new mode of arranging the organ at Westminster Abbey on the present organ screen; and to endeavour to show how very much must be gained by such a "restoration," both architecturally and musically, and also, and this is a pressing consideration, how much *easier* and satisfactory it would prove to the *performer*. It may be observed in the first place, confining ourselves to the Westminster organ, that the screen on which it stands was left in its present place and saved from destruction solely from the fact of the said screen being the work of a living architect—"out of delicacy to Mr. Blore," the then cathedral surveyor, it was said, "we preserve the screen." What would have happened had the screen been an old one, or a Renaissance work, I do not presume to say; in all human probability it would have been destroyed and the whole abbey "opened out," everything going before this one purpose, and the very idea on which the Abbey was built destroyed and lost. One cannot help wondering more and more that anything is left in this place, and here I cannot but call the reader's attention to the notice in a recent number of this journal, reprinted from the *Ecclesiologist*, where this now fashionable mode of architectural destruction—the opening out mania—is so emphatically and usefully condemned, and it is sincerely to be hoped that it will be carefully read and attended to by those who have it in their power to do so much good and so much *evil* while they hold our cathedrals in their custody. Nothing can surpass the dulness of the new work in the Abbey, the two iron screens across the transepts, and the smaller screen next to the sedilia, or "Sebert's tomb," as it is called in verger phraseology. So it is a simple bit of sheer luck that this organ screen is left, and we ought to be right thankful for it. Thus is Westminster Abbey theoretically and theologically complete, *i.e.*, so far as the mere idea of the place, as designed by the builders of it, goes, and there is, while this endures, ground to stand on and a certain and fixed point of departure—this enclosed sanctuary space, however used or misused. That the screen forming one end of it is a good place for the organ, whatever the date of its introduction, was at one time at least generally admitted, is proved by its almost universal acceptance in every cathedral in England, and by the magnificent results found to flow from it; and the sole question then and now is, *how* to arrange the organ or organs in the best way, and *where* the organist should be placed? In St. Paul's the whole of the sound effect produced was natural and proper to the building, but in Westminster this was not so. Nearly everything depended on the position of the several parts of the organ and on the skill and taste of the organist. I think the organ in Westminster Abbey should be arranged thus:—Beginning with the choir organ, used for accompanying quietly the singers—sixteen boys and twelve men—few enough for a large cathedral; and what on earth they, the cathedral magnates, would ever do without the boys it would puzzle a musical magician to say, for they and the organ do pretty near all the work. This organ should, I think, stand in the *centre* of the loft, so as to be surrounded by the larger organs, and thus the sound from its pipes be softened, for when the voices are good and the music very good too, the gentlest instrumental accompaniment is enough, indeed, a note *here and there* seems almost enough. The "swell" is, as all know, occasionally used for this purpose, and its effect, when judiciously employed, would seem to be the perfection of music, as far as the material means of producing it are concerned. This "swell" organ occupies some considerable space, and should stand on the west side of the screen, with the front of it facing the west window, the louvres of it opening towards the west, so as to send the sound, when the louvres are open, into the nave; for it is here that the fine musical effect of which I have spoken as peculiar to Westminster Abbey seems to me to have found its origin—*i.e.*, the sound gradually increasing as the louvres opened, rolling or swelling into the nave, and from thence by reflexion back again, so that the beauty of it, though so far artificial, rivalled that in St. Paul's, where the *building* itself did all the work. It may here be observed that every large open structure like St. Paul's or York Minster, or Westminster, has an echo, or sound, or note peculiar to itself, and of which it seems impossible to explain the exact cause, the elements of it being so complicated. But whatever be the cause the results are most glorious and striking, and I hesitate not to say that no Handel chorus has or can be ever heard truly out of a *cathedral* or other building wherein it exists; indeed, I lack words to do justice to it—certainly not to those who have not already noticed it. The louvres thus facing the west wall should not, as I think, be hidden by sham pipes, but should show themselves honestly, and if gilt would be as "ornamental" as the mere pipes, there would too be no obstruction to the passage of the sound from the swell box into the nave. I do not well know how it would act, but would it not be an improvement to *curve* the back of the swell box—say, about three-quarters of a semicircle, and thus to concentrate the sound before it finally leaves it? Opposite to this, and facing the sanctuary or east end of the church, would be the great organ, as it is called, with all the pipes in the front of it, or facing the east, speaking pipes, and plainly gilt, if the natural colour of the metal be hidden at all, for nothing can well be worse than badly designed and badly executed Gothic diaper. Thus far the old arrangement would be retained, the swell and great organs being in their old and time-honoured places. On the south end of the screen, and partially at least between these two organs, would come the pedal organ with the large wooden pipes, which of course would and ought to stand *upright*, so that their sound would rise up into the roof, and not, as it does now, right up against a dead wall, thus adding clearness and energy to the sound from them. These pipes ought to be allowed to show themselves as pipes, and not to be hidden by false pipes, or by being boarded up as they so often are. If the plain wood be thought unsightly then gilding them would be best, as was suggested with the louvre boards of the swell organ. I am merely suggesting, as I cannot give *accurate* dimensions, and a plan of the organ would necessitate one of the screen as well, and also the space taken up by the new trumpet stops, &c. These stops, almost forming a new organ, would occupy the north side of the organ, so that I suppose the whole instrument would form a square, or very nearly one. Thus the organ, though made up of many parts and sections, would form, as it should do, one complete instrument, all visible at a glance, and the whole of the parts of it sounding as one—a vital and essential point *when the full organ is at work*. It remains to determine the position of the performer. As is well known, it is generally in front of the organ, facing it, so that the organist, on whom so much depends, has the congregation and the singers behind him, and nothing would seem to be more awkward and inconvenient. This was the arrangement before this organ was altered, as it was at St. Paul's, and is so still. York Minster, the Temple Church, and St. Sepulchre's are all so arranged, and it has doubtless its advantages, best known to the organists themselves; but I would suggest that a better plan would be to place the organist on the north side of the instrument, so that the singers and congregation may be on his left hand, thus giving him the power of being able at a glance to see them, for there is, and must be, an advantage in *seeing* those whom he accompanies and leads; he still having the whole of the instrument before him, and not, as now, sitting in the *middle* of it, with one half of it behind him. A great deal more might be added to this, but it would lead us direct into organ playing, a wide and ever vexed question, unsuitable perhaps to these pages; but I may be permitted to add that while some most notable players accompany a psalm chant (to give one example) on almost a full organ, as the late Dr. Camidge, of York, did, as does Mr. Cooper, of St. Sepulchre's, Mr. Turle is content simply to lead and help the singers, sometimes with barely audible impressive notes—surely the perfection of "chant playing." I know nothing that is done in music comparable to this for modesty, inventiveness, and perfect finish, and it now serves only to perpetually remind us of our infinite loss when the material instrument on which it was so perfectly and wonderfully executed was so thoughtlessly and ignorantly and stupidly destroyed.

C. BRUCE ALLEN.

DETAILS OF CARVED OAK CABINET.

ONE of our principal engravings this week represents quarter-size details of the iron mounts, &c., of the carved oak cabinet given in the BUILDING NEWS, October 2. 1, 3, and 6 represent angle strap, locking plate with drop handle, and portion of the hinge. The roses, boldly convexed in the centre with a telling incision across at the top, which terminate the ties and hinges, are very effectively studded over the surface of the cupboard front, whilst their stems are bent in a very free and flowing manner. The foliage on the locking plate is exceedingly vigorous, and with the hollow drop handle and its washer is a very masterly piece of workmanship.

The woodwork, which for want of a better term we must call "carved," is grounded out of the flat. Nos. 2 and 4 are examples, and retain a curious feature peculiar to the decadence of mediæval art, viz., the somewhat erratic-looking curves incised on the surface of the larger leaves, evidently an attempt to depict in forced light and shade the raised mid rib of previous centuries, which in time flattened into the one-sided, crocketwise form so common to our own perpendicular work. Such landmarks as these will often go far to decide sixteenth and seventeenth century carvings, fragments of this date, especially in stonework, not being always easily distinguishable from Norman work. No. 5 is a portion of the diaper to doors of cabinet, half full size. The margin of the pattern is very thoughtful in design, and, trefoiled forms being unusual at the period, is rather uncommon. It is executed in black oak, and very delicately wrought, when compared with the rest of the woodwork. O. W. D.

The second annual dinner of the Liverpool Master Builders' Association took place on Tuesday evening, Mr. John Jones, the president, occupying the chair.

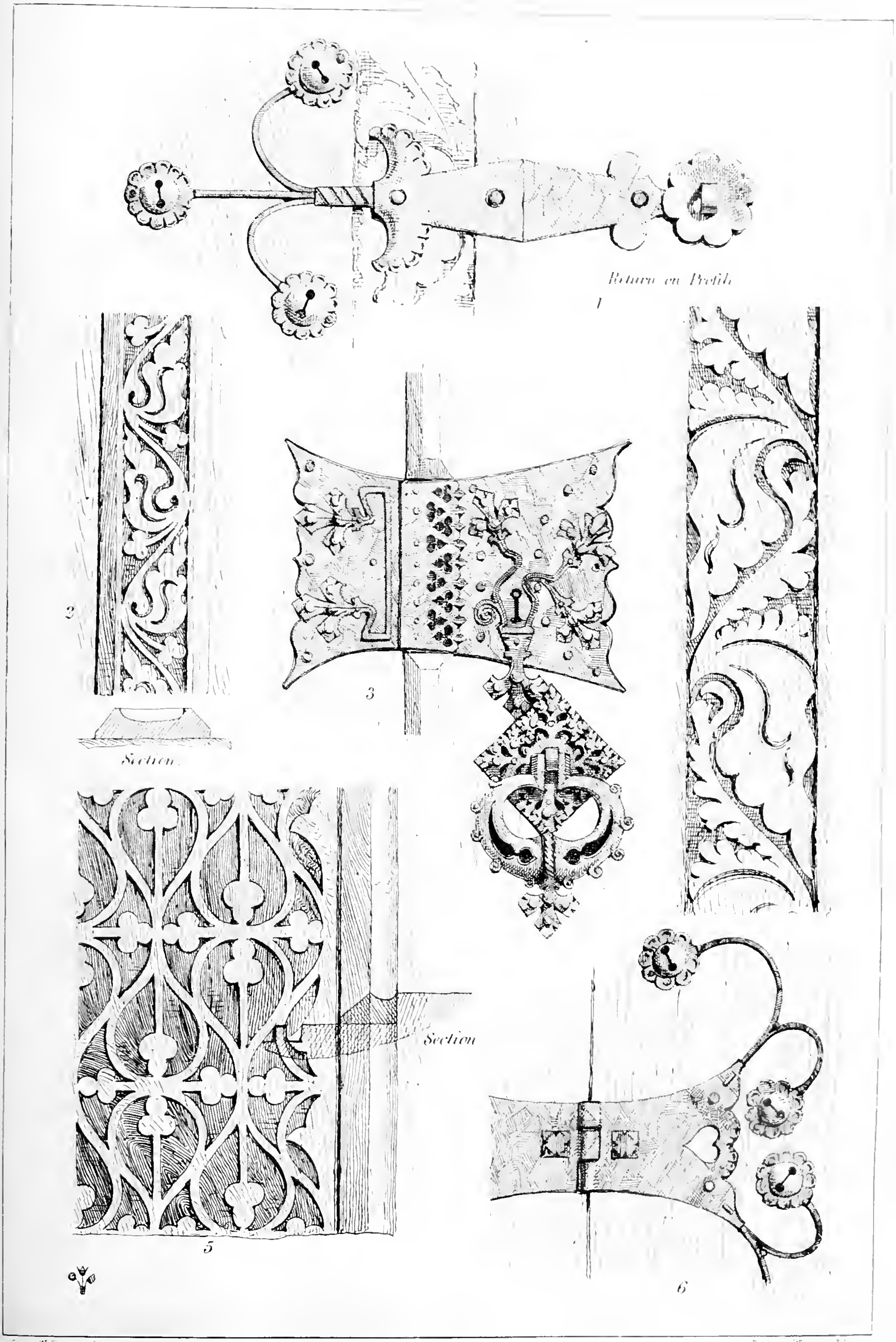
1

2

1. CORBEL : S·NICHOLAS·BLOIS :
2. CORBEL : NOYON : CATHEDRAL :
3. CAPITALS : NAVE : OF : SENS CATHEDRAL :

3

F. W. ROPER 1874



Owen W Davis del et lith

Photo-lith by Whiteman & Bass

DETAILS OF CARVED OAK CABINET. GERMAN 16TH CENTY WORK.

THE SWEDISH AND NORWEGIAN TIMBER SUPPLY.

IF our statesmen have done wisely in making inquisition into the supply of coal in this country (says Mr. Andrew Murray, F.L.S., writing in *The Farmer*), and the length of time it is likely to last at the present rate of consumption, similar inquiries into the amount and probable duration of their supply of wood would seem to be not less called for on the part of the Governments of Sweden and Norway. Those who have not looked into the subject have little idea of the rate at which this vital product is disappearing from the Scandinavian hills. There are various protective laws, but they are, as Mr. Murray shows in detail, inoperative, and there is no practical check on the diswooding of the country, which may not be said to have really commenced. English capitalists and English sportsmen have begun to purchase estates and farms there. English timber merchants have begun to take leases of great tracts, for the very purpose of cutting down the timber, and their interest, of course, extends no further than the duration of their lease. Various symptoms of the progress of the dreaded calamity may be pointed to. It was stated in the Swedish catalogue of the 1862 Exhibition that originally shingles for roofing houses there were made of fir (*Abies excelsa*), but the scarcity of fir had now caused the wood of *Pinus sylvestris* to be used instead. Our consul at Christiania, in 1860, reported that great complaints had lately been raised against the injudicious system followed of late years of cutting down indiscriminately young trees for conversion into pit props for the northern ports. To such an extent had the felling of small timber been carried that the State had deemed it expedient to nominate a commission for the purpose of reporting upon the present condition of the forests of the country, and their capability to sustain their present annual amount of export. Considerable State forest lands have been brought under the control of public inspectors, with a view to their better management. Our consul at Götha, writing in 1863, stated that the supplies of wood continue to exhibit a decrease of heavy sizes, and prove the steady progress towards a gradual exhaustion of the forests which supply the saw-mills in that part of the country.

The timber used in building in Norway is also smaller than it was wont to be in old times. Mr. Laing, in his "Residence in Norway," says :—

> In building houses in Norway, timber is used of a size far exceeding the dimensions we generally suppose its trees to attain. There is a log in this old house which is 3ft. on each square side, and retains that size for at least 25ft. of length. In all the houses, especially those of very old date, the logs are as large as the Memel or American timbers usually brought to England. I understand that the impediments in the rivers prevent the floating down of such lengths of great timber to the coast.

But nothing speaks so strongly as statistics, which show a very large increase in the exportations within a very few years. In 1853, Norway exported 248,402 lasts (two tons) of timber, and in 1864 she sent out 403,566 lasts. In 1858 she also exported 721,024 loads (50 cubic feet), and in 1863, 950,000 loads. Sweden, in 1851, exported 865,533 dozen deals and planks of fir and pine, and in 1863, 1,747,950 dozen. The same country in the former year sent 429,600 (in number) beams, rafters, masts, and spars, and in the latter, 883,397. The same rate of increase is visible in the imports into the United Kingdom from Sweden and Norway, for in 1854 there were imported from those countries 186,134 loads of timber not sawn or split, and in 1865, 336,457 loads ; and in the first six months of 1866, 196,794 loads were imported. One explanation of this large increase is due to the alteration on timber duties, so that Norway and Sweden have been enabled to encroach on the Canadian trade. Sweden now falls little short of that colony in her shipments of timber into England, and the removal of the duties may, instead of an evil, prove a blessing to Canada by restraining the excessive denudation of timber which would otherwise have taken place. In 1864 the importations into England were from Canada, 2,938,300 standard ; from Sweden, 2,644,500 ; from Russia, 1,904,900 ; from Norway, 1,504,500 ; and from other countries, 123,800 ; a total of 9,120,000. Thus Sweden with Norway supplies to her over four-ninths of her deals, and over one-half more than her own equally endowed province of Canada.

A Swedish correspondent thinks that the supply from Sweden reached a maximum in 1863 and 1864 (his latest dates), but statistics scarcely support this view, the export of fir from both Sweden and Norway in 1865 being 336,457 while that in the first half of the year 1866 was 196,794, or actually at the rate of one-eighth higher ; but even were it otherwise there would be little consolation for the Swedes in that, unless it was due to their own self-control or prospective regulations, and not (which it really was) a diminished demand from this country. On this point the same correspondent writes :—

> Till 1863 the export of wooden wares from Sweden was rising, as well of beams as of planks and boards. For the last years I have no reports. I scarcely believe that there has been any considerable decrease. However, the export of wooden wares may, at least for a period, have reached a maximum, and then be forced to diminish, for already a couple of years ago, the principal foreign import harbours for wooden wares were filled, and it is a known thing that there are many magazines of sawn dressed timber at the harbours in Norrland which they have not been able to sell.

It is difficult to avoid the conclusion, from the largeness of the quantity thus supplied, its rapid increase, and the fact that the dimensions of the timber supplied are gradually decreasing, that Sweden has been encroaching on the capital stock of her timber and not living upon its interest. It would seem a politic proceeding on our part to consider how this will hereafter affect ourselves, and whether it would not be wise to provide against the contingent dearth of timber to which our children may be exposed by planting more ourselves at home.

Building Intelligence.

CHURCHES AND CHAPELS.

On Thursday week the foundation stone of a new district church was laid at Monkwearmouth. The church will consist of nave, north and south aisles, chancel, vestry, organ chamber, and porch, and provision will be made for the erection of a lofty tower and spire at the south-west angle of the nave. The style will be the Early or First Pointed style of Gothic architecture, with a good deal of the early French character about it. Accommodation is to be provided for upwards of 600 adults. The church will be surrounded by a low wall and ornamental iron railing. The contract for the church is £3,600, and the total cost will amount to about £4,000, exclusive of the tower and spire, which will cost £700 or £800 more. The building is designed by J. P. Pritchett, Esq., F.R.S., B.A., of Darlington. The contractor for the whole is Mr. Walter Scott, of Sunderland.

A new Anglican Church, dedicated to St. Patrick, has been consecrated by the Lord Primate, at Carrickmacross, Co. Monaghan, Ireland. The building is in the Early Irish style, built of grouse stone and free stone, found upon the estate ; a plain nave and spacious apsidal chancel, the latter both pointed and roofed with stone, and surmounted by the Irish cross. The interior of the apse is lined with polished alabaster and Minton's tiling ; the pulpit and font are principally of Caen stone and alabaster, and the chancel is of green Galway marble. The windows are by Clayton and Bell, of London.

The church of SS. Philip and James, Milton, near Hanley, was reopened on Tuesday week, after restoration. A nave and aisle have been added to the former chapel, which now serves as a chancel. The total cost of the work was £862.

Eccleshall parish church, which was lately restored by Mr. Street at a cost of £7,500, as a memorial to the late Bishop Lonsdale, caught fire on Sunday morning. The north aisle, the tower, and the vestry, as well as the woodwork, have been very much injured, and the damage done is said to be to the amount of between £1,000 and £2,000. The fire began in a beam built into a chimney of the warming apparatus, which was only lighted for the first time on Saturday.

St. Michael's Church, Sittingbourne, has been restored by Mr. Vaughan, of Maidstone. In scraping the walls of the interior of the north aisle an amateur came upon the framework of a doorway to the staircase leading to an ancient rood loft stretching across the church. The figure-heads of Edward I. and his queen, Eleanor of Castile, may be made out as corbel heads of the doorway of the porch.

Archbishop Manning laid the first stone on Monday of a Roman Catholic Church at West Drayton, in West Middlesex. The church is to be English Gothic, in the style of the fourteenth century, and will be about 80ft. long by 15ft. The architects are Messrs. Wilson and Nicholl, and the builders Messrs. Fassnidge, of Uxbridge.

All Saints' Church, Little Munden, Herts, was reopened on Thursday, the 8th inst., after undergoing a thorough restoration (with the exception of the tower). The building consisted of nave, chancel, chapel, north aisle, north and south porches, and square tower with a low spire, to which have been added a vestry on the south side of chancel and a vault for hot water apparatus at west end of aisle. The church is built throughout of flint stones, which have been refaced and pointed, with Bath stone dressings and tiled roof. The old ceilings of the nave and chapel have been taken down and the roof opened to the ridge, the oak joists, &c., repaired and oiled and plastered between. Unfortunately the interior, looking westward, is spoilt by an abomination in the shape of a raised pew, or, more properly speaking, box, approached by a semicircular staircase, which blocks up the upper half of the west door. Strongly as it is condemned, nothing appears to induce the owner to allow of its removal. The whole of the works have been executed at a cost of about £2,000, by Mr. T. Ginn, of Puckeridge, under the superintendence of Messrs. Godwin, architects. Since writing the above, the order has been given to restore the tower also.

A memorial to deceased communicants has just been completed in Trinity Church, Hempton, Norfolk, in the form of a reredos extending the whole width of the chancel. The side spaces are filled in with encaustic tiles, and the central space above the retable shows two panels ornamented with Minton's majolica tiles, supporting the raised centre of alabaster, on which is a cross of green and red marbles on a background of alabaster (executed by Messrs. Field, of Parliament-street, Westminster). The retable has an incised text in early fourteenth century letters, red and black ; and the memorial inscription is placed behind the altar. The design was supplied and the work superintended by Mr. C. J. Moxon, A.R.I.B.A., of Gower-street, London.

The cemetery chapels and lodge, Thornaby, South Stockton-on-Tees, have just been completed. The materials used are red pressed bricks, with Dunhouse stone dressings and slated roofs ; the glazing is of Hartley's tinted cathedral glass ; the floors are laid with black and red tiles ; the roof timbers, as well as all other woodwork, is stained and varnished. The total cost of the whole, including two chapels, lodge, entrance gates, piers, railing, &c., is £816. The design is that of Mr. G. G. Hoskins, architect, of Darlington and Sunderland. Mr. Leonard Bourn, of Stockton-on-Tees, was the contractor.

On Saturday week the new church of St. John, Accrington, was opened. It consists of nave 92ft. by 40ft., chancel, side aisle, two transepts, porch, and baptistery in the lower part of tower. The exterior is plain and of simple detail. Mr. H. Macauley, of Accrington, is the architect.

A new Wesleyan Chapel was opened at St. Dominick, Cornwall, on the 22nd inst. The building, which is designed to accommodate about 200 persons, is of Early Gothic character, with a somewhat continental boldness of treatment, and is constructed of local stone, with Polyphant stone dressings. The only carving introduced is in the caps of columns to the main entrance. The total cost of the erection was about £500, and it is intended to add a schoolroom at some future time. The contractors for the work were Messrs. Cousens and Poad, of St. Dominick ; and Mr. Henry H. Pearse, of Stonehouse, was the architect, under whose direction all the works were executed.

The new church for the parish of North Otterington, Yorkshire, was consecrated last week by the archbishop of the diocese. The designs for the building were supplied by Messrs. Atkinson, architects, York. It consists of a nave, chancel, vestry at the north-east porch at the south-west end, and bell turret at the west end. The style is Early English. The outer walls of the church are rough Bradford sets, with Osmotherley stone facings. The inner walls are lined with pressed red bricks varied with courses of black brick. The floors and reredos are laid with Maw's encaustic tiles. The cost of the building is £1,150.

The chancel of the church of Bowers Gifford, Essex, has been restored. The windows, which were of wood, have been replaced by stone ones, of the Tudor period: the high pews, whitewash, and plastered ceiling have been removed, and a panelled timber roof erected. The altar has been raised, and the floor paved with Minton's tiles; and the east window has been filled with stained glass by Messrs. Lavers and Barraud. This window was exhibited by the firm at the Paris Exhibition.

St. Michael's Church, Cornhill, which was restored and partly decorated during 1858-9-60, has been recently closed for cleansing, &c., and further decoration. The works now completed comprised colouring and ornamentation of the walls and windows of the tower, decoration of the reveals, columns, &c., of aisle windows, scroll enrichment to main shafts, new encaustic tiling and marble steps to chancel, complete restoration of the reredos, the introduction of a circular stained light in the ante-church, and decoration of window and wall. A new cloister, leading from St. Michael's-alley to the churchyard, has been erected in Portland and Caen stone, with red Mansfield shafts, having richly carved capitals. The organ has been restored, and electricity applied for playing from one side of the chancel to the other. The decorative work has been done by Messrs. Trollope, under the direction and superintendence of Mr. Hubert Williams, the architect to the parish, and his son, the assistant architect; and Messrs. Barnsley, of Draper's Hall and Birmingham, the cloister and other works; the organ by Messrs. Bryceson Brothers, under the direction of Mr. Limpus, the organist.

BUILDINGS.

On Monday morning the foundation stone of the new townhall at Manchester was laid by the Mayor. The new hall is erecting on a plot of ground comprising 8,000 square yards, and is bounded on three sides by three of the leading thoroughfares of the City—Albert-square, Princess-street, and Cooper-steet. It is to be built from designs by Mr. Alfred Waterhouse. It will be a magoificent Gothic structure, with principal façades (having a tower in the centre of each) to the three thoroughfares named. The principal and most ornamental façade will be that to Albert-square, which will have a frontage 310ft. long and a clock tower 260ft. high. The hall will contain about 250 rooms, and is estimated to cost (including purchases of ground and property for the site) upwards of half a million of money. The building was illustrated and fully described in the BUILDING NEWS of May 8, 1868.

Mr. C. W. Whitaker writes to say that the cost of the new hall to be built over the market at Exeter is £3,000, and not £5,500 as stated by us last week. He also says that his father has no connection with Tiverton, as stated by us, but is the consulting engineer and surveyor to the Local Board of Exeter.

At Wisbeach, Cambridgeshire, a long-felt want is being supplied—viz., a properly constructed cattle market. The whole of the works are being carried out under the superintendence of Mr. Charles Mumford, the borough engineer. The contractor is Mr. John Fast, of Melton Mowbray, who recently carried out the important cattle market works at Peterborough. The ironwork is from Messrs. Mellard and Southwell, of Rugeley, Staffordshire.

The new premises for the London and County Bank at Oxford are just completed. The style adopted is Tudor. The materials used have been the best white bricks of the neighbourhood for the several fronts, with Bath stone for all the stone details. The exterior is relieved by buttresses, projecting chimneys, and windows of varied design. The whole of the works, including the adjoining premises, will cost about £9,000; they have been executed in a most satisfactory manner by Messrs. Jones, from the designs of the architects, Messrs. Francis, of London.

A company is now being formed at Ramsgate having for its object the erection of large assembly rooms. The capital is £10,000, a large portion of which is already subscribed. Mr. Bridge, architect, has drawn up plans and specifications of the proposed buildings The grand hall will be 120ft. by 55ft. Tho decorations will be in the Italian style. The roof will be domical, devised as a shell, and the ceiling will be elliptical. There is to be a colonnade of shops on the ground floor.

The new courthouses at Falkirk were opened last week for public business. The style of architecture is Scotch Baronial, and the design is by Mr. Ford, a local architect. The cost of the buildiog has been about £8,000.

There have been recently erected at Harlow, Essex (says a local paper), by Mr. Selwin Ibbetson, M.P., several model cottages for agricultural labourers. Each cottage contains a living room and three bedrooms, with entrance porch, scullery, pantry, fuel store, and privy, and each dwelling is provided with a washing copper, a sink, and a fireclay oven from Devonshire. The living rooms have cottage ranges, and the bedrooms fire-lump cottage grates. The rain water from the roofs is collected in tanks for domestic use. The cottages are built with Cambridge bricks and covered with Huntiogdonshire tiles. The works have been carried out by Messrs. Bell and Son, builders, of Cambridge, from designs by Mr. Birch, architect, of London. We hear that Mr. Birch is erecting similar dwellings on an estate in Wiltshire belonging to Mr. R. P. Long, M P.

At Warnham, the beautiful seat of Charles Thomas Lucas, Esq., a racquet court has been erected, and it is said by a correspondent to be one of the most perfect buildings of the kind. The floor is laid with Pyrimont Seyssel Asphalte, which has been found at Aldershot and other places the best possible material on which the game can be played.

During the closing of the Junior United Service Club for annual repairs some important alterations have been executed under the direction of Mr. Wilson W. Phipson, C.E., for the improvement of the ventilation of the Club. A fan worked by a small gas engine now supplies the fresh air to the building, a new fresh air supply erected near Waterloo-place, and an entire rearrangement of the old air pipes and main channels to the different rooms constitute the most important features of Mr. Phipson's new arrangement; besides which, a more direct use of the existing extracting shaft has been effected, so that the coffee-room especially derives great advantage from the adoption of this plan.

The foundation stone of a new public bathhouse was laid at Staleybridge on Saturday. The estimated cost is between £4,000 and £5,000. Messrs. Paull and Robinson, of Manchester, are the architects.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—W. I. F.—I. P.—P. H.—E. and P.—R. C.—C. L. E.—I and Co.—I. M. S.—C. L. C.—G. P. M.—I. F.—I. and T. H.—G. B.—I. H.—"No one in particular."—I. R. A.—W. R.—H. C.—A. T.—I A. H.—I. A. D.—I. F.—I. C.—T. A.—C. J. P.—G. G. H.—O. W.

R. C.—We cannot say without seeing the drawings.

A SUBSCRIBER.—Write to secretary of Institute of Architects, 9, Conduit-street, and secretary of Institution of Civil Engineers, 25, Great George-street, Westminster.

Correspondence.

CITY IMPROVEMENTS.

To the Editor of the BUILDING NEWS.

SIR,—More than seven years have now passed since first we suggested, through the medium of your journal, a means for gradually effecting considerable improvements in the City of London, and almost without cost. During that time we have met with nothing to deny the feasibility of the plan, and, as very few things are adopted in this country without much trouble and repeated attempts from the promoter, we beg leave to renew now the proposition which we made in the BUILDING NEWS for April 19, 1861. In the course of the last forty years, or we might even say the last twenty years, millions of money sterling have been spent (irrespective of railways) in improving the streets of London, and rendering them better adapted for a doubled and quadrupled population. This outlay has naturally, and perhaps wisely, been made upon leading thoroughfares; and when the Thames Embankment is completed, the new street from the Bank to Blackfriars finished, and other works already in progress are ended, our metropolis will certainly begin to assume an appearance somewhat worthy of her prodigious size and wealth. But we have at once to consider what is to be done, after the few trunk lines of communication have thus already been opened, towards improving the great number of second-rate streets in the City, which are so highly inconvenient from their extreme narrowness. There is but a very limited benefit to traffic in opening out a half-dozen of principal roads if scores on scores of tributary streets are left in a chronic state of congestion, proving a daily nuisance and hindrance to myriads of the population. How miserable, for instance, is the condition, for vehicles, not merely of such respectable streets as Thames-street, Tower-street, Queen-street (Cheapside), and others, but of the host of minor lanes or streets where there is much traffic, but a painful difficulty of moving it. What a farce to see hours and half-hours wasted by carmen with waggons, carts, and horses, every day of the year, while tediously trying to crawl into or out of some narrow tortuous defile with a carriage-way perhaps 6ft. or 8ft. wide, and that blocked-up by some lounging waggoner who has gone for his pot of beer, or who surlily refuses to expedite his own movements or to shift his vehicle a few yards along the lane. The class of streets referred to are such as Old Change, Friday-street, Bread-street, Ironmonger-lane, Abchurch-lane, Pountney-lane, Botolph-lane, Silver-street, &c., streets where property is very valuable, occupied by most respectable firms, and where a considerable traffic is carried on; but which all suffer from this want of space. No doubt that the chief reason of this remaining *in statu quo* so long is the frightful expense which at the first view appears necessary to improve these lanes, together with the effects of long-seated use and custom, and, shall we say? the want of some thought and ingenuity directed towards improvements.

The suggestion by way of remedy which we made in 1861 was simply to prohibit any new buildings in streets of less than a certain width being increased in height above the old ones, unless they were set back a few feet in proportion from the original building line. Thus, in a lane 20ft. wide (and many of the City lanes are much less than that) no new house should be allowed to be carried to more than (say) 40ft. above the level of the pavement. But, if the owner would set it 5ft. further back, let him have liberty to carry it 10ft. higher, equal to another story. Where there is a will there is a way, and it is simply a case of drawing rules and embodying them in a supplementary building act. There are already a multitude of regulations in the building acts, and why should we hesitate to add one more which promises to be as soundly beneficial as any at present in force? We have restrained the liberty of the building subject in a hundred ways, and rightly so: why not in this? In Paris there are rules limiting the heights of buildings: why not in London? If something of this kind is not done we shall yearly get from bad to worse; population and traffic are still increasing, and as fast as old houses are pulled down others larger and higher are built on their sites, so that, instead of becoming more light, airy, and healthy, these City streets will gradually get more dark, stuffy, and unhealthy.

Very many of the old houses, though fronting on narrow streets, stand on plots of ground which are very deep, and, therefore, could be set back without injury to owner. Perhaps on a lane 15ft. wide, the plots are often found 60ft., 80ft., or even 100ft. deep. In a few years as the lane became widened the value of houses in it would increase, and the owner would eventually gain rather than lose by the first sacrifice of a few feet of area. If the depth did not admit of setting back, the proprietor must be content with keeping his building to the original height of the old one. By the time a few houses were set back in a street traffic would be greatly facilitated, as the recesses would allow of carts and waggons drawing into the "lay-byes," and giving space for others to pass freely. In process of time a whole street would thus be widened, and, which is an advantage impossible to exaggerate, without any

considerable tax upon the public. Nor yet surely can it be deemed a hardship upon a free holder to say "you shall not, in a densely packed city, rebuild your house any higher than it was before, unless it is set a little farther back." The principle we advocate is that a street only 25ft. wide, or 3ft. more than Queen-street, Cheapside, though confined enough, will yet accommodate a great amount of traffic, though certainly not enough for a main thoroughfare; it allows of two foot pavements of 5ft. each, and a carriageway of 15ft., which is quite sufficient for two waggons to pass. Hence it would not be necessary in most of the city lanes to make the builders set back more than a few feet on each side. However, the exact degree of height or of setting back is a matter of detail.

While writing we will add that when a new building act is brought in it should make provision for the extremely complicated and vexed question of ancient lights, which in the crowded part of an old city might well be put upon a different basis to suburban and rural laws. And we think some further requisition might well be made for back areas—the space of 100ft. superficial is quite too small for a large house. We will just invite consideration of these two points but will not diverge into an argument upon them at present.—We are, &c.,

H. and R. Powell.

IMPROVED CHINESE INK.

Sir,—I beg to call your attention to a new article, which I think will prove a boon to the architectural and mechanical draughtsman. It is simply a solution of redissolved Chinese ink, in which is a chemical mucilage which renders the ink insoluble after it has dried upon paper; consequently any colour may be passed repeatedly over it without blurring or washing it up. I have found in business the constant demand, Will it wash?—one stick of ink that washes only a little better than another being considered by draughtsmen as a prize of great value. I think it will also be an economical ink, as it will not need pouring out on the palette; the pen may be dipped in it after breathing in between the nibs, and only the quantity used that is required. It will not decompose, and if it thickens by exposure a little water may be added. Chinese ink being pure, finely divided carbon, it settles by its great specific gravity. The bottle will therefore require to be shaken before use, and this is the only trouble to be taken with it. There have been many solutions of Indian ink prepared by artists' colourmen, but these are only offered as a solution of Indian ink, and consequently wash up like it; they also decompose, as Indian ink will if kept in a solution by water only.—I am, &c.,

W. F. Stanley.

3 and 5, Great Turnstile, Holborn, London, October 27.

WALKS WESTWARD—STATION BUILDINGS.

Sir,—A subscriber who signs himself "Albert Edward" objects to the remarks under the heading of "Walks Westward," which appeared in the Building News of October 16th. He thinks I was "too hard upon the architecture of the stations," and seeks to transfer the blame, if any, from the engineers or architects to the too parsimonious shareholders, and asks how "under such circumstances can anyone employed as architect show his powers of design?" Now, he mistakes the whole tendency of my criticism, and estimates very humbly the resources of architecture and the ability of architects. Decent poverty, even in architecture, is always respectable, but poverty is not always decent. I never complain of the mere absence of ornament, but I do emphatically condemn attempts to adorn a manifestly poverty stricken building by ornament of any kind, and more particularly by such as is of a festive character, as vases wreathed with flowers and the like. I also condemn the glass porches and the columns which support them at the entrances to the several stations, because they are ugly when they might, for the same money, have been elegant. Again, I do not find fault with these stations because they are only one story in height, nor do I see any difficulty in treating such buildings, as "Albert Edward" seems to do. It is the shape of the structure and the uncouthness of the details that offend my eye. I apprehend that no architect had anything to do with the stations of the Metropolitan Extension, and it is no matter of surprise that engineers, however skilful, should fail in an art which demands fully as much study as their own. So long as they stick to their tunnelling and railway embankment making they do very well, but they do not shine in architectural works. I am not sure that bridges even are more in the province of the engineer than the architect, and I am perfectly sure that no architect could have designed such a bridge as disfigures the river at the Cannon street Station. In conclusion, let me say that I am always ready to maintain my remarks by special instance if they offend anyone, and that in this case I am obliged to "Albert Edward" for giving me this opportunity of justifying, and perhaps amending, my former criticism.—I am, &c.,

The Writer of the Article.

Sir,—The special pleading in the letter from your correspondent "Albert Edward" is no defence of the Metropolitan Railway stations, the designs of which were so justly stigmatised by you in a recent number. "Albert Edward" urges the parsimony of the engineers connected with that railway as a reason why the station buildings, which are still springing into existence, are so unsightly. But a barn may be constructed in good taste, and a fortune may be spent upon a palace which when finished shall be an eyesore. It all rests with the architect, and with him alone, to make these station buildings harmonise or otherwise. Numerous good examples of railway architecture prove the fallacy of "Albert Edward's" assertion that such designs cannot be dealt with tastefully; indeed, upon the Metropolitan line itself we have one example in which the most difficult situation is dealt with in the best manner. I refer to the Portland-road Station, which was designed apparently before the peculiar urn and tablet order came into vogue upon these works. And besides their positively unsightly appearance, these stations are marred by features which are outrages even upon rudimentary architecture. For example, note the preposterously elongated doors at the Bishop's-road and the keystones scattered so liberally around the Kensington Stations.—I am, &c., S. S.

Sir,—Though agreeing with your correspondent, "Albert Edward," as to the difficulty in carrying out any ornamental architecture in railway stations, I confess that it seems to me possible that variety even in ugliness might be introduced. The elaborate plaster vases and elongated keystones are the prevailing features in the exterior of the Metropolitan Railway stations, and I can scarcely imagine these to be the only means of ornament at the disposal of their architect. The stations on the Thames Embankment section of the Metropolitan District Railway are not yet commenced. Is it too late to hope for some novelty or elegance in their design?—I am, &c., G. T. J.

SOUTH KENSINGTON SKETCHING CLUB COMPETITION.

Sir,—Competitions at all times are more or less unsatisfactory, in consequence of what, in plain language, is favouritism; but at South Kensington—the last place where one would expect to find the disease—the malady has been witnessed in perfection. The members of the above club having forwarded their studies either of landscape or foreground, the decision to be made by the head masters, the result to be known on Thursday, the evening students, many of whom were subscribers, on arriving, are told the prizes have been awarded, the drawings taken down, and the prize works taken home without their having had the least sight of them. This looking very suspicious we demanded their being produced, and, to our great astonishment, find one a sketch, 6in. by 4in., of a cemetery monument—a figure in attitude of prayer, which the masters must have undoubtedly mistaken for an antique study, a branch which they always do their utmost to encourage, and consequently have thought fit to award it with the first prize. The second prize water-colour, and the same prize oil ditto, were the works of a master in training and the manager of the club—the drawings being one a sky study, the other of distant trees, &c., ¼-in. diam., possessing neither power nor feeling. Both works were carefully hidden from view and securely locked away. The first prize oil colour was indeed taken home, and has not yet been seen by the evening competitors. This, without doubt, was a study of a bunch of grapes under the name of foreground, perhaps with a dead robin to make up a group.

I may ask, Why were not these drawings exhibited at least three or four days, and even to the public on the following Saturday, arranged according to their merit. This would enable the students as well as outsiders to discover that which constitutes good landscape painting. Now, this being a landscape competition, and open only to subscribers, no one can but acknowledge that the whole has been carried out in a most unfair manner. But the masters themselves on becoming sensible of the injustice that had been done for that evening, instead of meeting the students, quietly sneaked away.—I am, &c., Justice.

CONCRETE HOUSES.

Sir,—Considerable notice having been lately taken in your columns of the accident to my house, I send you its history. A few months ago I was induced (from a perusal of *Tall's* pamphlet on his new patent machine, &c.), to erect a four-storied house in concrete. I, therefore, purchased the machine, at a cost of nearly £130, engaged as clerk of works a man from Tall's office, and solely on his strong recommendation (a man, it was said, used to the method and the material), and in all details followed the instructions given in the pamphlet. As to materials, I used Thames gravel and Little's cement, both of which received continuous praise, and the walls when at the third story were visited by the patentee and pronounced to be "very good." Notwithstanding, one wall suddenly collapsed, and the remainder proved so unsound that the whole had to be pulled down. The ruins throughout showed no "blocks" of concrete, but simply were as rubble out of a gravel pit. In addition, the patentee, who covenants in his pamphlet and on his bill of sale to take back the machine (when a house is built) at half price, takes advantage of the accident and leaves it on my hands. I tell the tale that others may profit thereby, and be doubly careful—as the invention is yet in its infancy—in their choice of machines, agents, and materials.—I am, &c.,

Geo. Larden, D.C.L.

Twickenham, October 28.

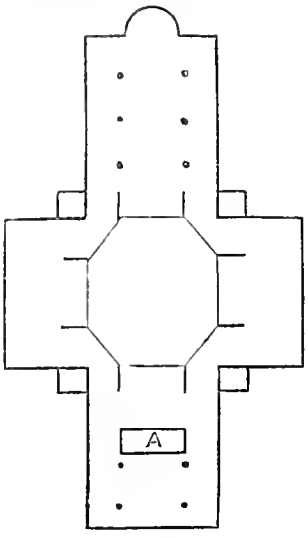
ORGANS AND ECHOES.

Sir,—In my former letter with reference to "C. B. A." and his predilections on the above subject, I did not write with your paper before me, and had the impression that it was the chorus, "The marvellous work," from the "Creation," which had been referred to by "C. B. A," and which ends in the manner I described. I find my memory had deceived me, and that it was "The Heavens are telling" that he referred to, which makes all the difference. Still I must maintain that the echo effect described by "C. B. A." is not essentially *music*, in the artistic sense of the word, and is, on the contrary, fatal to the effect of all but such simple music as consists in mere repetition of a few chords; and even in the simplest passages it is often injurious. For instance, I sat one day at the end of St. George's Hall, in Liverpool, when Mr. Best was playing the *chorale* from Mendelssohn's "Hymn of Praise," the melody of the chorale being given out, in very slow time, on the most powerful reed stops. The effect of the echo was such that at one point where the note C sharp is followed by D, the two notes were actually heard as if sounding together; the C sharp being prolonged by the echo through half the duration of the next note. Anyone with an ear will know what the effect of this must have been, and in this building all Bach's great fugues, when played on the full organ, are reduced by the echo to a most puzzling confusion of sounds; there is a sense of something grand going on, but one can never get the points of it clearly. I have both listened to and played Bach's organ fugues in a cathedral, and have always found the same result from the echo. When accompanying the Psalms to a simple chant the echo may, as I said, be made the source of fine effects, but all which *musicians* understand by music is destroyed by it; melodic outline and counterpoint are all reduced to a hubbub of "sound and fury, signifying nothing"—I am, &c., H. H. S.

CATHEDRAL ORGANS.

Sir,—"C. B. A." is evidently something more than a musical enthusiast, but I can hardly follow him in wishing to give the organ such prominence that for its sake the choir should have remained shut off from the main body of the cathedral. Another plan could have been adopted which would have been equally good for the organ and would not have injured the general effect. It

will be recollected that Sir C. Wren's first design did not contemplate a long nave for processional uses, but that it was forced on him by King



A.—Site of Organ.

James, and I think we can trace in the present building that the nave was no labour of love. Why not, then, have the organ placed in the same position in the nave as it held in the choir? perhaps better still place it one bay more to the west. The nave would then form the narthex or porch to the church, an appropriate site for all our monuments, the grand organ, where I still like to see it, at the west, and an unimpeded prospect, as now afforded, of the choir. The plan would be a Greek cross, with a prolonged choir.—I am, &c.,

E. E. S.

Intercommunication.

QUESTIONS.

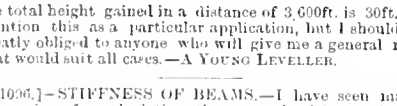
[1091.]—ANCIENT WRITING MATERIALS.—Can any of your correspondents inform me of a short account of ancient writing materials?—C. P. E.

[1092.]—LIQUID INDIAN INK.—Could you, or any of your correspondents, inform me of a way to preserve liquid Indian ink, so as to prevent its drying up?—T. E. B.

[1093.]—IRON PIPES.—I want to carry an iron main water pipe over an 8ft. opening. Will any of your correspondents let me know what size it ought to be to be able to carry the necessary quantity of water? The main pipes are 18in. in diameter, but the one to cross a span of 8ft. must have larger dimensions, which is what I wish to ascertain.—ALPHA

[1094.]—BARK OF TIMBER.—Can any reader kindly tell me what is the allowance usually made for the bark of trees in the purchasing of timber, and does it differ with the age of the tree or not?—BAILIFF.

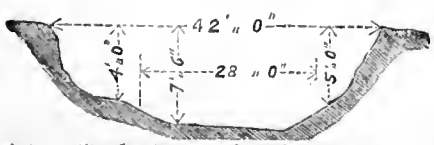
[1095.]—GRADIENTS.—What allowance should be made for the effect of inclines upon trains? How much is the resistance increased according to the steepness of the incline? Suppose I wish to calculate the additional resistance in the following case shown in the diagram, where



the total height gained in a distance of 3,600ft. is 30ft. I mention this as a particular application, but I should be greatly obliged to anyone who will give me a general rule that would suit all cases.—A YOUNG LEVELLER.

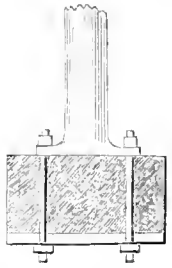
[1096.]—STIFFNESS OF BEAMS.—I have seen many rules given for calculating the strength of beams, but I am not acquainted with any referring to their absolute stiffness. In many instances, stiffness is required quite as much as, if not more than, mere strength. Would you oblige by ventilating this question in "Intercommunication"?—QUERIST.

[1097.]—WATERING OF RIVERS.—Given the section of a river, how is the quantity of water passing per minute to be ascertained? Let the section be as shown



what quantity of water passes in a minute, supposing the velocity measured by a float to be 25ft. per minute?—W. W.

[1098.]—SIZE OF BOLTS.—I am erecting some cast-iron columns, and they are fixed to concrete blocks by iron bolts (see sketch). What size ought the bolts to be? The



columns are 10in. in diameter, and are intended to carry the roof of a warehouse of large proportions.—CONTRACTOR.

[1099.]—AREA OF TRIANGLES.—I have measured the three sides of a triangle, and they are respectively 1,160ft., 965ft., and 945ft. I wish to obtain the area, but have been told that to do this I must first measure one of the angles. As I cannot use any angular instrument, would any subscriber let me know whether I have been informed correctly or not respecting the matter.—V. P.

[1100.]—A WASH TO CONFINE SANDSTONE.—Through your "Intercommunication," which I often read and find valuable information therein, I take the liberty to ask if you, or some of your readers, can inform me of a wash to confine the sand or powder coming from freestone when a syringe is used to water plants affixed to a wall? I have constructed a conservatory, the inside of which is wholly lined with Doulting stone, and creepers of various kinds will be running up wires close to the walls, and when the syringe is used the plants are covered with the white sand or powder. I have been persuaded to use a solution of alum, soap, and soft water. Will you kindly give me what information you can on the subject?—W. H. FOWLES.

[1101.]—CONCRETE BUILDINGS.—As I am about to erect a few working men's houses, I propose doing so in concrete. Am I at liberty to use any mixture for building such, and to proceed in any manner I choose? I know that Mr. Tall has a patent apparatus; I never saw such; but I have ideas of my own that I am sure will succeed. Any information on the above subject will oblige—A NORTHERN READER.

[You can use any mixture of concrete you please, but you must be careful that your mode of erecting does not interfere with the rights of any patented apparatus. Your best course would be to make yourself acquainted with the different patents taken out, full particulars of which the inventors would doubtless give. Mr. Tall's pamphlet can be had by sending 12 postage stamps to his address in London.—ED. B. N.]

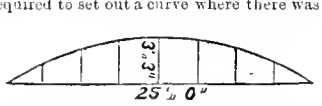
[1102.]—DOUBLE GLAZING.—How is double glazing to be effected in a single sash, so as to make and keep the inner sides of the glass perfectly clean?—A. PAYNE.

[1103.]—MEERSCHAUM.—I am a wood carver by profession, but find I can profitably occupy my leisure time by carving meerschaum pipe heads. Can any of your readers inform me where blocks of the material may be obtained, and whether there is any work which treats of the subject?—IRON MASK.

[1104.]—APPRAISER'S LICENCE.—I should esteem it a most particular favour to be enlightened on the following, viz:—Born a builder's son, I have practised all my life (business life) as an estimator, draughtsman, and quantity taker. Quarrelling some twelve months back with my then employer, I started in the same town on my own account, and have found plenty of employment in draughtsmanship, quantity taking, measuring up work, &c., &c. Now the query. If employed as above, when of course I am looked to to price or value the work so taken off or measured, do I require an appraiser's licence? I practised in all these capacities when (twelve months ago) I was clerk to a contractor. Now why should I not be enabled to do the same for (say) three or four different employers? At any rate, the uncertainty of my position makes it necessary to put the question. I do no more than every qualified clerk performs every day with impunity. Does the position of clerk or own master alter the case? for if so, I must have a licence at once.—C. H. KING.

[1105.]—CENTRIFUGAL FORCE.—Will any of your readers be kind enough to inform me what is the meaning of angular velocity, and how it is measured?—STUDENT.

[1106.]—SETTING OUT A CURVE.—I should feel obliged if some one of your numerous readers would kindly give me the following information:—Supposing it were required to set out a curve where there was not sufficient space to describe it from the point of radius; is there any method to find a number of points through which the curve could be drawn.—A MASON.



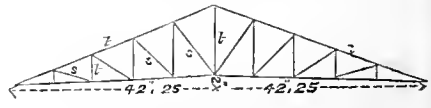
[1107.]—TOOLS FOR WOOD CARVING.—What is the cost of a set of small tools for wood carving, and where is the best place for obtaining them?—L. S.

[1108.]—FUNDS OF TRADE SOCIETIES.—I have heard that an act was passed during the last session of Parliament to protect the funds of trade and other societies. Will you oblige by informing me of the fact and indicating the provisions of the act?—W. R. T.

[The following is a copy of the act itself:—"Whereas it is expedient to provide for the better security of the property of co partnerships and other joint beneficial owners against offences by part owners thereof, and further to amend the law relating to embezzlement: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows: 1. If any person, being a member of any co-partnership, or being one of two or more beneficial owners of any money, goods or effects, bills, notes, securities, or other property, shall steal or embezzle any such money, goods, or effects, bills, notes, securities, or other property of or belonging to any such co-partnership or to such joint beneficial owners, every such person shall be liable to be dealt with, tried, convicted, and punished for the same as if such person had not been or was not a member of such co-partnership or one of such beneficial owners. 2. All the provisions of the act passed in the session of Parliament held in the eighteenth and nineteenth years of her present Majesty's reign, intituled 'An Act for diminishing expense and delay in the administration of Criminal Justice in certain cases,' shall extend and be applicable to the offence of embezzlement by clerks or servants, or persons employed for the purpose or in the capacity of clerks or servants, and the said act shall henceforth be read as if the said offence of embezzlement had been included therein. 3. This act shall not extend to Scotland."—ED. B.N.]

REPLIES.

[1051.]—STRAIN ON WROUGHT-IRON TRUSS.—Many thanks to "Calculator" for the trouble taken in replying to my queries. We agree very well as to strains of compression of rafter, and tension of tie rod at ends, &c.; but in the struts and queen rods we differ considerably. Does he not err in taking the whole load as acting on the struts and queen rods of one half the truss? It appears to me that only one half ought to be taken; but even then I do not make the strains so great. I presume, by "the



T are Struts, or in Compression.
S are Ties, or in Tension.

first strut nearest the end of rafter, &c.," he means the longest one nearest the middle of truss. I should feel much obliged, while on the subject, if he would give me the corresponding strains of the different parts. Supposing the truss to be arranged as in sketch, to compare the relative advantages of the two forms, I cannot see what bearing on my question the remarks of "R." have.—CONSTANT SUBSCRIBER.

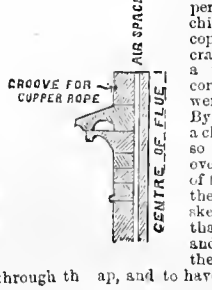
[1051.]—Would you please make the following correction in my formula, which appeared in the BUILDING NEWS of October 16? You will find it is put—

$$S = \sqrt{H^2 + \frac{W^2}{16}} = \frac{W}{4}\sqrt{\frac{S^2}{R^2} + 1},$$

Which I think, if you refer to my communication, is

$$T = \sqrt{H^2 + \frac{W^2}{16}} = \frac{W}{4}\sqrt{\frac{S^2}{R^2} + 1}. \qquad R.$$

[1059.]—FACTORY CHIMNEY FLUES AND SHAFTS.—I thank "H." for his kind endeavour to enlighten me as to chimney flues and shafts, although I consider his answer very unsatisfactory and inconclusive. I also think that he might have couched his remarks on my sketch in milder terms, and I trust he will find that my notions of masonry and equilibrium are neither queer nor ridiculous. I certainly had notions of my own before putting the question; but I also wanted the opinions of others. I have had to do with the construction of several mill chimneys, and live in close proximity to many lofty ones, and my observations of them lead me to offer the following suggestions. The smoke does not generally soak through the thickness of the walls so as to cause blackness on the outside, but it may be seen curling over from the summit of the chimney downwards, thereby disfiguring the exterior. Some time since I had the opportunity of examining stones and bricks from an old chimney then being pulled down. The smoke had permeated the brickwork which lined the lower part of the flue about 2in., while in the capstones, which went through the wall, the blackness had only penetrated ½in. on the inside, which formed the flue, and merely blackened the stonework externally. There are two chimneys within a short distance of me at this moment, one of which may be seen with the smoke drawing many yards down the sides, while the smoke from the other gets clear away. I am not able to account for this phenomenon. Unfortunately the wall line in the diagram given to illustrate my question was represented through the cap by a strong line instead of a dotted one; consequently it gave it the appearance of a joint instead of an imaginary line, forming, I fear, a stumbling block to "H." I have carried out the principle of the cavity on the outside of the wall line of a chimney cap, the profile of which was given me, and had it been carried out by bedding and overhanging the capstones, the whole concern would have inevitably have toppled down, the superincumbent weight being on the outside of the wall line, whereas by hollowing the overhanging portions of the stones the weight was thrown back on the thickness of the wall. Although I have ascertained, since I received my friend's answer, that lead was used to bind stones together in Pompey's Pillar, yet, as I am doubtful as to the properties of lead as a girdle for chimney tops, I would suggest copper rope instead; for iron cramps are well known to have a tendency to force away by corrosion the very stones they were intended to bind together. By permission I will introduce in a clearer form my first diagram, so as to show that the hollowed overhanging portions form part of the solid masonry resting on the bed of the wall. In this sketch I also show the air space that generally encircles the flue and is carried about half way up the shaft, to be continued forwards through the cap, and to have holes left at the bottom of



the shaft for the admission of cold air, which becoming rarefied would ascend probably with sufficient force to keep the smoke well up about the chimney cap.—L. M.

[1069.]—PATENTS FOR INVENTIONS.—Certainly not. The proposition put forward by "C. Watson" would be an infringement of the Patent Laws, which expressly forbid anyone to make or manufacture an article similar to the one protected by their agency.—PATENTEE.

[1074.]—RISE OF AN ARCH.—Square half the span of the arch, divide by the rise, to the quotient add the rise, and divide by 2 for the radius. This rule is founded on Euclid, book 3, problem 35.

$$\frac{1}{2}\left\{\left(\frac{25}{2}\right)^2 \div 3.25 + 3.25\right\} = \text{radius.}$$

$\frac{1}{2}$ (156.25 ÷ 3.25 + 3.25) = ,,
$\frac{1}{2}$ (51.3) = ,,
25.66ft. = ,,

"Carpenter" would find Euclid very useful in practice, as well as pleasant in theory.—R

[1074.] I must apologise to "Carpenter" for having omitted 3in. from my geometrical solution. I set the dimensions of "Carpenter" to small scale, at which the radius came so near the width of opening that I too hastily concluded the arch was described in the usual way—H.

[1074.]—"Carpenter" will find the radius of the arch he describes, where span and height only are given, by adopting the following rule: Square the half of chord line, divide by height of rise; add height of rise to product and divide by 2. The product is the length of radius, nearly 25ft. 8in.—BALCARRAS.

[1074]—"Carpenter" can obtain the length of radius by

$$\frac{C^2}{V} + V,$$

using the following formula:—R = $\frac{\quad}{2}$ in which R is the radius, C half span, and V versed sine or rise, applied to his case, will be =

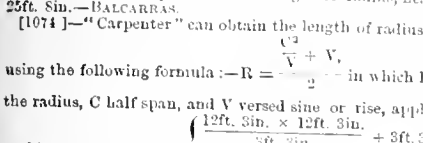
$$\sqrt{\frac{12\text{ft. }3\text{in.} \times 12\text{ft. }3\text{in.}}{3\text{ft. }3\text{in.}} + 3\text{ft. }3\text{in.}}$$

= 25.61ft. = 25ft. 7¾in.—H. S. P.

[1074.] In the various replies to "Carpenter's" inquiry for method to obtain radius of arch, two or three different lengths were given as radius to the arc, 25ft. span, 3ft. 3in rise. It will, perhaps, be some satisfaction to "Carpenter" and others to know that I set out the arc full size and found the radius required to be 25ft. 8in., as shown by "G. W. Usill" and others.—W. B. H.

[1075.]—LIMITS OF DEVIATION.—In reply to "Farmer," the limits of deviation within which a railway company may vary the centre line from the position defined on the deposited plans is 100yds. on either side of centre line for country district, and 10yds. for town or closely built districts. This does not, however, define the width of their survey for plan on which centre line may be laid.—H. S. P.

[1076.]—PRESSURE UPON VALVES.—Although not directly apparent, the question of the pressure of valves is a simple case of calculation, depending upon the laws of the lever. Thus, in the accompanying cut, let the value of W be 10lb. What pressure of steam would it require to lift the valve? Let the arms of the lever be as shown in the cut, the length of one being 3in. and that of the other



6in.; then the pressure to lift the valve may be determined from the following proposition:—Calling the required pressure P, we have P : 10 : : 6 : 3, and consequently multiply extremes by the means we find P × 3 = 10 × 6, and $P = \frac{10 \times 6}{3}$ = 30lb. At a pressure of 30lb., therefore, the valve would begin, technically speaking, to blow off.—ENGINEER.

[1077.]—CONTENTS OF SPHERES.—The following is the shortest rule I know to find the contents of a segment of a sphere:—

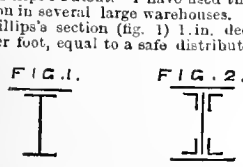
Let r = radius of base of segment, and h = height.
.5236 h (3 r² + h²) = solidity.
.5236 × 2.25 (3 × 4² + 2.25²) = ,,
1.1781 × 53.06.5 = ,,
62.51in. = ,, R.

[1077.]—The shortest rule I know of that will enable "A. B." to obtain the solid contents of part of sphere from the data given, is this: Solidity = .5236 × h² × (3 d — 2 h); or, in the case given, = .5236 × 2¼in. × (8in. × 3 — 2¼in. × 2) = 51.089 cubic inches. In the above, h equals height of segment, and d its diameter.—H. S. P.

[1078.]—EXTRA WORK.—"Builder's" course is perfectly clear. If the architect employed by the gentleman valued and certified for the extra work, he should summon the gentleman at once for the amount, subpœna the architect as a witness, and any jury will give him a verdict.—X. S. Y.

[1079.]—SIZE OF GIRDER.—The most economical form of girder is Phillips's Patent. I have used them with perfect satisfaction in several large warehouses. I would recommend Phillips's section (fig. 1) 1.in. deep, weighing about 50lb. per foot, equal to a safe distributed load of 23

FIG. 1. FIG. 2.



tons, being 3 cwt. per square foot of floor. An ordinary built up girder would require to be at the very least of section (fig. 2) web, 12in. by ⅜in., plates 5in by ⅜in., angles 2½in by 2½in. by ⅜in., weighing about 60lb. per foot, being 10lb. more than Phillips's.—ARCHITECT.

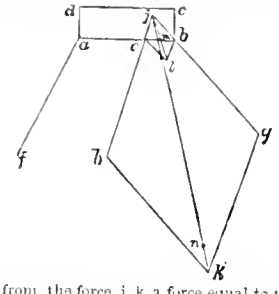
[1082.]—LIQUID GLUE.—Pour naphtha upon shellac until of a creamy consistency, and keep in a bottle, never allowing it to remain uncorked for any length of time. This glue will unite iron, wood, glass, &c., is quite waterproof and dries in a few minutes.—C. P. L.

[1082.]—To common glue add gently a small quantity of nitric acid.—R.

[1085.]—LAYING WROUGHT IRON JOISTS.—The joists ought to be laid as shown in "Carpenter's" sketch No. 1; because wrought iron having great tensile strength, and the load being placed upon it, would have a tendency to bend it and draw the wing asunder, just the direction in which wrought iron is the best able to sustain a strain; and, of course, just the reverse with cast iron. "Carpenter" has omitted the size of the joists, so that I cannot calculate the safe load; if he will give the dimensions I will do it for him.—L.

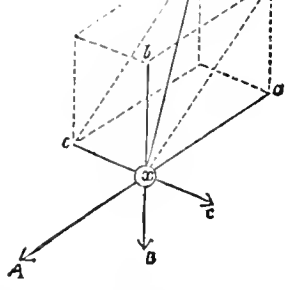
[1086.]—RESOLUTION OF FORCES.—"Student" must first find the resultant of two of the forces, say A B, which he will do by the "parallelogram of forces," a principle with which, as a student of mechanics, he is doubtless acquainted. His next step is to resolve the remaining force C, and resultant just obtained, into a second resultant by the same principle. This second resultant represents both in force and direction the three forces A B C.—J. J. C.

[1086.]—A force equivalent to two or more forces acting at different points on a solid body may be obtained by the use of the following proposition, called the parallelogram of forces:—If two forces be represented in magnitude and direction by the sides of a parallelogram, an equivalent force will be represented in magnitude and direction by its diagonal. Let a b c d be the body, and a b e the points in which the forces a f, b g, e h, act upon that body; produce e h and b g until they cut one another in j, and from h draw h k parallel to b g, and from g draw g k parallel to e h; then the diagonal j k represents a force equal to the two forces h j, g j acting upon the point j; but by the question the forces act upon the points e b respectively, so that



if we take from the force j k a force equal to that part of the resultant of the forces e j, b j, which lies within the body, we shall obtain a force equal to the forces e h, g b. From e draw e l parallel to j b, and from b draw b l parallel to e j; then from j draw the diagonal j l, cutting a b in m; cut off the length j m from the line j R; then m n is a force acting upon the point m, equivalent both in magnitude and direction to the two forces e h b g. The next step is to determine a force equal to the forces a f m n, which is done in the same manner as before. The diagonal is called the resultant of the forces represented by the parallelogram, and they are termed the components of the resultant force.—S. HURST.

[1086.]—As your correspondent is a "Student of Mechanics" he is of course aware of that primary law, the parallelogram of forces. Any number of forces can be compounded by this same law; for instance, as regards student's figure, let the body x be acted upon simultaneously by the three forces A B C, whose directions are expressed by the arrows, and their magnitudes by the lengths $x\,a$, $x\,b$, $x\,c$. Let him first compound any two of them (as A and B) by completing the parallelogram $x\,a\,b\,d$, by which he will find that the direction of their resultant is $x\,d$, and that its magnitude is to their magnitudes as the length $x\,a$ is to the lengths $x\,a\,x\,b$. He may then compound this resultant with the remaining force $x\,c$ by completing the parallelogram $x\,d\,e\,c$, the diagonal of which, viz., $x\,e$, will represent both the magnitude and direction of the general



resultant of all three forces; so that a force of the magnitude expressed by this length $x\,e$, and acting in an opposite direction to A B C would balance these latter forces. In this problem it matters not whether the directions of the forces lie all in the same plane or in different planes. In the latter case the three lines $x\,a$, $x\,b$, $x\,c$ would form the three edges that meet at one solid angle of a parallelopiped; and by completing this solid figure (as shown by the outer dotted line of the figure) its diagonal $x\,e$ will represent the resultant. Therefore, whether we regard the lines of this figure as they really lie flat on the paper, or as the projection of a solid parallelopiped the law is equally true. The same process is of course applicable to any number of forces, whether in the same plane or in different planes.—W. L. BERNARD.

WATER SUPPLY AND SANITARY MATTERS.

IT is anticipated that by the close of the year the first section of the operations of the company which has been formed to collect and distribute the Liverpool sewage will be completed. The section embraces the distribution of the sewage over a tract of sandy land in the neighbourhood of Ince Blundell. The Company intend ultimately to carry forward their operations to the borders of Southport. It is estimated that if the whole of the sewage of Liverpool were utilised and sold, a permanent annual revenue of £150,000 might be derived.

BUILDING AND LAND SOCIETIES.

THE second annual meeting of the Brighton and Hove Benefit Building Society, No. 4, was held on Friday evening last at the Town Hall, Brighton, the president, Mr. Alderman Bingden, in the chair. From the report presented by the secretary, it appears that this, the last established, is also the most successful of the original building societies of Brighton, 752¼ shares having been subscribed for, and 150¼ shares advanced on mortgage during the two years; the total amount of the securities being £12,148 10s. The chairman congratulated the meeting on the report, stating that 32 members had been assisted in the purchase of houses by the society in sums of from £38 to £1,007, and that 208 members had by their savings in the society during the past two years become entitled to a bonus on withdrawal of 12s per share. The report and balance sheet were unanimously adopted, and the officers for the ensuing year were elected.

WAGES MOVEMENT.

THE masons' strike at Aberdeen has caused the more energetic prosecution of a scheme already in progress for the formation of a co-operative company. The rules are now registered, and, a considerable number of £1 shares having been taken up, the company are prepared to commence operations. The architects are said to have promised them their countenance, and a fair number of jobs is hoped for.

The Coventry masons have given the masters notice of a new local code of rules, to come into operation on April 1, 1869. The hours of labour are to be 9 on Monday, 6½ on Saturday, and 10 on other days. That wages are to be 32s. per week, except during six weeks before and after Christmas, when they are to be 29s. per week. Sub contracting and piecework to be abolished, and no overtime to be allowed except on special occasions.

The dispute between the operative bricklayers of Liverpool and their employers is not yet definitely or satisfactorily arranged. Some weeks ago warrants were applied for against men who had interfered with some non-society men sent down from London by the Free Labour Association; and it was then stated that the officers of the trade society had given an undertaking that the non-society men should be permitted to work without molestation or hindrance. This undertaking seems to have been disregarded, for yesterday at the police court warrants for the apprehension of two men for illegal interference with the workmen in question were applied for. The solicitor who made the application said there was no doubt a formidable conspiracy in the town to drive the London men away. The warrants were granted.

LEGAL INTELLIGENCE.

A SURVEYOR'S CLAIM REDUCED BY THREE FOURTHS.—FROW *v.* THE BOSTON HARBOUR COMMISSIONERS.—The plaintiff, who is a surveyor and civil engineer residing at Holbeach, sued in the Boston County Court for 45 guineas rendered in November, 1866, in connection with a project for improving the outfall of the River Witham. His claim was for £47 5s for services rendered to the Commission, consisting in the preparation of plans, which, however, were not adopted, and in attendance both on the Commission and before a committee of the House of Lords. He called as a witness Mr. E. Millington, of Fleet, who said that, as a surveyor of great experience, he did not think Mr. Frow's claim at all unreasonable. The judge, however, thought differently, and decided that £12 12s., which the defendants had already paid into court, was ample remuneration for Mr. Frow's services.

A DISPUTED ACCOUNT.—HASTIE *v.* ELLIOTT.—The plaintiff, a slater, claimed, in the Newcastle County Court, of defendant, a builder of North Shields, £10 3s 8d., balance of account for work done. Plaintiff, at the request of Elliott, made a proposal for certain slating work at Bishop Buckland railway shed, amounting to £73. Defendant accepted the proposal, and the work was proceeded with. Before the ridge was gone on with, Mr. Bolland, clerk of the works for the North Eastern Company, informed plaintiff that Mr. Prosser, the architect, desired the substitution of a fireclay for a slate ridge, and a price was accordingly agreed upon—namely 2s 6d per yard, the price of slate being 3s. per yard. The difference was allowed, and certain sums of money were paid on account, leaving the balance now sued for.—The defendant pleaded that the fireclay ridge was stated at the time the alteration was agreed upon to be 2s. 6d per yard, while the contract price of the slate ridge was 4s. 6d per yard. The allowance claimed, therefore, was 2s per yard, or £8 14s for 87 yards.—Mr. Bolland, when sworn, said that great difficulty had arisen as to getting the slate ridge, and in consequence of the delay in getting it on, he suggested that fireclay should, with Mr. Prosser's consent, be substituted. Mr. Bolland said that a slate ridge would have had to be specially made to suit the peculiar roof, and that Hastie would have lost money on it at 4s. 6d. per yard.—Plaintiff, on the other hand, asserted that he should

be willing to supply any quantity of slate ridging at 3s. per yard —The items making up the difference between £8 14s. and the claim were settled, and the verdict was given for the defendant.

A CONTRACTOR'S LIABILITY. VESTRY OF BERMONDSEY *v.* MESSRS. LINDOW AND ANOTHER, THE EXECUTORS OF THE LATE WM. DETHICK. — Mr E. Thomas, instructed for plaintiff, stated that the action was brought for the expenses accruing to the reinstating of that portion of the carriage way extending from Drummond road to Unionbridge. The late Mr. Dethick began the work of the sewer in that place, which was completed by his foreman in September, 1867. The foreman (Mr. Walker) at that time waited on Mr. Elkington, the surveyor of the Vestry of Bermondsey, and stated that the road had been reinstated, and wished to surrender it into his charge. Mr. Elkington, inspected the carriageway or trench in question, and refused to take it as the representative of the parish under his charge, as not being made up to his satisfaction. A great deal of correspondence took place between the parties concerned, and on the 21st October, 1867, the Vestry came to a resolution to do the work themselves, and charge the defendants with the expenses of the same. That was done, and Mr. Elkington made out an estimate for the work, which said amount the defendants refused to pay. He contended that the Act of Parliament empowered the parish to do the work if it was not placed in the same state as before the commencement of the sewers. Mr. Elkington, the surveyor, was examined in support of the case for the vestry, as was also Mr. Ford, clerk of the works. On a suggestion by his Honour, a conference took place between the parties, the result of which was that defendants agreed to pay £10 more than they had paid into court, each party to pay their own costs.

IMPORTANT TO LOCAL BOARDS OF HEALTH.—On Saturday last before the Bucks magistrates, in special sessions at Slough, there were proceedings of considerable importance to local boards of health. Five residents of Slough, formerly members of the Slough Local Government Board, were summoned to show cause why warrants should not issue to enforce payment of £319 1s. 7d., surcharged against them by Mr. Barnes, the district auditor. It appeared that in the spring of 1866 the Slough Local Board opposed the bill of the Slough Gas Company in Parliament, and were unsuccessful (with the exception of one or two slight alterations), and the bill was passed. In the following June the five members of the board now summoned signed cheques for the payment of the sum named, being the costs of the opposition. The legality of these payments was challenged by some of the ratepayers on four grounds:—1, that it was an illegal expenditure by the local board of the money of the ratepayers as costs of opposing the Gas Company's bill; 2, that some of the members of the local board voting the money, and voting for a resolution in favour of opposing the Gas Company's bill, were members of a company of a like nature (an opposition gas company that had a bill in Parliament), and were, therefore, disqualified from voting; 3, that no such item of £319 1s. 7d appeared in the estimate of the rate out of which such payment was made; and, 4, that the resolution to oppose such bill was not made and passed in accordance with the bye laws of the local board. The auditor held that a local board has not any legal authority, direct or implied, to charge general district rates with the costs of opposition to a gas bill in Parliament; and that a local board, having a six months' retrospective power vested in it by the legislature to meet unexpected contingencies, could have no justification whatever to pay bills in June out of the proceeds of a rate made in the previous January, in the estimate for which they had not been included. The auditor accordingly disallowed the items which formed the £319 1s. 7d., and surcharged that amount upon the five members of the board who signed the cheques. An appeal was made to the Secretary of State and to the former clerk to the Local Government Board, but the appeal was dismissed by Mr. Gathorne Hardy, and the surcharge was confirmed. On a subsequent application to the Home Secretary for the remission of the surcharge, a local inquiry was held before Mr. Arnold Taylor, and upon that gentleman's report the Home Secretary refused to remit. The proceedings before the magistrates were taken under 21 and 22 Vic., chap. 98, sec. 60. After hearing the counsel on either side, the magistrates directed the issue of a warrant to recover the money at the expiration of a month, so that the defendants might, if so advised, appeal to the Court of Queen's Bench.

SCULPTURE FROM FRENCH CHURCHES.

WE this week illustrate three specimens of sculpture from different parts of France, Sens, Noyon, and Blois. We select these as being very characteristic examples of early date. Sens Cathedral contains many beautiful capitals of the type here illustrated, and the Noyon sculpture is not by any means inferior, the simplicity and elegance of the capitals being very striking. We have before drawn attention to the sculpture at St. Nicholas, Blois, in giving a lithograph of some of the capitals in a former number of the BUILDING NEWS.

Our Office Table.

A course of lectures on architecture will be delivered by G. G. Scott, R.A., Professor of Architecture, at the Royal Academy, on March 4, 11, 18, 25. A few tickets of admission are to be had at the rooms of the Institute, Conduit-street.

Mr. Holman Hunt, writing from Florence, says that unless speedy means are taken for the preservation of Titian's "Venus," it will soon be past restoration.

The entrance gateway of Burlington House, though in the course of being pulled down, is not to be destroyed. The Duke of Devonshire having declined it, we understand that its stones and bricks are to be piled up in Battersea Park for a time, until her Majesty's Government can agree as to its future destination. It would in our opinion be a much wiser thing to sell it for old material.

At the weekly meeting of the Metropolitan Board of Works on Friday last, Mr. Hows moved the appointment of a committee to conduct the business of the Board connected with parks and open spaces near the metropolis; but to this the chairman put a formal veto that the Board could not delegate its powers to any committee. Mr. Hows afterwards modified his motion, limiting it to the question of parks and open spaces being referred to a committee of the whole Board, a motion which was seconded by Mr. Westerton. An amendment was moved to this motion, which was put and negatived; after which Mr. Savage moved that a select committee of twelve members should be appointed for the purpose of planting and laying out of the parks, subject to the approval of the Board, and opening them for the health and recreation of the inhabitants of the metropolis in the spring of 1869. This was seconded, but after a long discussion it was negatived on a division by 16 to 10.

A correspondent writes to ask if some kind of interest is not at work to cause the commissioners for the new Palace of Justice to create sixteen additional cases for compensation. It is intended to form a communication with the Temple—either by bridge or subway, or both—and to enable them to do this they are about to serve notices upon the landlords and tenants of seven shops on the south side of the Strand, and nine houses in Thanet-place, also a block of buildings in the Temple abutting upon the end of Thanet-place, making, in all, a destruction of more than twenty houses, when, by moving the communication 20ft. farther west, an entrance could be effected to the Temple by the destruction of two places of business only, and would open into an open part of the Temple, thus obviating the necessity of taking four or five large houses in that expensive locality, in addition to sixteen places of business in the Strand and Thanet-place. The houses, &c., intended to be taken are those immediately adjoining Temple Bar on the west side and south side of the Strand.

A valuable paper by Mr. T. Van Herstelle' contribnted to the *Dietsche Warande*, as the first of a series, gives a brief account, with measurements, of a number of ecclesiastical buildings lately built or restored in the Netherlands. They are arranged alphabetically; and a certain number of them are illustrated by ground plans and transverse sections. Among the churches thus described are the parish churches of St. Laurence and St. Dominic, at Alkmaar, from the designs of Mr. Cuypers. The Church of St. Gertrude, at Jabeck, is illustrated by a ground plan; and that of Wijek (Naastricht) by a section. The parish church of the Name of Jesus, Oeffelt, has a most unusual and most unadvisable ground plan of choir. Its choir is an octagon in ground plan—added on to a nave which does not equal it in breadth. What is the advantage of this abnormal design? The parish church of Vechel is quite a cathedral in plan and scale, with an ambulatory round the chevet and an apsidal Lady-chapel projecting at the east end.

On Monday a public meeting was held in St. Mary's National School, Lewisham, for the purpose of organising classes for instruction in geometrical, mechanical, and architectural drawing, under a science teacher certificated by the Department of Science and Art. The Hon. and Rev. H. Legge occupied the chair. Mr. Buckmaster attended from the Science and Art Department, and delivered an address, in which he encouraged the young men to earnest work, and said that success in life depended more on continued effort than extraordinary natural gifts. A vote of thanks was accorded to the chairman and Mr. Buckmaster. The classes will commence at once.

Another considerable estate is now on sale in building plots between Redhill and Reigate, and a pair of neat villas already in course of erection on one of the lots. This neighbourhood, possessing as it does such extensive common lands and parks and salubrious air, seems likely ere long to become a most popular place of residence.

A rather singular accident was caused by the high wind which prevailed on Saturday evening last at the Church of St. Thomas, now in course of erection at Trowbridge, Wilts. One of the stone arches, 50ft. in height, in the interior of the building, intended for the support of the roof, and which had only been completed on the previous day, was discovered on Sunday to be leaning against the scaffolding which surrounded it. Not a stone in the structure was displaced, the arch being as true from the broken joints on either wall as when it stood erect. Had the scaffolding given way and the heavy mass had fallen to the ground, there is no estimating the loss Mr. W. Smith, the architect and builder, would have sustained; as it is, stone by stone the structure is being taken to pieces.

It is stated that in Germany timber rendered fireproof by saturation with silicates is extensively used for flooring planks, doors, and staircases.

The Exeter Court of Arbitration has issued the following advertisement:—"Exeter Board of Arbitration and Conciliation in the Building Trade. Umpire, E. Petersdorff, Esq. A Board of Arbitration and Conciliation having been established in this city, consisting of the following employers and workmen, viz., Messrs. Huxtable, Kingwell, Hubber, Lethaby, Westlake, and Martin, employers; Messrs. Wilcott, Halland, Delve, Reynolds, Chestor, and Hooper, workmen; feel it their duty to call upon all employers not at present connected with the Builders' Association, and upon all the artisans not connected with the several trade societies, to join at as early a period as possible in order that, should any dispute arise amongst them, the Board may have the power to arbitrate and settle the same, feeling assured that it will be the best means of placing the relations of capital and labour on a more satisfactory basis, and tend to promote a better feeling between employer and employed. Signed on behalf of the board, W. Huxtable, Chairman; J. Wilcott, Vice-Chairman; W. Kingwell, E. Reynolds, Hon. Secretaries."

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

345 J. LIVESEY. AN IMPROVED MATERIAL THAT MAY BE USED AS A SUBSTITUTE FOR GLASS. Dated January 31, 1868.

Here the material employed is wire gauze, perforated zinc, or other open work, with the meshes or spaces filled in with a transparent composition, such as copal varnish, silicates, or other suitable transparent substances used alone or in combination with suitable gums or other materials, which are capable of withstanding the effect of atmospheric changes, and it may be manufactured wholly or partly plain or in colours. Molten glass may also be run or rolled into the interstices.—Patent completed.

351 R. C. SMITH. IMPROVEMENTS IN THE ARRANGEMENT OR CONSTRUCTION OF SINKS, ETC. Dated February 1, 1868.

This invention consists in forming the trough with a vertical ledge or projection on the back and two ends, whereas the front side is formed with a lip or overhanging ledge, so that the destruction of the fixings connected with such apparatus may not occur by means of the water overflowing on all the four sides as at present; the liquid in the vessel or trough, when full, up to the level of the front lip only, then overflowing the vertical edge on three sides of the trough, may be covered with timber or other material to give it a more finished appearance.—Patent completed.

387 T. W. WALKER. IMPROVEMENTS IN THE MANUFACTURE OF BRICKS, TILES, SLABS, AND OTHER LIKE ARTICLES, AND IN THE MATERIALS AND MACHINERY OR APPARATUS EMPLOYED THEREIN. Dated February 5, 1868.

The patentee claims, first, the general construction, arrangement, and combination of machinery or apparatus for the manufacture of bricks, tiles, slabs, and other like articles, as described and illustrated by the drawings. Second, the combination with the pistons or plungers of machines for compressing bricks, tiles, slabs, and other like articles of a self-acting expanding packing, arranged and operating substantially as described. Third, the moulding and compressing of bricks, tiles, slabs, and other like articles on a bed, plate, or table, by the aid of a mould box or frame and piston or plunger, substantially as described. Fourth, the peculiar composition or compound for the manufacture of plain or ornamental tiles and slabs, as described. Fifth, the production or manufacture of ornamental tiles by punching or perforating holes or openings through such tiles according to any desired pattern, and filling in such perforations at the time of laying the said tiles with mosaic work, or with other tiles of a more or less ornamental character, as described. —Patent completed.

404 J. HONEYMAN. IMPROVEMENTS IN ARRANGEMENTS AND APPARATUS FOR TRAPPING AND VENTILATING. Dated February 6, 1868.

This improved pipe trap may be made in earthenware or metal. It is formed with four openings, two of which, for the connection of the pipes leading to and from it, are at opposite ends, and are directed horizontally. The two

other openings are in the top, one on each side of the tongue or dipping part, whilst the bottom is hollowed out with an easy curvature to form the usual recess to retain water, the contact of which with the tongue forms the seal or trap. The top opening on what may be termed the drain or sewer side of the tongue is for the escape of foul air into the external atmosphere, so as to prevent accumulation of pressure which would force its way past the trap, and this opening may communicate directly with the surface or with pipes or flues carried to any height. The top opening on what may be termed the house side of the tongue gives access for thorough cleansing of the trap, and also in one modification admits fresh air by the house pipe into the house. The trap may be buried at any convenient depth below the surface, and communication with the top openings may be obtained by means of direct vertical pipes.—Patent abandoned.

415 M. O'DONNELL and T. ARKILL. IMPROVEMENTS IN RAISING AND LOWERING VENETIAN BLINDS. Dated February 7, 1868.

According to one arrangement, the inventors mount an axis upon the fixed top lath or bar (or otherwise) of a venetian or other blind. Upon one end or other part of this axis they fix a pulley, by preference of larger circumference than the axis around which the cord or line for actuating the axis and raising the blind is wound. The lifting line or tape (one or more of which may be employed) attached to the bottom lath of a venetian blind is attached to the axis, so as to wind thereon in the opposite direction to that of the cord around the pulley. Below the pulley a lever click is suspended on axis, so as to cause the pointed end or tooth on one of its arms to enter or fall into the teeth of a ratchet wheel fixed on the pulley. The cord wound on the pulley passes downwards through an eye or loop on the lower end of the other arm of the lever click. The act of pulling the cord to unwind it from the pulley raises or moves the lever so as to release its end from engaging with the teeth of the ratchet, at the same time causing the axis to revolve, and thus wind up the lifting line or cord thereon, but directly the cord over the pulley is released, the end of the lever re-engages with the teeth of the ratchet, thus arresting the rotation of the axis and retaining the blind in the position to which it was raised. The lowering is effected in like manner by disengaging the click from the ratchet, and allowing the weight of the blind in its descent to wind up the cord upon the pulley whilst held in a position to prevent the click from engaging with the ratchet.—Patent abandoned.

422 W. R. LAKE. IMPROVEMENTS IN LOCKS. (A communication.) Dated February 7, 1868.

This invention relates to locks of that class which are generally used on the front doors of dwelling-houses, and in which the latch is operated by two knobs, one on the outside and the other on the inside of the door, the outside knob being constructed in such a manner that it can be thrown in or out of gear with the latch. The invention also relates to certain improvements in padlocks or locks of any ordinary construction. The said invention consists, first, in arranging an adjustable screw in the end of the spindle in such a manner that, by the said screw, the length of the spindle and the position of the knob can be regulated to suit the thickness of the door. Second, in enclosing in the knob or handle the mechanism which serves to throw the knob in and out of gear with the latch. Third, in arranging a nut on the spindle in combination with a movable stump and tumblers in such manner that, when the tumblers are set, and the stump made to drop into the notches thereof, the knob is thrown in gear, and the door can be opened from the outside, but, if the stump is withdrawn, the knob turns freely on the spindle without having any effect on the latch. Fourth, in arranging a safety stop in combination with the knob and washer which form the socket for the said knob and with the tumblers contained in the knob, in such a manner that, when the said tumblers and the knob are brought into the required position, the stop can be made to lock the outer knob and prevent it being turned while the inner knob continues to act on the latch. Fifth, in arranging a cam in combination with the movable stump, and with the stop and tumblers in such a manner that, by turning the said cam, the stop and stump can be thrown out of or in gear with the tumblers, provided the tumblers have been brought in the required position. Sixth, in arranging an abutment between the keyhole and safety stop in such a manner that the stop cannot be reached or its position disturbed by an instrument introduced through the keyhole. Seventh, in the peculiar arrangement of a lever stop in combination with a series of loose tumblers.—Patent completed.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects.—Opening meeting of the session, 8. Address by the president, W. Tite, Esq., M.P.
Society of Engineers.—"Modern Gasworks at Home and Abroad," by Henry Gore, 7.30.
Entomological Society, 7.
TUESDAY.—Anthropological Society, 8.
THURSDAY.—Linnean Society, 8.

Trade News.

TENDERS.

EDMONTON.—For building factory warehouse, &c. Mr. J. W. Reed, architect:—

Hawkes	£1795
Humphreys and Son	1720
Carter and Sons	1670
Eaton and Chapman (accepted)	1616
Emery and Co.	1580
Linzell	1495
West	1473

STROUD.—For the erection of two shops and dwelling houses in Gloucester-street, Stroud, for Sebastian S. Dickinson, Esq. Mr. William Clissold, architect:—

Harper (accepted)	£976

BLETCHINGLEY.—For building new infirmary, rain water tank, &c., at the Workhouse, Bletchingley, for the Guardians of the Godstone Union. Alex. R. Stenning, architect:—

Knight	£3900	0	0
Morris	3800	0	0
Worsell	3891	0	0
Cooper	3600	0	0
Galyer and Moore	3550	0	0
Sherwood	3540	0	0
Cooke	3535	0	0
Grover	3495	0	0
Barnes	3400	0	0
Kesterton and Head	3293	0	0
Smart	3250	0	0
Webb and Sons	3250	0	0
Daniel	3200	0	0
Henshaw	3164	0	0
Till	3150	0	0
Macey	3109	0	0
Colls and Sons	3080	0	0
Bayes	3072	0	0
Nightingale	3063	0	0
Knight	3054	0	0
Regis	3050	0	0
Johnson (too late)	3049	0	0
Woodward	2900	0	0
Constable and Baker	2800	0	0
Gage	2510	17	6

BRIGHTON.—For the erection of a new warehouse and offices, Queen's road, Brighton, for Messrs. Latham and Sons. Benj. H. Nunn, surveyor:—

	Warehouse.		Offices.
Reynolds	£3237	...	£468
Kirk	3190	...	817
Nash and Co.	3182	...	769
Parsons	3143	...	747
Cheeseman and Co.	3140	...	800
Matthews	2974	...	750
Nightingale	2973	...	823
Lockyer	2906	...	710
Sawyer	2887	...	670
Anscombe and Newman	2803	...	741
Dean and Dickenson	2750	...	637
Kemp	2710	...	740

GREAT YARMOUTH.—For erecting new Congregational church, Gaol-street, Great Yarmouth. Mr. J. T. Bottle, architect, Great Yarmouth:—

Wright	£2984
Cooper	2962
Leggett	2860
Brown and Bailey	2834
Hood (accepted)	2826

LONDON.—For the erection of a shop, and alterations to premises, 176, Walworth-road, for Mr. E. Belcher. The drawings were furnished by Mr. Pierse Arthur:—

Langdale	£800
Day	750
Talbot	712
Weston	690
Brett	630
Lane	595
C. Davis (accepted)	610

LONDON.—For altering, repairing, and painting the buildings of the Borough Market, Southwark, for the Trustees of the Borough Market. Messrs. Henry Jarvis and Son, architect:—

Baguley	£2557
Thompson	2140
Hart	1292
Henshaw	1175

LONDON.—For rebuilding house and shop, Newington Causeway, for Mr. A. Bunnett. Messrs. Henry Jarvis and Son, architects:—

Hart	£825
Thompson	830
Henshaw	820
Carter and Son	797
Richardson	795
Taylor	793
Colls and Son	740
Baguley	721

SUTTON.—For the erection of four shops, and repairs to cottages, at Benhill street, for A. Dyett, Esq. J. A. Bunker, Esq., architect, 27, King William-street, Strand:—

	Shops.				Repairs.				Deductions.
W. Hatton	£680	9	6	...	£95	19	3	...	£6
E. Dawson and Son	622	0	0	...	96	0	0	...	10
Cuff	487	0	0	...	70	0	0	...	10
J. Hall	478	0	0	...	60	5	0	...	5
Totter and Ferrage	470	0	0	...	174	0	0	...	10

TIVERTON (Devon).—New mansion at Knightshayes for H. Heathcote Amory, Esq. William Burges, Esq., architect, Buckingham street, Strand. Quantities supplied by E. W. Crocker, Esq., Southampton-street, Strand:—

			Extra if in Henley stone.
Davis, Taunton	£17,000	...	£2,250
Williams, Canton, Cardiff	16,950	...	1,685
Myers and Son, London	16,749	...	600
Dove Brothers, London	15,995	...	5,400
Pollard, Taunton	15,980	...	2,000
W. and J. Webb, Birmingham	15,960	...	500
Escourt, Gloucester	15,520	...	3,450
Call and Pethick, Plymouth	14,646	...	250
Fatcher and Son, Salisbury	14,000	...	—

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

MELBOURNE, NEAR DERBY.—For designs for a new Wesleyan chapel. Mr. W. H. Adcock, Melbourne, near Derby.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HASTINGS.—November 16.—For the purchase of ashes, cinders, marine stores, and refuse of every kind. G. Meadows, clerk, Local Board of Health, Hastings.

COLCHESTER (Essex).—November 6.—For erection of officers' quarters, &c. Commanding Officer, Royal Engineers' office.

SPILSBY (County of Lincoln).—November 7.—For alterations and additions to the house of correction. Clerk of the Peace, Spilsby.

WISBEACH.—November 4.—For making and fixing about 4ft. elliptical cast iron culverts. W. Adams, C.E., Wisbeach.

OWLERTON, NEAR SHEFFIELD.—November 4.—For the erection of a new church. Messrs. Blackmoor and Mitchell, Withers street, James street, Sheffield.

DOVER UNION.—November 6.—For the erection of new buildings, &c., for the infirmary. W. Cross, Clerk to the Guardians, Buckland.

LEWISHAM (Kent).—For the erection of six cottages at Hither green. Messrs. Messenger and Grundy, architects, 1, Robert street, Adelphi.

TUNBRIDGE.—November 22.—For the erection of a villa. Mr. S. Cooper, 10, Laurence Pountney lane, E.C.

LEICESTER WATERWORKS.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green street, Leicester.

ST. MARY CHURCH, TORQUAY (Devon).—November 13.—For the erection of new gasworks in the Barton road. Grant Wollen, clerk to the local board.

PENZANCE.—November 28.—For the improvement of the harbour of Mousehole, in the parish of Paul, near Penzance, in Cornwall. Rodd and Cornish, solicitors to the Commissioners, Penzance.

CHATHAM.—November 6.—For improving the drainage of Brompton Barracks. Commanding Officer, Royal Engineer Office, Chatham.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Frederick Beech, Hornsey-road, stonemason, November 5, at 2—Stephen Cavie, Tunbridge Wells, builder, November 6, at 2—James Richards, Palmerston-road, Plumstead-common, painter and glazier, November 5, at 12—James Canham and Robert Guiver Canham, Cambridge, builders, November 10, at 11—Thomas Hutchings, Montpelier road, Peckham, contractor, November 9, at 11.

TO SURRENDER IN THE COUNTRY.

William Cox, Tutbury, builder, November 6, at 12—John Edwards, Taunton, painter and glazier, November 4, at 12—Albert Thick, Woolston, Hants, builder, November 4, at 12—John and William Weeks, Painton and Dartmouth, builders, November 4, at 12—Giles Beard, Horton, Gloucestershire, timber dealer, November 6, at 11—John Lee, Primrose hill, near Huddersfield, stonemason, November 13, at 10—James Peters, Bristol, carpenter and builder, November 6, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 10, G. Warriner, Bedford-row, engineer—December 8, H. Keen, Mevrick road, Battersea, builder.—December 7, C. Goldsby, London Colney, Herts, builder.—December 8, E. Phillips, Leighton Buzzard, timber dealer.—December 10, W. Burnham, Chipping Wycombe, builder.—December 11, J. Dungey, Middleton street Clerkenwell, gas fitter.—December 11, T. W. Taylor, Colchester, builder.—December 11, T. Sheen, Holborn hill, ironfounder.—December 11, J. Baker, Toddington, plumber.—November 27, R. Court, Aston, near Birmingham, builder.—November 4, G. Beard, Horton, Gloucestershire, timber dealer.—November 4, J. Peters, Bristol, builder.—November 5, J. Wale, Leicester, builder.—November 18, T. Byard, Newent, contractor.—November 6, J. Somerset, Liverpool, joiner.—November 3, W. Lunn, Balderton, bricklayer.—November 17, O. R. Rowlands, Bangor, joiner and builder.—November 16, W. Playford, Woodbridge, sawyer.

SCOTCH SEQUESTRATION.

David Lindsay, Glasgow, builder, November 4, at 12.

PARTNERSHIPS DISSOLVED.

Carey and Garnett, Halifax, stone masons.—Speakman and Gerrard, Eccles and Swinton, builders.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak ....load	£10	10	12	10	Archangel, yellow	£11	0	£12	0
Quebec, red pine	3	5	4	15	St. Petersburg, yel.	10	0	12	0
„ yellow pine	3	5	4	5	Finland	6	5	8	0
St. John N.B. yellow	0	0	0	0	Memel	0	0	0	0
Quebec Oak, white	5	5	6	0	Gothenburg, yellow	8	0	9	10
„ birch	3	15	4	15	„ white	8	0	0	0
„ elm	4	0	4	17	Gefle, yellow	9	0	10	10
Dantzic oak	4	5	5	10	Soderham	9	0	10	10
„ fir	2	15	4	0	Christiania, per C., 12 ft. by 3 by 9 in.				
Memel fir	2	15	3	0					
Riga	2	15	3	0	yellow	10	10	13	0
Swedish	2	2	2	5	Deck Plank, Dantzic,				
Masts, Quebec red pine	4	0	6	10	per 40 ft. 3 in.	0	14	1	9
„ yellow pine	4	10	6	0	PUMICE STONE per ton	6	0	8	0
Lathwood, Dantzic, fm	5	10	6	10	OILS, &c.				
„ St. Petersburg	7	10	8	10	Seal, pale....per tun	35	0	0	0
Deals, per C., 12 ft. by 2 by 9 in., duty 2s per load, drawback 2s.					Sperm body	10	0	0	0
					Cod	37	0	0	0
					Whale, Sth. Sea, pale	35	0	0	0
Quebec, white spruce	13	0	18	0	Olive, Gallipoli	49	0	73	0
St. John, white spruce	13	0	15	0	Cocoanut, Cochin, ton	52	0	55	0
Yellow pine, per reduced C.					Palm, fine	41	5	45	0
					Linseed	31	5	34	0
Canada, 1st quality	17	0	18	10	Rapeseed, Eng. pale	33	0	0	0
2nd do.	11	10	12	10	Cottonseed	29	10	0	37

METALS.

LEAD—

Pig, English	per ton	21	2	0	0	0	0	2½
„ Spanish Soft	do	19	10	0		0	0	
Shot, Patent	do	22	10	0	22	15	0	
Sheet	do	20	0	0	20	15	0	5
White	d	27	0	0	30	0	0	

Copper:—								
Sheet & Sheathing, & Bolt	per ton	78	0	0	80	0	0	
Hammered Bottoms	do	81	0	0	0	0	0	
Flat Bottoms, not Hammered	do	81	0	0	0	0	0	
Cake and Tough Ingot	do	70	0	0	0	0	0	3
Best Selected	do	75	0	0	76	0	0	
Australian	do	77	0	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7	
Iron:—								
Welsh Bars in London	per ton	6	10	0	6	15	0	3
Nail Rod	do	7	7	6	7	10	0	
Hoops	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars	do	7	7	8	7	15	0	
Bar in Wales	do	5	15	0	6	0	0	3
Nailrods	do	7	7	6	7	10	0	2½
Foundry Pigs, at Glasg. No 1	do	2	13	3	2	17	6	net.
Swedish Bars	do	10	10	0	10	10	0	2½
Tin:								
English Block	per ton	95	0	0	0	0	0	
do Bar	do	98	0	0	99	0	0	2½
do Refine	do	97	0	0	0	0	0	
Panca	do	0	0	0	97	0	0	nett
Straits	do	92	10	0	92	0	0	
Zinc:—								
English Sheet	per ton	25	10	0	26	10	0	2½
*Devaux's V. M. Roofing Zinc	do	27	0	0	0	0	0	
Steel:—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
Spelter:—								
On the Spot	per ton	20	0	0	0	0	0	
Quicksilver	per btl	8	17	0	0	0	0	
Regulus of Antimony								
French	ton	43	0	0	0	0	0	

* And 4 per cent. discount if laid upon the new system

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 6, 1868.

THE ADDRESS OF THE PRESIDENT OF THE INSTITUTE OF BRITISH ARCHITECTS.

THE President, in his address at the first ordinary general meeting of the session, on Monday evening, and some of the speakers who followed him, touched upon sundry questions of considerable importance to the profession, upon which we would make a few remarks. The principal one was that of competitions, which is a vexed question indeed. Mr. Tite took occasion to review the proceedings in the case of the recent great competitions for the National Gallery and the Law Courts, which, though they may now be considered as settled beyond appeal, yet furnish a warning that for the future the regulations laid down and the conditions imposed and accepted should be more strictly and justly adhered to, if the most able men in the profession are to be expected to devote their time and their talents to the solving of architectural problems of such public importance. In those particular instances, as one of the speakers said, "It is time now to let the dead bury their dead;" and, as all seemed to agree that the result had been so far fortunate that the hands into which those two projected buildings have fallen are of first-class and acknowledged ability, and as Government has wisely abstained from trammelling them in their ideas, so that they are unfettered and free in every respect, a work in each case may be expected which will be an ornament to the metropolis. There are other public buildings to follow, and we would echo most earnestly the anxious desire expressed by Mr. Layard that the eyes of all concerned should be kept open, so as to prevent the occurrence of any gross blunders with regard to them, for the opportunities are such as have never before arisen, and may never arise again. The opening of the Thames Embankment must have rendered it evident to everyone that the sites it affords are those upon which the public buildings that are needed should be erected, and that if proper advantage be taken of them, the stigma passed upon London, as "the ugliest city in Europe," may once and for ever be swept away, for we unhesitatingly declare that no city, not even Venice, can boast of such a water frontage and such a noble stream passing through its centre. Alas! that the railway stations which abut upon its banks, and the bridges which cross it, should have been taken in hand just too soon, for had they been projected later than the completion of the embankment, not even engineers would have dared to have perpetrated such eyesores as they have done in its proximity. We must, in passing, take exception to the pungency of the strictures of Mr. Tite upon the Blackfriars Bridges; in our estimation, though open to strong architectural censures, we do not believe that they can in any way compete with the intense ugliness of those leading to the Charing Cross and Cannon-street Stations, nor be such defiant contradictions to the proprieties of metal design as that at Westminster. Time will shortly show, and we only trust that we are not taking too favourable a view of them; we also hope that the President is not mistaken in his anticipation that the long range of pavilions of St. Thomas's Hospital will hereafter be ranked among the few architectural successes of which London can boast.

Some very strong remarks, but not a whit stronger than the occasion deserves, fell from Mr. Godwin and Mr. Charles Barry as to certain competitions for various parochial infirmaries, hospitals, and other buildings now on foot. These seem reprehensible, not only on account of all names of eminence in the profession having been passed over in favour of untried men, but from the fact that the magistrates and authorities seem to have banded together to beat down the proper professional remuneration. As this is a subject which is under consideration of the council of the Institute, we look to that body for prompt and vigorous action in the matter. Many of the competitors who have acceded to the terms offered, which are insulting and degrading to the profession, are members of the Institute, and amenable to its discipline, and no half-measures can be dealt out to them. As it is, competition is the ruin of the architectural profession, and most injurious to the young men, the very class which it is supposed to benefit. They are brought by it into practice before they are fit, and though intoxicated by an early, seldom a deserved, success, they soon find out that one swallow does not make a summer, and that the system is a hard one which compels them to continual fighting and gambling to maintain the position to which it has raised them; and yet they cannot be surprised if the public use the weapon against them which they themselves supplied. We would ask Mr. Hope to take these points into consideration, for to him, as an amateur, the excitement of competitions may supply interest and amusement, and what may be death to us, may be only fun to him. Thus, when he asks "How is a young man without competitions to make himself known?" we might reply that we believe there are not quite so many architectural violets blushing unseen as he seems to suppose, and that if there were, the annual exhibitions would soon expose their fragrance, so that they need not long waste it upon desert air.

Another subject touched upon was the speedy completion of the new galleries for the Royal Academy, in respect to which no information was given as to whether any greater facilities are to be conceded to the architectural exhibitors than they have been used to—we can scarcely say—enjoy in Trafalgar-square. This is really a point which the Institute should agitate on behalf of the profession.

The only other remark made which we desire to notice was one by the President, deprecating the too rigid following of former styles, as being apt to degenerate into fashions: in this he was supported by Mr. Layard. Now, while there is much to say on this head, there is far more danger likely to result from the licence engendered by the opposite course. We are continually hearing of new styles, and of meeting the requirements of the day, but the efforts yet made which can claim any special novelty as Victorian are no improvements on the established styles. For our part, we would say, "Give us either good Gothic or good Classic, but none of your eclectic jumbles." Any requirement, modern as ancient, can be fulfilled in either. If they fail to be so, the fault is that of the workman, and not of his tools, of the architect, and not of the style which he employs.

THE ARCHITECTURAL MUSEUM.

THE council of this exceedingly valuable institution have just issued an announcement of the near completion of their new premises, which are situated in Bowling-street, Westminster, and they have invited their subscribers to inspect the home that has been there provided for the fine and unique collection of casts about to be removed from South Kensington. Much, they say, still remains to be done in the way of ornamenting the structure; nevertheless, almost the whole of the intended decorations have been liberally promised by various art manufacturers and workmen, and these are all expected to be completed and fixed in their places in time to permit of the opening of the Museum to the public, which ceremony is proposed to take place early in the coming year.

We heartily congratulate the council and subscribers on this highly successful result of their strenuous and praiseworthy efforts, for although the funds are at present exhausted, and an additional thousand pounds is needed in order to pay the balance due to the contractor for the building, we feel confident that the appeal they are compelled to make to the public for this amount will not long remain unanswered. The difficulties which have been encountered in the establishment of the Museum upon its present footing have been exceptionally great, and if the council had not at last boldly resolved almost to overstep the bounds of prudence in incurring this considerable debt, the whole scheme must have fallen to the ground, and the entire collection of casts would have been lost or dispersed.

It is, therefore, due to them under the present circumstances to make this perfectly clear, for which purpose, although the facts are familiar to many of our readers, we will give a short résumé of the history of the Museum. It cannot be denied that considerable impatience has been not unnaturally felt by many of the subscribers for some years past; this has arisen from their not having been able to see a sufficient or even any very tangible result for the long-continued sacrifices they had made in its behalf.

The Architectural Museum was founded in the year 1851, in order to supply means for the study of the architectural ornament of past ages, with the view of improving that of the present time. By obtaining and arranging casts from the finest ancient examples—English and foreign—it was intended to assist architects in designing, and workmen in executing, ornament, and to spread among the public a love for and knowledge of such artistic workmanship. In the first place, premises were hired in Cannon-row, Westminster, and the efforts made were so far successful that a large and valuable collection was got together, which was partly given and partly purchased. As this increased it outgrew the capacity of the structure in which it was housed, and the building, which was a mere timber shed, liable to destruction by fire at any moment, did not seem to be a fit and safe depository for contents of such value.

At this crisis, an offer having been made by the authorities at South Kensington to find space for it in their galleries, and the funds at the disposal of the council of the Museum being too small to admit of the payment of a heavy rental, negociations were entered into which ended in the transfer of the collection to that locality. The benefits conferred upon the two institutions at that time were mutual, for the Museum gained time in its infancy for development and growth, and was freed from the burdens which at that early stage would assuredly have proved beyond its strength, while the then unfilled galleries at Brompton received no mean addition to their attractions. Complete independence was stipulated for by the council of the Museum, and gracefully conceded to them, together with the free use of one of the theatres for the delivery of the series of lectures which they had established. By degrees, however, the objects of the two institutions were found not to be identical, for the one appealed to and strove to attract and gratify the general public, whereas the other was specially designed for the advantage of students—the one courted popularity and display, the other sought comparative retirement and repose. The latter thus found themselves denied the quiet and facilities they needed, while the former discovered little in the collection of architectural fragments of sufficiently striking interest to arrest their more cursory gaze. Under these circumstances, and convinced that South Ken-

sington was not the position likely to render their institution as useful as it ought to be to the working classes, for whose especial benefit it was intended, the council of the Museum sought long and anxiously either for existing premises suitable to their wants or for a site upon which they could erect such. The difficulties they encountered in this search were extreme, and required great energy to surmount. But at last they have been overcome, and the Museum may be said to be now placed upon a permanent and satisfactory footing. To give credit where it is due, we believe we are correct in attributing this successful result mainly to the indefatigable exertions and energy of Mr. Joseph Clarke, the honorary secretary, to whom also is to be principally attributed the design and superintendence of the building, for which he and Mr. Ewan Christian have kindly acted as joint architects. The thanks of the subscribers and all concerned should also be warmly accorded to the contractor, Mr. R. E. Roberts, who has executed the work in a most satisfactory manner and in a most liberal spirit, and we trust that he will soon meet with substantial "acknowledgments" in the shape of the payment of the large balance which still remains due to him.

Such is the history of the Museum. It now behoves us to speak of the material home that has been provided for it—of the collection itself we will defer any remarks till it has been transferred and arranged therein.

The site is a plot of ground within about two minutes' walk of Westminster Abbey, and may be approached from Great Smith-street, or from Dean's yard, the southern exit from which leads directly to it, and from which it is only a few steps distant. For the practical utility of the Museum this is a most excellent position, as it is in fact in the heart of the very district in which most of the art workmen and carvers of the metropolis reside.

The site contains upwards of 5,000 superficial feet. The frontage towards Bowling-street is about 40ft., and is occupied on the ground floor by the entrance in the centre and a small shop on either side. The façade is three stories in height, the two upper ones communicating with the galleries of the main building. The body of the structure is behind this façade, and is of the simplest charater, economy having been strictly kept in view. It consists, in fact, of but an outer shell of walling covered by a light iron roof, the greater part of which is covered with glass. A range of wooden posts divides it as it were into three aisles, the centre being open to the roof, while the sides have two tiers of galleries. The staircase is to be at the further end, rising from the centre and branching right and left. There is a considerable additional space or second court at the south-west angle somewhat similarly treated, from which two small rooms are partitioned off for the accommodation of the curator and porter of the establishment.

The only portion of the building which displays, or indeed which admitted under the circumstances, of architectural treatment and design is the street façade, which we now proceed to describe. The general material is ordinary red brick, with the gauged arches of rubbed superior bricks of the same colour, but there is considerable relief obtained by the use of stone, polished granite, tiles, and other materials. The main feature is the triple division resulting from the entrance archway and shop on either side. The wings are, we think, somewhat unfortunately made more prominent than the centre; they are comprised within lofty arched recesses, which are continued up to the top of the façade just below the cornice. These are pierced as windows only to the first floor, the space above being occupied by bands of ornament and circular panels within the arches. The mode of decorating these flanking arched recesses is, we think, happy, and the finest part of the whole. We will describe them again more in detail. The shops below are weak in comparison and little in harmony with all above. When will a shop be successfully treated? We fear other precedents must be sought than those at the Architectural Museum.

The entrance archway and the two-light window above, with its richly carved solid head under the comprising arch, are again separately effective and able, but the greatest defect in the composition, to our mind, is its stoppage at a lower level than the arches of the flanking recesses, and the consequent loss of the prominence which the centre of every such composition should have. It is but fair to say that this has been sought by other means, and that the statues and canopy on either side of the entrance will go far to redeem it in this particular. A square carved panel occupies the central space of the walling above the entrance, and a horizontal carved stone cornice with a parapet above, which has a series of arched recessed panels over each of the principal divisions of the front, completes the whole.

It will be seen by the above description that the design contains some unusually important and striking features, and an examination of their details will still further heighten the impression thus gained. Unfortunately, those parts from which most may be expected are so incomplete that it is hardly fair to judge of the effect of the whole in their present state, and we must defer any criticism as to their artistic excellence until they are finished.

The square panel in the centre which we have referred to may be taken as the post of honour, and is to be filled with the figure of St. George, carved in Sicilian marble by Signor Fabbricotti, from a design by Mr. Redfern. Next in prominence is the head under the comprising arch of the two-light central window of the first floor. It is a clever composition, in which several circular bosses are interwoven with rich foliage carving. One circle contains the design of the seal of the Museum, and those around it are to present portraits of the architect of the Parthenon, the architect of St. Sophia (Anthenius, of Tralles, in Lydia), and William of Sens.

The five polished red granite shafts of this window and those flanking it, which add greatly to the general effect, are gifts by Messrs. M'Donald, Field, and Co., and of Messrs. Fraser and Son, of Aberdeen.

The statues which are to occupy the positions on the brackets and under the castellated canopies in front of the central piles, in a line with the above shafts, are to be from the chisel of Mr. Earp and Mr. Farmer respectively.

Some oak tracery above the entrance door is given by Messrs. Rogers and Booth, of Gosport, and the carving of it by Messrs. Rattee and Kett, of Cambridge.

The circular panels in the heads of the flanking arched recesses are to contain busts in pale red terra cotta of William of Wykeham and Sir Christopher Wren, by Mr. Blashfield.

Below these are to be bands, 10ft. long by 3ft. high, by Messrs. Harland and Fisher, in their new painted encaustic tiles, representing processions, and these are set between bands of glazed red tiles with projecting green bosses, by Mr. Godwin, of Lugwardine. These bands are effective and rich, but they alarm us with visions of the plague of boils to which we shall be subject now that such facilities are presented to our present generation of boss-loving architects. Then the whole of the windows are to be filled with stained glass by various art manufacturers—three lights by Messrs. Clayton and Bell, two lights by Messrs. Lavers and Barraud, and one light by Mr. O'Connor, all of which are to be fixed in casements, which have been presented by Messrs. Burt and Potts, while quite a keen competition took place for the honour of giving the revolving shutters for the shops, Messrs. Clark and Co. having been successful in obtaining the opportunity, Messrs. Bunnett's offer having been sent later than theirs.

For the decoration and fitting up of the interior other liberal presents have been made and accepted, but the only one we could see in the present unfinished state of the building was a portion of the flooring which is being paved by Messrs. Maw with their enca tiles. Messrs. Minton contribute tiles for the centre of the larger court. Those for the lesser court will be by Oppenheimer, of Manchester; and another portion is to be laid with similar materials, from a design furnished for the purpose by the Rev. Lord Alwyn Compton, by Mr. W. Godwin, of Lugwardine. Walker, of Burslem, and Rust and Co. also make other presents of tiles. The walls of the lobby are to be decorated in part from cartoons furnished by Messrs. Clayton, Bell, and Co., and executed in mosaic by Dr. Salviati, partly by Messrs. Rust and Co., and partly by Messrs. Harland and Fisher, while other internal decorations will be furnished by Mr. Charles Hudson.

The Museum will be enriched with a considerable quantity of ornamental wrought-iron work from the workshops of many spirited manufacturers. Thus a balcony, whence lectures will be delivered, is to be given by Mr. Skidmore, and other articles will be supplied by Hart, Hardman, Peard and Jackson, Brawn and Downing, Richardson, and Slade and Ellson.

Many other articles of equal utility and cost, if less ornamental, will be contributed, among which we may name the sun-burner by Messrs. Strode and Co., staining and varnishing by Mr. Swinburne, a large stove by the London Warming and Ventilating Company, a washing apparatus by Mr. Jennings, while some furniture has been promised by Messrs. Cox and Son, and by Mr. Chapman, an art workman.

We think that the munificence and enthusiasm displayed by the above list of donations are most gratifying, and show an appreciation of the objects of the Museum on the part of the leading art manufacturers which almost guarantees its success; and we cannot doubt for an instant that a place for study which will be not only well-furnished with first-class examples, but replete with comfort, and positively sumptuous in effect, and which is planted among the very homes of the art-workmen, will be extensively used and enjoyed by them. We fear that the perusal of the list may create some disappointment to numbers who, had they been aware of such an opportunity, would have hastened in like manner to do what lay in the power of each towards the adornment or furnishing of so useful and popular an institution. We sympathise with such in their disappointment, for large though the structure is, it is not large enough for the display of every gift in kind that would have been lavishly conferred upon it. It is therefore positively a boon that there is so considerable a deficiency in the fund for defraying the cost of the actual building, to which such may still contribute in proportion to their means. There is not an architect who will not benefit if not directly by the Museum, will do so at least indirectly by the education it will furnish to those upon whom he depends for the execution of his designs; there is not a manufacturer of any article of general utility to whom it is not an object that the workmen under him should improve in intelligence and artistic power. The public who will employ the manufactures so improved are likewise strongly interested in the success of the Museum; so also are the workmen themselves, since, according to the use that they make of the advantages herein offered them, they will find their services at a premium, but on the other hand if they neglect them they will soon find themselves, in these days of increased international communication, left behind in the keen competition for employment which has become universal. We anticipate, therefore, that numerous architects, art manufacturers, and art workmen will at once hasten to enrol their names among those

of the subscribers. Of the public many also will doubtless swell the list, but to them we look rather for the future patronage of the artistic productions, the expected result of the movement of which this Architectural Museum is one of the most substantial and visible embodiments. Thus far we have addressed ourselves to the building and the more immediate and pressing necessity of providing for its cost. It must not be forgotten, however, that to maintain the efficiency of the Museum and to carry out properly the programme of the council, the exertions of its friends must not be relaxed. We believe that the authorities of the Department of Science and Art will liberally take upon themselves the removal of the present collections of casts and specimens and the fixing of them in their new home; possibly they may add to it some of their own casts of details, as their efforts are now more devoted to obtaining copies of entire works of art, and it is hoped that they may assist in the preparation of a catalogue of the contents of the Museum.

Further loans and gifts of casts have been promised by the Royal Institute of Architects, by Mr. Scott, Mr. Brucciani, and Mr. Octavius Hudson, and many others may be expected when it is known that there is ample room for their reception. The next point of importance, that of taking steps to make the collection serve its purpose of practical teaching, is, we learn, now under consideration of the council. Their past efforts in this direction have comprised the delivery of courses of lectures upon subjects connected with art, architecture, and art manufactures, together with offers of prizes "for the most meritorious specimens of stone and wood carving, metal work, glass and decorative painting, modelling, drawing, &c., in order to encourage and individualise the art workmen of the day." We hope that they will soon find themselves in a condition not only to follow out this programme, but even to develope it. To do this, however, they must have their annual subscriptions increased to about £600; they now only amount to about £300 a year, which they truly say is "a very small sum where the interests of so many are concerned." Earnestly wishing the Museum all the success desired and deserved by its council we now take leave of it in the hope of being able on a future occasion to refer to it when completed and in working order.

EDUCATE! EDUCATE!! EDUCATE!!!

IN these electioneering times we find even our placid selves catching the popular fever and breaking out into notes of admiration, and though the cry with which we head this article is shouted loudly at us from the broadest posters over all the country, and rampantly talked of from every platform, there is something else to be said about it which we have not yet heard. One want is much felt, one branch of elementary education in need of cultivation, and an addition is sadly required to those "three R's" which have been supposed to combine all that is necessary for human knowledge, and of this want we hear nothing. If to the workman there is a branch of knowledge which to him is more than another power it is the knowledge of how to draw, and yet it is strange to find how perpersistently this knowledge is looked upon as too good to give him—to give him at least, as healthy food. We see it doled out to him in little doses as a luxury, and he is taught to look upon it as such, and thus both the gift and its recipient are spoiled thereby. It is true we have provided a very costly machinery, which we have tinkered up from the Brompton Boilers to the Palace of Arts and Sciences at South Kensington. True, we have created many snug berths and built some very nice houses for its stokers and pokers. It is true we have branch establishments all over the country, with masters and assistant masters and certificated pupils, &c., &c., &c., but it doesn't work. The machinery, in fact, is much too cumbrous, and the worst of it is it won't make the article wanted.

Let us confess the fact, we have begun at the wrong end; we were so very sanguine about crowning the edifice that we forgot all about the foundations, and the wisest thing we can do now is to begin again in a better manner. Our first and greatest mistake was in providing separate schools and establishments for the teaching of drawing. Instead of looking upon it as an ordinary branch of elementary education, instead of treating it as a parallel to the art of writings or the art of grammar, the art of drawing has been looked upon, not as a necessary part of, but as an especial addition to ordinary knowledge, and the absence of it has not been esteemed ignorance. The very severance of it from the common curriculum of study has fostered this idea, and the consequence has been very serious. The acquisition of the rudiments of the art under the present system too often turns out a bane rather than a blessing, and the most conceited and worst class of workmen we know are those who have been unfortunate enough to win a prize at a Government school of art, They are puffed up with the wonders they have done and henceforth think themselves so much above their fellows that they scorn to be "artisans," and think themselves "artists," They soar to flights for which they are not fitted, and, Icarus like, fall in consequence too frequently to drown their senses and their aspirations in discontent and gin and water. This, alas! is no fancy sketch; many and many a career is summed up in this short sentence, and many and many an intelligent and able workman has been utterly ruined by this mistaken system, and the hundreds of thousands of pounds we have spent under the auspices of the Incubus who sits in South Kensington have worked more harm than good to the class who most needs our aid.

We will see what all our costly apparatus has done, and what part of it has been truly useful, in order that we may separate the tares from the wheat now that the wheat is fully ripe. South Kensington—it is somewhat ominous, by the way, how we speak of it as a separate power, an *imperium in imperio*, a state apart from "My Lords the Committee of Council on Education;" even its lawful title of the Department of Science and Art doesn't express it—South Kensington, then, has done great and excellent service by collecting what soon will be the finest museum of industrial art in Europe. By bringing together in its various loan collections many precious reliques of the art industry of the past, illustrating the study of the history of civilisation in the most brilliant manner, it has converted many a bric-a-brac collector from the mere hoarder of "auld nick-nacketts" to the scientific researcher in many a forgotten process, many a defunct handicraft, and leading to the revival of many a long-lost art. For this it deserves our warmest praise, and this we accord to it with the most grateful feeling, trusting that it may long continue to do such good work; nor do we begrudge the cost—though it is somewhat large—of what has thus been done.

Its passive instruction has been excellent, but *ogni medaglia ha suo reverso*, and its active teaching is execrable. Established at an enormous outlay with the idea of benefiting the arts of design—if there are such things—it has taught drawing to that portion of the middle classes which learned it before, and who look upon drawing as an "accomplishment." Its students are almost entirely composed of this class, attending until disgusted with its soulless routine, and then falling off to be replaced by others with the same result. Some few of the upper half of the middle classes who have not to work very hard nor very early for their living go on a little further and become a nuisance to their friends, and perhaps one here and there does something rather good. But very little comes of it all, and very little help do the industrial arts get in this way from South Kensington. An intimate connection with many branches of art workmanship has revealed to us how very few who have gone through a course of Government Art Training are employed in designing for art manufacturers. Some few undoubtedly there are, and here and there an able man, but it is very questionable if these would not have been much better without the forcing process they have undergone. As a rule, the best manufacturers seek higher aid than this, and notably that of architects. Owen Jones, Digby Wyatt, G. T. Robinson, W. Burges, E. W. Godwin, and many others have rendered far more aid to that improvement which has taken place in our industrial arts than the shoals of half-educated young men who, turned out of this would-be manufactory of artists, have found their whole life to be a commentary on that pregnant line of Pope's—"a little learning is a dangerous thing." Nor if we examine the results of the departmental training in the higher walks of art do we find anything worthy of all this expensive and cumbrous machinery. As we have recently had occasion to remark in these columns, there exists among us no special training for the artist; and the English painter, sculptor, or architect would sum up his career in those memorable words of Topsy, "spect I grow'd." The lack of any adequate scholastic training for the higher branches of art undoubtedly influences a baneful effect upon its growth, but in comparison with the enormous importance of the elementary education of the working classes this falls into comparative insignificance. It is at this important epoch, when so many men are honestly thinking of doing good by getting into Parliament, that we would especially urge the consideration of this question, and as every man nowadays must have a "mission," we should hail with acclamation the endeavours of some energetic and very persistent man who would wrestle with South Kensington. What is required is that the enormously expensive encumbrances which surround it should be lopped off, our special schools of "design"—heaven save the mark!—be done away with, and elementary drawing made to form a portion of the daily education in all our subsidised schools. Let the drawing-book and the copy-book take their place side by side, and, above all, let intelligent observation be more cultivated than neat execution. Not the least of the many evils of the present system of Government teaching is its cramping insistency on the fine wire-line style of drawing—the worst feature of the worst class of German training, which, by a strange fatality, it most persistently adheres to. Copies, supposed to be given to induce freedom of hand, are required to be executed in a style which forbids it, and objects having no especial interest to the pupil are imposed upon him *ad nauseam*. We would urge the attention of all interested in elementary education to the noble efforts and the wise direction made by and exercised in Belgium. Here drawing and writing are taught as necessities at the same time, and the first lessons are given with a piece of chalk on the black board. Rough, vigorous, intelligent outline is that which is demanded rather than mechanical precision. By this means free and prompt control over the muscles is acquired, rapid education of the eye ensured, and the legitimate end of drawing as a rapid means of description—an unmistakable shorthand—attained. In Switzerland, too, though drawing is not an obligatory portion of elementary education, the main end of the art of drawing is much better kept in view, and a recognisable representation is more sought for than high finish. In Prussia, where drawing is an enforced study on all, the schoolrooms are not hung round with neat moral texts (rubricated capitals and black letter illegible), but with large cartoons of figures, geometrical combinations, and draw-

ings of the common objects of daily life, whilst the primer or *handfibel* of the children contains small and detached portions of these as lessons in drawing. By this system the elements of composition are inducted and the syntax and prosody of the art of drawing taught with those of the art of grammar. We do not think we need do more than point out the increased range of observation thus gained as one of the causes why so much more progress has been made in Belgium, in Prussia, and in Switzerland of late years than with us. Contract after contract is leaving us. English civil engineers no longer find work abroad. The increased intelligence of their workmen outstrips ours in the race, and our country is losing its prestige, its power, and its trade. Meanwhile we have spent egregiously and suffered long. We sincerely hope that in the re-reformed Parliament now being elected there will be found some who will think seriously and do well for the workman, some who will recognise that the true wealth of his country lies in the intelligence of her people. Should they be found, we can promise them much present obloquy, but much future gratitude if they will struggle long and hard to strangle that fictitious fostering which has poisoned—not nourished—the elementary art-education of this country; and we would impress upon their minds the fact that the truest patriot is he who most helps the people to help themselves. Archbishops, archdeacons, and archpresbyters, of all kinds, have lately lectured the poor workman about getting drunk, but the only way to prevent the demand for fictitious excitement is to give to the mind a wider range, a greater faculty of observation, and thereby a greater source of pleasure, than can be obtained by debasing means. With this faculty of observation will come the power of reflection and comparison, and the increase of these mental qualities will obviate many evils now caused and endured by the working classes; and for these reasons we would urge the adoption of the best means of cultivating them. Compulsory education will come. Factory acts enforce it in part, but meanwhile we would urge the introduction of the art of drawing into every school, and for this important branch of learning we raise the cry we began with—Educate! Educate!! Educate!!!

TIMBER IN ALGIERS.

THE worst evil to which colonists can be exposed on settling in a new and undeveloped country is the want of water, and the next worst is the dearth of wood. Although the climate may not necessitate the use of a fire for the purpose of simply raising the temperature, yet the exigencies of the preparation of food will demand its constant employment. Any country that is well wooded and well watered, even if the soil be but moderately fertile, is calculated to answer the expectations of the emigrant, and in the long run reward him for the time and money he may lay out upon its amelioration. It was for a long time supposed that Algeria possessed no forests of any importance, and it was not until the London Exhibition of 1851, and that at Paris four years subsequently, that the supposition was proved to be a popular delusion. The display at the latter Exhibition of over three hundred different descriptions of timber corrected the false impression commonly entertained, and demonstrated that the French colony, especially the department of Constantine, was rich in timber and forests. Neglecting small wood, the total area of timber-producing land may be taken at five million acres. This vast extent of ground is covered by no less than 140 different descriptions of trees, of which 60 at least are suitable for employment in the various manufacturing and industrial arts. Only a few of these, comparatively speaking, have been actually utilised. They include several varieties of oak, the pine, thuya, cedar, citron, walnut, juniper, elm, mastic, and ash trees. Similarly to all other materials these woods may be classed under three general heads or principal divisions. The first of these includes all those adapted for purposes of actual construction, which may be properly termed large timber; the second, the woods suitable for joinery and house carpentry; and the third, those fit for cabinet and inlaying work. All the varieties of oak answer well as a constructive material, but the green oak and the specimen termed zeen are particularly esteemed. When the Turks occupied the country, previously to the expedition under Lord Exmouth, they built their war ships of the latter timber. It is at the present time largely employed for shipbuilding, and also for railway sleepers. One objection raised against it, and one to which every kind of wood is liable, is that in drying it warps considerably. This objection is, however, more specious than real, and can be easily mitigated, if not altogether obviated, by the adoption of proper preventive measures. In point of density and toughness these woods are superior to those of a similar description grown in Europe, and could replace them with great advantage. Their price felled in the forest is about 1s. 3d. per cube foot. In addition to these two kinds, there is a third extremely well adapted for the manufacture of furniture and the interior fittings of houses, such as wainscotings, panelling, and flooring. The appearance of this wood is very handsome; its colour is a deep red, black at the heart, with brilliant rings and a fine close grain. It takes a splendid polish, and retains varnish with great permanency.

From the earliest times, especially in Oriental countries, the cedar has been justly esteemed as occupying one of the foremost places among trees adapted for the construction of buildings. The request in which it was held in the days of Solomon, not only by him, but by other nations, is known universally. Both the provinces of Algar and Constantine are abundantly supplied with this magnificent produce of the forest, which frequently attains a height of 70ft., and a girt at the base of over 18ft. These unusual dimensions render it very serviceable in heavy carpentry, where balks of long lengths are required, and for which it is equally well adapted by reason of its other favourable properties. It is resinous without being sticky or gummy, and is readily worked by the hatchet, the saw, and the plane. For ornamental purposes it is invaluable, since, in common with all fragrant and scented woods, it possesses the advantage of being unassailable by insects. Its price, in the rough, is nearly sixpence per cube foot. Another Algerian tree, the Alep pine, reaches to an altitude of 60ft., and were our supplies from Russia and Norway to fall short, or to be cut off by any unforeseen contingency, we should be able to obtain any quantity we might require from the French colony. The price of this African pine is about the same as that of the cedar, and it is extensively employed in shipbuilding, and also makes capital posts for carrying the electric wires upon. The olive is another wood peculiarly suitable for furniture of an ornamental character. Some of them have diameters at their base exceeding 10ft. Both the elm and the ash grow to great size and perfection in Algeria, and can challenge honourable comparison with their European congeners. The price of the other ornamental woods mentioned at the commencement of our article varies from fourpence to sevenpence the cube foot.

The tree the best adapted, by virtue of its special qualities, for cabinet work, is the thuya. No other wood can compare with it for the beautiful manner in which it is marked and the richness of the veins presented by the trunk. Its grain is fine and close, rendering it susceptible of an exceedingly high polish, and it affords every variety of tint, from a bright crimson to the rosy colour of freshly felled mahogany. About 2s. per cube foot is the price of this highly ornamental wood in the rough. Not content with the timber that is indigenous to the country the colonists have introduced others from different lands. Some years back the blue gum, *eucalyptus globulus*, was imported from Tasmania. In its native soil this tree grows to almost a gigantic size, and, in addition to possessing all those qualities rendering it a serviceable constructive material, it is endowed with the peculiar property of emitting an aromatic odour, which, it is stated, exercises a purifying influence upon the surrounding atmosphere. From the above particulars it may be fairly presumed that the opening up and working of the Algerian forests, which at present are scarcely touched, will ultimately prove a source of great profit and emolument to those who have the capital and enterprise to commence and prosecute the necessary operations. France alone consumes annually nearly seven million cubic yards of timber. A third only of this quantity is obtained from its own forests, and she is, therefore, compelled to rely upon foreign sources to supply the remainder of her demands. There is no doubt that were the colonists to establish a timber trade upon an extensive scale, they could not merely supply the mother country at a cheaper rate than Russia and Norway, but would in all probability come in for a large share of our own importations in that branch of commerce. It is astonishing how rapidly any well-organised description of traffic developes itself under proper management and liberal conditions. The northern portions of Europe have long had almost a complete monopoly of the timber trade, so far as their own productions are concerned, and it is time that other countries possessing equal natural resources of a similar character should make an effort to rival them, and send into the great national markets the produce of their own forests and plantations.

ARCHITECTURAL ASSOCIATION.

ANOTHER session of this association was commenced on Friday evening last by a *conversazione*, which was very fully attended. A fine collection of embroidered needlework, by Brangwyn and Co., of Bruges; a display of Venetian and Bohemian glass, by Salviati and Co.; specimens of a new tile decoration for walls (referred to by the president); two sections of the old box front of Her Majesty's Theatre; and several series of well-executed sketches all contributed to the interest of the meeting. The following new members were elected:—

H. Marsh, W. Hilton Nash, James Williams, J. O. Butts, Owen W. Davis, Robert Blackmore, S. D. Pettit, Luke Ward, G. Y. J. Blackburne, A. Edwards, R. L. Cox, W. L. Bernard, R. Whichelow, T. C. Yates, R. P. Wood, T. Benskin, W. Frame, A. G. Winsor, W. Penstone, W. H. Saunders, George H. Hunt, R. S. Besant, E. Evans Cronk, W. J. Cuthbertson, Berman Swinstead, Walter Miller, Charles C. Petley, John Calder, W. H. Espenett, and C. Greaves.

The following prizes were then awarded:—

The Architectural Association's prizes for the best essay upon the influence of art upon literature or the history of stained glass:—First prize, Mr. Lewis F. Day; second prize, Mr. C. H. Boyes.

Prizes offered to the Class of Design for the best series of sketches contributed in the class:—First prize, Mr. Walter Evill; second prize, Mr. Walter L. Spiers.

Prize offered to the Class of Construction and Practice, for the best summary of subjects treated in the class:—Mr. C. Bell.

Prize offered to the Figure-drawing Class for the best series of studies in the class:—C. H. F. Lewes.

Prize offered by the Architectural Union Company for the best series of measured drawings from existing buildings:—Mr. W. Henman.

Mr. Tite's prizes for the best design for a church to seat 800 persons in a street of lofty houses:—First prize, Mr. Walter L. Spiers; second prize, Mr. Arthur Hill.

Mr. T. Roger Smith then rose, and in a somewhat lengthy speech highly eulogised the labours of Mr. J. Douglass Mathews (who has been one of the honorary secretaries during the last five years), and concluded by presenting to that gentleman in the names of the subscribers (about one hundred in number) a handsome épergne and a number of valuable works on architecture.

Mr. Douglass Mathews, in thanking the doners, said that in receiving their testimonial he felt that he was taking much that belonged to others, for to his colleagues was due much that he was credited with.

THE PRESIDENT'S ADDRESS.

Mr. WILLIAM WHITE, F.S.A., F.R.I.B.A., commenced his inaugural address by congratulating the Association upon the work that it had done and the success it had achieved during the past year. The influx of 120 members during the year, and the selection of 35 more at one meeting, showed that the Association was in a flourishing state. It was refreshing to find an Association in these days of which it could be truly said that the work it did was greater than the noise it made. The work which the Association had to accomplish was great, and to the accomplishment of that work it was devoting all its energies. Nothing could be a greater work than that which encouraged mutual improvement amongst those who had only themselves to rely upon for their education in that technical knowledge which was indispensable to them. If he expressed any misgiving as to their choice of president this year, it was not because he had any lack of interest in the work, but because he might not be able to afford exactly that kind and that amount of help to the work which their confidence had a right to claim and expect. An opportunity lost was lost for ever; an opportunity seized and used was a sure stepping-stone to further advancement. This thought afforded an opportunity for urging upon the junior members especially of the Association the advantages which they would derive if in the discussions upon subjects treated of at the general meetings they would not let slip any opportunities of gaining and of giving instruction, such as asking questions of those who gave addresses or read papers, and suggesting reasons for or objections to any argument or fact brought before them. This might be the means of bringing out some further truth or illustration throwing additional light upon the matter. The Association was essentially one for mutual improvement and encouragement, and this should not be lost sight of. If any investigators or teachers in any branch of art did not enjoy the members' confidence, yet, as George Herbert says—

> Do not grudge
> To pick out treasure from an earthen pot.

Something might be learnt from everybody, and an accumulation of small items of knowledge might prove of great value. But besides being an association for mutual improvement it was also, to a very great extent, one of mutual co-operation for the purposes of education. The various classes were happy in their selection of able professors in their several departments of study, and the formation of these classes was the most hopeful sign of permanent success. The very idea of *mutual* education implied in some respects a weakness of system and of position but one degree removed from *self* education. An establishment of students without a body of professors and without a college was in itself an anomaly. It showed the greatest possible desire amongst learners to obtain knowledge, but it showed that no authorised sources were open, or at all events no sources which were equal to the demand made for them. And it was not quite free from the pernicious effects almost inseparable from any system of licentious self-government. This was exemplified in the working of the Class of Design in several particulars. It almost necessitated an expenditure of unremunerative labour from the attempt made to ignore or reverse the good old maxim, "Out of nothing nothing comes." Pragmatical attempts at design were sometimes induced before the store of either practical knowledge or æsthetical power was sufficient for the task, and it was destructive of the formation of individual character. It was like the universally-deprecated evil of allowing a child of ordinary capacities to extemporise on the piano whilst still unpractised in the scales, still uninitiated in counter-point, still unversed in the works of the best composers. This was denounced as a practice the most destructive possible to future knowledge and power in music, and it might be the same with the art student. Without deprecating the attempts made for mutual improvement, he (Mr. White) would endeavour to give an intelligible rule and reason for the guidance of future students. In some such way as that instanced the mutual improvement system showed an unwholesome state of things, to remedy which the best efforts should be made. It might take long to prepare any permanent or satisfactory scheme, but the idea of it must be kept steadily in view—it might be for years—until it was fairly started on a proper footing.

The wide question of art education demanded the best attention. For a true and permanent development, it was of but little use for anyone independently to follow his own devices as to what was right and wrong, but all ought to aim at perfection in some one given direction. And, in order to this, education ought to be systematised, and to a considerable extent centralised, in the same manner as the higher branches of education generally are centralised in our universities. But so long as one teacher led in one direction and another in an opposite direction, so long as there was no common consent as to the first principles of design, our work must be feeble and our progress slow. Upon the student was thrown the burden of weighing the claims of rival views and opposing theories when his energies ought to be more exclusively devoted to the acquirement of knowledge and of expertness in a course of ascertained results. Some sort of convention in art was not only desirable but essential to a healthy condition and to a successful development. That mere whim was not a leading motive in any age preceding the decline of its architecture was evident from the fact of the wonderful agreement in each successive era of the way in which all architects, even with a difference of detail, followed the same manner in the treatment of its ornament when reproducing any typal variety of natural formation. In these days any such conventional treatment would be regarded as destructive of that spirit of originality which gave a character to all true art. But by learning to be truthful we might fairly hope in due time to go on and be original. If originality was made our first goal it would be long before we arrived at truth. Just as pretentiousness in a building was destructive of its character when any approach to poverty was shown in the thinness of its construction or in the unfitness of its material, so also was originality destructive of character if it had not a basis of truth whereon to rest. Originality exhibited the highest development of the imaginative faculties, but the originality of a feeble imagination or of an untutored mind would offend either by its pretentiousness or by its poverty. In these days of morbid craving for something new and striking, and of ardent desire to avoid tameness, the snare into which all were likely to fall by aiming at that to which they had no real claim must not be forgotten. At the same time, students must beware of committing themselves to an education too exclusively technical, remembering always that architectural art embraced the truly æsthetical as well as the essentially structural. Whilst guarding against a spurious originality we had equally to guard against a despondency at the slow progress made towards a good and enduring standard of practice and taste. Drawings could be made *ad libitum*, but early opportunities for the display of great things in durable material were comparatively few. It was only when built that the true expressiveness of a design could be properly realised.

The claims of a liberal education in order to qualify an architect for his work were hardly recognised as they ought to be. The cultivation of mind and refinement of taste which such education alone could give were amongst the wants of the present age. In the desire to impart an early knowledge of the technicalities of the art, care should be taken lest valuable time for early training should be lost. There was no fear of failure in the practical and scientific branch of the profession; but in the midst of a money-making age it was of the greatest consequence that there should be a deep and widely extended under-current of poetic feeling and unselfishness which should impart tone and power to what would otherwise degenerate into a merely practical and commonplace display of magnificence or of luxury. Forms suggested by the study of the ancient edifices of Athens or of Rome, or of the more recent period of the middle ages, might be taken as a basis of design, or, it might be, some compound of the two great eras of architectural development, in all cases of course being largely influenced by modern requirements and by all the resources which science had opened up. But let this be done ever so studiously and conscientiously, the model would not be approached in spirit and feeling if this great under-current was wanting. The intellect must be educated and the imagination cultivated, or the minds and feelings of others could not be impressed. What was the origin of the great Gothic revival? Who was it that first of all inspired the nation with a desire to understand and appreciate the genuine beauties of our national mediæval architecture? Was it Grose or Britton, Pugin or Ruskin, Rickman or Scott, or the host of others who had more or less vividly brought forward the forms and features of the works of our forefathers? No. They supplied a demand which had been created by a far different machinery. It was to such men as Sir Walter Scott that we were indebted for sowing the seed which had grown up, and was now bearing plentiful fruit, by bringing into popular notice and estimation the associations which gathered round the neglected and ruined remains of England's greatness in the middle ages. But it was urged that it was the buildings, not literature, which influenced Sir Walter Scott. This, however, was only another phase of the same mistake. It was literature and the careful study of ancient authors which called his attention to the buildings, and taught him to love and admire their beauties, at that time hidden from his fellow countrymen. When a merit was made of denying or depreciating the connection of poetry with architecture, or the influence of literature upon it, it was a sad evidence of a great national deficiency. It would be wrong not gratefully to recognise the work which Mr. Ruskin had done by throwing into popular form many of the principles of design which pervaded mediæval works. Well did he say, in speaking of modern attempts at revival and architectural education, that what was wanted was not so much to teach men to design *from* principles—which was an impossibility, for design could not be taught—as to educate the nation into a poetic frame of mind. It was urged, on the other hand, that the remains themselves, and the delineators of them, led to the present revival of Gothic architecture. Though true, this was but a small portion of the truth. It was the engine *minus* the steam. If it were the whole truth, it would be impossible, on the one hand, to account for the fact that those very buildings had exercised little or no influence upon the architectural mind of England for the last three hundred years until the present century, although before the eyes of the nation during the whole of that period, many of them in a far better state of preservation than they now were. On the other hand, the revival of the so called Classic art in England took place on the revival of Classical literature. Literature and the study of ancient remains represented the two great influences which were ever bearing upon architectural expression and practice. The study of precedent would naturally have the most direct and immediate effect upon form and style; but literature, though indirect and more slow in its operations, was none the less sure and deep in its influence upon the feeling and spirit which always underlaid that form if it was to express more than a practical purpose in its conception.

The report of the Society of Arts upon the subject of technical education was deserving of special attention. This was taken up warmly by the late president, Mr. Phené Spiers, in conjunction with Mr. [illegible], who were deserving of the thanks of the Association for the great attention which they gave to the subject, and for their supplementary report calling particular attention to the necessity of a liberal education for the architect, and of proper drawing classes for the purpose of perfecting his education. During the present year, the importance of the study of art as a material branch of a liberal education at our universities had been brought before the world by the noble bequest by the late Felix Slade, F.S.A., of £35,000 for the sole purpose of endowing professorships and scholarships at Oxford and Cambridge, but chiefly in London, University College being named as one of the recipients. There was hope, therefore, of some speedy improvement, for the scheme had to be matured within two years from April last. Long before this bequest was made the Professor of Architecture in University College, Mr. Hayter Lewis, had drawn up a scheme for the extension of the study of the fine arts as a branch of general education for all classes. A more comprehensive scheme than that implied by the bequest had been adopted by the Senate, and would doubtless have been carried into execution by the council had not the Slade bequest checked the development of the scheme for a time by bringing increased force into play. A proportionately large scheme had already been suggested, and to a certain extent matured, by an influential member of the council of the college. The scheme, though thrown out as a mere sketch, was excellent and well considered, but it was seriously to be questioned whether it was in accordance with the intentions of the testator. A still graver question, however, arose whether it would be practicable and acceptable to the public, as competing against and clashing with the old-

established educational system of the Royal Academy, the *prestige* of which ought not to be divided by a rival body, whatever might be the imperfections attaching to its present working. What a noble supplement might be made of Mr. Slade's bequest if it were used rather as a nursery to the Royal Academy to force that institution to take more active measures for the fullest development of its resources for the education of the masses of art students generally. Whatever course events might take, the legacy might have most important bearings for the members of the Association, as opening the door to a higher system of education in the fine arts than could now be acquired. It remained to be seen whether architects might not, after all, be left out in the cold dark—whether all that they had been craving and clamouring for as the very keystone of their position was to be simply ignored or gracefully recognised by those who had the disposal of the fund. Happily there was no need to put the question to the Association whether or not it considered the study of painting, sculpture, and drawing from the nude and from the model as integral parts of an architect's proper education; nor yet whether these branches of art were the guardian angels which condescended to take their young *protege* called Architecture under their patronising wings. The Association had already shown by its several classes—so ably conducted and so well attended, established by mere co-operation amongst those who were deserving of far higher opportunities—the recognition of the absolute need of these studies as an integral part of architectural education; whilst its very foundation (the members out of which it arose having been a drawing association) is witness to the fact of its maintaining the position of architecture as embracing and holding together in one all its subsidiaries. He (the president) would lose no opportunity of bringing forward before anyone who might have influence with those concerned the claim of architecture to be regarded not as a fine art, but as *par excellence the* fine art. A liberal education necessarily implied a longer course of study than was usually given to architectural students. It would prevent many from entering so early into practice for themselves. Under the present state of things a man considered himself turned out a finished architect long before he was properly fitted for the work. Great as was the value of literature to the architect, it must not be supposed to take the place, in the very smallest degree, of the study of existing architectural remains. It must be regarded only as a golden lamp by which to read the lesson taught by such remains. The student must carry with him an intelligent and appreciative mind, as well as pencil and paper, to enable him to listen to and learn from the true though silent eloquence of the old work. But he must make himself well acquainted with every form of preceding art by reducing it to line and shadow upon paper, for the purposes of comparison and analysis. More might be done than had been to supplement the good which had already been effected by travelling studentships, by members associating together, under proper leadership and management, to work a given district in a systematic way. The amount of observation thus concentrated on one locality would give everyone the advantage of the inferences to be drawn and the lessons to be learnt from such study, and the results would be in many respects much more wholesome than those gained by the isolated study of such work by each member separately. It was not necessary to make foreign countries the first to be visible. It had been too much the custom to make a first rush to Italy, as the great nursery of the arts, as, in truth, it was. He (the president) would rather say:—Begin at home as a centre, and gradually extend your survey as opportunity serves. Let your tastes be formed at home; let your first impressions be derived from your national position and instincts, but let your knowledge be extended to the utmost limits accessible to you. A further source of mutual interest and improvement might be opened out, supposing the arrangement for it to be possible, if all members could be induced to produce their vacation studies at an annual meeting of the Association. A fund of information would be not merely collected, but disseminated, as to the existence and locality of works which were best worth seeing; it would extend our sphere of observation and study; it would give to us to some little extent the advantages of each other's ideas upon some of the most interesting features of preceding design; and it would be an additional inducement to take more pains to work out sketches in an accurate and intelligible manner by a comparison with what others do. I have now carried my remarks to too great a length to allow of entering into other topics of interest, to which perhaps I ought to have referred at length, such as the disputed authorship of the designs for the Houses of Parliament, the new works of the past year, the Law Courts competition, and the Architectural Exhibition, which latter is still carrying on successfully the work at which it aims. I can therefore only conclude by calling attention to the collections which have been kindly lent us for this evening's entertainment. I would especially mention the beautiful collection of needlework exhibited by a firm at Bruges, and also a new process for permanent and indestructible wall decoration. The process consists in placing the tiles together and then painting the subject, after which the tiles are taken apart and burnt, forming an enamelled surface. This enamelled surface when done on glazed tiles, such as those exhibited by Messrs. Lavers and Barraud, is capable of the highest delicacy of finish. The other specimen of the same kind, exhibited by Messrs. Harland and Fisher, on ordinary plain tiles, is capable of less elaborate finish, and it therefore forms a less expensive mode of decoration. The sketches by Mr. Phené Spiers and other drawings and paintings have, I hope, afforded an attractive portion of the evening's enjoyment.

Professor Kerr said that the discourse to which the members had just listened had been so full of subject for reflection that to dwell upon it in any degree at that late hour of the evening would be an impossibility. The Association had done good work in the profession of architecture, and was able, if fairly tried, to do good work still. When he said that, he meant that it might do even better work than it had yet done. His connection with the Association dated from the very commencement. The Association had probably done more in respect to the education of the young mind than any other society which the profession possessed. Certain it was that the Royal Academy and the Royal Institute of British Architects had a more stately designation, and fulfilled more stately functions; but he had always thought that this particular Association, being an association of young men for the exclusive purpose of promoting practical education amongst each other, was one which could not fail, had not failed, and would not fail to be productive of immense advantages. He had often said before that some of the cleverest architects—although not necessarily those whose names were the most prominent—owed to this Association their acquisition of cleverness of design. He was speaking of fifteen or twenty years ago. It would be out of place to mention names, but there were friends of his in the room who knew to whom he referred. He was sorry to find, however, that of late years the system of reading papers at the Association by members themselves had been on the decline. He could not imagine what could be the reason that this Association, numbering now 530 members, could not produce a dozen good papers in the course of the year. He could not help thinking that, if an effort was made, there were many in their midst who only required to be urged to produce papers alike creditable to themselves and the Association and the profession to which they belonged.

One of the secretaries handed the Professor the syllabus of papers, from which it appeared that more than half the papers were contributed by the members, and the Professor expressed himself glad to know this.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Inaugural Meeting, Session 1868-9.

On Monday evening last the inaugural meeting of the Institute was held at Conduit-street. The minutes of the last meeting having been read and confirmed, the deaths of Messrs. D. T. Alison and G. R. Burnell, Fellows, were announced. Mr. Menzies Marshall, of 22, Old Burlington-street, was elected an associate, and a list of recent donations of books was read, which included valuable contributions by Mr. Tite, in addition to his recent munificent bequest for the library.

THE PRESIDENT'S ADDRESS.

Mr. Tite, M.P., in rising to deliver his inaugural address, apologised for not having it prepared and printed as usual, pleading in extenuation the time occupied in electioneering matters. Concerning the Institute, he said that its success was manifest and increasing. The total number of associates, fellows, and honorary members in May this year was 623, and of fellows (the more important element) in 1858, they only mustered 146, but at the present time they mustered 262. This was satisfactory, inasmuch as it showed that the main element of the success of the profession in life was increasing. There were few architects in London who had not joined the Institute and endeavoured to further its objects. It was pleasing to find that the finances were satisfactory. During the past year the library had been added to in an infinitely valuable manner. One of the last paragraphs of the report of the council, dated May 4, contained the following passage, in which he heartily concurred:—"The council are glad to be able to report that the new arrangements with regard to the appointment of paid officers made during the previous session has worked satisfactorily, and the honorary secretaries have been thereby relieved from the more onerous duties of the office, and have, in consequence, been able to give attention to many matters which have previously been left in abeyance." Though in the early days of the Institute Mr. Fowler worked exceedingly hard, the business of the Institute so greatly increased that no one actively engaged in professional pursuits could be expected to find time to give attention to the work. During the past session the papers read, though few in number, had been of very great interest. Mention might be made of that by Professor Ansted on the relations between geology and architecture, and also that by Mr. Digby Wyatt. The discussions which followed these papers were very important. The last paper was that by Mr. Charles Barry, which dealt with the improvement of structural architecture, as exemplified in Dulwich College, by the use of terra cotta. Having had some experience in the use of terra cotta, he (Mr. Tite) would caution his hearers as to its employment. Where terra cotta was used in the ante-fixæ of the great church of St. Pancras it failed in a good many instances. Again, the statue of the Prince of Wales at Brighton, composed of this material, now presented a pitiable spectacle, one arm and one leg having fallen or been broken off. Young architects should be extremely careful that the material was well and homogeneously burned, and in introducing a new material of that kind they ought not to be too ready to adopt that with which they had not an entire acquaintance. Referring to the great competitions for the National Gallery and the new Law Courts, he said that the many incidents in connection therewith were of the greatest importance to the profession, and he would, therefore, ask the secretary to read short summaries of the entire proceedings in these two competitions. [This having been done, the President proceeded.] In Mr. Beresford Hope's inaugural address to the Institute the year preceding his (Mr. Tite's) nomination to the presidency, he made the following remarks:—

> I was just observing that there were certain complications attaching to the competition for the New Law Courts. These were of an administrative character, and owed their origin to the fact that the Government had handed over no inconsiderable portion of the control (which in the case of most public buildings would have been shared between the Treasury and the Board of Works) to a special commission, created by Act of Parliament, and comprising a large infusion of the legal element. These gentlemen set to work with a very sound principle strongly before them, and, as was not unnatural, rode that principle a little hard. They assumed that the successful architect (or architects) ought to have made himself practically acquainted with the working of the different courts of law, and the inference which they drew from this undeniable proposition was that it was needful for them to be excessively restricted in the number of competitors chosen, in order to prevent the business of the courts from being interrupted by the frequent visits of curious investigators, and so they drew the line at six. This was palpably in the eyes of all men, except the Commissioners themselves, an extravagant application of their principle. Not to allude to any other objection this restriction manifested considerable confusion as to the artistic obligation, contracted with the national honour, to produce the best obtainable building. However, it required a vote of the House of Commons to overcome the reluctance of this most respectable junta.

What Mr. Hope then predicted followed exactly. At the same time, the result, on the whole, was not unsatisfactory. The calling in of two professional judges—men of the greatest possible eminence and practical skill—was exactly the course to remedy the difficulty, and the appointment of Messrs. Pownall and Shaw was satisfactory to all. It was said that the plan of Mr. Barry and the elevation of Mr. Street were the best. These two gentlemen, by putting their heads together to erect the building, would have satisfied the nation and acted upon a principle for which there was plenty of precedent. But

such was not the result. Discussion was indulged in, and ultimately Mr. Barry was awarded the building of the National Gallery and Mr. Street the New Law Courts—a result which did not appear very much to please anybody, and which appeared so extremely difficult to consider, because each gentleman had equal merits, and the solution which he (Mr. Tite) ventured at the time to suggest to the House of Commons appeared a reasonable one. That suggestion was made on the motion of Mr. Julian Goldsmid, and was as follows:—That inasmuch as it was perfectly well known that the Law Courts as designed would occupy much more space than that accorded them, they should be divided, one to be located on the Thames Embankment, and the other in Lincoln's Inn Fields, and that the one should be entrusted to the care of Mr. Street and the other to Mr. Barry. That suggestion was opposed in the House, and thus the matter ended in a somewhat unsatisfactory manner. He was unwilling to pursue the subject further, except to say that unless the strictest adherence was kept to the conditions it was hardly to be expected that men of honour and talent would join in such competitions. The result might be satisfactory in the present instance, for one or the other of the gentlemen concerned would be sure to erect a creditable edifice. At the same time, if there was no disappointment on the one hand, nor inconvenience on the other, he should still regret that some more satisfactory result had not been obtained. If competition was to be indulged in, it ought, it must, and it would be done only successfully, usefully, and wisely by the strictest obedience to the original agreement under which gentlemen went into these competitions. Turning to another subject, he congratulated the Institute on having obtained the valuable assistance and friendship of Mr. A. H. Layard, who purposed during the session giving a paper upon the "Art Decorations of Venice." In an address of his (the President's) in 1862, he said that in the House of Commons architects were not particularly well received. At present they were held in much greater estimation. He would strongly recommend young architects not to confine themselves to one style. It was of no use being merely a Gothic or a Classic architect; but an effort should be made to understand both styles They should not be led away by the mere fashion of the day. The difficulty of the present day was that everything must be Gothic. Gothic was excellent when well applied, but it was not very agreeable when not so applied. This style was carried a little too far in the present day. He had done as much in the Gothic way as most men. He was one of the first men who attempted a railway station in that style. Whether he had succeeded or not a visit to Carlisle would decide. It didn't go very well with the platforms and roofs, but very well indeed with the interior and the refreshment rooms. He congratulated Mr. Scott upon the development of that style as witnessed in the new Midland Railway Station at St. Pancras. One could not sufficiently admire the skill displayed in the construction of the roof, as also the propriety of the decorations belonging to it. It was a building in every way worthy of the nation and the time. He would now advert to a subject upon which it was painful to dwell. One of the deaths announced is that of Mr. G. R. Burnell, who was a great personal friend of his (the President's). He was well known as an architect and civil engineer of several great undertakings, and made his mark in the ranks of professional literature as a profuse and accurate author. Amongst his other works he contributed important series of articles to the BUILDING NEWS, principally upon roof construction. After briefly alluding to the death of Mr. Alison, Mr. Tite referred to the Thames Embankment as a work worthy of ancient Rome, and of which Englishmen might well be proud. That work had been carried out so far in a comparatively short time, but whether regarded from the beauty of the material, the excellence of the workmanship, or the utility of the work itself, it marked itself out as one of the greatest features of the age. Powers had been recently obtained for its continuance up to Battersea, and probably efforts would be made to continue it on the other side. He was gratified at the progress made in the new St. Thomas's Hospital, opposite the Houses of Parliament, which was being erected from designs by Mr. Currie, upon the plan of the Lariboisière and other great French hospitals. It would accommodate 600 sick persons, and as a piece of architecture would be just as creditable as it was as a work of humanity. After an allusion to the progress of architecture in the City, the President said that he recollected the Bishop of Oxford speaking some three or four years ago in the Egyptian Hall of the Mansion House on the subject of the re-decoration of St. Paul's. He said that he had been looking at Evelyn, who stated that "he had passed through London, and thought it the ugliest city in all Europe for its size." He (Mr. Tite) hoped that we were removing the great blot on our national education and means, and that soon we should have London worthy of the great nation of which it was the capital. He could not say quite as much for the bridges which were now spanning the Thames in all directions. Old Blackfriars Bridge had ceased to exist, and of the structure now taking its place he might apply the words of Evelyn, and say that it would be the ugliest bridge in all Europe for its size. However, it would bring increased convenience, and add to the comforts of Londoners. In conclusion, Mr. Tite thanked the members for their attention, and for the honour they had conferred upon him in electing him to the post of President.

Mr. BERESFORD HOPE, M.P., in moving a vote of thanks to the President for his address, paid a high tribute to his personal merits, although he could not endorse all that he said. He would, however, say that he thought the constitution of the Institute very peculiar, inasmuch as the mover of a resolution could not vote thereupon, and were any so wild as to get up and move a counter proposition to that which he had put forward, he would, by the rules of the Institute, be unable to support his own motion. He thought it time that a reform should be effected in certain matters connected with the Institute. Then, again, there was another rule, worthy only of four hundred years ago, relative to memberships and fellowships of the Institute. £25 made an honorary fellow, and architectural eminence only made a member, so that in the opinion of the Institute £25 was of more value than architectural eminence. If the profession was to be honoured and respected, reforms must be effected at the Institute. As to competition, how was a young man to make his talent known without it? Those who decried competition should at least be able to bring forward some other plan by which the interests of all would be served. In reference to some question concerning the profession which he was to have brought before the House last session, he said that he had not done so for several reasons; but, if returned to the new House, he intended to introduce the question as a branch of a more comprehensive scheme—viz., the appointment of a public Minister of Art, Architecture, and Science, who should absorb the offices of the First Commissioner of Works and other officers—a minister who should be responsible to Parliament. He agreed with the President in saying that it was the duty of the architect to study all styles of art.

Mr. G G SCOTT seconded the resolution, saying that so far as he was personally concerned he was satisfied with the results of the competition, and he thought he spoke the general feeling of the profession.

Mr. GEORGE GODWIN, in support, said that while it was advisable to let bygone competitions be bygones, he must remark that there was at present a great number of competitions which appeared to be managed in a very remarkable manner. He especially alluded to those for erecting asylums in the metropolitan district for the imbecile poor. He wanted to know who named the six or twelve gentlemen who were selected to compete. In one or two cases at least the best that could be said of the young men brought into these competitions was that they were untrammelled by anything like former work or former connections, and would make their *début* as architects of these asylums. Some of them would doubtless distinguish themselves, but older men should not be passed over.

Mr. CHARLES BARRY suggested that the architects of the asylums referred to were selected from motives of economy. The terms offered were such as no member of the Institute could conscientiously accept. The subject of competitions was, however, under the consideration of the council.

Mr. A. H. LAYARD, M.P., in supporting the vote of thanks, referred to the fact that the Government was about to erect the largest series of buildings that had ever been undertaken at one time. These comprised the new Law Courts, the National Gallery, a greater portion of the public offices, and a building in the neighbourhood of South Kensington for the natural history collections of the British Museum. He would offer no opinion as to whether these buildings should be in the Gothic or in the Classic style. He wished that those words were forgotten, and that attention was turned more to the cultivation of a true English style. It concerned the national honour that these buildings should be erected in a style and in positions worthy of us. They had a magnificent site in the Thames Embankment, and opportunities were now afforded of erecting a series of public buildings unequalled in grandeur by those of any other country. He trusted that the Institute would direct particular attention to these buildings with a view to prevent the perpetration of errors. The decision of the House of Commons concerning the National Gallery had not been satisfactory, but it was idle to think of altering it now.

Mr. BERESFORD HOPE put his motion, which was carried by acclamation.

The PRESIDENT, in responding, said that the Royal Academy would be ready to receive the pictures in April next, when a large increase of wall space would be given to the profession.

Mr. PARKER briefly called attention to the proceedings of the British Archæological Society at Rome, after which the meeting adjourned.

ASSOCIATED ARTS INSTITUTE.

THE opening *conversazione* of session 1868-9 took place on Saturday evening last. The walls of the room were adorned with many fine paintings and sketches, and in the way of statuary Mr. W. Whale's group, "The Slaughter of the Innocents," for which the last gold medal at the Academy was awarded, and a bust of the poet Montgomerie Ranking (who is a member of the Associated Arts Institute), by Mr. F. Scarlet Potter (one of the secretaries), were exhibited. Some sea pieces, by Bellamy, and some fine sketches, by Mr. R. Phené Spiers, attracted much attention. Particularly noticeable, however, and forming a principal feature in the proceedings, was the exhibition of a series of water-colour sketches of exteriors and interiors of old abbeys, castles, churches, and mediæval buildings, the productions of the late Sir Richard Westmacott. These were much admired, and allusion was made to them in the president's opening address. Madame Talbot Sherer, and other ladies and gentlemen, tended greatly to the evening's enjoyment by displaying their musical abilities.

Professor Westmacott, the president, in commencing his address, said that an opinion might now fairly be given upon the condition and prospects of the Institute, seeing that it was now in its fifth session. He was very glad to say that these were very promising. They must all be aware of the difficulty of organising new societies, more especially when they had so much in relation to others that already existed, and the only advantages to be gained by the creation of a new institution of the kind was to give it some specific distinction. The purpose of this institution was sufficiently distinct to warrant the promoters of it in carrying it out as they had done. That purpose was to direct artists in all branches of art—painting, sculpture, architecture, and engraving; to lend its assistance to the furtherance of all schemes which were of general interest to all engaged in the pursuit of art, upon the principle that though every branch of art might be practised separately, each of its particular sections tended to a perfect whole; and, taking this view, the communication of ideas and the interchange of opinions might lead to results which should produce those harmonious wholes and combinations which all the arts together ought to effect. That was no new or impossible or Utopian theory, because they knew from existing examples that this union and combination of artistic opinion had already been very successful, and had led to great results. More especially did we see this in the best periods of Greek art, which embraced a system of beauty which had never before existed in any other school. Art, as they all knew, was far too difficult for it to be supposed that individuals could, as a rule, excel in every branch. There had been, however, remarkable instances where excellence had been attained in several directions, such as Michael Angelo, Raphael, and others. Bernini was an artist who had a great mind for combinations, and produced very remarkable works. It was told of him that in his time a fête was given in Rome, when he designed the theatre, painted the scenes, wrote the drama, composed the music, and executed the

statues for the staircases and the difficult parts of the building. Although Bernini's works were not such as could be put before artists as examples, he was possessed of remarkable power, and such a possession was a rarity. It must be admitted as a depressing fact that out of the thousands and thousands of persons who devoted themselves to the pursuit of art, very, very few were able to leave works behind them which would live. But this fact in itself placed art in a very high position, for it showed that it was impossible to give too much time to it if excellence was sought to be attained. It was almost impossible for any individual to hope to excel in all branches, seeing that it required the whole energy of a lifetime to excel in one. It was not unnatural under these circumstances that young men especially should endeavour to organise some system by which they and their brethren might talk together over the difficulties of art. With such an object this association had been formed. They ought to feel, and they must feel, that those engaged in particular sections of art ought to work in concert, and to show that although every individual had to attain excellence in his own particular branch, all those parts were parts of one whole, leading to one great result. Those who knew anything about the history of art knew that such combinations of artists as that institution existed in mediæval times in the guilds and brotherhoods of art, where individual feeling was absorbed into association, and self was lost sight of in a corporation. The results of this association and abnegation of self were seen in some of the great works on the continent even now. The artists sacrificed their own views in order that some great purpose might be carried out. They sacrificed at this shrine of combination all personal feelings of jealousy and greed of gain, which had often seriously diminished the strength of art. He thought that it was precisely this want of the renunciation of self that characterised the art of the present day. It had this advantage, certainly—that we saw a great deal of originality in art, arising from each artist pursuing the bent of his own inclinations; but they must all admit that there was a great want of association in art in all that they did. If a Greek architect was required to execute a great work, the Parthenon for instance, he called to his aid all the resources of this principle of combination, and the artists of the middle ages worked in precisely the same spirit: and that it was that produced the art of those periods. Although there were prejudices which arose against societies of that kind, it was but fair to state how the Institute guarded against them. It was thought in some quarters that these associations very often ended where they began—in talk. The Institute was not a debating society. Its members never met until their work of the day was finished, when they met to exchange opinions. There was no objection to this, provided that the members guarded against any abuse of it. Throughout life people were met with endowed with different gifts; and in a meeting of that kind were to be found many gentlemen who could literally give valuable information to their friends from their own practical knowledge of art. There was another class of members who had time and opportunity to study the literature of art, and another class who had been in the habit of studying the canons of criticism. From all these various classes of members which the Institute embraced much was to be learnt, for there was no single intellectual exercise that might not be brought profitably and advantageously to the service of art. There was another peculiarity in that Institute which was highly creditable to its founders; it held out its arms to give a welcome to amateurs, and was only too glad to show that there was no petty professional exclusiveness that could shut the door against anyone who as a student of art was eligible for membership. Mr. Potter, the secretary, had furnished him (Professor Westmacott) with some statistics which showed that the Institute was in a healthy state. The present was the fifth session. At the opening in 1863-1, the number of members was 9. Now, in 1868, the members numbered 114. There were few societies that made such small calls upon the powers or the time of artists that could be said to show greater signs of vitality. The subscriptions of the members, though only 5s. per annum each, had been more than sufficient for the wants of the Institute. It was, however, proposed to increase the amount of the subscriptions, not with a view of making a purse, but it had been thought that when artists of distinction or experience were so kind as to address the members and give them discourses on art or on subjects connected with art, it might be advantageous, with the new means at the disposal of the Institute, to have these printed and delivered to the members. There was another reason why it would be desirable to record the proceedings of the Institute. In case there should be any members who attended only to hear their own voices, they might be a little deterred from making long speeches from the fact that "there's a chiel amang them takin' notes, an' faith he'll prent it." The meetings would, for the future, be held fortnightly, and papers upon art subjects would be read at alternate meetings only. There would be an exhibition of sketches once a month, from subjects announced on the programme of the Institute. Elaborate drawings were not expected, although true artists would, of course, send in nothing but works of art. On the evenings of these exhibitions there would also be discussions upon questions bearing upon and influencing the growth of art. In conclusion, the Professor adverted to the series of sketches (sixty in number), by the late Sir Richard Westmacott, which he had had great pleasure in lending for the evening. They had never before been publicly exhibited, but when it was considered that they were the works of a sculptor he felt no shame in showing them, for there were few men who could produce such a series of sketches. An eminent architect had said that they were remarkable for the breadth of treatment which characterised them—breadth of treatment in an art (architecture) which their author did not profess.

NEW CHURCH OF ST. LUKE, MILLWALL.

THE new Church of St. Luke, Millwall, of which we give a view and plan in our present number, is the development or rather fructification of the work of the Mission established in the district of the parish of Poplar, and which has been in operation for the last three years with the most beneficial results. Hitherto the services of the Church have been performed in a temporary building situate in the West Ferry-road. This will presently be superseded by the new and permanent church now in course of erection on a site adjacent, given by the Lady Margaret Charteris. That lady has further assisted the work by a liberal money contribution, in which she has been followed by many other well-wishers to the undertaking.

The new church, which is from the designs of Mr. E. L. Blackburne, architect, of Bernard-street, Russell-square, is calculated to afford accommodation for 600 adults, all upon its floor space. Its style is an early phase of the Pointed Gothic. Its plan comprises a chancel, having a vestry with porch, &c., on the south side, and an organ room on the north, respectively marked D and C on the plan; a nave and north and south aisles, with tower and spire at the east end of the former; and an ambulatory and porch at the western end, marked in like manner B and A on the plan. The materials employed are Kentish rag stone random-laid, with coursed bandings of the same for the exterior face of the walling, and stock brick, relieved by yellow malms and white Suffolk bricks in the arches and stringcourses, &c., for the interior. The freestone work for doors, windows, nave columns, and arcades, &c., will be the best Bath and Ancaster stone. The roofs and other portions of the timber work will be clean deal, varnished. The seating and other similar furniture will also be of clean deal, varnished. The pulpit and reredos will be of stone, the font, of course, the same. The floor of the chancel will be paved with ornamental tiles, as will also the nave and aisle passages, &c. Such parts of the area as are covered by the seats will be boarded. The windows will be glazed with tinted cathedral glass in quarry patterns. The roofs will be slated, and the ridge finished with an ornamental cresting in tile. Mr. Howard, of King-street, Covent Garden, is the contractor for the whole of the works.

NEW METHOD OF LAYING TIMBER IN ASPHALTE.

IN the annexed cuts, in figs. 1 and 2 we have a longitudinal section an elevation, and a cross section of a new method of laying joists and other timbers in asphalte or bitumen. The invention has been recently patented by M. Rigoulot, the object being to ensure a greater degree of solidity, with a less expenditure of labour. The timbers intended to be laid down upon the substances mentioned are in the first place grooved longitudinally by machinery upon that face which is intended to lie upon the asphalte. The groove in cross section (see fig. 2) represents a swallow's tail,

FIG. 1.

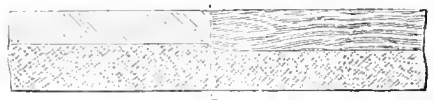
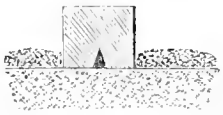


FIG. 2.



and the consequence is that when the wood is placed upon the hot bitumen, the latter penetrates and fills the groove, affording a great increase of support and strength to the timber. Half of fig. 1 represents a longitudinal section of a joist, showing the bitumen filling the groove, and the other half an elevation. Another advantage of this method is that it dispenses with all nails, screws, and other fastenings. Moreover the wood can be laid with greater rapidity than under the ordinary system. There is, of course, the cost of grooving the wood to be taken into account, but this is more than counterbalanced by the saving in labour and materials.

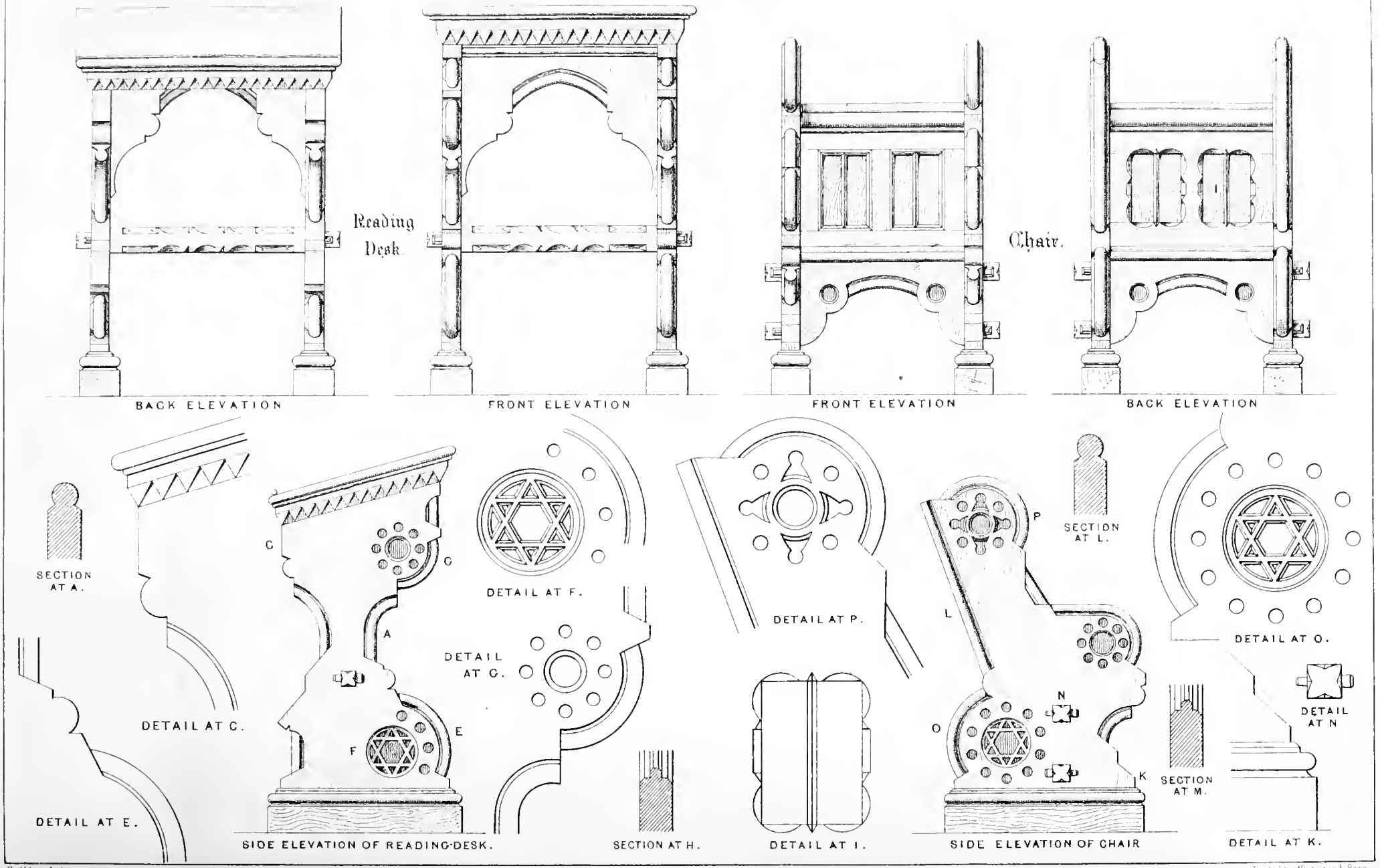
READING DESK AND CHAIR, CHAPEL NESTFIELD, DARLINGTON.

THE chair and reading desk which with details forms the subject of one of our illustrations was designed by Mr. G. G. Hoskins, of Darlington, for the United Methodist Chapel at Nestfield, Darlington, which building has just been completed from his designs. The furniture is of red deal, with pierced sides and ends, and stained and varnished, the chamfers being stained a darker tint than the rest of the work, thus causing the mouldings to stand out in bold relief. The cost of the chair was £6 6s. 6d., and the desk £5 11s. 6d.

NEW STEAM GENERATOR.

THE *Leeds Mercury* has pleasure in drawing attention to a new steam generator, in the using of which explosions are entirely obviated, and where, moreover, economy of space is a desideratum, its compact and portable form must ensure its speedy adoption. We refer to the new patent boiler and superheater, by the well-known firm, the Messrs. Howard, of Bedford. Two of these boilers, now working at Messrs. Illingworth and Ingham's, timber merchants, Wellington-street, we have seen. They are tubular, commencing over the fire with a series of horizontal tubes, a vertical series rising from these joins to another horizontal series at the top; these latter and top of the former becoming the superheater. The bursting pressure of each of the tubes is at least 2,000lb. to the square inch, and tested to a bursting pressure of 500lb. to the inch. In the event of the bursting of a single tube (a very unlikely occurrence) no dangerous accident could ensue, the result being only equal to the opening of a valve, with a rush of steam and water into the heating chamber, a sudden lowering of the steam pressure, and possibly the extinction of the fires. The two boilers are each 35 horse-power nominal, or collectively 70 horse-power, and only occupy a space of 12ft. by 10ft. by 6ft. 6in. Priming, the original evil connected with this principle of construction, has been entirely overcome, and the evaporative power of the boilers is something uncommon, 11lb. of coal evaporating 10lb. of water. A working pressure of steam can be generated from cold water in twenty minutes from the time of starting the fires. So that apparently from every point of view this invention seems successful.

At Nottingham a Board of Arbitration has been formed of six master builders and six operative joiners as arbitrators, and an architect as umpire. The president is a builder, and the vice-president an operative; and one of the secretaries is a builder, and the other an operative. The other branch trades have not yet fallen into the plan.



H. Abbott, Lith.

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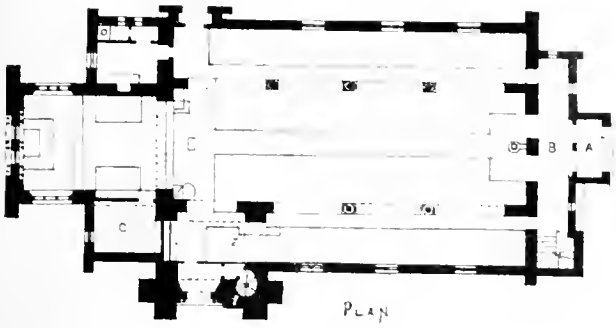
Reading-Desk and Chair, Chapel, Nestfield, Darlington. Mr. C.C. HOSKINS, Archt.



St. Luke's Church. Millmall. — Mr E. L. BLACKBURNE, ARCHT.

SMOKEPROOF ARCHITECTURE.

IN prospect of the erection of the new Law Courts, some of the daily papers have very properly insisted on the necessity for using such building materials only as will resist the action of a London atmosphere. There must be no repetition of the lamentable failure at the Houses of Parliament. But this is not all. It is not enough that our chief national works should be free from premature decay if they are still liable to be blackened and defaced almost beyond recognition. Of what use is it to select costly stones, and fashion them with infinite labour, when a very few years will hide every tint and every detail under a veil of soot? Design is almost wasted under such conditions, and elaboration is fairly thrown away. Three-fourths of the money spent in ornament on our new City buildings would have been laid out to far better purpose in improving the materials with which they are built, and thus making their design a permanent instead of a transitory thing. Under these circumstances some of the journals above referred to have advocated the extensive use of terra cotta: and the relative merits of this and some other substances may be worth examining. With regard to durability, terra cotta seems to vary considerably. It has certainly acquired a high reputation, but this is chiefly based on its performances in more favourable localities than London. The very best description may probably prove more durable than most kinds of stone, but the inferior ones—as anyone may see at some of the stations of the Metropolitan Extension—begin to scale off and disintegrate after a very short exposure to the air. On the effects of frost, supposing water to find its way into the interior of hollow terra cotta blocks, it is needless to dilate. This is a source of failure which care might prevent, though care of this kind is not always certain to be employed. The unpleasant variations in colour to which this material is liable form a more serious failing. Nothing is more common than to see, in the different blocks which make up one feature, all shades between white and reddish brown, the whole vividly recalling the different stages of baking exhibited by the loaves in a shop window. By more caution in burning, and more firmness in the rejection afterwards of bad specimens, this evil might be diminished, of course with a corresponding increase in expense. But the fact remains that under no circumstance is terra cotta equal in colour and texture of surface to good stone. It is unfortunate, therefore, that manufacturers should still attempt to make it an imitation of stone. Red would be a better and more characteristic tint for it than the dirty white which is most usual; but red terra cotta is at present rarely used.

Our object in noticing these weak points is by no means to discourage the use of terra cotta generally. Difficulties of manufacture may be and doubtless are being surmounted. Ancient buildings in abundance show how much may be effected with the material in question; and several modern ones, including the new Courts at the Kensington Museum, owe much to its introduction. It is, in fact, the highest form of brick decoration. Terra cotta dressings are to a brick building what freestone dressings are to a rubble one. And as brick is the natural groundwork for the great bulk of London architecture, terra cotta is extremely appropriate for its ornamental features. It needs to be used with care, for it lends itself with unfortunate readiness to that love of display which is the canker of modern art. There is the disheartening prospect of seeing the same details used over and over again to weariness, till what was striking and effective at first becomes thoroughly sickening by repetition. This, after all, is the great danger to be guarded against when terra cotta is introduced into our street architecture; and architects will be wise to avoid cast ornament and to have the chief points of their work modelled. But, to follow more closely our main subject, Will terra cotta resist the action of smoke? The truth seems to be that its power of doing so varies greatly according to its quality; that in nearly every case soot will adhere to it, but not in such a way that it is incapable of being washed off. This is an improvement, so far, on Bath or Portland stone, and it is something to have buildings that may be restored—for a month or two—almost to their pristine freshness whenever the proprietors will go to the expense of having them cleaned. But this, it is to be remarked, is a very different thing from having buildings that remain always bright. Our present blackened structures of Portland stone might be washed into a mitigated shade of brown if anyone cared to do it. The late cleansing of Temple Bar shows how much might be done in this way, and yet there stand City churches and halls in such a state that one could hardly say whether some parts of the walling were originally of chalk or coal.

Terra cotta, then, seems worthy of far more extensive use in our street architecture, but it is after all a material for second class rather than for first class work. Both in colour, texture, and excellence of workmanship, good masonry will always remain superior to it. But it has, or ought to have, two advantages over ordinary masonry. It is less liable to decay, and more capable of being cleansed. Is there, however, nothing that will combine these properties with those that are wanting? One need not look far for a reply. Without going beyond the limits of the British islands, we have an abundant supply of marbles and granites, of almost any colour, which can be so far polished as to resist all adhesion of soot, and which are all but unassailable by decay. Some of them are extremely beautiful, and their beauty, unlike that of common stone, could be lasting and unalterable. It is true that they are costly to work: permanence always involves labour, but what is once executed in them will remain. And, after all, which is the most extravagant—to put a given amount of workmanship where it will be practically annihilated in a year or two, or to put double the quantity where it will last unimpaired for century after century? A country as rich as England can surely afford to build its public works, not for ephemeral display, but for permanent use and grandeur. But it is not so much a question of more money as of more wisdom in laying out the money. The Houses of Parliament, now blackening and decaying before our eyes, might have been built of granite and marble for the sums spent to fritter away their surface into panelling. If the use of durable materials did nothing but check the eruption of meaningless ornament now epidemic, it would be well worth advocating. Mr. Ruskin says somewhere that there would be more good painters if colours were a guinea a cake; and on a similar principle, there might be more good carving if carved cornices were a guinea an inch. Architects and sculptors, too, would then put a little more thought and purpose into what was to be paid for so dearly. And if the style of building here suggested—the only one at present known which smoke and dirt will not deface—should have the trial it deserves, it can hardly fail to cause a most healthy reaction in our architecture. People would then think twice before inserting elaborate features, which, like a great many commonly adopted, are neither useful nor ornamental. Designs would become, so to speak, more terse, more concise, expressing more than now with much less apparent effort. They would gain in "temperance," and therefore in force, and so would become worthy of the permanence which their materials would confer.

The subscription for Leigh Hunt's tomb is sufficient for the purpose, and Mr. Durham will at once proceed to finish his design for it.

NORWICH BOROUGH LUNATIC ASYLUM.

THE Corporation of the city of Norwich some time since invited Mr. Brown and Mr. Phipson, architects, to send in plans for the new Lunatic Asylum which they intend to build. This was done, and the council have at length, acting on the report of the select committee, who were mainly guided by the reports of Drs. Robertson and Campbell, selected those submitted by Mr. Phipson. The building, which will probably be shortly commenced, will cost £33,000, or about £5 per head. Mr. Phipson's design is a combination of the pavilion with the old system, and his description states that the building will not pretend to any architectural effect.

MODERN GASWORKS AT HOME AND ABROAD.

ON Monday evening an elaborate paper on this subject was read at a meeting of the Society of Engineers by Mr. Henry Gore, consulting engineer. Among the varied applications of scientific discovery to the purposes of daily life, few, if any, have obtained greater importance than that which relates to the manufacture of coal gas. Scarcely a city, town, or village of considerable size in this country, on the continent, or in the United States of America, remains unsupplied with this indispensable agent in our industrial and social existence. Its use is rapidly extending in more remote regions, for, strange as it may appear, there are many peoples and communities who, though persistently resisting useful applications of practical science as dangerous innovations, are yet eager to avail themselves of the use of gas as a source of artificial light and heat. Even religious prejudices of the most obstinate character have succumbed to this desire, and we now behold the Christian church, the mosque of the Mahometan, the Hindu, Buddhist, and even the Chinese temple, each illuminated by this simple yet beautiful light.

In the earlier years of gas-lighting the illuminating power of gas was not regarded as a question of any great importance. The coal or material most easily or cheaply obtained was used, so that rich or poor gas was produced just as the works happened to be nearest to ordinary or cannel coal. When opposition was raised to the companies, it was always on the ground of price. Opposition to high prices led to the establishment of the Great Central Gas Company for supplying the City of London. The two fundamental principles upon which this undertaking started were a low price and a low standard of illuminating power.

To carry these proposals into practice required that the works should be constructed upon a system involving some important modifications and changes in the machinery and apparatus: and a process of manufacture was adopted, the main feature of which was to obtain quantity, quality being only a secondary consideration. The principle laid down in the case of the Great Central Company has been more or less applied throughout the country, and the result has been that the constructive details of gasworks have been carried out almost exclusively with a view to obtain the largest possible quantity of gas from the materials used for its production. Furnaces affording the greatest heat, retorts exposing the largest carbonising surface, condensers and scrubbers making the strongest ammoniacal liquor, purifiers of large capacity and surface for the oxide system of purification, monster gasholders, and last, though not least, street mains of the dimensions of small tunnels—these, and perhaps some other matters, are the concomitants of cheap gas as introduced at the period above referred to. Subsequent events, however, have shown that the consumers have become dissatisfied with their bargain. An agitation which originated some years ago still continues for a repeal of the condition as to quality, and the legislature has so far interfered as to raise considerably the standard of illuminating power; the important question presents itself whether, in meeting this change, it may not be requisite to modify the present mode of constructing gasworks, especially in those localities where mixed coals are used for producing gas of the quality required by these new regulations.

In large works, and with clay retorts, the system of through setting with double mouthpieces is unquestionably the most economical both as regards fuel and durability. But this arrangement is open to grave objections. If the

retorts are used for the generation of gas of high illuminating power, the increased surface over which the gas passes after it is eliminated from the coal exposes it to the chance of decomposition and the consequent deposition of its carbon. That this goes on to a very great extent is evident from the amount of solid carbon or graphite found on the inner surface of the retorts. In through retorts this deposition is due mainly to two causes; in the first place, in charging the retort with coals either by the scoop or shovel, the centre of the retort scarcely ever receives its due portion of coal, and as this part is always the hottest it follows that the gas generated from the thinner stratum of coal is exposed to intense heat, and a portion of it is speedily decomposed, liberating the hydrogen and depositing the carbon, thus forming a deposit which rapidly increases and soon renders the retort useless, unless precautions are taken from time to time to remove the carbon. Another cause of this deposit is the want of uniformity in the pressure in the two hydraulic mains; a slight resistance in one main or the other causes the gas to take the course offering least obstruction, and as the particles of gas thus pass over a larger amount of heated surface, they are exposed to the greater risk of decomposition. Several expedients have been suggested to remedy this evil; one is to use a valve to each ascension pipe so as to dispense with the dip pipe when the retort is working; another is to have only one hydraulic main placed over the centre of the ovens and both mouthpieces connected to it by a single dip pipe. The material of which the retort is made will exert a very important influence on the production of gas of high illuminating power. The high temperature at which clay retorts are worked tends to produce a very large quantity of carbonic oxide and hydrogen, by the decomposition of the olefiant gas and hydrocarbon vapours. It is frequently asserted that by the use of richer cannel coals the excess of non-illuminating gas is rendered highly luminous by becoming saturated with the hydrocarbons given off from the richer coal; but this is only true to a limited extent, inasmuch as the mixture undergoes rapid deterioration, consequent on the liquefaction of a large portion of these hydrocarbon vapours. The two forms of condenser most generally in use are the tubular, or series of pipes, and the annular. Whichever of these forms is adopted a large extent of surface is indispensable, in order that the separation of the mechanical and non-chemical impurities contained in the crude gas may be gradual. In the generality of works as now constructed, the gas, after leaving the condenser, is subjected to the process of washing, either by means of the old-fashioned wash vessel or the modern contrivance called the scrubber; the object in either case is still further to purify the gas from any remaining particles of tar, heavy oils, and ammonia. Many very conflicting statements have been made in reference to the effect of water in removing some of the light-giving constituents from coal gas. Several chemists have asserted that water exerts but a small influence in diminishing the illuminating power of coal gas. Some engineers, on the contrary, say that water produces a very injurious effect.

On the first establishment of gasworks some very absurd opinions were expresed as to the form, construction, and capacity of gas-holders. The restrictions proposed as to the dimensions of these vessels are certainly very amusing when recalled and contrasted with the monster creations of the present day. The demand for gas, consequent on the reduction of price, has led engineers to construct gas-holders the capacities of which are measured by millions instead of hundreds of thousands of feet, as was the case formerly; attempting to answer satisfactorily the ever-recurring question of economy. The larger the gas-holder the cheaper its cost at per thousand feet of its contents; but it is a question for serious consideration whether, as a matter of safety, these enormous depositories are not open to grave objections. So long as the quantity produced in the course of manufacture was the essential object of our manipulations, the effect on the quality of gas by its storage was only of secondary importance; but if, as we are by recent events led to believe, a much higher standard of illuminating power is to be imposed on gas manufacturers, the advantage of these enormous gas-holders may not prove so obvious in the future as they appear at present; for, besides other reasons that will suggest themselves to the mind of every competent gas engineer, the fact that the storing of gas (especially such as contains any considerable amount of hydrocarbon vapours) is sure to result in an appreciable diminution of its illuminating effect is, of itself, a good ground for objection against the construction of injudiciously large gas-holders.

In selecting a site for works, the following are among the most essential desiderata:—Sufficieney of area, a low level, a good supply of water, good drainage, and easy access. Even in some modern works these important conditions are sometimes most palpably neglected; as a general rule, however, they are complied with. In the earlier times of gas engineering it was thought desirable that the supply should be as near as possible to the centre of the consumption, but modern practice removes our gasworks to remote distances, and some enthusiastic persons have even suggested the removal of the manufactories to the centres of our coal districts. Wild as this proposal seems, it might possibly be realised if *gas* and not *light* was the product to be supplied; but if the public demand *gaslight*, and not *light gas*, then the proximity of the works to the locality of the consumption must be a vital element in the economy of gas manufacture. The longer the distance through which the gas has to travel before reaching the burner of the consumer, the greater will be the loss of illuminating power; hence it follows that a company supplying gas from works three or four miles from the district or place where the gas is to be consumed willl have to use a much larger proportion of canne or other light producing material to produce and supply gas of equal quality with a company only a mile from its consumers. It is very questionable if the advantages said to be gained in a sanitary point of view, or the greater economy effected in the delivery of raw materials, and the distribution of residual products, as coke, tar, liquor, &c, will at all compensate for the increased outlay in mains and the attendant loss of illuminating power.

In designing gasworks for new countries, it is a great error to be guided solely by home practice, especially in reference to retorts and furnaces. The number of retorts in a setting should never exceed five, and, even in the largest works, settings of threes should always be provided. The demand for gas in some of these countries is not at all uniform, especially in the case of public lighting; special festivals and the exercise of police and municipal authority frequently interfere to affect in an important degree the quantity of gas required. To meet such exigencies, it often happens that it would be better to light up two beds of threes than one bed of fives, or *vice versa*. Simplicity of arrangement in the setting of retorts is also of the utmost importance, so that the bricklayers' and other work may be performed by comparatively unskilled operatives. The employment of native labour is an essential element in the success of all gasworks abroad.

It is of the greatest importance in hot dry climates to keep the gas-holder cool during the hottest part of the day. It is the universal stipulation on the part of the gas companies that the public lamps shall not be lighted when the moon is visible, and the practice is to reduce the stock of gas in the gas-holder at such times as low as possible, consistently with safety, relying on the retorts to meet any sudden extra demand. During the summer or dry season, the evaporation caused by the heat of the sun's rays is so great that an immense quantity of aqueous vapour is formed in the gas-holder, which is carried forward by the gas into the mains and fittings, causing great annoyance and trouble. Painting the roof of the gas-holder white and several other expedients have been tried to get over this difficulty, but the only one attended with any success has been sprinkling the roof with water by means of a rose jet. Notwithstanding all that could be done, a very considerable amount of water is from time to time deposited in the mains and fittings, and it requires constant and careful attention to avoid inconvenience to the consumer.

For foreign gasworks, especially for warm or tropical climates, the author would suggest the desirability of the greatest simplicity in the design and construction of the requisite buildings, and the absence of all complication in the machinery and apparatus. The buildings, if not used as storerooms for valuable goods, should be merely roofed sheds, supported on iron or even wooden pillars. All enclosing walls should, as far as practicable, be avoided. Care should be taken to provide ample covering for coals, but with sufficient ventilation. An abundant supply of water is essential, with appliances for raising streams or jets to a considerable altitude. The tanks of gas-holders, if required to be made of iron, are better of wrought-iron than of cast, particularly in countries exposed to earthquakes. If the engineer is not well assured of the nature of the ground, he should shrink from designing a brick or stone tank for such countries. In laying street mains especial care should be taken to ensure a more than average depth below the surface, and a sufficient, but not too great, inclination or fall.

In carrying on the operations of a gas establishment in countries similar to those just described, the engineer will find his duties and responsibilities infinitely more arduous and onerous than those he would be called upon to discharge in the situation of a manager and engineer at home; it is therefore of the utmost importance to him that his works and apparatus should be as simple as possible consistently with due efficiency. Above all, let him employ to the utmost extent to which they are available the labour and the materials of the country. In doing this he may have to pluck up deeply rooted prejudices, probably to place in abeyance well-grounded opinions, the soundness of which he may have thoroughly proved under other but widely different circumstances; this he should be ready to do with cheerful alacrity and unreserve. Assuredly he is most certain in a foreign country to achieve success in engineering and manufacturing enterprises who acquires the most thorough knowledge of, and influence over, the inhabitants of the country, and masters most completely an acquaintance with the character and capabilities of its productions; who can enlist the hearty co-operation of the people, and lay the native products under contribution to subserve his purposes; who, in a word, most completely adapts himself to the peculiarities of the circumstances, influences, and objects which surround him in the new world in which he is placed.

SCHOOLS OF ART.

THE distribution of prizes gained by the pupils in the Oxford School of Art during the past year took place in the Townhall on Thursday week. More than the usual interest was felt in the proceedings, as the Lord President of the Council (the Duke of Marlborough) had consented to take the chair, and hand the distinctions gained to the recipients. In the course of his remarks the Duke said he hoped to see a greater number of schools taking advantage of those loans which were made from the Central Museum. There were about ninety-eight schools of art in this country, and he regretted to say that only twenty-one of them had availed themselves of the opportunities afforded in this respect. One advantage enjoyed by students in art schools was the grant of "aid" of £3 for "free studentships" in the artisan class. By a recent minute, an addition of £5 was also given for the payment of pupil teachers. A step in advance had also been made with regard to the payment of masters. The Department was really anxious in every way to promote the efficiency as well as the enlargement of its schools of art, and he trusted that not only the Government he had the honour to belong to, but succeeding ones, would have credit for their exertions, and that the money freely given would not be bestowed in vain.

Yesterday week the Mayor of Bristol distributed the prizes won by the competitors of the local school of art. The following is an abstract of the report which was read by the secretary:—The school is in a satisfactory position so far as the success of its students can be a test; nevertheless the debt of £655 and the decrease of annual subscribers continue seriously to fetter the expansion of the school. The annual examination of the second or elementary grade, was held on the evenings of the 12th, 13th, and 14th of March last, under the superintendence of members of the local committee, in accordance with the requirements of the Committee of Council for Art. The results of the examination, as awarded in London by the inspectors of the Science and Art Department, have been most encouraging. 111 exercises were satisfactorily worked; 16 students received prizes, and 7 obtained "full certificates" of the 2nd grade. The number of awards made to students of the school in the advanced stages amount to 13 prizes, and 5 honourable mentions; 19 works obtained the honourable distinction of being selected for national competition. It being popularly believed that the School of Art and Fine Arts Academy are one and the same institution, it is desirable to make it generally known that they are distinct and separate institutions; and as subscriptions are urgently solicited, it should be clearly understood that they are wholly devoted to assist in paying the working expenses of the night classes for artisans, who are taught at a nominal fee. The day classes are self-supporting, and do not benefit by any subscriptions in support of this school. The numbers in the day classes are 120; in the night classes or artisan class, 140.

The following is a hint for builders of new churches. We have from Valparaiso an extraordinary account of the election of a patron saint to one of the churches there, which was concluded on September 6. The *Mercurio* says the favourite candidate was "the Adorable Saviour of the World," who polled 19,946 votes; the Most Holy Virgin" had 4,132; sundry odd saints put in a poor show, polling in the aggregate 384 votes. After the election a Te Deum was sung and a sermon pronounced in celebration of the joyful event.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of Croxall, near Tamworth, which has been closed for some months for alterations and improvements, was reopened on Tuesday week. The old square pews have been replaced by handsome oak benches, a new pulpit of Mansfield stone has been placed in the north-east corner, near the chancel arch. The organ has been removed from the west end of the church to a recess built for it on the north side of the chancel. The works have been done by Mr. Lilly, of Measham, from plans by Mr. Street.

A new United Methodist Free Church was opened at Keighley on the 16th ult. The style is Gothic, and the plan consists of a parallelogram, 86ft. by 48ft. within the walls, with an apsidal projection 20ft. deep at the rear for orchestra. The interior is divided into nave and aisles by iron columns, from which springs an arcade of seven arches on each side, which supports open hammer-beam trusses across the nave. There is a square tower at one corner, surmounted by an octagonal turret and spire, the total height being 125ft. The stained glass of the windows has been executed by Messrs. Edmundson and Son, of Manchester. Mr. William Sugden, of Leek, Staffordshire, was the architect, and the contractors for the several departments of labour were all local men. The total outlay is about £5,000.

On Thursday, October 15, a new iron church was opened at New Wandsworth, erected for Rev. J. S. Jenkinson, the vicar of Battersea, by Messrs. Francis Morton and Co. (Limited), engineers, Government contractors, and iron church builders, of London, Liverpool, and Glasgow, in a very satisfactory manner—the interior, with its side arches and clustered columns, its lofty open timber roof and handsome stained glass windows and plastered walls, being quite as elegant and comfortable as a brick or stone building. There is accommodation for about 500 persons, and the entire cost of the church, including gasfittings, heating brickwerk, drains, laying out and planting ground with trees, &c., was under £3 per sitting.

On Saturday afternoon the ceremony of laying the foundation stone of St. Paul's Church, High Town, Crewe, was performed by Mr. T. B. Horsfall, M.P. A suitable site has been secured, upon which will be erected a stone building in the Gothic style of architecture, from designs furnished by Mr. J. W. Stansby, engineer to the London and North-Western Railway Company. The estimated expense, including the price of the land, is between £6,000 and £7,000. The nave alone (the dimensions of which are 100ft. by 41ft.) is now being erected. As additional funds are received, the chancel, transept, and tower will be added. Accommodation will be provided in the nave for 700 worshippers, and, when the entire building is erected, for 1,000. The church is being erected by Messrs. P. and J. Parker, of Burnley.

St. Saviour's Church, Preston, was consecrated on the 29th ult. The plan consists of a nave and broad aisle, the latter containing a gallery. The completion of the exterior requires a tower on its upper stages. The architect is James Hibbert, Esq., of Preston.

St. Paul's Church, Blackburn, was reopened on the 1st inst., after restoration, which embraces the removal of the old pews across the gallery at the east end of the nave, the erection of new chancel, with large three-light windows, and two spacious entrances on either side, with wide stone staircases for access to the galleries. The roof, previously ceiled at the square, has been opened out to the collar beam, and the whole boarded, stained, and varnished, adding a great effect to the appearance and comfort of the interior. There are also 200 additional seats provided. The work has been executed from designs by Mr. James Bertwistle, architect, Blackburn.

A new Anglican Church is being built at Nazareth, in the Holy Land, at a cost of £2,000. The plans were originally designed by Mr. Schiek, of Jerusalem, and were subsequently revised by Mr. Stadlen, of Zurich. We willingly state that Mr. T. Brocklebank, of the Royal Bank Buildings, Dale-street, Liverpool, or his bankers, Messrs. Heywood and Son, would be glad to receive subscriptions towards its erection, as the extreme poverty of the natives greatly hinders the erection of this the only Anglican church in the district.

BUILDINGS.

On Wednesday, October 28, the foundation stone of a new Convalescent Home, at Meltham Mills, near Huddersfield, was laid by Earl De Grey and Ripon, with full Masonic honours. The building, which will cost £30,000, is the gift of Mr. Charles Brooke, jun., of the firm Brooke and Brothers, thread manufacturers, and is intended as an adjunct to the Huddersfield infirmary. The style of architecture of the hospital is of the Domestic Gothic character, with a few modern developments. The main front will face north east, and be about 190ft. long. The centre part of this will project a little, and will be devoted to the administrative department, and will contain on the ground floor a central entrance, with matron's parlour, surgeons' consulting rooms, and patients' waiting room. The wards branch out right and left for each sex, and consist, on the ground floor, of spacious staircases and corridors, which, being on the south side, will be agreeable for invalids in bad weather, leading to the convalescent day rooms and night wards for the infirm. The patients' entrances from the recreation grounds will be to the main staircases, under covered glass porticoes; extending further south-west is a dining hall, with the kitchens, pantries, and store rooms beyond. The buildings are to be constructed of Yorkshire stone, and will be erected from the plan and designs prepared by Mr. Edward Birchall, architect, of Leeds, and carried out under the superintendence of Messrs. Kirk and Sons, architects, Huddersfield.

On the 24th ult. the foundation stone of the new baths, the gift to the town of Staleybridge of Mr. and Mrs. Robert Platt, was laid by that gentleman in the presence of a very numerous assembly. The usual ceremony of presenting the trowel could not be adopted, as Messrs. Hunt and Roskell, who are preparing it, had been unable to complete it in time, and a rough model of it had to do the work as deputy for the very beautiful one in course of construction, and which will cost about £50. This has been subscribed for by some 5,000 inhabitants in sums varying from 1s. to 1d. each—a spontaneous expression of the people's appreciation of Mr. and Mrs. Platt's princely liberality. The building will front the church and market hall, and the centre of the entrance portico will be opposite the middle of Church-street. There will be an enclosed swimming bath 70ft. by 40ft., and an open one 80ft. by 40ft. for summer use. Private baths and Turkish baths are also provided, and all the latest luxuries in balneation will be adopted. The style of the building is Italian and of simple character.

Improvements are about to be made for the proprietors of the Albion Assembly Rooms, North Shields, by the addition of a new "first-class" staircase and retiring room, new second and third-class refreshment rooms, and an extension of the gallery accommodation, the last to admit of an increased admission of 500 adults. The refreshment rooms will be 37ft. by 22ft. and 12ft. high, while the ground-floor will be occupied as shops; the total height of the building approaching 50ft. The plans, which have been prepared by Mr. J. P. Spencer, architect, of Wantage and London, were passed by the Local Board of Health on Wednesday week, and the work will be commenced early in the ensuing spring.

One of the largest and most imposing buildings belonging to the Roman Catholics is about to be erected a short distance from Dublin, and is to comprise a college and a church. In addition to the usual offices there will be noble reception rooms, fifty-two private studies, and about seventy-five bedrooms. The principal or south front will have a magnificent façade, upwards of 300ft. long, from the centre of which will rise an equatorial observatory, forming a tower, with transept and observation rooms. At the eastern end of the college will be placed the church, access to the same being obtained from the college by an elaborately groined cloister upwards of 100ft. long. The church will consist of nave, chancel, transepts, baptistery, and a tower 260ft. high. A stream of water running near the college will be judiciously made use of by the architect for raising the two lifts which the college will be supplied with. The style of architecture employed is Decorated Gothic, and the whole of the designs are by T. W. James, Esq., architect, of Salterton, near Exeter, and Birmingham, whose plans have been selected in a limited competition.

Yesterday week the new Corn Exchange at York was inaugurated. The building is 74ft. long by 63ft. wide, and about 51ft. high. The cost is about £3,000. Mr. G. A. Dean, of London and York, is the architect, and Messrs. Weatherby and Rymer, of York, the contractors.

On Wednesday week the St. Edith's Home of Rest for the aged poor of the parish of Emscote, Warwick, was opened by the Lord Bishop of Dunedin. The architect was Mr. Robinson, of Leamington and Manchester, the builder was Mr. Smith, of Chilvers Coton, and the contract for the work was £800. The building is three stories high, its architecture Gothic, and it comprises a common room, a sitting room, kitchen, and bedrooms.

TO CORRESPONDENTS.

NOTICE.—Cases for binding the BUILDING NEWS, Vol. XIV., are now ready, price 2s. each.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—T. E. D.—J. H.—R. S. and Co.—J. P. S.—C. E.—F. A. P.—G. T. R.—T. C.—E. T. Cox.—J. B. (Blackburne.)—E. and P.—W. M.—S. M.—G. S.

G. S. A. (Glasgow.)—The designs you refer to are spoken highly of by other subscribers, thus showing how hard it is to please all.

A WORKING MAN.—Suggestions from subscribers like yourself are always valued, and shall be borne in mind.

THOMAS WHITAKER.—We cannot understand your question. If you will put it more explicitly we shall have great pleasure in inserting it. Was the wall blown down during the erection of the roof? If so, do you wish to know whether yourself or the joiner is responsible? And, speaking of plans and specifications, what do you mean by "the original?" Do you mean the agreement or contract?

Correspondence.

CATHEDRAL ORGANS.

To the Editor of the BUILDING NEWS.

SIR,—The letters of "Ecclesiologist," "W.P.," "C. S. J.," and other writers are confirmatory of the view I have taken in common with the restorers or improversof St. Paul's, Westminster Abbey, and other of our cathedral churches in respect to the position of the organ. The dictum I affirmed in my letter, that the "organ in *itself* was subsidiary or subservient to sound," however much of a truism it may have appeared to "C. B. A.," has at least been acted upon, and therefore recognised by those well able to judge and who can connect a general law or broad principle with subsidiary duties. It would be absurd to impair the effect of the size and grandeur of one art by the mere means or mechanical vehicle of another (as an organ case), to say nothing of the relative superiority of architecture and instrumental music. The voice of antiquity as well as that of modern art concur in placing the organ somewhere at the side least obstructive in the general view, and it was only Puritanic zeal in a reactionary age that wholly discountenanced the usage and put the instrument on the choir screen to best effect the object of the day, viz., to convert the serviceable parts of our cathedrals into "panelled snuggeries." The division of the organ into two parts on both sides of the nave, instead of obstructing the latter, seems a good arrangement, and could be architecturally managed. Discarding a sentimental mediævalism on the one hand and an over scrupulous religiousness on the other, there is a proper subordination to be observed in art as in religious accompaniments.—I am, &c.,

G. H. G.

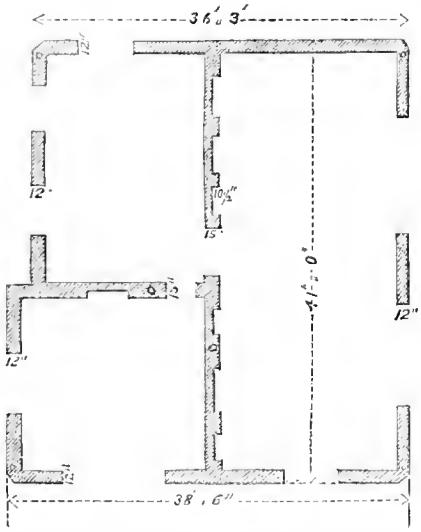
SIR,—I have been much interested in the correspondence relative to the position and effect of organs in cathedrals that has appeared in your columns. Without being a critic I may yet speak a word in favour of retaining, where possible, the effect referred to by "C. B. A." I have noticed it in York Minster, and admired it there. So far from lessening or interfering with the effect of the preceding music, it seemed the noblest finish to it, and "like the rush of angels' wings."

I trust I may be pardoned if I take objection to the way in which one or more of your correspondents have tried to throw discredit on certain effects by the use of depreciative epithets.

In music, as in other arts, there is wide scope, and nothing good in any should be thrown away. If softness and delicacy are best in their proper place, yet grandeur, sublimity, or pathos must sometimes have the sway. Is there no music in the sounding sea or in the sighing or occasional roar of the wind through the forest trees? If there is sometimes the simple note, shall there not also be the roar of the multitude, and the voice like "the sound of many waters"?—I am, &c., G. M.

CONCRETE BUILDINGS.

Sir,—With reference to G. Larden's letter in your last issue, I trust you will allow me to state the following facts, and contradict statements made by him. In the first place, the clerk of the works recommended by myself was one who had successfully carried out much larger works than that at Twickenham—viz., the concrete house at East Sheen of thirty rooms, with concrete floors and 12-inch walls; also one at Ealing with the same apparatus. The responsibility of construction does not rest with the clerk of the works, he being under the control of the architect. I enclose you a plan, showing at a glance the great



defects in carrying up the skeleton, 38ft. high, without floor joists or tie whatever (a very unusual course with any building), this being done on account of the delay in obtaining the iron joists from Belgium. You will notice circular openings for a 5-inch rain-water pipe, and the chamfering at each quoin, materially weakening a part where strength is so very essential; also the number of openings and recesses for fireplaces and cupboards in the party wall, formed to the proprietor's instructions, leaving a back of concrete only 4½in. thick, making the mainstay to the outer walls the weakest part of the building; also the number of wide openings in the front and back walls. Combining these defects with bad cement and bad foundations in the front, is the result to be wondered at? With respect to the work being under my superintendence or being in any way responsible, this I totally deny, as I do not in any case undertake the supervision of any building whatever. I also emphatically deny G. Larden's statement as to my being on the works when three stories in height, and hold him responsible for any step I may take to compel him to contradict this and other assertions. I visited the works once when 9ft. high, and then pointed out to the clerk of the works the serious defects at each quoin, and advised him to obtain the rain-water pipe and put in with neat Portland cement without loss of time to remedy this great defect, and which I fully expected had been attended to. The cement, some of the worst I ever saw, was purchased of a dealer instead of a manufacturer, because it could be obtained at 1d. per bushel cheaper. As to the ruins G. Larden speaks of, showing no blocks of concrete, but simply rubble as out of a gravel pit, this is not true. I and several practical gentlemen who visited the works during the pulling down of the house, noticed solid blocks of concrete from 3ft. to 5ft. long being broken in pieces by two labourers with their picks. I also wish to mention that I waited upon G. Larden with his architect, and proposed rebuilding the house in concrete, guaranteeing its safe erection under a penalty of £500, through his architect, on condition that the cement obtained be of a good maker, and the erection entirely under my supervision; but this he refused to do, and with respect to the arrangement made as to my taking back the apparatus at half its original cost, this I am quite willing to do as soon as G. Larden fulfils his agreement.—I am, &c., J. Tall.

Falstaff-yard, Kent-street, Southwark,
November 3.

Sir,—Seeing Dr. Larden's letter in your last week's issue as to the fall of a portion of his concrete house at Twickenham, I (now constructing a large warehouse 70ft. by 50ft. and 60ft. high, of the same material, with Mr. Tall's patent apparatus) visited Twickenham for the especial purpose of obtaining any information on the subject, and am happy to say that I had no cause whatever for anxiety, for it only required a passing glance to see at once the reason of the failure.

In the whole height of the building (about 40ft.) I could not trace a single tie or brace of any kind, *not even a joist*, and the only support to the main walls, the party wall, was recessed to such an extent as to be apparently useless for the purpose of a support, and the corners of the building I noticed not only cut off but deeply indented for a rain water pipe, materially reducing this important part for strength. The back and front walls, about 40ft. long, had numerous large openings from 9ft. to 10ft. wide in them for windows and doors. Combining these defects in construction with (as I was informed) a very inferior foundation there is no wonder at the wall suddenly collapsing. As regards one portion of the Doctor's letter, I must respectfully differ, that is, where he states "the ruin throughout showed no blocks of concrete, but simply were as rubble out of a gravel pit." I saw blocks from 4ft. to 5ft. long in a solid mass in the fallen part, but cannot vouch for the bulk of the structure which had to be pulled down. I should not have the least fear in carrying my warehouse up 100ft. high in concrete, and for satisfaction I have tested the lower part of my building by breaking out portions of the granite-like concrete, a specimen of which I send you. I had upwards of 200 tons of gravel and other material packed on the ground floor immediately the basement walls were completed, and I invite all interested parties to visit my warehouse and judge for themselves.

I have been very careful in the selection of my Portland cement, knowing that the success of the building rests principally with this material.—I am, &c., H. Goodwin.

Great Guildford-street, Southwark, Nov. 4.

SOUTH KENSINGTON SKETCHING CLUB.

Sir,—A letter appeared in your last week's issue under the above heading. It would have been better to treat it with the silent contempt it deserves but that others of the same stamp relating to matters at South Kensington, and evidently by the same writer, have already passed unnoticed. The attack made by "Justice" has met with universal condemnation among the students of the art schools, and the mildest expression of opinion has been that the writer "ought to be ashamed of himself." The students generally have been disposed to take no *public* notice of the letter, but I for one feel it my duty to make some reply, and, as I was a competitor and am thoroughly cognisant of the whole facts, I can speak with something like certainty. The competition was strictly private, being got up among the students in training and others in July last, and a meeting was held to arrange the terms, which were to be similar to those of last year—viz., all works (foreground and landscape) done in the vacation being eligible. There was a small subscription and the prizes were a sort of sweepstakes. To have the competition as fair as possible, there were two sections—A and B—the former for all comers, the latter set apart for general students only. Of this "Justice" has taken no notice. The head master and painting master, both of whom are artists, kindly consented to adjudicate, and the use of the life room was obtained. The so-called exhibition took place on Thursday, October 22, when the awards were made known. The drawings, &c., remained up until four o'clock, when, as the model was to sit in the evening, the students themselves took the works away. Everyone of the competitors saw the drawings with the exception of two of the evening students, and "Justice" was the only one dissatisfied with the fairness of the award. In section A, that more especially under notice, the first prize (water colour) was awarded to a foreground study, 12in. by 10in., not 6in. by 4in., as stated by "Justice." It *was* a cemetery monument, but with grass and well-drawn foliage, too—the cleverest thing in the display, and acknowledged as such by all but "Justice." The second prize was awarded to a carefully painted bit of country, 15in. by 12in., the work of a student in training much respected in the schools, who acts in such matters as our treasurer. The first prize in oils was carried off by a very excellent painting of the Thames beyond Putney, and not, as suggested, "a bunch of grapes and dead robin." The second prize again fell to our treasurer, and the allusion of "Justice" to trees, &c., ¼in. diameter, possessing neither power nor feeling, is simply nonsense. Each of the statements of "Justice" is either twisted to suit his purpose or palpably false. The wonder has been why such a letter suggested itself, and the reason is obvious that "Justice" had plumed himself upon success, and had moreover attached his name to each of his drawings, quite contrary to the rules; and, further, he had counted upon a *public recognition* of his talents.

The only grumbler has been "Justice" himself, though his letter would seem to show that he spoke in the interest of many. It has been too transparent a case of "Dog in the manger," and has only succeeded in bringing ridicule upon itself. The several spiteful insinuations against the training in an institution to which "Justice" owes his little fame are beneath notice, but I must say that the statement as to the masters "sneaking away" is a downright falsehood. Apologising for occupying so much of your valuable space, I am, &c., T. M. L.

Intercommunication.

QUESTIONS.

[1109.]—LAND SURVEYORS' CHARGES.—Will any of your readers kindly inform me, through your columns for "Intercommunication" how and at what rate a land surveyor is paid in the following instance?—Required to survey a tract of land about 100 acres in extent for the purpose of building. A map to be drawn out of the same divided into roads and plots. The management afterwards is to be left in the surveyor's hands, and all applications to be made to him.—X.

[1110.]—ANCIENT LIGHTS.—Can any of your readers inform me if I can stop up a window that has at some time been put in a wall which has been raised upon the end wall of my house and belonging to me, my house being two stories and my neighbour's three. He has built the end wall of his house upon my wall, and also put in a window overlooking my property. I now wish to raise my house, and cannot do so unless I can stop up the said window.—H. C.

[1111.]—STAIRCASE LIGHT.—Will you or any of your correspondents kindly furnish a subscriber with information as to how near an owner of adjoining property can build against a staircase window which has been uninterrupted upwards of 200 years.—G. C.

[1112.]—STRENGTH OF WALLS.—Will you allow me to ask your experienced readers if one of them will inform me how I am to calculate the thickness the walls of a building require to be to resist the outward thrust of the roof where there are no tie beams?—Inexperience.

[1113.]—VENTILATION STOVE AND LAMP.—Can any of your readers inform me if the ventilation stove and lamp of Mr. J. D. Morrison, Edinburgh, described in the Building News of August 21, p. 566, is patented, or if not patented where I can obtain descriptive drawings of the apparatus?—Ventilation.

[1114.]—MACHINE WORK.—Is it possible to obtain mouldings correctly worked out of *seasoned* material and of the quality ordered? My experience is that all mouldings obtained in my own locality are worked out of green stuff of the most inferior description, and so far from being true it is impossible to make a good fit at a mitre; if I wish to do my work in a respectable manner the only chance is by having recourse to hand labour instead of machinery. I shall be glad if any of your readers can inform me where a good honest article can be obtained.—One of the Olden Times.

[1115.]—GELATINE.—Will any of your readers be kind enough to inform me where I can procure the gelatine such as is used by modellers, and the price of it?—E.K.T.

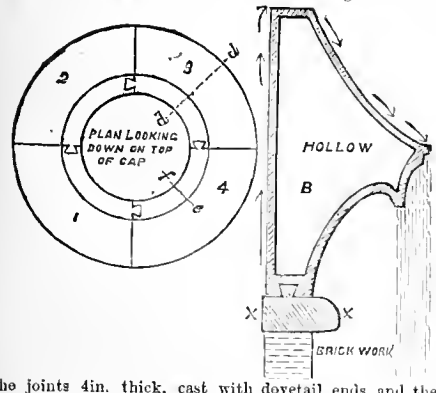
[1116.]—WATERPROOF WOODSHED.—Can any of your correspondents inform me as to the best method of making a woodshed waterproof?—R. H.

[1117.]—DISCOLORATION OF STONE.—I have a quantity of wallstone which has become much discoloured by lying in a field during the last twelve months. I should feel much obliged to any of your readers who could inform me how to remove (or partially so) this discoloration.—SUBSCRIBER.

REPLIES.

[1051.]—STRAIN ON WROUGHT-IRON TRUSS.—I cannot put my question more distinctly than I have done. I want to know if "Constant Subscriber" can assist me. When I was working out the strains I came to this formula as in this week's BUILDING NEWS, and, as stated in the issue of October 16, I could not understand the formula, and I should feel truly grateful if "Constant Subscriber" will explain it.—R.

[1059.]—FACTORY CHIMNEY FLUES AND SHAFTS.—Having read your correspondent's remarks on chimney caps, and of the very narrow chance of being turned topsy-turvy—indeed it was a miracle—I do not consider stone or brick capping at all suitable for such work, and more especially if they must be clamped, or as it were bound together like an old woman's waist. The accompanying sketch will show to "L. M." and all others doing similar work that cast-iron caps such as I have sketched would be far more preferable, and probably cheaper to use, than either of the former, B section being quite hollow in the centre, d d, the outer and inner rim being inch thick,



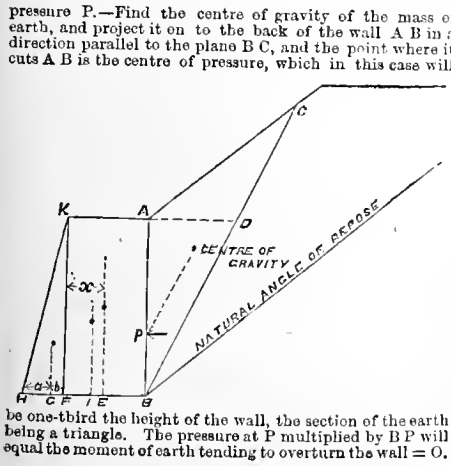
the joints 4in. thick, cast with dovetail ends, and the whole depth of cap caulked with lead. From f to e should be 14in. wide. The bed mould should be of iron, similarly dovetailed together, with dowels on the upper bed tailed into capping, see section X X. By moulding the caps in cast iron or other metal, a much larger projection could be given, the quirking and under grooving could have more acute angles, thus preventing soot and rain trickling down the face of the shaft. I have laid out my capping in four pieces, but there might be eight joints if requisite, for once set they would form one block. The iron work should be either galvanised or painted four coats in red lead.—FRANCIS HANSOM LUSCOMBE.

[1071.]—BAKERS' OVENS.—I should feel obliged if any of your numerous readers would kindly inform me the best way of constructing and heating bakers' ovens?—AMATEUR.

[1076.]—PRESSURE UPON SAFETY VALVES.—Should not "Engineer's" answer to this, in your last impression, be 20lb. instead of 30lb., as therein stated? He has also omitted to state that the assumed area of the valve in his reply should be one square inch. Thus we have—

$$P = \frac{10 \times 6}{3 \times 1} = 20\text{lb.}$$—AMATEUR.

[1080.]—RETAINING WALLS.—As "X + Y" does not appear to have received a satisfactory solution of his question as to the pressure of a surcharged embankment against a retaining wall, and a method of finding the thickness of such wall when battering either on the face or towards the bank, I have given the matter a little consideration, and beg to submit to him the result of my investigation. My diagram will be sufficiently clear to him without description. First, then, as to the pressure of earth against the wall. The portion tending to slip and to be retained is the triangle A B C. Its pressure against the wall will be its weight × tang. of angle A B C on $\frac{\text{W A D}}{\text{A B}}$. To find the centre of pressure P.—Find the centre of gravity of the mass of earth, and project it on to the back of the wall A B in a direction parallel to the plane B C, and the point where it cuts A B is the centre of pressure, which in this case will



be one-third the height of the wall, the section of the earth being a triangle. The pressure at P multiplied by B P will equal the moment of earth tending to overturn the wall = O.

To find the width K A of the wall, the height and inclination of batter being given—let w = weight of face of wall K H F, or $\frac{\text{K F} \times \text{H F}}{2} \times$ weight per cubic foot; a = distance H G, or two-thirds H F; b = distance G F, or one third H F; x = half additional thickness of wall K A; W = height of wall × weight per cubic foot. The centres of gravity of the two portions of the wall pass vertically through G and E, and that of the whole wall through I. The distance G I is proportional to I E, as the weight of K A F B is to K H F. Thus as $w + 2\,W\,x : b + x :: 2\,W\,x \times (b + x)$ $W\,x : G\,I$; or, $\frac{2\,W\,x \times (b + x)}{W + 2\,W\,x} = G\,I$. The entire weight of wall is $W + 2\,W\,x$, and its moment $\frac{2\,W\,x \times (b + x)}{W + 2\,W\,x} + a$, which multiplied together, gives $(2\,W)\,x^2 + (2\,W\,a + 2\,w\,b)\,x \times w\,a = O$, which reduced will give the formula

$$x = \sqrt{\frac{o - w\,a}{2\,W} + \left(\frac{a + b}{2}\right)^2} - \frac{a + b}{2}$$

The thickness of the wall K A = 2 x. The formula for wall with a batter towards the bank will be

$$x = \sqrt{\frac{o - w\,b}{2\,W} + \left(\frac{w}{2\,W}\right)^2} - \frac{w}{2\,W}$$

x in this case is also half K A. These formulæ give the earth and wall in exact equilibrium.—J. L.

[1082.]—LIQUID GLUE.—Recipe No. 1.—Orange shellac and rectified naphtha put together in a bottle will dissolve in less than 24 hours. It must be kept corked, or a film will be formed over the surface. Recipe No. 2.—Boil some glue in the ordinary manner in water, and while boiling drop in slowly nitric acid. The exact proportion of nitric acid I forget, but it may easily be found by experiment.—N. N. N.

[1083.]—WATER SUPPLY.—In answer to "Waterworks" I beg to inform him to fix one or two rain gauges in favourable situations, and the quantity of rainfall thus registered, multiplied by the surface area of gathering ground, will give him the amount of water available for storage. Allowance for overflow of storm water, percolation and evaporation to be deducted, particulars of which he can find in "Beadmire's Hydrology." Existing springs should be daily gauged, for, although the rain gauge may register a certain quantity, the springs may widely differ according to the geological strata. All springs in elevated regions are fed from the clouds, the regularity of flow depending upon the subterranean reservoirs. I am connected with waterworks, and would willingly render "Waterworks" further information through your "Intercommunication" or otherwise.—WM. WATTS.

[1094.]—BARK OF TIMBER.—In reply to "Bailiff," I beg to say that in twenty years' experience of the purchase and sale of round timber, the only rule I have ever known is 1in. to the foot on the girth. But the usual method of measuring round timber, although convenient, is so very far from correct that it is quite possible different customs may prevail in different localities. I once heard of a bailiff who wished to allow less than 1in. to the foot on young timber; but do not consider that he had any right to deviate from the rule above given.—HENRY CONWAY, builder, &c., Evershot, Dorset.

[1095.]—GRADIENTS.—The following table and formula, taken from "Molesworth," page 40, will, I think, supply "A Young Leveller" with the information he seeks:—

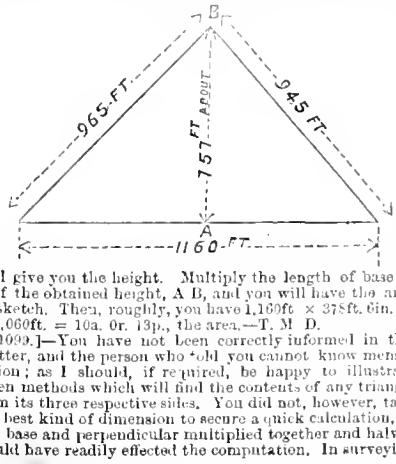
Rise per mile and resistance due to gravity alone.

Gradient of 1 in	20	25	30	35	40	45	50	60	70	80	90	100
Rise in ft. per mile	264	211	176	151	132	117	105	88	75	66	58	52
Resistance in lbs. per ton of train	112	83½	74½	64	56	50	45	38	32	28	25	22

Resistance due to gravity on any incline in lbs. per ton of train $= \frac{2240}{\text{rate of gradient}}$. Therefore, a rise of 30ft. in 3600ft. gives a gradient of 1 in 120, and $\frac{2240}{120} = 18.66$lb. per ton of train.—GEO. W. USILL.

[1097.]—WATERING OF RIVERS.—"W. W." has forgotten to give a vastly important item in his requisition, the *rate of inclination*, without which it will be impossible to ascertain the quantity of water discharged per minute.—GEO. W. USILL.

[1099.]—AREA OF TRIANGLES.—All you have to do is to draw the triangle out on paper to any scale; take one of the sides as the base (say the 1,160ft. one); draw the line A B (at right angles to base) from base to apex, which



will give you the height. Multiply the length of base by half the obtained height, A B, and you will have the area as sketch. Then, roughly, you have 1,160ft × 378ft. 6in. = 439,060ft. = 10a. 0r. 13p., the area.—T. M. D.

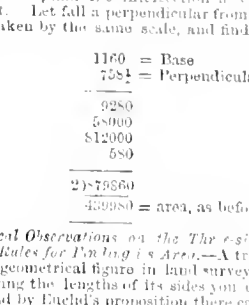
[1099.]—You have not been correctly informed in this matter, and the person who told you cannot know mensuration; as I should, if required, be happy to illustrate seven methods which will find the contents of any triangle from its three respective sides. You did not, however, take the best kind of dimension to secure a quick calculation, as the base and perpendicular multiplied together and halved would have readily effected the computation. In surveying it is customary to measure the three sides, and a line from a point in one side to another side or angular point, which line, on scaling the figure, proves the exactness of position of its angular points. The perpendicular is then deduced from the same scale to which the figure was plotted. Such a method I should recommend you to try in the present case. The first method to find the contents of the triangle in question which I shall describe is an old-fashioned method, but it is simplified much by Logarithm tables, the absence of which renders me unable to shorten the work. *Method the First* (by the old rule).—Firstly. Add together the sides, and halve the sum, from which deduct each side severally, thus:

1160	1535	1535	1535
945	1160	945	965
965			
2)3070	375	590	570
1,535ft.			

Secondly—Multiply the half sum and the differences continually together, and the product will be the square of the superficies. 1,535 × 375 × 590 × 570 = 187,382,637,500 = the square of the area in feet. Thirdly—Take the square root of these figures for the area,

$$\sqrt{187,382,637,500} = 433,080.3$$

= area in square feet, or 44,000 square feet, sufficiently true for practice. *Method the Second* (by the plotting scale).—From a scale of equal parts set out the base A B 1160. From the same scale take 965, and with the feet of



the compass in B describe the arc a a. From the same scale take 945, and with the feet of the compass in A describe the arc b b, and the intersection at C is the third angular point. Let fall a perpendicular from C on to A B = 758·5, as taken by the same scale, and find the area as follows:—

1160	= Base
758½	= Perpendicular.
9280	
58000	
812000	
680	
2)878860	
439080	= area, as before.

Trigonometrical Observations on the Three-sided Figure, and Further Rules for Finding its Area.—A triangle is the only correct geometrical figure in land surveying, because without altering the lengths of its sides you cannot alter its shape; and by Euclid's proposition there cannot be two triangles having two sides of the one terminated in one extremity of the base, and likewise those terminated in the other extremity, equal to each other. Trigonometry teaches the art of measuring triangles, and shows the relationship between their sides and angles; for it is evident that the angles must be proportionate to the sides when the greater angle is always subtended by the greater side, and the lesser angle by the lesser side. Again, the three interior angles of every triangle are together equal to two right angles, or 180 deg.; hence, the measurement of an angle is the number of degrees, &c., it contains, or so many equal parts of the circumference of any circle divided into 360 equal parts. There are various instruments used for taking angles, such as the plain table, circumferentor, prismatic compass, box sextant, and theodolite; the latter of which is recommended for accuracy, as it takes the horizontal and vertical angle at the same time. The following algebraic rule will be found useful in finding the area of a triangle from two sides and an included angle:—

Let A B and B C = two sides, and ∠ A B C = included angle.
∴ Log. A B + Log. B C + Log. sine ∠ A B C = x.
x — 15.301 = Log. of area.

Also, when one side and two adjacent angles are given:—
Let A B = base, and ∠ A B C and ∠ C A B the adjacent angles.
Then Log. A B + Log. sine ∠ A B C + Log. sine ∠ C A B = x.
Then Log. sine (∠ A B C + C A B) + 10.301 = y.
x — y = Log. of area.—ROBERT CARPENTER, accountant and surveyor.

[1099.]—"V. P." has been wrongly informed. It is not necessary to measure one of the angles of a triangle to ascertain the area. Rule: Add the three sides together, then take half the sum of the three sides, subtract each side severally from this quantity, then multiply this and the three remainders together, and take the square root for the area. Example: What is the area of a triangle whose three sides are 30, 40, and 50 chains?

$$\frac{30 + 40 + 50}{2} = 60 = \text{half sum.}$$

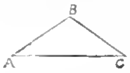
60	60	60
30	40	50
30 ×	20 ×	10 × 60 = 360000 chains.

Answer: $= \sqrt{360000} = 600$ chains = 60 acres.
"V. P." I think must have made an error in giving the length of one side of his triangle.—W. R. ATKINSON.

[1099.] "V. P." will find the rule for calculating the area of a triangle having three sides, given in BUILDING NEWS of September 11, which I will repeat:—"From half the sum of the three sides subtract each side severally, multiply the half sum and the three remainders continually together, and the square root of the last product will be the area."

1160 + 965 + 945	=	3070
3070 ÷ 2	=	1535
1535 — 1160	=	375
1535 — 965	=	570
1535 — 945	=	590
1535 × 375 × 570 × 590	=	193582637500
$\sqrt{193582637500}$	=	439080.3, area of triangle in feet.—R.

[1099.]—I see your correspondent "V. P." wishes to find the area of an unequal-sided triangle of certain dimensions. He might have found the rule by consulting any good mensuration. It is this: From half the sum of the three sides added together deduct each side separately; then multiply the half sum and the three remainders continually together; extract the square root, and the result will be the area. Example:



Let A B = 945ft. ,, B C = 965 ,, A C = 1160 — 2)3070 — 1535

	1535	1535	1535
	945	965	1160
Then	590	570	375

and 1535 × 590 × 570 × 375 = $\sqrt{2}$ 193582687500 = 439980.3ft. super. Answer—10 acres, 0 roods, 16.06 rods, poles, or perches.

1535
590
—
138150
7675
—
905650
570
—
63395500
452825
—
516220500
375
—
2581102500
361135435
15486615 — 9ft. in 1yd. sup.
—
193582687500 (439980.3
16 — 48886⅓ sq yds.
—
83) 335
249
—
869)8682
7821
—
8789)·6168 — 1a. = 4840yds.)48886(10a. 0r. 16.06p.
79101 — 4840
—
87988) 706775 — 486
703901 — 4 roods 1 acre.
—
8709603)28710000 — 1944
26298809 — 40 rods 1 rood.
—
2311191 — 77760
4840
—
29360
29040
—
32000
29040
—
2960

I hope this will give him the information he wants.—GRAY.

[1106.]—SETTING OUT A CURVE.—The most accurate method for "Mason" to proceed to trace out a curve when there is not sufficient space to find the centre, would be as follows:—Let A B, Fig. 1, be the given length of curve, D C the height; make E F, Fig. 2, equal to the heights D C in Fig. 1. Describe the curves E G H. Then divide F H into as many number of parts as A D and

FIG. 1.

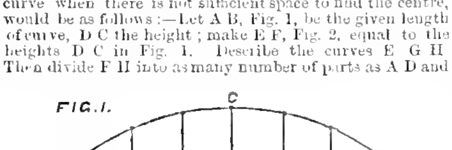
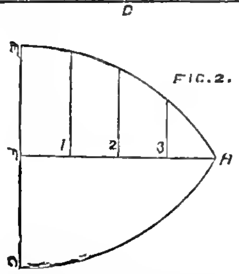


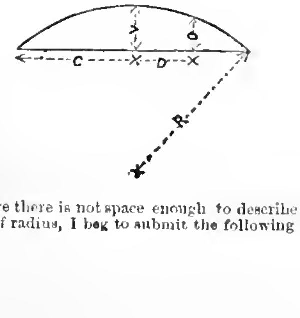
FIG. 2.



D B in Fig. 1. Square the ordinates, then take the various heights 1 2 3, Fig. 2, and set them at 1 2 3, Fig 1. Having obtained the heights, place nails in the several points, bend a slip of wood round these nails, care being taken to get it of equal thickness; then, by drawing a pencil along this slip, the required curve line will be obtained.—H HOWELL, Neath

[1106.]—In reply to "Mason," relative to setting out a

FIG. 1.



curve where there is not space enough to describe it from the point of radius, I beg to submit the following formula and calculation, which may be useful to him:—

$$O = \sqrt{R^2 - D^2} - (R - V)$$

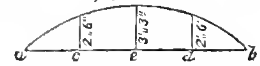
Where R = radius.
C = semichord.
V = versed sine.
D = distance of ordinate from centre.
O = any ordinate.

Example:
Let R = 25ft. 8in. = 25.66
D = 6ft. 3in. = 6.25 (say half semichord
V = 3ft. 3in. = 3.25 for example.)

Then $\sqrt{25.66^2 - 6.25^2} - (25.66 - 3.25.)$
$= \sqrt{658.4356 - 39.0625} - (25.66 - 3.25)$
$= \sqrt{619.3731} - (25.66 - 3.25)$
$= 24.88 - (25.66 - 3.25)$ [nearly.]
$= 24.88 - 22.41 = 2.47 =$ 2ft. 6in.

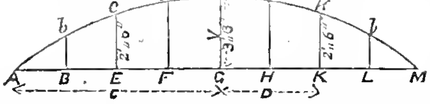
Therefore length of O is 2ft. 6in., and if "Mason" divides his chord or span into four equal parts he will find his rise a V at e (fig. 2) is 3ft. 3in., and the height of ordinate at c

FIG. 2.



and d to be 2ft. 6in., and if he wishes to prove the correctness of these heights if he will set out a line or chord 25ft. long and divide it into four equal parts (as in fig. 2) and set up 3ft. 3in. at e, and 2ft. 6in. at c and d, then from the point of radius describe an arc of 25ft. 8in. radius, he will find his curve will trace through the points measured from his chord. This should be done to a large scale. Of course if "Mason" wishes to have more points whereby to trace his curve he will have to increase the number of his ordinates, and in order to do this he must be careful that he accurately ascertain the length of D and use the same formula with the exception of the difference in length of D. For instance, let him divide his chord into eight equal parts (see fig. 3), and proceed in the same manner to ascertain

FIG. 3.



the heights of H h, F f, and L l, B b, as I have for those of K k, E e, and by this means he may trace his curve without the aid of a radius. There are other ways of setting out curves, but would hardly apply to so small a radius, and I think this formula is the most simple.—GEO. W. USILL.

[We have also received similar answers from "A Carpenter," "G. H., Swansea," and "A Joiner, Melton Mowbray."—ED. B. N.]

[1107.]—TOOLS FOR WOOD CARVING.—In reply to your correspondent "L S," the best tools for carving in wood are made by Addis, of London, at 9d each and upwards (without handles) and can be purchased from any respectable ironmonger in the provinces.—W. B. HALL.

BUILDING AND LAND SOCIETIES.

AT the sixth annual meeting of the members of the Fourth City Mutual Building and Investment Society, held on Tuesday, at the City Terminus Hotel, Cannon-street, a report was presented stating that the money advanced during the year amounted to £16,060, and the total amount of advances since the commencement of the society was £149,925. The balance remaining to the credit of the profit and loss account, after carrying forward £40,040 8s. 10d. for future interest on advances, and adding £100 more to the reserve fund account, was £4,373 7s 6d., out of which interest would be paid on the original investing shares (that is, shares taken prior to the new issue, which commenced on March 13 last) at the rate of 8 per cent. per annum. The number of investing shares now in existence is 1,840, which (when fully paid up) will give a capital of £110,400, and of which £69,878 12s. 1d. remained to the credit of the members on September 30; and the amount received on investing shares will necessarily decrease yearly as the shares become completed or paid up, thereby decreasing the number on which subscriptions have to be received.

WAGES MOVEMENT.

THE master builders of Leeds have given notice of their intention to adopt, on May 1 next, very extensive and important alterations in the rules of the various trades. Instead of 30s. per week they propose to pay ordinary skilled workmen amongst masons 7½d per hour; plasterers, instead of 30s. per week, 6½d. per hour; plasterers' labourers, instead of 22s per week, 4½d. per hour; and plumbers, instead of 26s. per week, 5½d. per hour: superior or inferior workmen each trade to be paid by special agreement. They also require the abolition of the rule or custom in the masons' society forbidding or interfering with the introduction or use of stone work at the quarry, or anywhere else than the place where it is to be used. Any rule or custom forbidding piecework or subletting amongst masons and plasterers they also require to be abolished. With respect to the bricklayers, bricklayers' labourers, masons, masons' labourers, plasterers, plasterers' labourers, and the plumbers, the masters require that in future all trade rules, disputes, demands, and differences shall be settled by conciliation and arbitration, and that proper courts shall be constituted for that purpose. They further state that they are prepared at any time, upon six days' notice from the men, to meet them to appoint arbitrators and select an umpire, and that they are willing to leave to the decision of the arbitration court, thus appointed, not only all future settlement of trade rules, demands, and differences, but also the settlement of all matters contained in the notice they have just given.

STATUES, MEMORIALS, ETC.

A BEAUTIFUL memorial brass, in the mediæval style, sunk in a black slab of Irish marble, has just been executed by Messrs. Hart and Son, of Brook-street, Hanover-square, in whose show-rooms it has been greatly admired as a fine specimen of modern art workmanship. This tablet is to the memory of the late and sixth Earl of Harrington, and is now being erected in Elvaston Church, near Derby. The slab, considering its size, being 8ft. 6in. by nearly 4ft., is remarkable for its purity. The inlaid brass is both rich and delicately worked, the exquisitely enamelled portions being very effective, the colours harmonising well with the general design. The whole is bordered by appropriate texts and symbols. Under the canopy is a full-length portrait of his lordship in collegiate attire, and below this are illuminated the arms of the family, and the words:—"In the vault under this church, by the side of his father and elder brother, lie the mortal remains of Seymour Sydney Hyde, sixth Earl of Harrington, born 27th September, 1845; died, before attaining his majority, on the 22nd February, 1866."

STAINED GLASS.

THE church of St. Mary the Virgin, Collaton, near Paignton, Devon, has recently been enriched by the addition of an east window, in memory of the founder. In the three principal lights are represented—1. Our Blessed Lord bearing the cross; 2. The Crucifixion, our Lord commending His mother to the care of St. John; and 3. St. John leading away the Virgin Mother. In the central compartment is introduced the figure of St. Mary Magdalene, and in the first compartment those of the other two Marys. The two quatrefoils above are filled with representations of angels, and the highest quatrefoil with the emblem of the Lamb of God. A small separate light near the roof contains the emblem of the Virgin. One special feature is the introduction of trees and flowers. In the first compartment the palm-tree appears, and in the last the sycamore. The window was designed and executed by Messrs. Ward and Hughes, of London.

A window has lately been erected in the church of the Holy Cross, Tramore, near Waterford—the Brighton of Ireland. It consists of three lights and tracery of the Decorated style, and in the treatment great care has been taken in keeping the proper character of the period. The subjects are figures, life size, of the Blessed Virgin, and of the archangels St. Michael and St. Gabriel. The framework is of foliage admirably designed. The window is from the studio of Earley and Powells, Camden street works, Dublin, who have executed many similar works in Ireland.

LEGAL INTELLIGENCE.

BREACH OF THE BUILDING ACT.—Mr. Thomas Rae, builder, appeared before the Liverpool magistrates on Wednesday, October 28, to answer a summons taken out under the 71st section of the Building Act, in which he was charged with having made an opening more than six feet wide in the party wall between two buildings in Mill-street.—Mr. Atkinson appeared in support of the case, and called one of the building surveyors, who stated that the opening in question was 8ft. 2in. wide.—The defendant, as an answer to the case, stated that he had strengthened the wall by an iron beam, and had placed an iron pillar to support it in the centre of the opening, so that there was only 4ft. on each side. Mr. Atkinson said the act was very stringent, and the building surveyor was bound to report cases like this. Mr. Anderton (clerk to the justices) said the act under which the information was laid was framed before iron came into general use for building purposes. The building surveyor said the pillar and beam used by the defendant were perfectly sufficient for the purpose, and the wall was as strong as ever. Mr. Stitt said the bench felt inclined to dismiss the case, if they had the power to do so. The law-clerk, however, had informed them that a technical offence had been committed against the act, and, therefore, they must impose a nominal penalty. The magistrates inflicted a nominal penalty of 6d.

Messrs. Okell and Morrison, builders, Wavertree-road, were summoned for a similar offence. According to the evidence, it appeared that the opening in this case was 13ft. in width, but the wall was sufficiently strengthened by an iron beam. The building surveyor said he had no objection to this wall. Mr. Stitt observed that the bench regretted the defendants had been brought to the court on such a charge. At the same time, the building surveyor was doing his duty in laying the informations, thereby carrying out the provisions of the act. He (Mr. Stitt) thought the law upon the matter ought to be remedied. The gentleman who appeared for the defendants concurred in the remarks made by his worship, and expressed his conviction that the enforcement of such an act would stop all improvements within the borough. A nominal fine of 6d. was imposed, and a similar penalty was inflicted upon Mr. Andrew Sinclair, builder, summoned on a similar information.

THE DUKE OF BUCCLEUCH v. THE METROPOLITAN BOARD OF WORKS.—This was an action brought in the Court of Exchequer on Tuesday to enforce an award made by Mr. Charles Pollock, Q.C., giving compensation to the Duke of Buccleuch for injury done to Montagu House, Whitehall, by the works of the Thames Embankment. Mr. Hawkins, Q C, on the part of the defendants, now applied to be allowed to abandon the writ of error by which they had proceeded after the decision of their Lordships against them, and to carry the case to the Court of Error by way of an appeal from the judgment of the Court of Exchequer. He stated that the Duke of Buccleuch had consented to this course being adopted, and it only enabled the defendants to revert to the right which they originally had under the Common Law Procedure Act, without the consent of the court. Baron Channell: We cannot give you leave to appeal, because we positively refused to do so; but you can avail yourself of your right to appeal. The Lord Chief Baron: There can be no objection to your reverting to the right you possess under the Act of Parliament. Application granted.

The Emperor of the French is about to erect a number of houses for workpeople at Bayonne. Each dwelling is expected to cost 4,500f. The tenant is to pay 300f. a year, of which 100f. will be set aside as a sinking fund. The inhabitant will become the owner in fifteen years.

Our Office Table.

The first monthly meeting of the winter session of the London Association of Foremen Engineers is appointed to take place at the rooms of the Association, George Hotel, Aldermanbury, City, to-morrow, the 7th inst., at eight o'clock in the evening. On this occasion the secretary will produce a comprehensive statistical and financial statement illustrative of the progress and prospects of the institution.

The gallery which recently held the National Portrait Exhibition at the South Kensington Museum is now in course of being enriched with the famous collection illustrating the history of ancient armour as it existed in Europe from the Norman Conquest to the reign of King Charles II., formed by the late Sir Samuel Rush Meyrick, at Goodrich Court, Herefordshire, and which, together with the production in 1824 of his magnificent work on ancient armour, procured him a high place among the most eminent antiquaries of his time.

The death of Mr. William Thomas, clerk of the works to the Queen, occurred on Tuesday, somewhat suddenly, at his residence, Brunswick-terrace, Windsor. Although he had been unwell for some months past, his illness became alarming only on Monday, after he had been out riding, and he died on the following morning from the rupture of a bloodvessel in the head. Mr. Thomas was held in much respect by Her Majesty, by whom he had been entrusted to superintend the works of the Prince Consort's mausoleum, at Frogmore.

Photography is being made use of, and advantageously, as a means for testing the authenticity of supposed valuable pictures. It appears that some persons have "touched up" and "doctored" several unfinished pictures by the late Mr. John Phillip, R.A. His executors, therefore, have given notice that they had all his pictures, finished and unfinished, photographed before they were sold, so that any touched by other hands can at once be detected.

Mr. T. C. Sorby, on account of the increase of other duties, has resigned his appointment as Surveyor to the Metropolitan Police and Police Courts, and Mr. Caiger, the Deputy Surveyor, has been appointed by the Secretary of State to the vacancy. The principal buildings erected, and erecting from the designs of Mr. Sorby, are the Lambeth Police Court, police station at King's Cross-road, Vine-street, Wapping (High-street), Blackman-street, Hammersmith, Rochester-row, Sea-bridge, Bedfont, Richmond, and Ealing.

The progress in the construction of the Mont Cenis tunnel continues satisfactory. Nearly three-fourths of the tunnel are now completed, and the remainder is being constructed at a rate which will admit of the entire completion of the tunnel in about two years, should no unseen occurrence intervene. The total length of the tunnel will be 13,364 yards, and of this distance there had been driven to the end of September from the Bardonnèche end 5,700 yards, and from the Modane end 3,970 yards, making a total length completed of 9,670 yards, leaving 3,694 yards to drive. The operations at present are proceeding more rapidly on the French than on the Italian side.

The Arundel Society is about to issue a new work, being a description of its own publications during twenty years. This book will be illustrated, and has resulted from the success of some experiments in photographing the prints, casts, &c., on a small scale, suitable for book illustration, which the Society has issued during the period in question. The whole of the Society's works, including the ivory carving, will be reproduced in the chronological order of their former publication, and one-fifth the size of the originals. The Society will soon receive drawings, made by its artists in Italy and Germany, from the following famous pictures:— 1. "The Last Supper," from the fresco, by Andrea Del Sarto, in S. Salvi, near Florence; 2 and 3, "The Resurrection" and "Christ in the Garden," from frescoes by Fra Angelico, in S. Marco, Florence; 4, "The Virgin and Child," after a lately-discovered fresco by Fra Bartolomeo; 5, "Christ and his Disciples at Emmaus," after Fra Bartolomeo; 6, "The Adoration of the Shepherds," after Perugino, at Perugia; 7, "The Madonna," after Holbein, in the palace of Hesse-Darmstadt; 8 and 9, two paintings by A. Durer, "The Four Apostles," at Munich; 10, 11, and 12, three interesting drawings after Piero della Francesca.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

420 G. TUCKER. IMPROVEMENTS IN THE MANUFACTURE OF RAIN-WATER PIPES, &c. Dated February 7, 1868.

This invention consists of certain improvements in the manufacture of such cast iron goods as sash weights, rain-water pipes and gutters and their connections, furnace pans, and hot water pipes, and their connections. These improvements consist in casting the requisite articles in chills made of the required shape, whereby great economy in the manufacture of large quantities is obtained with a harder and more durable surface. The molten metal is poured into the chill, which is a cold metallic mould of the shape required, and the sudden cooling thus occasioned converts the surface into an extremely hard white iron.—Patent abandoned.

421 G. HARFORD. IMPROVEMENTS IN SCAFFOLDING, AND APPARATUS TO BE USED FOR BUILDING AND OTHER SIMILAR PURPOSES. Dated February 8, 1868.

The inventor forms all around the object to be constructed, whether it be a chimney, a wall, a vessel, or other erection, a double frame consisting of sole plates or pieces at right angles to or parallel with and passing through the thickness of the wall, into which sole plates or pieces, both on the outside and inside of the wall, uprights are fastened either by mortises or screws, or in any other convenient manner; these uprights may be of any convenient length, but he proposes that, when the invention is used in the building of a house, they should be equal in length to the height of one story of the house; the tops of these uprights are to be kept in their proper places by cross-bars or beams. On the crossbars or beams is placed a rack and pinion or screws, so that, when the building is completed to the height of the uprights, the entire framing may be raised from off the sole plates or pieces to the height of the next story or portion, after which the sole plates or pieces used at the lower portion of the building may be withdrawn, and placed upon and across the completed portion of the building, and the framing rested upon them, and so on until the entire building or construction is complete.—Patent abandoned.

426 T. WALKER. IMPROVEMENTS IN THE CONSTRUCTION OF SEWERS AND DRAIN PIPES OR TUBES. Dated February 8, 1868.

As sewers and drain pipes or tubes are at present arranged, the subsidiary or feeding channels open into them at their upper parts or above the ordinary level of the sewage water therein, by which the effluvia from the matters in such sewers or main drain pipes or tubes rises up the subsidiary or feeding channels into the streets or ways, and, in some cases, into the surrounding dwellings, with most injurious results. The object of these improvements is to remedy these evils, and, for this purpose, the patentee arranges the openings for the subsidiary or feeding channels into the mains at the bottom thereof, or where the outlets or mouths of the subsidiary drains into the mains will be covered by any sewage water in such mains, and the subsidiary or feeding drains will thereby become self sealing or self trapping. The patentee forms pipe drains with these branches on their lower sides inclining upwards at an angle or passing partly round the external surface of the pipe or tube to the gallery or other inlet.—Patent completed.

441 N. C. SZERELMEY. IMPROVEMENTS IN PRESERVING WOOD. Dated February 8, 1868.

In order to preserve railway sleepers and other timber from white ants, Teredo navalis, dry rot, and decay from other causes, the patentee dissolves, in 50 gallons of boiling water, 10lb. of powdered potash, and 10lb. of powdered lime. In another 150 gallons of cold water he mixes 40lb. of sulphuric acid, and, afterwards, he mixes the two liquids together: this is compound No. 1. Again, he boils in an iron pot 50 gallons of crude petroleum, 40lb. of asphaltum, 30lb. of powdered lime, mixing in therewith, by preference, 20lb. of zopissa, and lets it boil until it ignites. As the zopissa can only be dissolved by fire, after half an hour's boiling he mixes therewith one pint of sulphuric acid: this is compound No. 2. He immerses the railway sleepers or timber in the liquid No. 1 for a quarter of an hour, or he coats them with a large tar brush, and dries them for a day or two afterwards. He also coats the sleepers or timber with a tar brush well on all sides with the composition No. 2 in a hot state.—Patent completed.

453 J. TANSLEY. IMPROVEMENTS IN APPARATUS FOR WORKING THE ROLLERS OF BLINDS, SHUTTERS, ETC. Dated February 10, 1868.

The object of this invention is to remove the need for cords and springs in the raising and lowering of blinds and of roller maps, and of chains in the working of coiling iron shutters, and to substitute therefor a simple and economical arrangement of mechanism which may be applied to operate the blind or shutter, or it may be two or more simultaneously. To this end the patentee employs, for the purpose of transmitting motion to the roller carrying the blind or coiling shutter, a screw spindle, somewhat like those used for hand drills, which spindle is provided with a traversing nut for giving it an axial motion that is transmitted by gearing to the roller. The invention is not fully described apart from the drawings.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Geographical Society (at the School of Mines, Jermyn street), 8.30.

WEDNESDAY.—Geological Society, 8.

FRIDAY.—Architectural Association.—"On the History of the Manufacture of Clocks, and the Structural Arrangements made for their Display and Preservation, with Practical Rules for the Guidance of Architects," By M. Digby Wyatt, F.R.I.B.A., F.S.A.

Trade News.

TENDERS.

BURTON JOYCE (Nottinghamshire).—For chapel and school at Burton Joyce, Nottinghamshire. Mr. J. Tait, architect:—

J. Wright and Son (accepted) .... £[illegible] 12

DERBY.—For Congregational chapel, Derby. Mr. J. Tait, architect:—

Stoddard (accepted) £1258

ELVASTON.—For the erection of steward's residence at Elvaston, for the Hon. the Earl of Harrington. Messrs. Stevens and Robinson, architects, Derby. Quantities supplied:—

Thompson	£1390
Wood	1350
Fryer	1270

KENSINGTON (Derbyshire).—For mission chapel, Kensington, Derbyshire. Mr. J. Tait, architect:—

Warner and Son (accepted) £262

LONDON.—For alteration, repairs, and decorations to 72, Grosvenor street. J. and E. Baddeley, surveyors:—

Clarke and Mannoch	£[illegible]	0	0
B. B. Sapwell	[illegible]	3	4
Scrivener and White (accepted)	819	0	0

LONDON.—For alterations, &c., to No. 7, King-street, Snow Hill. Mr. B. Tabberer, architect:—

Oatley	£615
Clarke	512
Young	495
Pearce	463
Larke	459
West	446
Walker	394
Bostel	382
Whittingham	365

LONDON.—For rebuilding Nos. 27 and 28, Monkwell-street. Mr. B. Tabberer, architect:—

Larke	£2387
West	2204
Turner and Sons	2076
Brass	1997
Pearse	1997
Browne and Robinson	1997
Prind	1935
Henshaw	1890

RAMSGATE.—For building a warehouse, &c., 59, Queen-street, Ramsgate, for Messrs. Vye. Hinds and Sons, architects:—

Hobbs	£1350
Goodchild	1180
Horne	1095
Harrison (accepted)	1075

READING.—For the erection of new Infant School for the parish of St. Lawrence, Reading. Messrs. Wm. and J. T. Brown, architects:—

Matthews	£712	0
Barnicoat	690	0
Sheppard (accepted)	634	10

READING.—For the erection of a house and shop in Broad street, Reading, for Mr. Batho. Messrs. Wm. and J. T. Brown, architects:—

Kendell	£576
East	566
Sheppard	55[illegible]
Carter	529
Clacey (accepted)	507

READING.—For the erection of a house and shop in Broad-street, Reading, for Mr. Hiscock. Messrs. Wm. and J. T. Brown, architects:—

Whiting (accepted) .... £[illegible]

SEVENOAKS.—For additions, &c., to a house, Sevenoaks. Mr. B. Tabberer, architect:—

Willshire	£3[illegible]
Grover	2[illegible]
Larke	242

STROOD (Kent).—For the erection of new corn warehouse at Strood, Kent. Henry Andrews, architect, Rochester:—

Wilkins and Son, Chatham	£1[illegible]	0
Baxter and Sa[illegible]man, New Brompton	1475	0
Ball and Co., Strood	14[illegible]	0
R. West, Strood	142[illegible]	0
Clements, Rochester	1404	0
Sollitt, Strood	1[illegible]	0
Naylar, Rochester	1347	0
Gates, Frindsbury (accepted)	1298	6

WOODFORD (Essex).—For proposed new Methodist Free Church and Schools, Woodford, Essex (by public competition as previously advertised). Messrs. Hooper and Lewis, architects. Quantities by Mr. J. W. Forge:—

	Amount of Contract.	Credit old materials.	Nett amount.
W. J. Bayes	£2[illegible]	£11[illegible]	£2011
S. and W. Pattinson	22[illegible]0	200	2060
J. Rivett	[illegible]	110	1983
Staines and Son	[illegible]	80	1977
G. Hall	[illegible]	160	1971
Mundy and Hutchinson	1[illegible]	83	1909
W. Shurmur	19[illegible]	85	1895
Crabb and Vaughan	1974	1[illegible]6	1868
Kemp and Morrisson	1996	1[illegible]6	1810
R. Munn, jun.	1[illegible]0 0	1[illegible]	1800
Wicks, Bangs and Co.	18[illegible]	12[illegible]	1778
C. Baker	1870	175	1695
J. Moster (accepted)	1[illegible]3	14[illegible]	16[illegible]3

WOOLWICH (Kent).—For taking down and rebuilding two shops, Nos. 52 and 54, Artillery street, Woolwich, for the executors of Thomas Stevens Burt, Esq., deceased. Messrs. William Gosling and Son, architects. Quantities supplied. The contractor to be allowed the old materials, and to use such bricks as the architects may approve:—

Woodford	£998
Hanks	900
Richardson and Thompson	850
Ginger	760
Vickery	755
Blake	750
Lidbetter	728
Carter	725

COMPETITIONS.

India.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

Melbourne, near Derby.—For designs for a new Wesleyan chapel. Mr. W. H. Adcock, Melbourne, near Derby.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Hastings.—November 16.—For the purchase of ashes' cinders, marine stores, and refuse of every kind. G. Meadows, clerk, Local Board of Health, Hastings.

Leicester Waterworks.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green-street, Leicester.

St. Mary Church, Torquay (Devon).—November 19.—For the erection of new gasworks in the Barton-road. Grant Wollen, clerk to the local board.

Penzance.—November 28.—For the improvement of the harbour of Mousehole, in the parish of Paul, near Penzance, in Cornwall. Rodd and Cornish, solicitors to the Commissioners, Penzance.

Rochdale.—November 24.—For lighting the new townhall with gas. T. Mellor, town clerk.

Rochdale.—November 24.—For warming and ventilating the new townhall. T. Mellor, town clerk.

Tower Subway Company.—November 30.—For the construction of lifts. Mr. P. Barlow, engineer, 26, Great George-street, S.W.

Trinity House, London, E.C.—For the supply of dressed and scappled granite for new lighthouse at Longships rock. R. Allen, secretary.

Market Drayton.—November 11.—For the construction of a cattle market. E. E. Warren, Market Drayton.

St. Luke's, Middlesex.—November 11.—For certain repairs and alterations to St Luke's Church. Vestry clerk, Vestry Hall, City-road.

Bradford.—November 16.—For the erection of a large fireproof mill and engine house in Lumb lane. Lockwood and Mawson, architects, Exchange, Bradford; 10, Lincoln's Inn Fields, London.

Bradford.—November 23.—For the erection of thirty shops in Godwin-street. Lockwood and Mawson, architects, Exchange, Bradford; 10 Lincoln's Inn Fields, London.

Bradford.—November 16.—For the erection of a new wing to the Hydropathic Establishment as West Rhydding. Lockwood and Mawson, architects, Exchange, Bradford; 10, Lincoln's Inn Fields, London.

Ilkley.—November 12.—For the erection of an hotel and boarding house, near Wells road. Thos. Ambler, architect, 9, Park place, Leeds.

Leeds.—November 14.—For the erection of new school buildings, in connection with the Methodist Free Chapel at Farsley. C. S. and A. J. Nelson, architects, Albert chambers, Park row, Leeds.

Wolverhampton Union.—November 13.—For alterations and extensions to the Wolverhampton Union Workhouse. Edwin Pritchard, Clerk to the Guardians, Wolverhampton.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Bowtell, Leyton, Essex, builder, November 19, at 12—Charles Parks, Foley street, Marylebone, builder, November 19, at 1—Henry Smith, Johnson-street, Nottinghill, painter and glazier, November 19, at 2—William Woolley, Twickenham, builder, November 24, at 11—John Allen, Avenue road, Camberwell, smith and engineer, November 17, at 12—Martin Homan Bourke, Richmond, Surrey, railway contractor, November 17, at 1—William Few, Hargrave Park road, Upper Holloway, builder, November 12, at 12—George Huckle, Great James-street, Bedford-row, builder, November 17, at 12—Thomas Vincent Lee, Millman-place, Bedford-row, civil engineer, November 12, at 1.

TO SURRENDER IN THE COUNTRY.

Samuel Benn, Great Horton, plumber and glazier, November 13, at 9.30—Agar Gardner, Towlaw, Durham, joiner, November 16, at 4·30—William Fletcher Ireland, Bolton, slater and felt merchant, November 18, at 10—William Clamp, Leicester, painter and builder, November 17, at 11—Thomas Taylor Hilton, Blackburn, bricklayer, November 10, at 11—Archibald Kane, Carlisle, joiner, November 13, at 11—George Ravenscroft, Crewe, Monks Coppenhall, builder, November 11, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

November 25, T. W. and J. Stears, Hull, engineers—November 18, W. Wilson, Bulmans Village, near Newcastle-on-Tyne, builder—November 20, T. G. Jenkins, Liverpool, builder—November 20, W. Briggs, Halifax, bricklayer—December 17, S. Denton, Regent's Park-road, Finchley, builder—December 14, R. Hall, Kentish Town-road, carpenter—December 17, F. Nash, Alton, plumber—December 17, A. P. Jones, Edgware-road, builder—December 17, W. White, Poole, builder—November 20, J. Cobden, Pooles Park, near the Seven Sisters-road, Holloway, builder—November 30, J. Powell, Forest Gate, builder—November 16, R. Watkins, New Kent road, plumber—November 16, T. Fergusson, Wharf, Amberley-road, Paddington, brick merchant—November 18, J. W. Crook, Langley, Bucks, carpenter—November 18, T. Morgan, Testerton-street, Notting-hill, plasterer—November 20, T. Lane, Watford, builder—November 26, W. H. Litherland, Manchester, timber dealer—November 11, J. Lockett, Hanley, brickmaker—November 6, M. Mansell, Wellington, Salop, bricklayer—December 11, Z. Stebbing, Bury St. Edmunds, painter—November 18, W. Shetton, Stonesby, Leicestershire, lime burner—December 3, D. Ward, Brighton, carpenter and joiner.

PARTNERSHIPS DISSOLVED.

Hudson and Varley, Leeds, timber merchants—Moore and Collins, Wilton road, Pimlico, and Penge, builders—Wood and Sons, Worcester, timber and slate merchants—Nichol and Derbyshire, Liverpool, timber merchants.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, rawback, 1s.

Teak	load	£10	10	12	10	Archangel, yellow	..	£11	0 £12 0
Quebec, red pine	....	3	5	4	15	St. Petersburg, yel.	..	10	0 12 0
,, yellow pine	..	3	5	4	8	Finland	.....	6	5 8 0
St. John N.B. yellow		0	0	0	0	Memel	.....	0	0 0 0
Quebec Oak, white	..	5	5	6	0	Gothenburg, yellow		8	0 9 10
,, birch	.....	3	15	4	15	,, white	.....	8	0 9 0
,, elm	.....	4	0	4	17	Gefle, yellow	.....	9	0 10 10
Dantzic oak	.....	4	5	5	10	Soderham	.....	9	0 10 10
,, fir	.....	2	15	4	0	Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir	.....	2	15	3	0	yellow	.....	10	10 13 0
Riga	.....	2	15	3	0	Deck Plank, Dantzic, per 40 ft. 3 in.	....	0	14 1 9
Swedish	.....	2	2	2	8	Pumice Stone per ton		6	0 8 0
Masts, Quebec red pine		4	0	6	10	Oils, &c.			
,, yellow pine	..	4	10	6	0	Seal, pale	....per tun	36	0 0 0
Lathwood, Dantzic, fm		5	10	6	10	Sperm body	.....	10	0 0 0
,, St. Petersburg		7	10	8	10	Cod	.....	37	0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, Sth. Sea, pale		38	0 0 0
Quebec, white spruce		13	0	18	0	Olive, Gallipoli	.....	68	0 73 0
St. John, white spruce		13	0	15	0	Cocoanut, Cochin, ton		52	0 55 0
Yellow pine, per reduced C.						Palm, fine	.....	44	5 45 0
Canada, 1st quality.		17	0	18	10	Linseed	.....	29	5 34 0
2nd do	.....	11	10	12	10	Rapeseed, Eng. pale	..	33	0 0 0
						Cottonseed	.....	29	10 0 37

METALS.

Lead—						
Pig, English	....per ton	21	5	0	0 0 0	
,, Spanish Soft	..... do	18	10	0	0 0 0	
Shot, Patent	..... do	22	10	0	22 15 0	5
Sheet	..... do	20	0	0	20 15 0	
White	..... d	27	0	0	30 0 0	
Copper:—						
Sheet & Sheathing, & Bolt	....per ton	78	0	0	80 0 0	
Hammered Bottoms	..... do	81	0	0	0 0 0	
Flat Bottoms, not Hammered	.. do	81	0	0	0 0 0	
Cake and Tough Ingot	..... do	70	0	0	0 0 0	3
Best Selected	..... do	75	0	0	76 0 0	
Australian	..... do	77	0	0	0 0 0	
Yel. Metal Sheathing & Rods	....per lb	0	0	6½	0 0 7	
Iron:—						
Welsh Bars in London	....per ton	6	10	0	6 15 0	3
Nail Rod	..... do	7	7	6	7 10 0	
Hoops	..... do	8	5	0	9 0 0	2½
Hoops, Single	.... do	8	0	0	9 0 0	
Staffordshire Bars	..... do	7	7	6	7 15 0	
Bar, in Wales	.... do	5	15	0	6 0 0	3
Nailrods	.... do	7	7	6	7 10 0	2½
Foundry Pigs, at Glasg. No 1	.. do	2	13	3	2 17 6	nett.
Swedish Bars	..... do	10	10	0	10 10 0	2½
Tin:—						
English Block	....per ton	95	0	0	0 0 0	
do Bar	..... do	98	0	0	99 0 0	2½
do Refine	..... do	97	0	0	0 0 0	
Banca	.... do	0	13	9	87 0 0	nett
Straits	..... do	92	10	0	92 0 0	
Zinc:—						
English Sheet	....per ton	25	10	0	26 10 0	2½
*Devaux's V. M. Roofing Zinc	.... do	27	0	0	0 0	
Steel:—						
Swedish Keg, hammered	.....per ton	15	0	0	15 10 0	2½
Swedish Faggot	..... do	0	0	0	0 0 0	
Spelter:—						
On the Spot	....per ton	20	0	0	0 0 0	
Quicksilver	....per btl	6	17	0	0 0 0	
Regulus of Antimony						
French	..... ton	42	0	0	0 0 0	

* And 4 per cent. discount if laid upon the new system

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 13, 1868.

ARCHITECTURAL ASSOCIATION.

WE took occasion recently to consider the position and prospects and to review the programme of the proceedings of the Royal Institute of British Architects, and also to refer to the address of its president. We now propose to do the same with regard to the Architectural Association, the session of which was opened by a *conversazione* of its members and their friends on Friday evening, October 30.

In the first instance we congratulate this junior body of the profession, as we did its senior, upon a continuous and steady increase in its numbers. The list of these just issued shows that the association now consists of no less than 392 members, of whom 105 were enrolled during the past year. This fact is most gratifying and speaks for itself as to the appreciation with which the institution is regarded. It might at first seem strange that the Institute should fail in attracting these young men into the ranks of its students, and that both bodies must suffer somewhat by their apparent disunion. Self-help, however, has advantages, and self-government has attractions, while youth and age have many points of difference; so that on the whole we question whether the arrangement as it stands is not better than any possible fusion of the two. The utmost harmony now prevails between them, and the younger institution often refers to the elder for assistance on various matters, and is aware that it may always reckon on its sympathy and support. Evidence of this cordiality is adduced in the list of officers of the Association; thus the name of the president for the year is followed by the mystic initials F.R.I.B.A., while A.R.I.B.A. is attached to those of the two vice-presidents, the two honorary secretaries, and to seven out of the ten members of committee. A glance at the description of the proceedings shows that some of the objects and wants of the Association are such as could not be rendered compatible with those of the Institute. For instance, with regard to its library, it is set forth as being the *only lending library in the profession;* as such its utility to students cannot be over-estimated, and yet it would be simply impossible to combine such a feature with the character of the library of the Institute, the valuable works in which could not be so exposed to the risks of injury or loss. The *Syllabus of Papers* for the entire session, issued at its commencement, bespeaks great energy on the part of the secretaries, and must conduce greatly to the deliberation with which the papers are prepared and discussed.

The *class of design* has always been a distinctive and most useful feature in the proceedings of the Association, and the sketches which are the result of its labours are annually seen at the Architectural Exhibition, and their value has been repeatedly acknowledged; but the *sketch book* is a comparative novelty, and shows even a greater spirit of enterprise. It consists of drawings and sketches of ancient buildings or details, contributed and lithographed by the members. It is published in monthly parts, the sketches being selected by a committee. One volume has already been issued and reviewed at length in our pages, and highly though we were able to commend it generally, we notice an improvement in those parts which have been published since. There can be no doubt that by this work the Association will do good service and gain much credit.

Another valuable class is that of *construction and practice*, "formed in order to assist the members to obtain a knowledge of the practical part of their profession by means of an organised system of mutual study." The course adopted is as follows:—A number of questions are issued bearing on the subject to be treated of. The members are required to furnish replies to these in writing. One of these is selected and read out at the meeting, and the remainder are compared with it. The results are then discussed, and the methods by which they have been arrived at explained and illustrated by sketches on the blackboard. We are not surprised to find by the report that "this procedure has been found to work well, and that a large amount of information has been acquired and disseminated during the existence of the class."

The class for *figure drawing*, the object of which is defined to be "to study the drawing of the human figure with special reference to its bearing on architecture," is one of the greatest value, for the establishment of which the Association deserves great praise. The want of the opportunities it affords has long been felt by many of the more art-loving members of the profession, and we trust soon to see its practical results in advanced artistic power on the part of the rising architects. A *water-colour class* under the guidance of Mr. Aaron Penley, the arrangements for occasional visits to ancient and modern buildings, and a goodly list of prizes offered for the most successful efforts in the various classes above described, show a thirst for knowledge and a determination to attain and profit by it which cannot fail to command success.

We are, however, by no means of opinion that these praiseworthy endeavours on the part of the students to help themselves at all absolves their elders from the duty of assisting them. Such efforts in the limited time which young men can devote to these pursuits can be but desultory. "Technical education" in architecture is still the sore need of the profession, and we do not intend, therefore, to relax our endeavours to raise the cry, "Educate! Educate!" to some purpose.

The necessity for such an appeal, notwithstanding all that has been attempted or is contemplated by the Association, was forcibly put by its president, Mr. White, in his able address, a summary of which we published in the last number of this journal. "Education," he remarked, "ought to be systematised, and to a considerable extent centralised, in the same manner as the higher branches of education are centralised in our universities," since, as he pointed out most clearly, "the very idea of *mutual* education implies in some degree a weakness of system and of position but one degree removed from *self* education;" and he remarked with truth that "it was not quite free from the pernicious effects almost inseparable from any system of licentious self-government." To impress on his hearers the warning conveyed in the words we have quoted was the object throughout the greater portion of Mr. White's address, and, being well meant, it was well received, although naturally the members of the Association might not be supposed to see the defects of their system as clearly as its merits, and might fairly plead that none other has as yet been established for them.

There are doubtless many difficulties in the way of founding the education for architects which is needed, and the first question is by whom should it be done? Perhaps Government can hardly be expected to take one particular profession under its wing, and the only hope for State aid in the matter is in obtaining a fair share of consideration for architects in any general scheme, such as that for "Technical Education," for which the Society of Arts is agitating. It is true that the Department of Science and Art undertakes the tuition of designers for manufactures in the schools at South Kensington and in the provinces; but a part of the programme of the proceedings of that body has always appeared to be the systematic ignoring of architecture and architects, so that it is quite useless to look for help in that direction. The Royal Academy, which is independent of Government, provides for the education of painters and sculptors, and does just so much nominally for architects as to impede any other effort of the kind, in the same way as by the modicum of space it allows for architectural drawings it injures any other architectural exhibition.

The Institute has not the means to do more than offer prizes or set on foot examinations to test the results of education already obtained elsewhere; and this, as is evident by the failure of its "voluntary examinations," is, in fact, putting the cart before the horse. It can, however, head the agitation for what is so greatly needed by the profession, and is, we understand, now engaged in resuscitating a committee of representatives of various societies, to whom was committed some time since the consideration of a scheme for establishing "a school of arts accessorial to architecture," suggested by Mr. Scott. We learn, also, that Mr. Joseph Clarke, on the part of the Architectural Museum, has proposed that the new premises of that institution might be made available in connection with such a school. Another hope is held out by University College, where Mr. T. Hayter Lewis is the Professor of Architecture, and has for some time been endeavouring to set on foot "a scheme for the extension of the study of fine arts as a branch of general education for all classes." The late Sir Felix Slade's bequest of £50,000 for endowing professorships and scholarships for students of art it is hoped may assist this effort, and, if so, here is another nucleus to which a proper system for architectural education might be attached.

Of course any such system could not supersede the necessity of the present one of pupilage. It would only be supplementary to it, and intended to supply that theoretical knowledge for which the routine of office duties does not allow sufficient opportunity. We think, however, that considerable modifications might be made with advantage in the relations between masters and pupils, with the view of ensuring to the latter the proper time to avail themselves of the advantages for which we are pleading. Technical education should unquestionably commence long before a student enters the office of an architect, but it should be continued in connection with his studies there, so that the theory and practice of the profession might be learnt simultaneously. It is satisfactory to find that there is so considerable an amount of agitation in progress with regard to this important subject, and it may be confidently hoped and expected that before long, by the agency of one or other of the levers which are being used to attain the desired object, some practical good will be effected. In the meantime we would wish to encourage the laudable efforts of the Architectural Association to attain the same end for themselves. Indeed, whatever may be effected for them outside of their own body, their operations will not be less needed; while the enthusiasm which is one of the best results of their mutual studies cannot otherwise be supplied. Enthusiasm is, in fact, at once the cause and the effect of the very existence of the Association separately from the Institute, and the secret of its well-deserved popularity among the junior members of the profession.

LONDON LAMP-POSTS.

STREET lamps, lighted with gas, have been in use in the principal streets of London, Edinburgh, Glasgow, Manchester, Birmingham, Liverpool, and other great cities since the year 1821. Now, in half a century many improvements have been made in various branches of art and industry, but they have not affected the lamp-posts. It is

true that by the recently introduced method of lighting the gas by means of a torch time and labour are saved, and the proverbial despatch of a lamplighter no longer means a feat of almost acrobatic agility performed at intervals of a few seconds. But, in the form of the posts bearing the lamps, no improvement has been made since the year 1821. The earliest lamp-posts are to be seen in Whitehall, the latest in Park-lane.

At the present time, when we may expect many improvements in our street architecture, for we firmly believe the authorities are doing their best according to their dim lights, the beauty even of so utilitarian an object as a lamp-post is no unimportant matter. Having been at much pains to examine them in various parts of the metropolis we have arrived at the conclusion that it is high time to change old lamps for new and new lamps for newer. Let us commence at the Royal Exchange. These are suitable as accessories to a public building, but are not fit for ordinary street use. They are heavy and expensive, bound with the fasces of the Roman, inscribed with the S.P.Q.L. of civic authority, and surmounted by the civic cap, borne on the civic cushion, with little civic tassels hanging at the corners. At the Bank of England there are no lamp-posts, but elegant brackets projecting from the wall at right angles supported by a curved strut. They harmonise with the character of the building. Opposite the Mansion House are three posts, each supporting five lights. These show a good deal of design, but very little proportion. There is no doubt the designer took much pains with them, but the lamps are too small and the posts are too large. In the new lamps in Hyde Park and elsewhere this error at least is avoided. The three lamps on the obelisk in Moorgate-street, bearing date 1863, are certainly of better design, though they are placed somewhat high. At the Post Office the standards form part of the surrounding railings. They are heavy even as accessories to Grecian architecture. In the square of Bartholomew's Hospital four lamps have very recently been placed. They look very well in that situation, but are too fine for everyday street use, making the ordinary lamp-posts which still remain in the square to look very shabby indeed. At the Cannon-street Station, where something above the average might be expected, one is doomed to disappointment. The lamp-posts consist of a sort of base or pedestal, something of the same form as those of the ordinary street lamps, surmounted by a shaft twisted into a spiral in the Gothic manner. The effect is exceedingly bad, and they show no indications of artistic taste on the part of the designer, but the glass globes are of good form and the lights are placed sufficiently low. The lamps at the Charing Cross Station are similar in every respect to these. Returning to lamp-posts of more importance the latest are to be seen in the quadrangle of the new Foreign and India Offices. They are literally covered with ornament, either cast in the solid or screwed on in little bits. This ornament is of a most trumpery character, but is contrived with strategic ingenuity to catch and tear any textile fabric with which it comes in contact. A wooden post well provided with tenter-hooks is not more to be avoided than these evil posts. Incidentally it may be mentioned that owing to improper construction nearly every lintel and sill in the basement story, of the quadrangle at least, is cracked through and through. The settlement of the building was the cause, but the *causa causans* was their being placed in position too soon—in short, before the piers had settled. For this there can be no shadow of excuse, and the fact of its occurrence is disgraceful to all concerned. The most ignorant mason or bricklayer in London must have known the inevitable result. The lamps on the piers in Palace Yard do not come under the head of lamp-posts, and, therefore, need no remark, but the new posts in the green and in front of the peers' entrance, &c., call for observation. They are simply the worst to be found in all London. The lower part positively consists of buttresses—buttresses in cast iron!—craftily devised for offensive purposes, while the upper part or shaft is twisted in the approved manner to give the ignorant the idea that much Gothic character is given. If these posts were in a less important situation it would not so much matter. Of precisely the same character, but of larger size, are the four standards in the Victoria Tower. They are more *costly* than cast iron itself, and it would be difficult for human ingenuity to combine in one work more bad lines. The bases are too large, the shafts too tall, and the lamps too small. The bases are very much in the form of the struts which support the flagstaff on the top of the tower, which is equivalent to saying that they could not well be in worse taste. Whoever the author we assure him, from motives of pure compassion, that he will never be a man of metal. At all events, let him beware of lamp-posts. From the green let us return to the steps leading from the India House into St. James's Park. On these steps are four lamps of really elegant design, as is all the metalwork of this building, with the exception of the ill-designed and worse-placed lamp-posts in the quadrangle. Let the visitor by no means overlook these steps. Proceeding along Broad Sanctuary the standards on the rail of the Westminster Palace Hotel are worthy of observation, but they have great advantages over the ordinary street lamp: the difficulty of a suitable base is got over because they are already sufficiently elevated, and they may besides be of a much more ornamental and delicate character than befits a street lamp-post. They would, however, have a better appearance were they somewhat higher. The same may in a still greater degree be said of those at the Grosvenor Hotel, which are positively stumpy. We are curious to see what the lamps on stone piers which are to adorn the green immediately opposite will be like. In Grosvenor-place up to Hyde Park Corner a very ambitious style of lamp-post prevails. They are at least eighteen inches square in the base and are much too lofty, and, like almost every lamp-post in London, are not upright. At Hyde Park Corner there are two lamp-posts in the centre of the road, each bearing three lamps. They do not even correspond, one being entirely of iron and the other set on a stone pedestal nearly six feet high. This latter was erected in 1840. In front of the arch and entrances to the park are ten lamp-posts of imposing proportions. Unfortunately, though of fair classical character and appropriate to the structures to which they belong, they are tripods on plan, and a tripod can only look well when seen directly at right angles to one of its faces or one of its corners. From any other point it is a lop-sided composition. The new lamps in the park next claim attention. They are cast by Messrs. Ching and Co., Castle-street, Long Acre. The designer no doubt intended them to be very ornamental, but they have grave faults. The base or pedestal is very large, and its projecting corners are objectionable if not dangerous. The globes are an improvement on the usual street lamp, but Mr. Lenzberg, of 486, Oxford-street, has invented something which in our opinion is still better. It is well known that all the light which passes through the lamp in an upward direction is lost, and no successful means of reflecting it down on to the pavement has hitherto been found. Mr. Lenzberg's lamp consists of two parts, a half globe covered by a hexagonal top of enamelled glass in metal frame. This effects the purpose. Eight or ten of these lamps may be seen in position opposite Mudie's library. They are set on the old posts, which are much too high, and they are made to hang over the pavement; thus there is nothing whatever to cast a shadow anywhere but on the road, where it is almost imperceptible, less indeed than is that cast by the frame of the ordinary lantern. Opposite the Marble Arch are two posts, each supporting a pair of lamps. They are stiff beyond measure, and, large as they are, they do not maintain the perpendicular. In situations like these something handsome is required, such as the posts in Blackfriars-road and the Borough, or the new one in Holborn where Middle-row once was. In Regent-street the lamp-posts are very bad indeed. They are enormous at the base, are bound with fasces having spear-heads at the height of about six feet, which are for the most part broken off. When the quadrant was altered to its present appearance a few lamp-posts of better design were put up. There is some attempt at decoration, but there is too much repetition of form, and the lanterns are too small and placed too high; ten feet is the proper height for the burner. In Regent Circus South, where something ornamental might have been expected, there are two lamps which do not match. One of them is a "fearfully and wonderfully made" affair, with a red glass globe a-top surmounted by a flying Mercury bearing a small ball of silvered glass. This lamp indicates the proximity of a telegraph station; the other is not so ambitious and is in every way unremarkable. In Waterloo-place the Crimean Memorial is flanked by two posts of curious design, wreathed with leaves emblematical of military virtue. From a little distance these wreaths have every appearance of being very large snakes trying to climb the posts. On the balustrade of the United Service Club may be seen some very well conceived posts with small heads and spreading bases. The two in front of the Reform Club, like those of the Traveller's, are very handsome, but the head throws too much shadow. At the Carlton the lanterns are too small and the bases very commonplace. The small standards on the parapet of Trafalgar-square are very elegant, but we cannot say as much for the four large ones especially erected for burning the Bude light. Having now found fault with almost every lamp-post in London it may be expected that we should give some idea of what a lamp-post should be. The accompanying sketch represents such a post. With a base fifteen inches square to give it a chance

to stand upright—which scarcely one in a hundred does—it should gradually taper to a diameter of about four inches at the height of four feet six inches from the ground. It may be plain or fluted. There should be no fillets or horizontal lines of any kind, as the post would be certain to break at those places if subjected to a blow. The head should be small so as not to cast a large shadow. Such a post as this offers little obstruction to foot passengers, has no sharp corners, is strong, and inexpensive. The form of the reflector above the lamp might be improved, but we profess to give merely a plain street lamp. The lamp is that patented by Mr. Lenzberg, and is similar to those which he is about to place experimentally on the Thames Embankment.

ROOF COVERINGS AND EXTERNAL DESIGN.

IT is singular that while there is only one part of a building in town architecture which the rain may be trusted to keep constantly clean this should be the very part on which least design is usually expended. Decoration in abundance, or rather in superfluity, is lavished on the walls, though everyone concerned knows that it will soon be almost obliterated by dirt, but the roof, which remains unchanged year after year, is passed by unnoticed. It is true that the best examples, at least in the Gothic style, seem to show that decoration in the roof covering should be subordinate to that in the structure beneath. It is easily carried to excess, and plain surface is just as valuable in slating, for example, as in walling; still the general tendency hitherto has been rather to neglect this part of the design than to over-do it, and in many elaborate structures the part above the cornice seems quite unworthy of that below it. How effective it may be made in point of form the new buildings in Pimlico, amongst others, sufficiently show; but our present purpose is less with general form than with roofing materials. These of course are divisible into three main classes—metals, tiles, and slates. Of the first class, lead and zinc are the only ones much used in this country; copper is still occasionally employed, and tin plate very rarely, if at all. As cheapness is nowadays considered much more important than durability, it is natural that zinc should to a great extent be superseding its rivals. How long, even under the most favourable circumstances, it will resist the action of a London atmosphere is yet uncertain. Sulphuric acid, which appears to be the chief agent in the decay of our building stone, dissolves it rapidly, and the sulphate produced is too soluble to form a protecting surface to the metal beneath. It is, therefore, scarcely to be hoped that even with the most careful treatment zinc will prove a very desirable material for town architecture. From an artistic point of view this is, perhaps, to be regretted. A metallic covering gives facilities for many forms of roof which are both convenient and picturesque, for which slate would be unfitted. It has naturally, by reason of the rolls or other junctions of sheets, more variety of surface and more strong and muscular lines. It is not a smooth texture less plane like slating, it is broken up by light and shade. And this character can be increased to any extent that is desired. Cast and stamped ornament rise out of constructive forms almost as a matter of course. Edges can easily be formed into characteristic patterns, metal crestings and finials are obviously appropriate, and colour can be added without difficulty. The leadwork of the Middle Ages—or what little of it remains—is most suggestive on these points, but the misfortune is that we have become too economical to perpetuate the system. Lead is too costly for us, but even in using zinc something may be learned from ancient practice.

It is a principle more generally acknowledged than adopted, but still a most important one, that the designer should use every material he deals with so as to bring out its distinctive properties. Those of a metallic roof covering, as we have seen, are chiefly in the projections of surface appropriate and even necessary to it. But while its design will thus be mainly based on form, that of slating will be far more largely affected by colour. Decoration here has, indeed, been often attempted by cutting the edges of the slates into fanciful shapes, but the result seldom repays the labour involved. Coloured patterns, it is true, are not always more successful, but they are, at any rate, more capable of being made so. Unfortunately there are but few varieties of tints attainable. There is the ordinary bluish-grey of various shades, the pinkish-grey or mottled, and the green. The last has a doubtful reputation for durability, and the very dark grey a still worse one. Green slates, too, if good, are expensive, and being generally supplied of a slightly different size from the blue slates of the same denomination, further expense in cutting is needed to make them work together. But, in spite of these drawbacks, we have hardly anything to compete with them for use in patterns. Almost any of the shades of grey will do as a groundwork: the mottled one gives, of course, the greatest contrast, but not always the best effect. As, however, it is impossible to surround the pattern with a dark outline, it should always be lighter than the ground on which it is placed. Flat ornaments darker than the surface on which they lie usually require a border of some kind to keep them distinct. Where Countess slates are used, the scale of the patterns, again, is so great as often to be injurious to that of the building. They are so large as to detract from its size, and they fail to harmonise with the details, for example, of the brickwork. This is a difficulty to be met in different ways in each particular case. A smaller description of slate may be employed, or narrow bands and only the simplest forms of decoration may be adopted. But, in any case, delicacy and moderation are needed. There is an old rule which recommends people always to leave their dinners with an appetite; an analogous one would be equally good in artistic matters. All works of art should be such that spectators leave them wishing for more rather than satiated by too much enrichment; and the maxim was never more applicable than to the subject now in hand.

The third class of roof covering—that of tiles—combines, in some respects, the characteristics of both the preceding ones. It admits of nearly as much variety in form as metal, and of much more variety in colour than slating. But whether it would be wise to push both these characteristics to an extreme at once is more than doubtful. Intricacy of form needs simplicity in colour to make it intelligible, and the opposite course leads to confusion, not to excellence. Following this principle, plain tiles may properly be relieved by differences of hue, while pattern tiles will do better in uniform or merely graduated tints. Even in the first species slight contrasts are usually the safest. Every one must have noticed the picturesque effect which often arises when old and newer tiles are worked in together, even with no special design. A harmony and excellence of tone are manifested which glaring contrasts never produce. Plain tiles are in many respects preferable in appearance to slates, at least for buildings of an unpretending class. Their slightly curved outlines and thick edges give them far more picturesqueness than can be gained by straight, wiry lines of the alternative material. Practical considerations, however, such as their weight and their absorbent quality, have in great measure diminished their use; and the ground they have thus lost will probably never be regained. But with other forms of tile the case is different. Amongst the developments of the *pantile* principle, both here and in France, there are several to which no objection, except that of expense, can be raised. Instead of exhibiting a simplicity bordering on rudeness, they are the latest advance in mechanical ingenuity as applied to roofing. As regards design, most of them would be improved by being less pretentious, but in construction they have much to recommend them; and the broken up surface which they naturally give is at any rate capable of being turned to good account artistically. Most of the patterns hitherto brought forward show, indeed, such strongly-marked and heavy lines as to agree better with Italian or Romanesque than with Gothic; but there is no reason why the same principle should not be carried out so as to suit any style of architecture, and whatever class of roof covering we may have to do with thought and invention will not be wasted on it. Town architecture has long been half-ruined by the attempted concealment of its roofs. Their disguises have been unpleasant enough when seen from below; but now that their complete deformity is thrust on the view of every passenger by a suburban railway, it is surely time that they were made a little fitter for the close inspection under which they have been brought.

WORKING PLANT AND APPLIANCES.

HUMAN invention and ingenuity are ever on the stretch to keep pace with the contingencies that are daily and hourly occurring, and are the inseparable attendants of an age of reason, enlightenment, and national education. No sooner is one improvement patented and given to the public than another springs up superior to its predecessor, and after that another, and so on until man's inventive faculties are racked and the powers of imagination strained to the utmost to meet the ever-increasing demands upon the fertility of its resources. Notwithstanding that the aid of machinery has been called largely into requisition in the construction of engineering and architectural works, yet many of the processes and operations still continue to be carried on by manual labour. Earthwork, as excavating and filling are usually called, is still nearly universally performed by hand. The old system of laying down temporary rails, filling the "lorries," and tipping them over the "tip head" is still practised, and will be for a long period to come. Where the excavation takes the shape of a tunnel special machines are used, as in the case of Mont Cenis, which is an example upon the largest and most successful scale that has ever been attempted. A marked improvement was visible in the construction of engines, movable cranes, and other mechanical appliances for raising loads at the recent "Exposition," in comparison with the specimens exhibited at previous international displays; they were much simpler in construction, better finished with respect to fitting and workmanship, more practical in design, less costly, and better adapted for rapid manipulation, and less likely to cause accidents and mishaps among those working them. Except in comparatively insignificant instances, the old system of scaffolding for house building is completely obsolete. Contrast the methods at present employed in the erection of the new mansions on the estate of the Marquis of Westminster with the more ancient system, wherein round larch and fir poles and rope lashings formed the prominent features. We replace manual labour in what might be termed the transference of materials by the agency of movable cranes running upon strong timber traverses; and in this respect our system, as a whole, is superior to that of our French neighbours, who admit the superiority in an economical point of view even if they are disposed to question the scientific or constructive bearings of the matter. England has always been celebrated for the solid and durable character of its masonry, and it must be acknowledged that our last great work, the Thames Embankment walls, fully sustains the national reputation we have acquired. Prussia is, perhaps, the only continental country that can excel us in stonecutting, and the manner in which her workmen can turn out the beautiful Silesian marbles, cut and polished, either by hand or machinery, is only known to those who saw the specimens exhibited at the Paris Exposition. There is no country where the erection of buildings, so far as modern inventions and conveniences are concerned, has made so little progress as France. Notwithstanding that there are abundance of more favourable appliances at hand, she continues to employ the ancient methods in spite of their slowness and cost. Unless her architects and engineers effect an alteration for the better, they

will find themselves in the background. Neglecting the consideration of those instances where the aid of machinery is called into play, we have made an immense improvement in the treatment we adopt for structures of less significant pretensions. The rapidity with which we erect light and strong scaffolding for the purpose of repairing the frontages of old buildings; the ready and ingenious devices for raising the materials required; the facilities at hand for underpinning arches and putting up centreing for bridges, and a host of other contrivances evince the march of progress in this particular branch of constructive art. It must not be supposed that other continental nations have exactly followed our example in these matters. One especial point in which there is a marked distinction between us and them is in the substitution of iron for timber. Among ourselves this is now almost universal. An engineer would never dream of erecting a timber bridge except upon a scale of the most trifling character, nor, in fact, were it intended for railway traffic, would the Board of Trade sanction it. Cast and wrought iron joists and beams are now the ordinary supports in warehouses and large buildings, to the almost entire exclusion of timber. The case is otherwise in France, where heavy balks are still employed in situations that we should now never think of their occupying. Recently iron wire has been used there with great success instead of ropes for scaffold fastenings. From very early times the Italians have been in the habit of adopting a peculiar description of scaffolding in which very short timbers are used, and the erection of which is carried on with extreme rapidity and considerable solidity. It is quite possible that if this system were modernised, and received the benefit of all the recent improvements and modifications, it might prove a very valuable one.

It might be supposed, from what has been stated respecting the substitution of iron for timber, that the trade of the carpenter had declined, and had, in fact, become merged in that of the smith. To some extent this supposition is probably true, but not to a degree sufficient to affect the absolute earnings of the former. Permanent iron constructions of the present day demand an amount of carpenter's work for temporary purposes far exceeding what was required for the permanent timber erections of bygone times. Let anyone take a glance at the forest of piles, uprights, horizontal trussing, bracing, strutting, and centreing, that obstruct the river at Blackfriars, and it will be more than sufficient to assure them that timber and carpentry still play a very considerable part in engineering and architectural structures. Machinery has been established on the most improved system and on the most extensive scale for fashioning the timberwork intended for the interiors of houses; sawing, planing, mortising, tenoning, and all the other operations once performed solely by hand labour, are now accomplished by the agency of machines. It is rather curious that the principal railway terminus in Munich was one of the first instances abroad where all the timbers were prepared by machinery. Germany and our own country were the two foremost in availing themselves of the aid of steam power for this purpose. The real merit of the substitution of machinery for manual labour is undoubtedly due to the Americans, and in their case was a practical illustration of the old adage, "Necessity is the mother of invention." From a scarcity of manual labour, an inconvenience that all young countries suffer from, she was obliged to invent some means of accomplishing by machine power what was effected in more populous countries by hand labour. It is often said that the Americans invent, but we improve, and there is much truth in the remark. The reason is easily found, and the validity of the observation confirmed. The Americans have not the time to perfect any invention; they are daily, almost hourly, in want of it, and are compelled to utilise it before it has received that finish and those nice adjustments which in reality constitute the whole mechanical beauty of the machine. When the crude material comes to us we have leisure to examine it; and it, therefore, receives from us that remodelling and final improvement which the urgency of the case did not admit of in the land of its birth.

OUR ARCHITECTURE.

In his inaugural address delivered recently, Mr. F. Horner, the newly-elected president of the Liverpool Architectural and Archæological Society, made some remarks on the present state of our architecture likely to be interesting to all, and instructive to many of our readers.

If, said he, our architecture is a compound of Greek and Roman, of Italian and French Renaissance, and Gothic, is not our language equally compounded of, and derived from, all these sources? To the Greek, the Latin, and the Teutonic races, and even to modern France, how much are we indebted for its richness, its fulness and perspicuity! The comparatively contracted mental development of the rude Anglo-Saxon required, no doubt, a very simple form of speech wherewith to express any ideas he might wish to clothe in words; but as civilisation advanced, the science of language naturally became more complicated, and we find ourselves now supplied with an ample vocabulary, borrowed from all the foregoing sources, wherewith to give utterance to our thoughts. If in some particulars this fusion of tongues and dialects may lack the grandeur of simplicity which some original languages possess, it at least affords other advantages—of being full almost to redundancy, and of forming a very perfect channel for the expression of intricate ideas We do not, because we possess such a multitude of derivative words, therefore declare the English language to be effete; but, on the contrary, accepting its mixed character as an almost necessary result of the passage of time and our knowledge of the past, we admit at once that it is admirably suited for our state of high intellectual culture. So with our architecture, accumulated as its knowledge has been from the lights of past ages. The researches of the archæologist and our intercourse with foreign countries have legitimately placed this acquired experience of generations within the grasp of the practitioner of the nineteenth century, to be interpreted and adapted freely by him, and, with the additional resources which a man of talent ever has at his command, from the exercise of his own individual invention, to be used for the purpose of meeting the complex circumstances and requirements of a refined age; and thus treated as an art, it is still a living and progressive one.

Many and great as are the facilities and appliances which attend a state of high civilisation in the culture of science and taste, it may well be doubted whether, in respect of the latter at least, these acquisitions are unmixed benefits. May we not, on the contrary, often find in the works of our forefathers much of simplicity, of unity, of repose and association, which our more modern designs frequently lack, but which, after all, are very important elements of power? One of the characteristics of our own day, no doubt, is that scientific knowledge and mechanical skill have advanced in a much greater ratio, even within our own recollection, than artistic feeling or taste; and there seems to be some danger of the spirit of the latter being almost merged in the general utilitarian tendency of the age. It behoves us, then, to combine in keeping alive some spark of regard for the poetic by every means in our power; and I cannot think that for the attainment of this object it is wise with regard to any art, not even of the art architectural, constantly to crave after some new thing.

Architecture, like its sister arts, has a noble history to look back upon; and her development has been as gradual as the lapse of years, upon whose centuries it is written in living stone.

The growth of the architecture of Greece was the work of hundreds of years; and it slowly arrived at its perfection by the patient and careful study of harmony of proportion and beauty of form; and the same truth is to be learnt from the history of the rise and progress of Gothic art.

"Beauty," says a writer in "Frazer's Magazine," "is everywhere, unnecessary, useless beauty, throughout earth, water, air, and the infinite of space; and everywhere developed, in metre, in balance, in rhythm, in symmetry; the grand original Poiesis."

There is a great truth in this quotation; but such words as "unnecessary" and "useless" can never, in their ordinary acceptation, be applied to any works of nature.

That elements of beauty everywhere exist in nature, supplying no physical want, and ministering to no material necessity, is, I think, the most striking argument which can be adduced in proof of the vast importance of the place assigned it in the economy of creation as a moral and intellectual agent for the mental use of man; and thus viewed, every trait of beauty to be found in the universe is in the highest sense both necessary and useful.

Founded on an innate love of the beautiful, that subtle and delicate mental gift called "feeling" is in fine art the key to truth; and all that is lofty, refined, and consistent is perceived through this faculty. To him who possesses it not, I fear it can never be supplied by reason or philosophy.

There are men to be found moulded much upon the model of our iron age, who seem ever desirous of dragging down the standard of taste to a level with their own perceptions; possessed of no sensibility themselves, they ridicule its presumed assumption by those who do possess it; ignoring the probability that the deficiency may reside in their own prosaic and matter-of-fact brain, and not in any affectation of the poetic mind of the artist. To such spurious connoisseurs as these we may reasonably assume the poet laureate to have addressed his objurgation:

> Vex not thou the poet's mind
> With thy shallow wit,
> Vex not thou the poet's mind.
> For thou canst not fathom it.

The well-informed art critic who is philosophical in thought, and moderate and judicious in the statement of his opinions, is entitled to our respect, and is often a very valuable coadjutor to the man of genius in the attempt to forward their common cause, and to raise the tone of the public mind to something like an appreciation of questions of taste. But it behoves these gentlemen to be careful that, even when perfectly honest and unbiassed in the treatment of their subject, they do not fall into the error of conventionalism, both in idea and expression; an offence which they are wont to visit somewhat heavily upon the heads of any whom they may deem amenable to it.

The opportunities which the modern architect enjoys of exercising his talents upon works of national importance or of great magnitude are, I fear, few and far between. But if this be denied him, yet many occasions must occur in the course of the practice of a lifetime, which shall enable him to illustrate the true principles of his profession, and leave enduring monuments of his skill, which shall influence the future development of his country's architecture in long years to come.

No branch of art so materially affects the health and well-being of a people as architecture, and with the return of commercial prosperity let us hope that the work of converting our formerly most prosaic and unartistic street designs, already so ably begun, into erections worthy of our day, may yet more rapidly and successfully proceed to the true embellishment of this important town, and to the reputation and profit of the professional members of this society; and I feel sure that, apart from every other consideration, the love of art, for its own sake, will stimulate every gentleman whom I now address in his efforts so to act his part as to leave associations of beauty and refined taste connected with every architectural monument of which the chronicler of future times shall record his name as the author.

THE DESTRUCTION OF CHURCH ORNAMENTS IN LINCOLNSHIRE AT THE REFORMATION.

An interesting paper on this subject appears in the last published collection of reports and papers of the architectural societies of York, Lincoln, Northampton, Bedford, Worcester, and Leicester. It is by Mr. Thomas North, honorary secretary of the Leicestershire Architectural and Archæological Society, and was read at a meeting of that society.

Few persons acquainted, even in a slight degree, with the variety and nature of the necessary

furniture of an English parish church in pre-Reformation times, and with the many fittings vessels, and vestments essential to the performance of the public worship, or the occasional offices of the church, and the celebration of the sacraments, can fail to be surprised that so few of those articles are now in existence to attest their former abundance and general use. Although the great mass of the people discarded, in the sixteenth century, many of the doctrines and customs of the Romish Church, there were undoubtedly not a few who still openly or secretly adhered to them, and who would as a consequence, it might fairly be presumed, have preserved as precious relics of their long used, and still loved, services and liturgy some of their least expensive and more easily concealed requisites. To describe in detail the means adopted for their almost entire destruction would be a long, an interesting, but at the same time, to some extent, an unnecessary labour. When Henry VIII. began his war with the Papacy, the religious houses – first the smaller, then the greater—were dissolved. The rich plate belonging to these was swept into the King's exchequer and converted into money. The then cathedral church of this diocese—Lincoln—contributed in one year (1540) 2,620 oz of gold, 4 285oz. of silver, besides precious stones almost innumerable. Upon the accession of Edward VI., injunctions were issued regarding the fittings and furniture of our churches. These were followed by orders in council and commissions, the purports of which were, amongst other things, to command the removal of almost all the appliances of the Romish ritual and ceremonies from the churches, and to cause their destruction or their conversion into money. That the course then followed would lead to abuses and extravagances was to be expected. Edward VI. found it necessary to issue letters relative to the alienation and destruction of church goods by persons applying the proceeds to their own use. He appointed commissioners in each county to prevent the indiscriminate sale of vestments, plate, jewels, ornaments, bells from the steeples, and lead from the roofs of the churches. Although during the brief reign of Edward VI. the churches were to a great extent stripped of their rich plate and of the requisites for the altars and of the other essentials of the mediæval services and ceremonies, still there does not appear to have been that systematic destruction of them which took place in the reign of Elizabeth, for upon the accession of Mary very many of those articles were forthcoming, having either fallen into friendly hands or been preserved for various reasons by the persons who purchased them from the churchwardens in the previous reign. Not that the churches regained a tithe of their ancient splendour during the reign of Mary—the besom of destruction had been too busy for that—but we must look to a somewhat later date for that almost entire destruction of all the accessories of mediæval worship. To such an extent did the spirit of destructiveness hold sway during Elizabeth's reign that she was compelled to take a similar step to that taken by her brother, Edward VI., in order to prevent, if possible, needful reformation from becoming licentious disorder. In a letter addressed by her to the commissioners for causes ecclesiastical, in 1560, she complains that

> In sundry churches and chappels where divine service, as prayers, preaching, and ministration of the Sacraments be used, there is such negligence and lacke of convenient reverence used towardes the comelye keeping and order of the said churches, and especially of the upper parte called the chauncels, that it breedeth no small offence and slander to see and consider on the one part the curiositie and costs bestowed by all sortes of men upon their private houses, and the other part the unclean or negligent order or spare keeping of the house of prayer by permitting open decaies and ruines of coverinages, walls and wyndowes, and by appointing unmeet and unseemly tables, with fowle cloths for the communion of the Sacraments, and generally leavynge the place of prayers desolate of all cleanlyness and of meet ornaments for such a place, whereby it might be known a place provided for divine service.

How far the Queen by her own example, and by this and other means, succeeded in stemming the reaction that set in against the undue exaltation of the externals of religion as carried out in the English Church in pre-Reformation times, and in checking the spirit of greed, and the want of reverence for holy places and holy things, which then were forming so strange and strong a contrast to the liberality and simple—though it may be said, blind—faith of earlier times, is well known. We in this generation have felt fully that the reaction just referred to was too strong to be checked to any great extent at the time it set in. In a vast number of dilapidated and decaying churches we see its result; in an almost entire neglect of the use of "meet ornaments," we trace its effects. In 1566 returns were made by the churchwardens of each parish to certain Royal Commissioners of such articles of church furniture as had been in their possession in the reign of Queen Mary, but which were then considered to be superstitious or unnecessary. Fortunately many of these returns, made from the neighbouring county of Lincoln, are still in existence, and have been recently transcribed and edited by Mr. Edward Peacock, F.S.A. A glance at these will show the procedure adopted throughout the country. The altar used in the church before the Reformation was a stone one, and therefore not movable. The altar stone was the large unbroken slab placed upon its top—unbroken, to symbolise the unity of the church. This altar stone generally bore upon it five crosses marked previous to its consecration; and within a cavity in it, or under it, were usually placed some relics of a saint or a consecrated wafer. When the doctrine of transubstantiation was rejected by the Church of England the stone altars were ordered to be destroyed, and movable tables of wood to be used in the liturgy. How thoroughly this was done is shown by the very few stone altars now standing in their original places, and also by the very few altar stones which have been discovered appropriated to other uses. The returns from Lincolnshire are very explicit in the information given as to the fate of the altar stone in each church; its destruction was clearly considered a matter of importance by the commissioners. One very common way of disposing of the altar stone was, after breaking or defacing it, to use it as paving stone in the church. A careful examination of the floor of a church will sometimes now reward the ecclesiologist with the discovery of a piece or pieces of the altar stone from the high or side altars, easily recognisable by the consecration crosses. Thus, the churchwardens of Ashby-juxta-Sleaford say—"Itm or altar-stones—brokne and pavid in or churche, Aō quitō Elizabethe." Very many others tell the same tale. The people of Bardney, however, say—"Itm ij alter stones—laid downe in the churche vnbroken." It would be well if these documents recorded no worse desecration than this of the altar stone. We find men putting it to what they termed "prophane vse," such as "bridges paving," like the churchwardens of Burkstone, of Bitchfield, and of Croxby; the repairing of private houses, as was the case at Braceby; the mending of the highways, like the men of Bradley. Again, we find altar stones put to more "prophane vse" still. Thus the churchwardens of Crosby say—"ij alter Stones:—One Mr. Sheffied haith made a sinck of it in his kitchine. . . ." Those of Horbling confess that their altar stones were broken and made into "troughes," others were made into a "cistern bottom," "set in a fire herthe," "lieth at Mr. Harr'gtns fier back." It is pleasant to turn from these descriptions to the note made by the people of Aslackby: "Itm one alter stone—laid upon a grave and so continueweth . . . .;" and more still to that entered by the churchwarden of Owmby—"Itm one alter stone sold to Willm Thixton, and he caused yt to be laide on his grave when he departed." This custom of using the altar stones for grave stones is thus curiously illustrated in the return from the parish of Haither:—"Itm as for alter stones we had none in quene maries tyme, but certaine grave stonnes weh wee were faine to take up of or church flower, and when the alters were taken downe we paved theim againe."

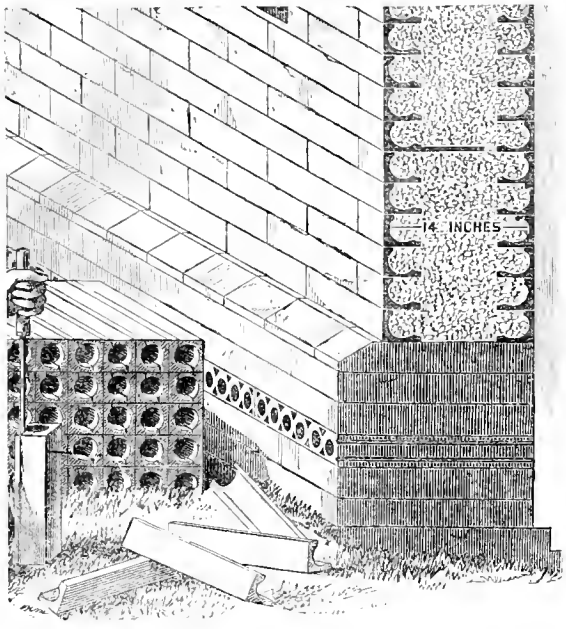
METROPOLITAN GAS SUPPLY.

THE amusing absurdities resulting from the neglect of the salutary maxim that "the cobbler should not go beyond his last" are very numerous, yet the proposition to supply London with gas manufactured at Newcastle probably surpasses most of them. The proposition is one which has been from time to time brought forward almost from the first introduction of gas-lighting at the beginning of the century; but as it invariably emanates from those who have no practical acquaintance with the subject, and will not trouble themselves to ascertain the experience of others, their suggestions might be permitted to pass unnoticed but for the unfortunate circumstance that those are permitted to legislate who are utterly ignorant of the subject to which their legislation is directed. It is stated that the Metropolitan Board of Works has again had the question of the removal of gas manufactories "from the populous districts of the metropolis" brought under its consideration; and in connection with that circumstance some would be *sarcastic* laments that the proposition for a remedy "to the present dangerous and preposterous system of making gas in the most crowded parts of the richest city in the world" should be limited to removing the factories "into the country," and conveying the product by a few miles of piping to the consumer. This authority writes that he really cannot understand why our gas should not be made at the mouths of the coalpits that supply the material, which, by a costly and tedious process, is at present brought to London by rail or sea, the freight being not less probably than 10s per ton between the pits and the factories, all of which the consumer pays, besides being injured in health and endangered in person by means of the manufacture taking place in that which is the worst possible spot in the world for the purpose. The cost of laying down gas mains between London and (say) Newcastle would not be greater than the maintenance for a short period of the fleet of colliers which bears the crude material to London, where wages, living, and land are more costly than anywhere else.

In the celebrated Doulton trial recently concluded at Brussels, one of the interested parties explained that his reason for making certain demands, which the court considered exorbitant seeing that the services rendered were of an imaginary character, was that "he always understood that the English were very eccentric in money matters," and certainly the recognition of such schemes as that referred to would be admissible as conclusive evidence of the accuracy of that opinion. The whole of the arguments adduced are entirely fallacious, and display the utmost disregard for every essential fact. The make of gas in the metropolis at present far exceeds eight million thousands of cubic feet per annum, which in round numbers requires the consumption of 1,000,000 tons of coal, and involves an outlay by the gas manufacturers, for raw material, wear and tear of plant, and labour, of about £1,000,000. But of the eight million thousands manufactured not more than six million thousands reach the consumer, one-fourth of all the gas made being lost by condensation, leakage, &c., so that the companies (taking the average at 4s per thousand) only receive £1,200,000 for their annual make. Now if the loss in delivering even from the works to the consumer in the same district is 25 per cent. it can readily be imagined that the attempt to convey gas to London from even the nearest coalfield would be attended with so serious a loss that we might be deprived of our gas supply altogether unless we consented to a considerable advance in the price of gas. But the actual loss of gas is not the sole objection to its manufacture at a distance from the place of consumption; the mere cost of overcoming the friction resulting from the passage of the gas through the pipes, so as to maintain the requisite pressure at the burners, would vastly exceed the cost of conveying the coal the same distance; the cost of keeping the extra pipes in repair would exceed the total cost of making the gas, even in London; and a comparatively trifling injury to the provincial main might leave the city in darkness for an inconvenient period. With regard to the injury to health asserted to be attendant upon the manufacture of gas, it certainly has not been proved, nor is it likely to be proved, that the odour which escapes from gasworks is in any degree unwholesome, although it is, beyond question, very unpleasant.—*Mining Journal.*

Mr. Howell, surveyor to the parish of St. James, Westminster, in a report made to the vestry of that parish, states that serious stoppages happen in the sewers by the accumulation of ballast and gravel. The causes of this accumulation are several; one being that at the time the sewers were built openings or "eyes," covered with pieces of wood, were left for the purpose of connecting the house drains at some future period, which it was expected would have lasted long enough or until the connection was made. It turned out subsequently, however, that it was too much trouble to find these "eyes," or from some cause they were not found, the drains were otherwise constructed, and in course of time the pieces of wood decaying, the rats commenced operations upon them, and the sand and heavy soil beginning to run into the sewer, soon caused an obstruction.

CONCRETE BUILDING WITH A BRICK FACE.



CONCRETE BUILDING WITH A BRICK FACE.

AT the present time, when so much attention is being bestowed on concrete and the erection of all descriptions of buildings with this material, it will interest our readers to notice the system now in operation for stabling and boundary wall in course of erection on Richmond Hill, close to St. Matthias Church, which we now illustrate.

The walls are principally 14in., faced on either side with an elbow-shaped block, made of the best clay. The one side of the block is bedded into the wall, the other forms the face, and at the same time the trench for the concrete.

In this system the work is equal to the best face brick, and is said to combine all the advantages of concrete in cheapness of construction, strength, dryness of wall, &c.

Alfred Smith, Esq., 19, Buckingham-street, Strand, is the architect. Mr. Pither, of Sunninghill, Berks, is the contractor.

The Broomhall Tile and Brick Company (limited), of Cox's Wharf, Blackfriars, S.E., hold the patent for and supply the blocks.

PULPITS.

ALTHOUGH the word "Pulpitum" was employed by the ancients to signify merely "a place raised where the speaker stands," the word with us has come to be applied almost exclusively to an enclosed or semi-enclosed place for a preacher, in contradistinction to the platform or raised open space or stage which were the earliest speaking places.

For the traditional idea of our pulpits we are of course indebted to the early Gothic artists, and, as their ideas were founded on the natural requirements of the Catholic religion, the pulpit, we find, is far less emphasized than the altar or reredos. With them the pulpit was conventionally simple, being only an accessory in the picture of which the magoificent high altar is the chief figure. This being the focus* to which all eyes were turned during the great ceremony of their church, it was of a surety *the* point to render emphatic; hence the accessory pulpit is simple, quiet, and retiring, while on the altar is lavished all the richness their wealth would give and all the beauty their fancy could conceive.

In Protestant churches, however, the altar does not play such a conspicuous part, and though in the ceremonial of the English Church it still holds a place (rather misty and undefined), which increases in importance as we approach ritualism and dwindles to next to nothing in Low Church, in most other Protestant churches the altar is entirely abolished, as in the Church of Scotland and most of the English Dissenting chapels. In these the position occupied in former times by the altar now holds the pulpit, and it has become in its turn the focus for both eyes and ears. In many churches or chapels of this class the pulpit is worked up till it loses its true purpose and becomes, in some sort, a shrine to contain the congregational divinity, who sits enthroned like Olympian Jove or Alexander Selkirk, "monarch of all he surveys." This arrangement of having the pulpit at the centre of the end wall tends to destroy all ecclesiastical feeling, and to substitute that of the lecture hall, and to foster the idolatrous feeling with which a clever preacher is regarded, and contributes in a great degree to that noble emulation in the diviner sex which displays itself in the working of slippers, braces, and other necessaries of civilised life for presentation to the congregational idol.

The position of the pulpit in Episcopal churches has something graceful and poetic in it. The pulpit is neither in the centre nor at the end of the building, and the chancel space beyond encourages us to look physically and mentally beyond both pulpit and preacher—physically to, perchance,

> . . . the high embowed roof
> With antique pillars massy proof,
> And storied windows richly dight,
> Casting a dim religious light.

and mentally, to the more glorious pictures which are ideal, evanescent, and of the invisible, which is beyond all.

It is the fashion for pulpits to be smaller nowadays than in the days of our grandfathers. Action, which Demosthenes regarded as the chief part of oratory, is now considered *infra dig.* by modern curates, and it is only in very unfashionable churches, or in the pages of Dean Ramsay, that we get glimpses of those good old stout defenders of the faith who pommelled the cushions and battered the book-board in their metaphorical fights with the Prince of Darkness. Pulpit action, like the legitimate drama, being thus under a cloud, pulpits are worn very much smaller now in consequence.

Before concluding this, which has grown a longer article than I intended, it is worth while observing that, although the Catholic *Gothic* pulpit is small and unassuming, directly it is Classicized or Italianized, it becomes magnificent and triumphal. Note those, for instance, of the chief Italian and Spanish churches. Note, too, that a good lesson may be learnt from pulpits of other styles besides Gothic and Classic. For spirit and delicacy of treatment, I have seen nothing better than the Arabian or Mahometan pulpit lately acquired by the Kensington Museum. In the sketch in this week's number, the pulpit is shown nearer the centre of the chancel than its true position in order to give more of the design.

J. M. S.

* "Focus" means literally fire hearth or altar.

NORTHUMBERLAND HOUSE.

AT the last meeting of the St. James's Vestry, Mr. Webber moved "That a memorial be addressed to the Metropolitan Board of Works, urging on them the propriety of taking such steps as may be necessary to secure a West End approach to the Thames Embankment by the purchase of Northumberland House, and strongly urging that no other route than a direct line to the Embankment through the site of Northumberland House will answer for the extensive and increasing traffic from west to east." It was far from his (Mr. Webber's) wish that fair compensation should not be given for the property in question, but he should like it to be based on its present value, and not upon what it will be worth when some millions of the public money have been expended on the neighbourhood. When the question was before Parliament all sorts of means were adopted to defeat the bill. A sensational notice had been circulated among members of Parliament to the following effect:—"Certain division, 4 o'clock, Monday, February 26. Your attendance is earnestly requested in the House of Commons at 4 o'clock to-day to save Northumberland House, which is menaced with destruction by the Thames Embankment (North) Approaches Bill. Mr. Beresford Hope will move the rejection of that Bill, and you are earnestly requested to support him." Mr. Webber hoped that such practices would not be tolerated in a Reformed Parliament. Mr. Downes seconded the motion, and Mr. Bidgood, in support, said that it was only fair to state that it was not during the present Duke's time that the division took place. The Metropolitan Board required backing-up in their action. No other entrance to the Embankment from the West End would be worth a rush. The motion was carried with but one dissentient.

DUMBARTON BURGH HALL AND ACADEMY.

THIS building was completed about two years ago from the designs of Messrs. Wm. Leiper and R. G. Melvin, architects, Glasgow. There are two halls. The large or main hall is placed immediately behind the front building, and access from the main street is provided by a spacious corridor entering from the open porch which forms the base of the tower. A smaller hall is situated on the first floor of the front building. Waiting rooms and large class-rooms occupy the rest of the building. The whole of the external walls are of freestone. The open porch at base of tower has a groined roof. Depth of shadow in the window openings is gained by the glass being recessed the full thickness of the walls. The whole cost was about £7,500. Mr. Thomas Rissett acted as clerk of works.

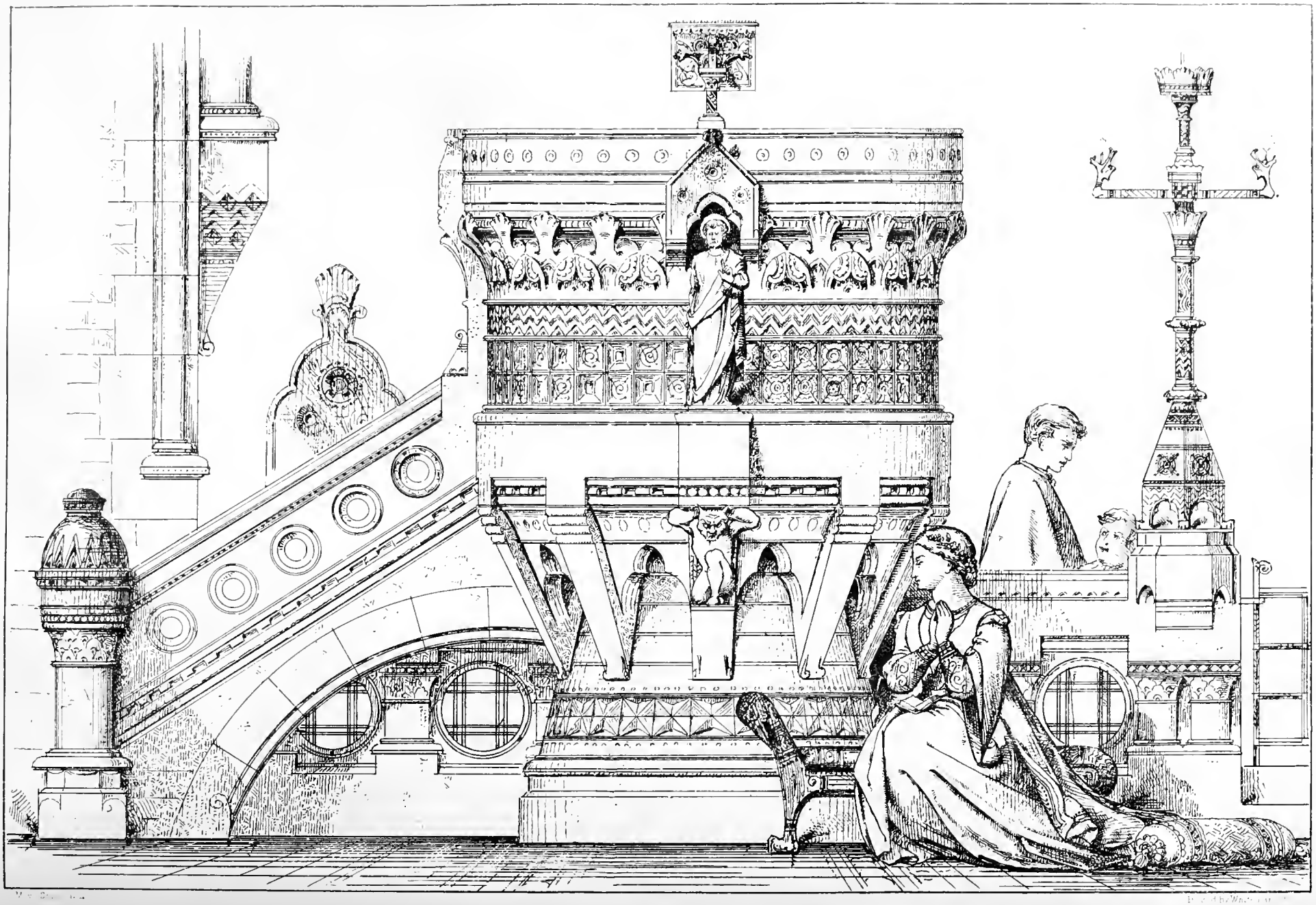
THE NEW HOTEL DIEU OF PARIS.

THIS building is progressing rapidly, it being the Emperor's wish that this house of the poor should be completed before the new Opera House. Such is the care bestowed on the brilliant and profuse ornamentation of this latter edifice, and such the expense which it entails, that it is said it will not be completed before some seven years hence. Meanwhile (says *L'Union Medicale*) the whole of the area which the new Hotel Dieu is to occupy is covered over, and measures not less than 22,000 square metres. Three distinct blocks of buildings already begin to take form and shape. When finished these blocks will constitute three pavilions, the principal fronts of which will face Nôtre Dame. The first or front block will be appropriated to the administrative department, the reception and waiting rooms, and lodgings for officials. On either side of the courtyard will be a large amphitheatre for clinical lectures. The second block will be a vast longitudinal edifice, which will serve to connect three pavilions situated on the right for male patients, and three on the left for female patients. Large open gardens, planted with trees and shrubs, and surrounded by galleries, will separate the different pavilions. The third part of the building forms a large courtyard facing the Quai Napoléon, in which will be comprised the chapel, the dead-house, &c. The kitchens, the bleachery, and the various stores occupy the basement. The hospital is to contain no less than 700 or 800 beds.

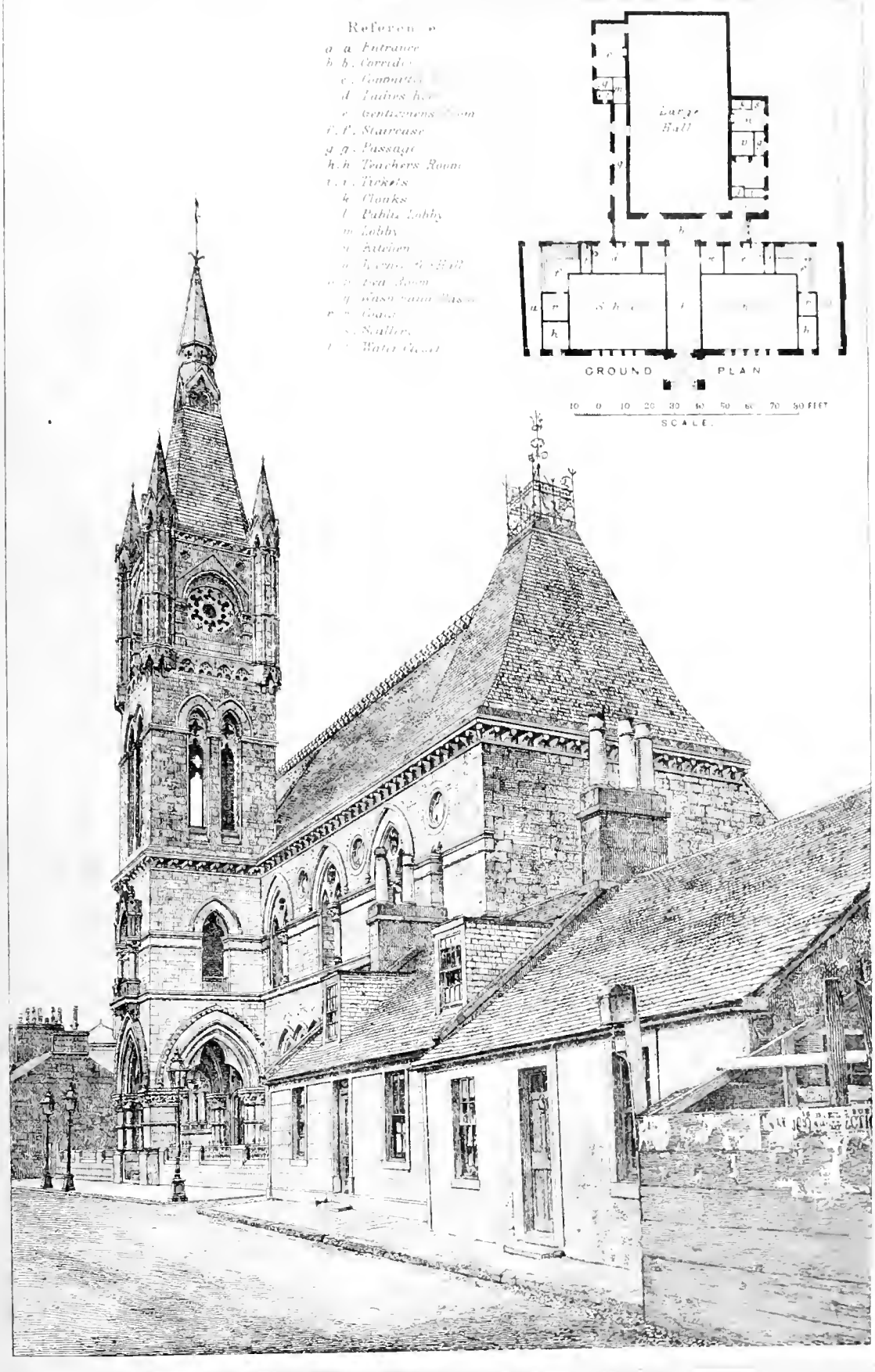
ADAPTABILITY OF SLATE.

A HOUSE has recently been built at Brownsville, Maine, U.S., which is not only shingled, but is clap-boarded with slate. It is a slate *edifice*, fireproof and indestructible. The slates are put on to the boarding of the walls with only paper between. They are in the form of segments of a circle, overlapping each other, and have a very ornamental effect. The natural colour of the slate is pleasing to the eye, and no paint is needed. If it were the slate would furnish it, for when ground it makes an excellent paint, which has been used on a barn with good effect. The whole establishment is elegant in appearance, and shows what can be done with native materials. The front steps are of beautiful slabs of slate; the sinks, mantels, and shelves are of slate; the woodwork is brown ash, a native wood, which makes a handsome finish. In short, this is a real State-of-Maine house, and shows the wealth of her resources. The slate costs little, if any, more than clap-boards. When this material can be economically brought to us slate houses will become fashionable.

Mr. H. Clutton has been requested to submit plans for the Roman Catholic cathedral in Westminster.



PULPIT, &c.—Designed by J. Moyr Smith.



New Burgh Academy & Hall, Dumbarton.

W. LEIPER, ARCHT.

ST. PAUL'S, PAST AND PRESENT.

NEVER before in the history of art were there so many educational influences at work as there are now in the present nineteenth century days, all having for their ultimate object the improvement, as it is called, and the progress of art, and the building and decoration of better and nobler buildings. Never before were there so many societies for the sole purpose of accomplishing all this, but, in spite of these gigantic efforts, the art produced and the buildings erected utterly fail to equal, much less surpass, those which have preceded them, and which certainly had never any such advantages and furtherances. When St. Paul's Cathedral was designed by Sir Christopher Wren, and built under his immediate and *daily* superintendence, there was no architects' institute in existence, no antiquarian society, and surely no class of learned lecturers to point out to the architect what he had to do, and what was most fashionable. Wren laboured under not a few disadvantages, and when we carefully examine his work it is surprising to see how well he did it, and how fine and true his natural aptitude for it was. Assuredly it well made up for all these deficiencies; nay, sometimes we cannot help thinking that ignorance itself is a gain instead of a loss, for the whole faculties of the mind are thus concentrated on a single object and style of art. A few thoughts, therefore, on this great work of Wren's may prove of some interest, and cannot be otherwise than instructive if carefully considered with the building itself in view all the while, for its present and probable future condition well deserve attentive study. We may begin by affirming that, where it can be done, it is most desirable to build *solidly* and with walling of sufficient thickness, and that, when possible, it is a capital thing to build the *inside* of a structure as solidly and with as good and true materials as the *outside*. No living architect, I presume, exists who would not congratulate himself on the fortunate chance of being able to line the whole of the interior of a church, or even room, with solid stone instead of plain plaster. Marble may be an impossibility, but stone, if you can get it, all will agree to. The builder of Westminster got it somehow or other, and so did Wren, luckily for us, or we should never in these days have known what was meant by a stone interior. In these days we are too poverty-struck for such solid luxuries. Any modern man, therefore, who has been fortunate enough to reach this height of expensiveness will at least go one step further and agree with the dictum, that having got a good and fair stone facing inside the building, whatever it may be, it is, and must therefore be, most desirable to show its reality, *i.e.*, to let the world see that *it is stone*, and not plaster on brick, or common oil colour on plaster. It may therefore not a little surprise some who see this for the first time to be made aware of the fact—for fact it is—that the whole of the real and solid stone interior of St. Paul's Cathedral has been covered up and painted over four times in common oil colour, as near to the colour of *new* stone as may be, and that consequently all the advantage that is to be got from the lucky fact of the inside of this building being *real* is totally lost. It is all just as if the building were constructed of common brickwork, plastered over and painted in the ordinary way. I am sorry to be obliged to say that this "ornamental" feat was the work of the late Professor Cockerell, the then architect custode of this great cathedral. It is quite a little bit of architectural history, and belongs to St. Paul's, and ought to be recorded here if nowhere else, for we feel sure that Dean Milman has said nothing about it in his forthcoming "Memorials of St. Paul's." I have two special reasons for these few lines about it—first, because I personally tried hard to persuade Mr. Cockerell *not* to do it, and almost offended him thereby, and next, which is the important point to be considered, it just one-half destroys the building as a "sound-chest;" and then again it will show what the word restoration really in these days does mean.

Before the interior of this fine building was thus painted in common oil colour and the reader is earnestly desired to go and look at it and not to take anything that is here said on credit merely), the whole of the interior was, of course, visible Portland stone, not of its natural colour, as fresh from the quarry, but as coloured by weather influences and time. What was this colour in the building? Westminster *is* coloured, and so *was* St. Paul's; anyone, therefore, may see for himself what it is by a little careful looking at the inside of the Abbey; and no one, I think, will contend that the interior of it would be *improved* by its being painted stone colour like a common shop front or a smart street doorway. St. Paul's had some of this natural colour in it, far richer and deeper than any that painter could put on it; but when I presumed to ask Professor Cockerell "Why he had painted the whole of the *plinth* all round the interior of the Cathedral new stone colour?" he replied, "Because, sir, it was dirty." So, as the reader may see, is the plinth all round and the bases everywhere of the columns of Westminster Abbey; and so even now is the *floor* of St. Paul's, and so is the woodwork of the stalls; why not, therefore, paint all of them, and thus hide the dirt everywhere. There is now in reality, and it is worth noting, no difference whatever between the inside of St. Paul's Cathedral and the very cheapest of cheap chapels, where every brick almost has been counted and the commonest and cheapest of materials used in its construction. May it not, therefore, be said that a very sad mistake was made when this wretched paint was made to hide the building? and may it not be laid down as an architectural axiom that where there is natural colour it should be left *to show itself* fairly and truly? But this is not all. There would seem to be, in addition to the *purity*—I can find no other word—of *natural* colour, as seen in all materials that are not artificial, a certain transparency and depth, which, as it were, remove the object *from* the eye, and soften the impression which it makes. It is difficult to make this clear to anyone who has not already observed it, but never was it so visible to memory and eyesight as in the past and deplorable present state of the *dome* of St. Paul's. I say it deliberately when I affirm that the dome, before the drum of it was painted, as seen from the floor of the cathedral, looked just half as large again as it does at this moment now that it has been painted in common oil stone colour to match the plinth and the walls; and for the simple reason that the depth and *transparency* are gone. It is dismal work this fault-finding, but I do not see how any greater injury can be done to the prospects of art and architecture than this of the central and chief building of the metropolis of a country being so misused and destroyed artistically, and made the subject of mere vain and foolish experimenting. It would take some time to endeavour to explain what is meant by colour in a building, as no one ever seems to be able to perceive that even *black* when diversified is *colour*. Why the outside of this building of St. Paul's is coloured with a far deeper tone and intensity of hue than any one of the portraits of Velasquez, where, as Ruskin has so well noticed, the "blacks" are more resplendent than most other painters' "crimsons;" and there is more real colour in a dull background of Rembrandt than in all the reds, and yellows, and blues, of our Academy Exhibition put together. If the outside walls of St. Paul's, now thought to be dirty, could be transferred and turned inwards, and so roofed in, and the black and grey of them to be in the interior instead of exterior, then would the interior of St. Paul's be the most wonderfully coloured building in existence, for the simple reason that nature and art had accomplished the work. Who will, therefore, say that St. Paul's Cathedral does not stand in need of "restoration" by cleaning off the oil paint from the whole of the inside of it so industriously put on it by the learned Professor of Architecture at the Royal Academy!

It is comforting to see that one or two *panels* here and there have been lately cleared of their coating of paint by the somewhat unfortunate and destructive process of planing or smoothing or *polishing* them, thus destroying the tool marks of the workman, and of course the character of the mouldings round the plain wall facing. Surely nothing more is or can be needed but the mere and simple removal of the thick coat of paint. St. Paul's, I say again, is a sort of experimental warehouse, and one is a little curious to know what is to be stored up in it, and where the "crane" is to be to lift it all into position. One is fairly appalled at the sight of the *iron* girders! In our little quarrel in the building itself I said to Mr. Cockerell, after all other arguments, colour included, had failed, "You will destroy the *sound* of the place." He replied, "Nonsense! how!" I do not know whether the singular fact has been noticed of how resonant, to use the familiar word, an unpainted wainscoted room when empty of furniture is, and how finely any musical instrument (as a violin) always sounds in it, and how, again, it is found to lose much of this resonant clearness when it comes to be thickly covered with oil paint. I once had the opportunity of observing this fact. It would take time to try to explain the cause of it, but here, and for our present purpose, the bare fact is enough; and it is the same with stone as with woods, the coating of paint will be found to deaden, almost to destroy, the clearness of the sound reflexions and air tremblings. Mr. Cockerell did not deny this; but, as we see, it did not prevent him from doing all the mischief he has done, and which it must be for his successors to remedy. St. Paul's is not a good place for sermon hearing or for prayer reading, but it is in this country altogether unrivalled and unequalled as a place wherein these may be emphasized, and the dulness of dull reading made endurable and sometimes intelligible.

C. B. A.

PROPOSED NEW FISH MARKET AT FARRINGDON-ROAD.

THE Smithfield Market Appropriation Committee, to whose efforts may be ascribed the erection of the new meat and poultry market on the site now occupied, entertaining strong convictions of the appropriateness of the land lying between the new market and Farringdon-road for the purposes of a fish market, have availed themselves of the professional services of Mr. Lewis H. Isaacs, architect, of Verulam buildings, Gray's Inn, to demonstrate how that object could best be obtained, and have published a plan, of which we have received a copy, showing the situation of the proposed market and a view of the intended structure as seen from the Farringdon-road. The ground proposed to be utilised is a parallelogram, bounded on the north by the new road leading to the Charter-house, on the south by an intended new street in continuation of Long-lane, on the east by the new street now formed at the end of the meat market, and on the west by Farringdon road. The total area of the land is 198,400 square feet, of which 126,000ft. would be occupied by the building, and the remainder would be devoted to the courtyard next the Farringdon-road and to the formation of the new street on the south. The design of the proposed market is similar in almost all respects to that of the new meat and poultry market; it would be in fact a continuation or repetition of the building. The cost is estimated at £150,000, to which must of course be added the value of the land.

We understand that the Port and Harbour Commissioners of Hartlepool have adopted the plans of Messrs. Harrison and Jaffrey for the improvement of the harbour.

SCHOOLS OF ART.

ON Thursday evening, November 5, the annual distribution of prizes awarded by the Science and Art Department to the students of the Hull School of Art took place at the Public Rooms. The Mayor, in distributing the prizes, remarked at some length on the good prospects of the school and the assiduity displayed by the students. Mr. Rowney (secretary) read the master's report, which showed a very satisfactory state of things, and that at the commencement of the year the Department of Science and Art issued a memorandum offering bonuses ranging from £50 to £10 to those masters of Schools of Art in which the results as tested by the examinations of the department should be most satisfactory. Mr Chandler, the master, obtained a bonus of £10. Votes of thanks were proposed to the Mayor and Mr. W Chandler, which those gentlemen suitably acknowledged and the meeting terminated.

On Monday evening a new Building Evelyn School for Technical Education was inaugurated at Bradford.

An exhibition of paintings and drawings illustrative of the government scheme of art instruction by Schools of Art, was held in the County Hall, Lewes, on Wednesday last, and in the evening a lecture, explanatory of the subject, was given by Mr. Fisher, the master of the Lewes School of Art. Drawings and paintings, executed by students in various schools of art, were arranged on the walls in a classified order. The explanations of the specimens and of the value of the study involved in producing them was listened to with much attention, and at the close of the lecture, after a vote of thanks had been accorded to the lecturer and to the chairman, the majority of the audience remained to re-inspect the drawings, &c., in the light of the information they had just obtained. In addition to the set of students' works, a number of paintings and drawings by Mr. Fisher were also exhibited, and, as testifying to the careful study by which he has qualified himself to instruct in the various branches of art, they formed an interesting part of the exhibition.

ARCHÆOLOGY.

INTERESTING discoveries have been made by the opening of a barrow on Tredinney-hill, six miles west of Penzance. The barrow is nearly a complete circle, with a diameter of 38ft., enclosed by an outer circle of large granite slabs set on edge. A trench having been sunk in the middle of the mound to a depth of about 18in., the explorers came to a large pile of granite rocks heaped together promiscuously. The course of one of these, which sloped in an easterly direction at a distance of 7ft., was followed, and led to a flat stone, 3ft. by 2ft. On raising this stone the rim of an urn was seen, filled with fine dark earth, and further exploration proved that this was of the ancient Celtic kist vaens, and one which has turned out to be unique in the district. Instead of being formed in the usual way of four stones set on edge, it was constructed of two stones to each wall, the upper one slightly overlapping the other in such a manner that the urn, which was placed mouth downwards, was tightly wedged in. The only other kist of this description ever discovered in Cornwall was at Gwithian, in 1741. The kist discovered is about 1ft. square, and just large enough to contain the urn, which is 1ft. high and 9in. in diameter at the mouth. It is ornamented round the upper part by three bands of rude irregular indentations, which extend over four knobs or handles protruding from the sides. The style of pottery is rude, and the vessel is not so well baked as most of the urns which have been found in the neighbourhood.

WATER SUPPLY AND SANITARY MATTERS.

A SECOND enormous reservoir for the supply of Paris with water is now in course of completion at Montrouge; this is to receive the waters of the River Vanne, which will be brought to the capital by means of an aqueduct which crosses the valley of the Bièvre, and is constructed upon the arches of the Aqueduct of Arcueil, originally built to bring the water from Rungis for the gardens and fountains of the Luxembourg. In the time of Henri Quatre, the Minister Sully caused researches to be made to discover whence the Romans obtained water for the Palais des Thermes, the remains of which are annexed to the museum of the Hotel Cluny, but it was not until the year 1613 that the works were commenced for bringing water from Rungis to Paris; the aqueduct was designed by Jacques Desbrosses—executed by Jean Coing, at a cost of £18,400, and terminated in 1864; it is on the old arches of this aqueduct that those of the new one are being constructed.

Building Intelligence.

CHURCHES AND CHAPELS.

On Thursday, November 5, a new Congregational Chapel was opened at Hull. The style is Gothic, and the cost £8,000, including £4,500 for land. The plan consists of transept and nave—the transept 72ft. in length, and the nave 50ft. wide. Accommodation is provided for 1,000 persons, two galleries in the transept and one in the nave holding 300. Mr. Kitching is the architect, and Messrs. Hutchinson, of Hull, the contractors.

Yesterday week the old church at Ewyas Harold, Herefordshire, was reopened after restoration by the Bishop of the diocese. A portion of the tower has been rebuilt, and the whitewashed ceilings have been removed, discovering a well constructed oak framed roof, which has been renovated. An archway has been opened out between the nave and tower, affording additional accommodation, and a new vestry and porch erected. C. C. Haddon, Esq., of Hereford, was the architect, and Messrs. E. and J. Giles, of Ewyas Harold, the contractors.

After thorough restoration by Mr. G. E. Street, Lillingstone Dayrell Church, Bucks, was reopened by the Bishop of Oxford on Sunday, November 8. The church is a very interesting little fabric. It is for the most part Early English, but the chancel arch is Saxon and the arch of the tower Norman; there are windows of later date, and a fine stone roofed porch of the fifteenth century. The north aisle, which was demolished some 200 years ago for sordid reasons, has been rebuilt. The entire cost of the work has been defrayed by Mr. A. J. Robarts, of Lillingstone House.

BUILDINGS.

New warehouses for Messrs. Wright and Co., provision merchants, have been erected at North Shields. The style is Byzantine, worked out in red and white bricks, the front broken by corbelled pillars and strings, terminated by a cornice. Mr. Martin Greener, of Sunderland and South Shields, is the architect. The completion of the building was celebrated on Wednesday week by a dinner to the workmen.

On Saturday afternoon, Mr. C. M. Palmer, of Jarrow, presented new schools to the parish of Easington, Yorkshire. The schools are the design of Mr. Richards, and are in the Gothic style. They will accommodate 110 children at a cost of about £1,000. There are separate entrances for boys and girls, and there is a large class-room and every convenience.

The foundation stone of a new Roman Catholic College for the diocese of Waterford was laid on Tuesday week at Upper Grange, on the outskirts of the city. On the true ancient collegiate plan, the college will embrace a large central court, surrounded by cloisters, class rooms, library, refectory, kitchen, offices, and numerous commodious apartments for professors and students. In the centre of the courtyard will be a church. The buildings will have a front elevation of 170ft. The estimated cost is £12,000. Mr. George Goldie is the architect, and Mr. M'Mullen, of Cork, the contractor.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—T. W. C.—T. C. H.—Midland Railway Co.—E. S. (Hull.)—M. and Co.—H. G., see B. C. B. Society.—G. and C.—R. C.—A. L. B.—C. S. Co.—Smithfield Market Committee.—J. I. M.—R. A.

J. T. BELL, Moorfield.—Your letter throws no new light on the unlucky accident at Twickenham. As to the latter part it is an attack only on an advertisement which appeared in the BUILDING NEWS. We can therefore only insert it as such. The controversy now going on between the two patentees must be excluded from our columns.

E. COOK.—We should be glad to act as you suggest, but it is now a rarity to meet with good works of the description you admire. You probably noticed Mr. Thompson's building at Glasgow, which we illustrated two or three weeks since.

C. W., Cork.—It rests with our readers to enhance the value of "Intercommunication." We do all we can and are glad to know that it is appreciated.

Q. E. F.—Simply by forwarding illustrations of works from which we make our selection.

FERRARUM.—In our description last week of the new Court House, at Falkirk, we stated that Mr. Ford was the architect. We since have learned that Messrs. Browne and Wardrop, of Edinburgh, were the architects, Mr. Ford being the clerk of works.

Correspondence.

ARCHITECTURAL ASSOCIATION.

To the Editor of the BUILDING NEWS.

SIR,—I trust you will allow me to correct an error in reference to the supplemental report of the committee of the Society of Arts on Education.

It seems that in my address I attributed to Mr. Burges the part which was taken by Mr. Seddon, the indefatigable secretary of the Royal Institute of British Architects, who was nominated by the council of the Institute to represent them in the sub-committee, and who was instrumental in bringing forward the important suggestion alluded to.—I am, &c.,

WILLIAM WHITE, President A. A.

Wimpole-street, November 9.

SOUTH KENSINGTON SKETCHING CLUB

SIR,—It appears that my letter of the 30th ult. is considered rather severe, as I have been assailed by a reply in your last number from "M. T. L.," in which he has used most unbecoming epithets and insinuations, all of which I am happy to say I can afford to despise. Undoubtedly, it is gratifying to many to see how courageously he has endeavoured to defend the course taken in the late proceedings, but being an outsider, and not enjoying the pecuniary advantages of that institution to which so many owe their "little fame," I feel at liberty to protest against what I consider prejudicial to my interest. I am only an evening student anxious to receive whatever instruction can be obtained in the short time allotted, and to have my drawings exhibited was my object in sending them there, to have their defects pointed out was my highest aim, and by special order of both master and secretary I affixed my name to each in order that they might be returned to me. As to "spiteful insinuations," of which I am accused, I emphatically deny them, and that stale and vulgar cant of the dog and the manger is a most absurd and inapropos remark. As I am above falsehood I ignore that expression, but return him the empty compliment of his own language two-fold, by telling him he is guilty of a grievous error in stating that I am the only one dissatisfied with the club management. Believe me my sentiments are felt by many who will not or care not to express them.—I am, &c., JUSTICE.

SMOKEPROOF ARCHITECTURE.

SIR,—In an article in your last impression entitled "Smokeproof Architecture," there are several points relating to terra cotta on which I trust you will permit me to make some observations. I am the more induced to address you because I see in your report of Mr. Tite's very able speech at the inaugural meeting of the Royal Institute of British Architects, that that gentleman made some very serious objections to terra cotta as a building material.

There is, as you remark, a growing tendency to revive the use of terra cotta, and it is important, therefore, that the various advantages which it possesses should be impartially contrasted with the objections to its employment. Mr. Tite, I am obliged to confess, is far from doing justice to terra cotta, and I am thus led to believe that he has been very unfortunate either in the choice of his material or in the manufacturer whom he has employed. I am not acquainted with the statue at Brighton, which he instances as an example of the want of durability of terra cotta, but I must point out two facts with reference to it. One is that terra cotta is from its nature a very unfit material for large public statues, and also on account of the difficulty and danger of firing pieces of any considerable size entire; and the other is that the constant exposure even of the most durable substances to the salt and moisture of the sea air is found fatal to them. Mr. Tite states that the arm and leg of the statue have been broken off. Surely marble would have been equally liable to mutilation from wanton mischief.

The fact mentioned by Mr. Tite that the terra cotta work of St. Pancras has failed in a good many instances is quite new to me; indeed, I have always regarded that church as a monument of the lasting character of the material under notice, when exposed to the atmosphere of London. Mr. Tite is, however, perhaps not aware that the terra cotta work of St. Pancras is the joint production of two firms—Messrs. Coade and the Brothers Rossi. The latter gentlemen were, I believe, the sculptors who modelled the whole of the enrichment, and who, on quarrelling with Messrs. Coade, built some kilns of their own and completed the remainder of the work, which consisted of the enormous caryatides and the superstructure which they support. I am unable to perceive that, in any instance, there has been a total failure of a block, but in two or three cases an evidently imperfectly fired portion of the enrichment has lost its sharpness and scaled away to the same extent as the Portland stone with which the building is ashlared. These blocks should manifestly have been rejected in the first instance by the architect. I have never myself been able to ascend very close to the most exposed parts of the terra cotta work, which may have failed as Mr. Tite describes, but those portions to which I have been able to get near enough to examine them carefully are all

that can be desired in point of preservation. Now, St. Pancras Church was built in 1821.

The remark in your article that terra cotta varies greatly in quality is most true, and badly fired and imperfectly made terra cottas are worse than useless for building purposes; to this class must belong the enrichments of the new Metropolitan Extension Railway stations, as their failure in so short a period can be due to no other cause than to faultiness in manufacture. Even bricks, which are inferior terra cottas, last for scores of years in London without showing signs of decay.

The danger from frost to which you allude might surely be omitted, as every substance is open to this objection—moisture is just as likely to attack the joints of granite as of terra-cotta. I may note here that terra cotta should never be left hollow; it is made so for facility of drying and firing and is sent hollow from the manufacturer, but this fact may be reckoned as one of the great advantages which it possesses over stone, as here you have the means in brick buildings of bonding and incorporatiog the dressiugs and enrichments in the most perfect manuer with the walls and other work.

Permit me totally to disagree with you with reference to the play of colour in terra cotta. There is not the slightest necessity for any very important variation in the tints, as blocks which are too light in hue may be fired again and have their tone thereby deepened to any extent. The dirty white colour you speak of is almost invariably a sign of an inferior article and should be rejected by the architect: thoroughly well-burnt terra cotta should never be paler than a straw colour, and tints varying from this to a deep amber colour, sometimes warming into a rich flesh colour, are what I should exact from a manufacturer. I have always felt the interchange of tints in a large front to be of the *utmost value* in point of effect, and in no other material can this interchange be obtained with the same facility and certainty of success as in terra cotta. The fact of the article under our notice being a burnt clay points it out especially, as you observe, as a dressing for brick buildings, and the danger you allude to of infinite repetition is more a fancied than a real evil.

A matter of the utmost importance with reference to the use of terra cotta is that it must always be treated and described as a substance entirely different from stone. The attempt to make terra cotta like stone, or to employ terra cotta for stone dressings, does always, and can only, result in failure. Terra cotta architecture must be studied as a speciality, and the size and arrangement of the blocks, the projection of enrichments and mouldings, and the colour must be peculiar to terra cotta. Any comparison of terra cotta with stonework, therefore, is a mistake, and to lay down as a rule that good masonry must always be superior to it is, I am convinced, equivalent to saying that painting must always be superior to sculpture.

In selecting polished marble and granite for the enrichments of the London of the future, you overlook, I fear, two facts—one is that you cannot build wholly in polished materials, even were they procurable in sufficient quantities, and such a building, even if executed, would most likely be a failure; the second is, that such materials would almost entirely preclude the employment of decorative features, as these are incapable of polish, and from the dark colour of most of these substances they would be ill-suited for the display of ornamental features. I must admit, however, that you indicate what we really want, that is, a substance with an imperishable vitreous surface, into which no moisture can soak, and to which no soot can cling. This we are now about to obtain in glazed or enamelled terra cotta—the revival of the old Della Robbia ware, with a harder and more durable ground; and from the samples of this material which I have examined, I confidently look forward to the time when terra cotta, glazed and unglazed, will make the buildiugs of smoky London not only beautiful, but at the same time imperishable.—I am, &c., GILBERT R. REDGRAVE.

CONCRETE HOUSES.

SIR,—I do not mean to take up your space with a personal altercation with the patentee, whose name I should not have agaiu brought forward but for his contradiction of my facts. Let me set myself right with your readers in a few last lines. I can *prove* that my walls were at least 18ft. high when Mr. Tall saw them, and gave beer-money to the men. If he came after September 3 they were proportionately higher. The plan he sent to you is far from correct, and many of his statements wrong as to detail, and he shows considerable igoorance in asserting that "the cement was purchased because it was 1d. a bushel cheaper," when, in fact, it cost me more than the previous lot.

If the foundations were insufficient, and if the cement was "some of the worst (he) ever saw," I can but say that the man he recommended to me planned the one, and *advised* and purchased the other. As to my having said that Mr. Tall was "responsible for" or "superintended" the work, I defy him to extract such meaning from my letter; and with regard to the quality of the "rubble" blocks (the size of which I admit) I spoke of, I send you a piece, broken off a larger block, by the head only of a pick, that you may judge for yourself.—I am, &c.,

GEO. LARDEN, D.C.L.

P.S.—May I ask how Mr. Goodwin (whose letter is a pleasant contrast) could possibly have seen a house and "looked over it" *after* the date of my letter on the 31st, which was totally cleared away off the ground on the 24th? However, it is not of any consequence.

[With regard to Mr. Goodwin's letter, we, by leaving out a long and unnecessary intervening paragraph rendered the commencement of his letter somewhat ambiguous. There can be no doubt that he saw the building. We have allowed this correspondence to appear while it was at all connected with the merits or demerits of concrete as a building material, but it has now become a merely personal dispute between the patentee and Dr. Larden, and each having had the opportunity of contradicting the other's statement, we can insert no more letters on the subject. We have before us several other letters giving similar accounts of the building to those given by Mr. Newton and Mr. Goodwin, but cannot possibly afford space for their insertion.—ED. B. N.]

Intercommunication.

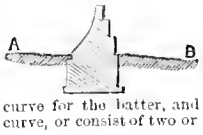
QUESTIONS.

[1118.]—SHAPE OF CHIMNEYS.—Having to build a small chimney-shaft, about 45ft. high, I should wish to know whether it would be better to build it square on plan or round. I should be greatly obliged to any correspondent who would inform me on the matter, and also give me a general idea about what the dimensions ought to be at bottom and at top.—BUILDER.

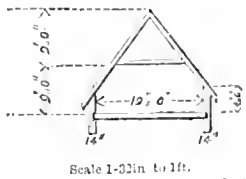
[1119.]—MEASUREMENT OF BRICKWORK.—I have had to measure up some work in walls and buildings to check the measurements of another surveyor, but I find that he gives the results of his in cube yards of brickwork. I give mine, as is the usual custom, in statute rods, and I am at a loss to know how to prove whether they tally or not. Can any reader kindly assist me?—E. B.

[1120.]—FALLING BODIES.—Is there any rule for determining the rate at which bodies will fall? and will a heavy body fall faster than a lighter one? Does a body in falling continue to increase the rate at which it falls? and if so, what is the law, if there is any, which it obeys?—STUDENT.

[1121.]—BATTER OF WALLS.—In building retaining walls is there any necessity for continuing the batter below the ground line? or should the foundations be carried down plumb, as shown in the annexed cut? I should be glad if any subscriber would let me know the best way of describing the curve for the batter, and whether it should be a uniform curve, or consist of two or three with different radii.—J. P.



[1122.]—ROOF CONSTRUCTION.—Is the collar in the sketch in a state of tension or compression, and are purlins necessary; if so, what scantlings, and where should they be placed? and how are the collars joined at the intersection of two roofs situate at right angles with each other?—BEGINNER.



Scale 1-32in. to 1ft.

[1123.]—WAR DEPARTMENT CLERK OF WORKS.—Will some of your correspondents be good enough to inform me how to obtain an appointment as clerk of works to War Department, as I am anxious to get one? also what are the salaries given? and oblige—A CONSTANT SUBSCRIBER.

[1124.]—ORNAMENTATION OF IRON.—I have read with great interest the article which appeared in the BUILDING NEWS of October 30, on "The Ornamentation of Iron," and should be very glad to be more fully informed on this subject. Can any of your readers inform me where I could get fuller particulars as to mixing the paint; also whether the same process is applicable to brass, and if not, what alterations must be made in the chemicals used? By inserting this in your next number you will much oblige—G. E. R.

[1125.]—BUILDING SURVEYORS' CHARGES.—I shall feel obliged if one of your numerous readers will kindly inform me what percentage (on the rent per annum when let for building) should I charge for the following:—Surveying land and laying out the same, arranging with adjoining landowners, introducing a respectable builder, conducting all correspondence, and furnishing various persons with copies of the plan?—NOVICE.

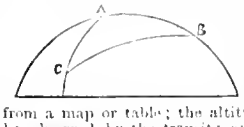
[1126.]—CIRCULAR GAS TANK.—I would be thankful to you or any of your readers for information on the undermentioned subject, viz., a circular gas tank, 14ft. in diameter and 14ft. high inside, finished measurement. I excavated 9ft. deep, which was gravel, and then formed gravel layer and good puddle mixed to a depth of 6in. I drove an iron bar through this layer, and water came up. I stopped the hole made by the bar with puddle, then built the circular stone wall which forms the tank with sound stone and good lime and good sharp sand a thickness of 20in. This wall I raised higher than the surface, and backed it with the excavated gravel, so as to strengthen the superstructure; coated the inside of wall with Portland cement and sharp sand 1in. thick; laid 6in. of puddle in the bottom of the tank, well incorporated; on the puddle I laid a course of flags, and a coat of Portland cement and coarse sharp sand on the flags. In a month after this I filled the tank with water to within 16in. of the top. I could not fill it higher. The next morning it fell 4ft lower, and in three days the water was all out, except 21in. in the bottom. I pumped that out, and could not see any defect in the cement except two small bits in the angle of the bottom. I re-did these in cement; and on the original floor laid another 12in. of good puddle and flags down on the original floor. I have filled it a second time with water, and it has lowered 9ft. in three days.—F. N.

[1127.]—GUINEAS.—I have in my possession an old guinea, dated 1788. The inscription on one side is "Georgius III. Dei Gratia," on the other "M. B. F. et H. Rex. F. D. B. et L. D. S. R. I. A. T. et E." I can make out the first part easily enough, but I do not understand all the abbreviations. If any of your correspondents could enlighten me on the subject I should feel much obliged.—ROBERT WILLIAM.

REPLIES.

[1083.]—WATER SUPPLY.—The area of the gathering ground must first be carefully ascertained from a good map. Should there be no map, a survey must be made, in order to obtain its measurement. This survey need not embrace details, but should be sufficient to enable the engineer to calculate the superficial extent of the land included. The area having been determined, the average rainfall in the district may be ascertained either by actual experiment, or better and more speedily by meteorological statistics. With these two data, and making a due allowance for local evaporation, the quantity of water that may be expected and fairly relied upon may be easily calculated.—CALX.

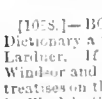
[1084.]—REGULATING TIMEPIECES.—"Verax" may proceed as follows, but he must bear in mind that it will take one or two trials, perhaps more, before he will be able to accomplish what is rather a delicate operation. It is a question of spherical trigonometry. In the figure, let the sun be supposed to be at C, then what is required is the hour angle, which is the angle A B C. The data required are the latitude of the place of observation, which can be got from a map or table; the altitude of the sun, which can be observed by the transit; and the declination of the sun for the day and time of observation. This last is given in the "Nautical Almanac." By the laws of the solution of spherical triangles, when three sides are given, any of the angles can be calculated. Consequently, if we could find the values of the sides A C, C B, A B, we could determine the value of the hour angle A B C. But A B is the complement of the latitude, A C the complement of the observed altitude, and B C the polar distance or complement of the declination. Putting S for the half sum of the three sides, we have the following formula for finding A B C:—



$$\text{Log. tan. } \frac{A\,B\,C}{2} = \tfrac{1}{2}\left(10 - \log.\sin S + 10 - \log.\sin (S - A\,C) + \log.\sin (S - B\,C) + \log.\sin (S - A\,B)\right)$$

Having found the value of A, we can turn it into time by knowing that 15° = one hour. Suppose the value of A to be 46° 20' 20", then we have the proportion—15° : 46° 20' 20" :: 1 : X, and X = 3h. 5m. 21s. Subtracting this from 12, and adding 3m. 15s. as the equation of time, we find the true time to be 8h. 57m. 54s. If we suppose the clock to indicate 8h. 50m., then it is 7m. 54s. behind time.—NAUTA.

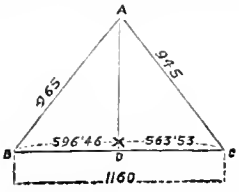
[1087.]—SUPPORT FOR FLOORING.—Instead of using brick arches I should advise your correspondent to strengthen his floor by simply bolting on a second set of beams side by side (see figure) with the existing ones. Together they would be amply strong for the purpose, and would not exercise any effect upon the side walls.—A. S. X.



[1088.]—BOOKS.—"A Student" will find Dr. Ure's Dictionary a very good one; also another by Orr and Dr. Larduer. If he were to write to the well-known colourists, Windsor and Newton, they would send him a list of their treatises on the subject he wants. There is a capital work in Weale's Series, called "Painting, or a Grammar of Colouring," by George Field.—X. B.

[1089.]—COLOURING DRAWINGS.—If the paper be properly strained upon a board it will not crease when a wash of colour is laid on. The reason that creases often occur in drawing paper that has been coloured is that the colour has not been allowed time to dry before the paper is worked upon. Whenever creases do occur, they may be altogether removed by well damping the paper upon the other side, and, if necessary, pressing it well besides with some heavy books, or anything that may be handy.—S. T. W.

[1039.]—AREA OF TRIANGLES.—All the solutions to V. P.'s problem of the triangle in your impression of the 30th ult., are arrived at by taking the square root of the continued product of half the sum of the three sides, and the respective differences of the three sides and the same half sum. I beg to offer the following solution by finding the segments of the base:—Call one of the sides, say the longer one, B C = 1160ft., base; then say, as the base (B C) is to the sum of the two other sides (B A + A C), so is the difference of these sides (B A — A C) to the difference of the segments of the base (B D — D C). 1160 : 1910 : : 20 : 32.931 = difference of segments of base. Half the difference of these segments added to half their sum will give the greater, and half the difference taken from half their sum will give the less. Thus—



580	580
16.4655	16.4655
596.4655 = greater B D.	563.5345 = less D C.

The perpendicular A D is found by using the well-known 47th proposition of the First Book of Euclid.

$$A D^2 = A B^2 - B D^2.$$

A B = 965	Log. B D 596.4655 = 2.7755854
965	2
4825	Log. 355771.25 = 5.5511708
5790	
8685	

$A B^2 = 931225$
$B D^2 = 355771.25$

Log. 575453.75 = 5.7600104 ÷ 2 = 2.8800052 = Log. A D. The area is found by taking half the product of the base and perpendicular height, thus, by logarithms:—

Log. Base B C 1160 =	3.0644580
Log. Perpendicular height A D =	2.8800052
Log. 879960.6 =	5.9444632

439,980.3 = area in feet = 48,886.7 square yards.—MARTIN B.

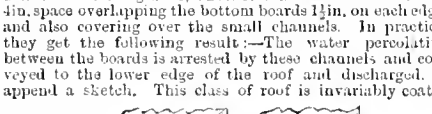
[1099.]—In reply to "V. P." I never use any angular instrument. If the triangle be laid down from a large scale, the perpendicular may be measured and the area found by the usual rule. Or, from half the sum of the three sides subtract each side severally; multiply the half sum and the three remainders continually together, and the square root of the last product will be the area of the triangle. Thus: 1165 + 965 + 945 ÷ 2 = 1535 the half sum, 1535 — 1160 = 375. 1535 — 965 = 570. 1535 — 945 = 590. Then we have √(1535 × 375 × 570 × 590) = 33478630434 square feet, the area of the triangle.—E. H.

[1049.] I beg to observe that I do not understand "Robey Carpenter's" mode of finding the area of a triangle (printed in the BUILDING NEWS of November 6) by making use of the number 15 301. If "Robey Carpenter" will kindly send in a solution having given that the angle at A = 74° 47' 6.56", B A = 965, and A C = 945 (the same as in the original triangle given by "V. P." in the BUILDING NEWS of October 30), he will oblige—RAYMOND F.

[1104.]—APPRAISER'S LICENCE.—If "C. H. King" prices or values work that he measures, I should recommend him to take out a licence; if he does not, and his valuations should at any time be disputed in a court of law, the judge would not receive his evidence to prove his own valuations, which might cause a loss to his client.—S. JACKSON.

[1114.]—MACHINE WORK.—In reply to your correspondent "One of the Olden Times," in the BUILDING NEWS of November 6, we beg to offer to him, through your medium, our machine-made mouldings, which we know to be first class, but if not approved can be returned to us at our expense. We are sure they will give perfect satisfaction.—CRAVEN BROTHERS and Co., Darnall, near Sheffield.

[1116.]—WATERPROOF WOODSHED.—Buildings of a cheap and temporary character require covering with less costly material than slate, tile, or metal. In this case wood naturally presents itself. It is cheap, light, and easily wrought, but being subject to a greater amount of expansion and contraction under the influence of our changeable climate than is the case with other and more costly coverings, it presents difficulties that we are at a loss to overcome. One of our most ordinary modes of covering is that of "weather boarding," with 11in. or 9in. boards, ¾in. or ⅞in. in thickness, the lower edge of each board being nailed upon the upper edge of the board below. There are several objections to this principle. Firstly—If they are narrow boards, the upper face—from the lower edge of the board being placed upon the upper edge of the previous board—is so nearly horizontal on its upper face that the rain naturally beats under the boards. This may in some measure be overcome by having the roof of steep pitch; but here again comes the question of cost. Secondly—If they are broad, thin boards, we are bound to secure them on both edges. This prevents the natural expansion and contraction of the wood; the consequence is, in extreme hot or dry weather, the boards will split down the centre. Another mode of covering is with upright boards running from the eave to the ridge, the joints covered with boards or strips. This plan is preferable to the former, inasmuch as the water is more readily discharged from the roof. One of the causes of this kind of roof being defective is the distance of the side trees or purlins; the lower boards are not well supported, and the water percolates under the overlapping covering. If this is remedied, we are bound by the laws of construction to secure the boards on their outer edges. Here, again, we find the boards split down their centres in hot or dry weather. We have instances of wood being cut into the form of slates, and used in like manner, with great success. This plan can only be recommended in connection with saw mills producing a quantity of waste material that could be cheaply converted into a covering of this character. On the whole, our methods of constructing wood roofs are defective. We naturally call in the aid of roofing felt, painted canvas, tar intermixed with lime or sand, &c., to enable us to make them waterproof. In England we are blessed with an abundance of building materials, the best of which we can apply to the most suitable purposes. This is not the case in other countries, especially in the north of Europe, where one or two kinds of constructive materials wholly prevail. In Sweden and Norway wood is essentially the material for building, with the exception of a few panes of glass and a few bricks for the chimneys. The houses—away from the large cities, where its use is prohibited—are entirely constructed of wood. The question of constructing waterproof wood roofs has had their most serious consideration. Having travelled over a portion of that country, and being deeply interested in all matters pertaining to the building trade, I hope a few details under the heading of wood roofs may be interesting, if not instructive, to your correspondent. The most ordinary—and certainly the cheapest—mode of constructing waterproof wood roofs is that of "shingles." These are mere shavings cut from round whitewood poles about two feet in length; they are of various widths, graduating from the first shaving from the round pole to the broad shingles cut from the centre of the wood. As an article of commerce, they are packed in wood frames, 2ft. square, and as the shingles are 2ft. long, a bundle is consequently 2ft. square all ways. In this form they are dipped in creosote oil for 5in. or 6in. from one end, and are sold for 8s ore (9½d.) per bundle. In covering a roof, they are placed several thicknesses together at the eave, and as they are distributed over the roof they are allowed a lap of 19in., showing a face to the weather of about 5in. It naturally follows, as every 5in. of the shingle is overlapped by an additional one, there is no part of the roof where the shingles are less than five in thickness. They are nailed upon laths in rows the length of the roof, in the same manner as slates, but instead of abutting to one another at the edges they are overlapped. For instance, a row of shingle is fixed, commencing from the left-hand end of the roof; as each shingle is fixed it overlaps the preceding one about 1in. along its edge. This is repeated to the other end of the roof. The next row is commenced from the opposite end, and is lapped in a contrary direction. This principle effectually precludes the beating rains from driving in at the joints. The sun curls up the edges, and splits the lower end of the shingles in the form of a comb, but still the roof is sound and watertight. For better class houses, these roofs are again lathed upon the top, and covered with pantiles; in this case the shingles are used to exclude the frost in winter, whereas with an ordinary tile roof they would be uninhabitable. Another mode of covering, and one perhaps more in unison with the views of your correspondent, is that of upright boards. These boards are 7in. wide and 1¼in. in thickness, placed about 4in. apart. The upper face of each board has a channel ¾in. wide and ¾in. deep, running from end to end along each edge of the board. This being done, another board is nailed over the 4in. space overlapping the bottom boards 1¾in. on each edge, and also covering over the small channels. In practice, they get the following result:—The water percolating between the boards is arrested by these channels and conveyed to the lower edge of the roof and discharged. I append a sketch. This class of roof is invariably coated



over with wood or Stockholm tar intermixed with red ochre. This material gives a nationality to all their rural erections.—W. S., Nottingham.

BUILDING AND LAND SOCIETIES.

ON Wednesday evening, the 4th inst., the first appropriation meeting of the City Central Mutual Benefit Building Society was held at the Broad street Ward Charity Schools, No. 59, London wall, when upwards of 600 shares were allotted. The society is a terminable one, limited to 1,200 shares of £150 each, and has for its object the assisting and encouraging of saving habits in its members by the admittance of small regular payments, which are to be safely invested, and of rendering practicable a system of small mortgages, with a view to enable each of the members to obtain an advance of £300 for the purchase of leasehold or freehold property. The money is advanced for 12½ years, and is repayable at £24 per annum, without any interest or premium for balloted shares, the appropriation being by two ballots and one sale alternately. The subscription, at the rate of 2s 6d a share, is payable on the first and third Wednesday in each month.

WAGES MOVEMENT.

A CROWDED and influential meeting of delegates from most of the metropolitan trade societies was held at the Bell Inn, Old Bailey, on Saturday evening last, to consider what steps should be taken to forward the adoption of arbitration in trade disputes. Mr. Allen (Amalgamated Engineers) presided. Mr. Dunning, bookbinder, moved:—"That this meeting of trades societies' representatives approves of the principle of arbitration, in the belief that it is the best method of settling disputes between employers and employed, and recommends that trade committees, in their various localities, seek to bring about meetings of masters and men, with the view of establishing boards of conciliation and arbitration; and this meeting feels deeply indebted to Mr. Mundella for the successful efforts he has made to establish such boards." Mr. W. Hammett seconded the resolution, and Mr. Odger (secretary, London Trades' Council), in support, said that the trades of London had adopted the principles of arbitration some years ago, but the question now was how best they could carry it into operation. Some weeks since, having business with the new Lord Mayor, Mr. Alderman J. C. Lawrence, he mentioned the subject to the worthy alderman, who said that he should be happy, at the commencement of the new year, to attend a conference of masters and men for the mutual consideration of the subject. Mr. Mundella had also promised to attend the conference, which, no doubt, would be the most important held for many years in this country. After a few remarks from Mr. Lloyd Jones, the resolution was carried unanimously, and the proceedings terminated.

The operative carpenters and joiners of Bristol have given notice to the masters that on and after May 1 next they wish to leave work on Saturday at 12 o'clock, and to receive an advance of one halfpenny per hour on the present rate of wages.

STATUES, MEMORIALS, ETC.

THE ceremony of unveiling the relief monument of the late Admiral Sir Charles Napier, which fills one of the niches in St. Paul's Cathedral, near the north entrance, took place on Friday last. The expense of this monument was defrayed by a few friends and companions-in-arms of the late admiral. It is of white marble; in the centre is the head, in bold relief, surrounded by a wreath of laurel and oak, and upon two flags are the names of most of his battles; in the background is the ship Wellington, gunboats, and a fortress blown up; beneath is the simple inscription, "Charles Napier, M.P., Admiral, Count St. Vincent, born 1786, died 1860." The work was designed and executed by George G. Adams, sculptor, who has now five monuments in the Cathedral, two being colossal statues of the Admiral's cousins, the Generals Sir Charles and Sir William Napier.

LEGAL INTELLIGENCE.

IMPORTANT CASE.—THE QUEEN *v.* THE METROPOLITAN BOARD OF WORKS.—In the Court of Queen's Bench on Wednesday last, this case (which was an appeal by the board against a poor rate levied on their sewers in the parish of Greenwich) was argued, and the question raised was whether the sewers are rateable. The claim was made on the ground that the sewers were used for purposes of profit, inasmuch as the sewage was disposed of for manure. The technical form which the rate assumed was this:—It was upon freehold ground belonging to the board within the parish occupied by the length of sewers within the parish; and, further, the board were rated in respect of the area of land occupied within the parish by the buildings erected for the pumping engines, &c; the gross estimated rental was altogether put at £9,520, and the rateable value at £5,114, upon which the poor rate at 1s. 1d. in the pound came to about £300. The board appealed upon the grounds—1, that the property was not in its nature rateable; 2, that the board had no occupation of the property in respect of which they were rateable; 3, that they had no beneficial occupation; 4, that the board did not inhabit the parish; 5, that the board did not nor did any person derive any benefit from the works; 6, because the parish and not the board derived benefit from the works; 7, that the board had no interest in the soil; 8, that the board occupied only under their Act of Parliament, and for the purpose of the Act. Of course, if the present claim was sustainable, the sewers would be rateable in all the other parishes through which they passed; and the magnitude of the question may appear from the aggregate amount of the sums levied and expended by the board. And by a Parliamentary return of April 10, 1866, it appeared that the board had raised £7,500,000, and had repaid £800,000, leaving unpaid £2,750,000, on which interest had been paid to the amount of £502,000. And, on the other hand, it appeared that the total expenditure had been £3,584,846. An idea of the magnitude of the works may also be obtained from a printed report of the proceedings of the board presented to Parliament under the Act, in July, 1865. From these and other official documents it will be seen that there are 82 miles of sewers in London. The sewers were constructed under the 11th and 19th Victoria, cap. 120 (the Metropolitan Management Act); under sec. 135 of which the board were empowered to make such sewers as they might think necessary, and then by sec. 170 they are empowered to levy rates for the expenses incurred. And the 21st and 22nd Victoria, cap. 104, extended their powers. The sums levied by the rates were to be paid into the Bank of England. In the meantime, the board were empowered to raise money by loan, and the funds lodged in the bank were to be paid out by order of the Lords Commissioners of the Treasury until the money borrowed was paid off. Thus, it was contended that the Board of Works, in fact, never touched the money. It appeared that the board had entered into an arrangement to dispose of the sewage for manure, but that no profit had as yet been realised. The argument in support of the rate likened the sewers to the gaspipes or waterpipes of the gas and water companies or to canals. In the course of the argument, however, the Lord Chief Justice observed that there was a great difference in these cases. The mere fact that the board levied rates could not make the sewers rateable, or streets might as well be rated. Mr. Justice Lush observed that the Act of Parliament imposed upon the board the duty to erect the sewers and levy rates for the purpose. No other rates were leviable. After a long discussion judgment was deferred.

NOTICES OF BOOKS.

The Elements of Plane Geometry, for the Use of Schools and Colleges. By RICHARD P. WRIGHT, formerly teacher of geometrical drawing in Queenwood College, Hampshire. With a Preface by J. ARCHER HIRST, F.R.S., &c., Professor of Mathematics in University College, London. London: Longmans, Green, Reader, and Dyer. 1868.

THE author divides the contents of his volume into four books or sections, the first of which treats of the properties of lines and figures, formed by a

combination of any number of straight lines, including triangles, squares, parallelograms, and polygons, regular and irregular. To every chapter in the sections are attached a few miscellaneous examples for the instruction of the student and also inserted for the purpose of enabling him to exercise his own knowledge and ability in determining their solution. Practical examples of this kind are always valuable, as they serve to keep alive the interest of the beginner, and impart a real appearance to the study he is engaged in.

Book the second introduces us to the "circle," with its numerous accessories of arcs, chords, tangents, and segments. Full information is afforded to enable their various directions, magnitudes, and values to be determined. To thoroughly understand the different properties of the circle requires a little more mental exertion and perseverance than to acquire a similar knowledge respecting right lines and the figures formed by their combination. One does not "see" the solution so readily, or the different steps in the reasoning process so clearly in the former as in the latter instance; but by giving more attention to the subject, it will become clear, and well reward the labour bestowed upon it. In book third a still more difficult and intricate branch is taken up—namely, ratio and proportion. Commensurable and incommensurable magnitudes are clearly defined and illustrated, and the incommensurability of the diagonal and the side of a square well exemplified. Ratio and proportion are not confined to lines and numbers, as might be at first imagined, but all other figures, whether circular or rectilineal, can be accurately compared by these means. The areas of rectilineal figures, polygons, and circles are treated of in the last book or section, and a chapter upon the proportional areas of polygons concludes this well-written, well-digested volume. It is scarcely possible to endow geometry with any original or absolutely novel features, but the author has done more than we have witnessed in any of the many works on this subject to put it in a new dress, and has introduced some propositions which, so far as their particular application is concerned, have not appeared elsewhere. The diagrams are well cut, and the lettering bold and distinct. Bearing in mind that geometry constitutes the very first branch of rudimentary technical education, which must be soon extended to our artisans and working classes generally, plain practical textbooks are much wanted, especially those of a description which are tended rather to allure the beginner than scare him away—a result which not unfrequently follows the selection of an abstruse and difficult treatise for a new hand to commence with.

A Handy Book for the Calculation of Strains in Girders and similar structures, and their strength; consisting of formulæ and corresponding diagrams, with numerous details for practical application, &c. &c. By WILLIAM HUMBER, Assoc. Inst. C.E., Author of "A Practical Treatise on Cast and Wrought-iron Bridge Construction;" "A Record of the Progress of Modern Engineering," &c., &c. London: Lockwood and Co., 7, Stationers' Hall-court. 1868

WE entirely disagree with the author respecting his statement in the preface, that there are no works extant affording the requisite information upon the subject of strains. Mr. Stoney's work contains everything necessary for the calculation of the strains in the different types of iron construction.

To us it is simply impossible to treat the question, involving so much diversity and complexity, with any success in the manner proposed by the author. The volume becomes one mass of formulæ and figures, rendered doubly bewildering by the extraordinary manner in which the text is arranged, and by the miserably small type employed. If any description of book requires indispensably a bold, clear type, it is a volume of the character to which the present compilation aspires. Notwithstanding the assumption in the preface regarding strains, that "pocket-books have been compelled to leave its treatment incomplete," Mr. Humber would have done well to have imitated Mr. Molesworth in the general style and get-up of his valuable little work. The truth is, that the author, while affording a vast amount of information, has endeavoured to condense too much. It should be borne in mind that it will not answer to condense a subject for a beginner. He only becomes perplexed in his attempts to use a formula, the basis of which he does not understand. It is difficult to ascertain to what category "Strains in Girders" belongs. The author admits it is not a treatise. It is certainly not a pocket-book, and it can scarcely be called a hand book, in the strict sense of the term, since, in order to arrive at the solution of any particular example, it necessary to refer to three or four different parts of the volume. Many of the examples are more of a theoretical than a practical nature, and might be omitted with advantage. The diagrams, although small, are clear, and the plates equally good. The valuable portion of the book is the information afforded respecting the geometrical method of arriving at the strains of bridges and roofs.

A Treatise on Optics, on Light and Sight, theoretically and practically treated, with the application to Fine Art and Industrial Pursuits. By E NUGENT, C.E., Ex-principal of Commercial, Nautical, and Engineering College, New York. London: Virtue and Co., 26, Ivy-lane. New York: Virtue and Jorston.

IN spite of the support given by many distinguished mathematicians, opticians, and philosophers to what is termed the "theory of emission," the other more recently propounded doctrine known as "the wave or undulatory" theory of light is nearly universally recognised at present as the true cause of that remarkable phenomenon. Mr. Nugent, while mentioning the two theories, does not trouble himself about their relative merits or the claims which each may possess to be regarded as the correct explanation of the principle of light. Even in an optical treatise of a most scientific character, discussions upon these points are altogether superfluous. They generally only perplex instead of informing the reader, and nothing but actual experiment can ever advance our limited knowledge of the imponderable elements. The author has acted judiciously in abstaining from introducing into the instructive and interesting contents of his work any abstruse or extremely erudite matter, or in complicating the text with mathematical and algebraical formulæ. He has intended the volume to be of general not partial utility, and the manner in which the various branches of a subject so important have been treated fully justifies the opinion that his intention will be a very successful one. Starting with the two correlative principles of the refraction and reflexion of light, better known to the optician under the names of dioptrics and catoptrics, the two leading features may be briefly mentioned. A couple of simple rules suffice for establishing the relations existing between incident, refractive, and reflective rays of light. If a ray of light fall upon any transparent medium, it will be refracted, that is, bent or diverted from the line of its original direction by an amount depending upon the nature of the medium through which it passes. This amount is synonymous with the angle of refraction, which is always constant for the same medium. Thus, if the ray be incident upon a sheet of water, the angle of incident will always bear to the angle of refraction the proportion of 1·336 to 1. When the ray, instead of falling upon a transparent body, is incident upon an opaque one, it is reflected from the surface, and the universal rule prevails, liable to no exception, that the angle of incidence is equal to the angle of reflexion.

The chapters upon the aberration of light, its constitution and decomposition, are particularly deserving of attention, and the reader will find himself much interested in the experiments made by Sir Isaac Newton—the first to prove by direct experiment that all the seven prismatic colours, when again combined and made to fall upon the same spot, formed or recomposed white light. Sir David Brewster maintained that there are only three original spectrum or primary colours—namely, red, yellow, and blue. Mr Nugent mentions the other philosophers who coincide with Brewster, and sums up very fairly the relative arguments put forward by both parties, leaving the reader to form his own conclusion on the question. It is, nevertheless, generally considered that the discoverer of the law of gravitation was unconsciously led into error by the manner in which he conducted his experiments. Some instances are given of people who have suffered from colour blindness, or an incapability of accurately distinguishing some colours from others. One would not expect to find the name of the late Mr. Troughton, of the firm of Troughton and Simms, the eminent mathematical instrument makers, among those who were affected with this peculiar description of optical deficiency. But the fact is so; he was incapable of fully distinguishing colours, with the exception of blue and yellow. The author enters into an accurate description of the various examples of telescopes and the principles governing their construction. The stereoscope, kaleidoscope, cameras, and every sort of optical instrument, whether intended for the purposes of utility or amusement, are also described, and their leading features examined in detail. Taken in its entirety, we consider Mr. Nugent's volume to be one of the most readable that has come under our observation. He treats what is abstractedly a rather dry and difficult subject in an instructive and popular manner. It is just the sort of book that an artisan could read with advantage to himself, and really acquire a sound knowledge of optics, without being deterred by abstruse problems and mathematical investigations, which are so plentifully displayed in most treatises. The type is large and clear, and the cuts and diagrams distinct and well chosen for the illustration of the various subjects.

Our Office Table.

At the usual meeting of the Metropolitan Board of Works on Friday last, tenders were received for the execution of the work for the formation of the ornamental work of Finsbury Park. There were eleven tenders, but the one accepted was by Mr. James Clarke, for £7,130. A plan was also received and adopted for the improvement of Park-lane by the opening up of Hamilton-place as proposed by the bill promoted by the Board in 1865, and the taking of the two northernmost houses on the east side of Hamilton-place, and the solicitor was instructed to issue the necessary notices of the Board's intention to apply to Parliament for an act to enable them to carry out the improvement.

A meeting was held on Monday evening at Bradford to inaugurate the establishment of classes for the purpose of imparting technical and scientific knowledge to the operatives and apprentices connected with the building trades in Bradford and the neighbourhood. This movement was described by the chairman, Mr. A. Neill, as the first fruits of a Board of Arbitration which had been recently formed in connection with one branch of the building trades and of the combined efforts of men and masters to ensure the harmony and well-being of all connected with the trade.

An agitation has been commenced in Lambeth with the object of securing a portion of the extensive grounds at the rear of the archiepiscopal palace for purposes of public recreation. The new primate, whoever he may be, has here an opportunity of making a graceful concession to the inhabitants of a densely-populated district.

The multiplication and extension of metropolitan railways during the past few years, although conducive in the highest degree to the public convenience, have nevertheless not been without certain drawbacks. One of these is found in the miserable manner in which, in wet weather, rain-water leaks through the roadway of the numerous iron girder bridges on to the passengers and traffic below. This is, indeed, more than a drawback; it is an intolerable nuisance, and we are glad to see that the Lambeth Vestry is about to take steps for its abatement.

The Hydro-Carbon Light Company exhibited their new light in front of their offices at 18, Parliament-street, on Monday evening last, in honour of the birthday of the Prince of Wales. The value of the light was well manifested by its superiority over the adjacent gas lamps, the premises being distinguishable at a very considerable distance by the beauty and brilliancy of the light.

The meetings of the Institution of Civil Engineers will be resumed on Tuesday, the 17th inst., when a paper will be read "On Lighthouse Apparatus and Lanterns," by Mr. David M. Henderson, Assoc. Inst. C.E. In the interval that has elapsed since the close of the last session the premises in Great George-street have been entirely rebuilt, and the accommodation for members, both in the meeting room and in the libraries, has been more than doubled. The meeting-room will now seat comfortably about four hundred.

The King of Prussia has given to the inhabitants of Frankfort an annual donation of £3,200, the gift being assured for the next ten years.

The Dover Gaol Committee have had under consideration the question how far a salaried surveyor is entitled to separate remuneration for particular work. In this case the surveyor had been employed as architect in the Borough Gaol Extension, and he claimed £427 as architect's commission at 5 per cent. upon the total outlay. After a long discussion as to whether the work done was extra-official or not, a motion that the charge should be paid was unanimously adopted.

The construction of the buildings in the rear of Burlington House for the London University and the picture galleries of the Royal Academy has rapidly progressed, and the contractors are sanguine that the latter will be completed for the opening of the exhibition in the spring of next year. The structures in the forecourt in Piccadilly (with the exception of the mansion itself) have been within the last few days cleared away to make room for an edifice 60ft. in height, which is to occupy the front and two sides, and thus form a quadrangle after the manner of Somerset House. In this building the Royal Linnean, Geological, and Astronomical Societies and the Society of Antiquaries are to be lodged, and thus, in close proximity, the whole site will contain the headquarters of science, learning, and art.

The Town Council of Portsmouth have been obliged to call in advice as to the construction of their drainage works. At a meeting held on Friday last it was resolved that Mr. Hawksley be engaged to report to the Council on the present state of the drainage of the borough, and what he considered desirable to effectually carry it out.

Arrangements, we understand, have been made for commencing classes throughout the entire coal district for teaching technical and scientific subjects, in connection with the Government Department of Arts and Sciences. Classes will be opened at once at Blyth, Sunderland, Newcastle, Hetton, and Bishop Auckland, and will be followed as fast as suitable masters can be obtained by classes at Seaham, Rainton, and all other populous places. The subjects taught will be machine drawing, navigation, mathematics, chemistry and geology, building construction, applied mechanics, steam mining, &c.

The eleventh session of the Edinburgh Architectural Association was opened on Wednesday week with a lecture delivered in the Craigie Hall, St. Andrew-square, by Mr. John D. Marshall. There was a good attendance of members and their friends. The chair was occupied by Mr. J. Ballantine, jun., president of the association, who briefly introduced the lecturer. The subject of Mr. Marshall's lecture was "Taste and Style as applied to Ornamentation." A number of photographs, &c., were exhibited during the evening, including photographs of competition designs for Government Law Courts in London, which were kindly lent by Mr. David Bryce, R.S.A.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

459 C. and L. VERHULST. IMPROVEMENTS IN THE ARRANGEMENT AND CONSTRUCTION OF FIREPLACES. (A communication.) Dated February 11, 1868.

This invention consists in bringing the firegrate forward into the apartment to be warmed, and in applying thereto a movable hood or apparatus to prevent the escape of smoke; also in an improved valve or damper for regulating the orifice between the firegrate and the chimney. The whole firegrate is made to project beyond the line of the chimneypiece, so that the warmth may be distributed in the apartment more advantageously than heretofore, and the hood is constructed so as to cover the firegrate, or partially cover it, or leave it entirely uncovered, as may be found necessary. The hood is supported on inclined rails, and it is counterbalanced by a weight passing over guide pulleys, the position of the hood being regulated by a handle projecting through the front of the chimneypiece. The valve or damper to regulate the draught consists of a swivel plate provided with counterweights, and its position is also regulated by a handle passing through the front of the chimneypiece.—Patent completed.

482 J. TOWLE. IMPROVEMENTS IN THE ARRANGEMENT OF SEWERS AND DRAINS FOR THE COLLECTION AND DISTRIBUTION OF SEWAGE MATTERS. Dated February 12, 1868.

Here the inventor proposes to carry off the storm waters of towns by means of a separate small barred drain, or pipes of suitable material and size, according to circumstances, laid under the present rain-water gutters, close to the kerb of the footpath, one on each side of the way, except the street be a narrow one. These drains are to be laid as shallow as possible, so as to be safe from injury by carriage wheels, and for the obtaining of one uniform fall.—Patent abandoned.

515 L. MUMMENHOFF. IMPROVEMENTS IN THE MANUFACTURE OF BUILDING BLOCKS, AND FOR USE IN BUILDING. (A communication.) Dated February 15, 1868.

Here the patentee combines together ashes of coal and coke and Portland cement, or Roman cement, or other similar cement, and he also combines with the mixture other materials, varying according to the purpose for which the block or composition is required. Thus, for use out of doors and in massive structures, he employs ashes of coal or coke, cement, slag, lime and water glass. For use inside buildings, as for fireproof arches, and for other purposes, he uses ashes of coal or coke, cement, slag, and lime, without water glass. For use inside buildings for lighter purposes he uses ashes of coal and coke, slag and lime. For use in structures exposed to water, for building cellars, and for similar purposes he uses ashes of coal or coke, cement, slag, lime, and river sand. The prepared materials may also be used for flooring.—Patent completed.

525 J. WALKER. IMPROVEMENTS IN THE MANUFACTURE OF ORNAMENTAL TILES, SLABS, BRICKS, AND OTHER ARTICLES. Dated February 17, 1868.

According to this invention, the patentee perforates the absorbent mould in the parts where it is recessed, in order to form the pattern with small holes which serve to supply the air more freely between the die or mould and the moulded tile, and cause the two to separate more readily. Also in place of filling the mould as usual, he forces it upon a batt or slab of clay or clays by means of a press or otherwise, and the requisite impression is thus formed on the batt or slab of clay or clays the holes giving free escape to the air, and allowing the clay to penetrate into all the recesses of the mould afterwards in the usual way. The hollows in the moulded slab or batt of clay or clays are filled in with clay of another colour or colours, and the tile is finished as heretofore. The same process of manufacture is applicable to slabs, bricks, and other articles.—Patent completed.

528 W. R. LAKE. IMPROVEMENTS IN KILNS. (A communication.) Dated February 18, 1868.

This invention relates to a method of burning or baking bricks, tiles and other articles by passing them on trucks or moving platforms through a long tunnel provided with means for regulating the temperature, whereby the bricks or other articles are heated and cooled gradually during their passage through the tunnel. The improvements consist, chiefly, in the peculiar construction of the kiln or tunnel, in the means for effecting the gradual heating and cooling of the bricks thereio, in the novel construction of the trucks or platforms for carrying the bricks, and in the devices for controlling the motion of the trucks and for adjusting them in any desired position in the kiln.—Patent abandoned.

541 H. CHAMBERLAIN. IMPROVEMENTS IN THE MANUFACTURE OF COMPRESSED BRICKS, AND IN THE MACHINERY OR APPARATUS EMPLOYED THEREIN. Dated February 18, 1868.

This invention consists, essentially, in pressing the brick two or more times, and each time in a fresh mould, so that the second pressure which is exerted upon a brick delivered from the first mould in the more or less defective state usual in dry brick moulding, perfects the article by completing the expulsion of the confined air, and equalising the density of the brick, which, according to this invention, is turned over or reversed whilst passing from one mould to another, and, consequently, becomes equally pressed on the top and bottom surfaces.—Patent completed.

550 W. H. STEEL. IMPROVEMENTS IN HAND SAWS FOR CUTTING DOVETAILS AND OTHER PURPOSES. Dated February 19, 1868.

The patentee claims the improved construction of handsaws for cutting dovetails, and for other purposes, in which part of the blade plates are turned up or project sideways at suitable angles to the main portion of the blades, on which angular or projecting part ordinary saw teeth are formed, for the purposes substantially as described.—Patent completed.

553 W. R. LAKE. AN IMPROVED PROCESS OF SEASONING AND PRESERVING WOOD. (A communication.) Dated February 19, 1868.

This invention consists, chiefly, in treating the wood with a boiling solution of borax in water, which easily and effectually dissolves and removes all those perishable substances without injuriously affecting the wood fibre, which, on the contrary, becomes hard, impregnable to water, vermin proof, perfectly indifferent to the moisture or dryness of the atmosphere, and almost indestructible.—Patent completed.

588 A. DE METZ. IMPROVEMENTS IN POTS OR VESSELS TO BE USED AS WATER CLOSETS. Dated February 22, 1868.

These improvements have reference to portable or fixed vessels constructed of a material or materials which would at the seat present an uncomfortably cold surface to the sitter or person using them (as, for instance, metal or earthenware), and comprise the construction of such vessels at the seat with an inner top of some comparatively low heat conducting quality (such as, for instance, papier mache, felt, or gutta percha) fixed to or forming part of the body of the vessel itself.—Patent abandoned.

Trade News.

TENDERS.

BATTERSEA.—For building presbytery at Battersea, for the Right Rev. Dr. Grant. C. A. Buckler, architect:—
B. E. Nightingale (accepted) £800

BROADSTAIRS.—For repairs, &c., to Nos 2 and 3, High-street, for Mr. Chapman. Mr. John R. Collett, architect:—
Hiller £275
Blackburn (accepted) 230

BUCKINGHAMSHIRE.—For rebuilding chancel and adding vestry to Ellesborough church, Buckinghamshire. Fredk. Preedy, architect:—
Cooper £1186 10
Haddon 1100 0
Fitkin 1040 0
Holland (accepted) 1000 0

CATERHAM (Surrey).—For alterations and additions to the Manor House, for Mr. G. Parbury. Mr. Richard Martin, architect. Quantities not supplied:—

Blyth	£2375	...	£ 95	...	£2280
Ward	2368	...	159	...	2218
Regis (accepted)	2220	...	130	...	2090

GLOUCESTERSHIRE.—For the restoration of Mickleton church, Gloucestershire. Fredk. Preedy, architect:—
Espley £1972
Tomes (accepted) 1620

HUNTINGDON.—For rebuilding north aisle and restoring part of Yelling church, Huntingdon. Fredk. Preedy, architect:—
Thackray (accepted) £519

ISLE OF ELY.—For the restoration of Sutton church, Isle of Ely, Cambridge. Fredk. Preedy, architect:—
Freeman Brothers ..... £.531 10 0
Bell and Sons 2344 0 0
Bennett 2.00 0 0
Bardell and Son (accepted) 2153 6 6

KINGSTON-ON-THAMES. — For Sewerage Extension at Kingston-on-Thames. C. Slagg, Borough Engineer:—
Wigmore £2349
Morton 2325
Walker 2316
Wells 2145
Harris 2090
Robinson 2090
Voss 2032
Neave and Fry 1975
Blackmore 1900
Bugbird 1888
Hayward 1875
Burgess 1610
Bellamy 1600
Cole 1598
Young 1559
Bloomfield 1512
Potter 1460
Killiogbeck 1441
Floyd 1400
Nicholson 13 8
Ossenton and Carter 1365
Hubbard 1361
Jackson (accepted) 1350
Rumble 1315
Frayne 1240
Irons and Porter 1210

LONDON.—For rebuilding a warehouse, No. 15, Watling street, City, E.C. Mr. Herbert Ford, architect. Quantities supplied:—
Lawrence and Sons £2557
Myers and Sons 2409
Burton and Moreland 2102
Conder 2313
Pritchard 2306
Ashby and Sons 2295
Browne and Robinson 2263
Henshaw 2256
Brass 2119
Webb and Sons 2103
Piper and Wheeler 2047
Crabb and Vaughan (accepted) 1994

MAIDENHEAD.—For putting new roof and attics to Stubbings House, Maidenhead, for H. D. Skrine, Esq. Fredk. Preedy, architect:—
Silver (accepted) £1080

NEWBURY.—For building nine mechanics' cottages, for Mr. W. H. Care. Including old materials. Mr. J. H. Money, architect:—
Church £1390 10
Sargent 1120 0
Elliott 895 0

WORCESTERSHIRE.—For building chapel of ease, Hollybush, Castle Morton, Worcestershire. Portion of materials given. Fredk. Preedy, architect:—
Hughes ..... £:28 0
Walt and Hook 640 0
Garbutt 632 10
Inwood 597 0
Griffiths 595 0
Smart 583 10

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

LEICESTER WATERWORKS.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green-street, Leicester.

ST. MARY CHURCH, TORQUAY (Devon).—November 19.—For the erection of new gasworks in the Barton-road. Grant Wolleo, clerk to the local board.

PENZANCE.—November 28.—For the improvement of the harbour of Mousehole, in the parish of Paul, near Penzance, in Cornwall. Rodd and Cornish, solicitors to the Commissioners, Penzance.

ROCHDALE.—November 24.—For lighting the new townhall with gas. T. Mellor, town clerk.

ROCHDALE.—November 24.—For warming and ventilating the new townhall. T. Mellor, town clerk.

TOWER SUBWAY COMPANY.—November 30.—For the construction of lifts. Mr. P. Barlow, engineer, 26, Great George-street, S.W.

TRINITY HOUSE, LONDON, E.C.—For the supply of dressed and scappled granite for new lighthouse at Longships rock. R. Allen, secretary.

BRADFORD.—November 23.—For the erection of thirty shops in Godwin street. Lockwood and Mawson, architects, Exchange, Bradford; 10 Lincoln's Inn Fields, London.

METROPOLITAN BOARD OF WORKS.—November 20.—For the construction and maintaining in repair of certain brick sewers in Hammersmith. J. Pollard, clerk, Spring-gardens, S.W.

MARYPORT.—November 30.—For laying street gas mains, and for excavating, restoring, and sustaining the streets. J. Barwise, Harbour Office, Maryport.

For an iron bridge of two spans. J. C. Laryon, 58, Gresham House, Old Broad street.

November 30.—For the erection of a block of model buildings, near Tottenham Court-road. Mr. S. Legg, architect, 32, Bedford row, W.C.

HAMPTON COURT AND WALTON BRIDGES.—December 16. Tender for tolls. Mitre, Hampton Court.

PROPERTY SALES.

OCTOBER 27.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Freehold and leasehold properties, situate in Shoreditch, Whitechapel, Dalston, Lower Clapton, Tottenham, and Stoke Newington, in 19 lots:—

Lot 1, sold for £5,700; lot 2, £600; lot 3, £330; lot 4, £330; lot 5, £410; lot 6, £490; lot 7, £470; lot 8, £480; lot 9, £350; lot 10, £350; lot 11, £460; lot 12, £440; lot 13, £320; lot 14, £330; lot 15, £310; lot 17, £330; lot 18, £630; lot 19, £910.

Freehold 9a. 0r. 24p. of building land, situate at Addlestone, Surrey—£1,050.

Freehold 10a. of building land, situate in Liberty lane, Addlestone—£650.

Freehold 2a. 2r. 10p. of building land, situate at Roydon, Essex—£110.

OCTOBER 28.

At the Mart.—By Messrs. E. Smith and Co.—Leasehold residence, No. 17, Ampthill square, term 74 years unexpired at £10 10s. per annum—£840.

OCTOBER 29.

At the Mart.—By Messrs. Smith, Son, and Oakley.—Freehold wharf and waterside premises, known as Limehouse Dockyard, situate at the end of Limehouse reach, fronting the Thames, and embracing an area of 111,228 square feet, with two houses, cottage, warehouses, and sheds—£25,000.

By Messrs. Dowsett and Chattell.—Freehold residence, known as Melbourne Villa, Queen's road, Norbiton hill—£810.

OCTOBER 30.

At the Mart.—By Mr. Dale.—Freehold house, No. 1, Salter street, Limehouse, let at £27 per annum—£265.

Leasehold four houses, Nos. 8 to 11, Chapel terrace, Tredegar road, Mile end, producing £103 per annum, term 73 years unexpired, at £3 5s. each per annum—£1,035.

Leasehold eight houses and shed, in Bloom street, Mile end, producing £103 17s. per annum, term four years unexpired at £16 per annum—£90.

Leasehold four houses, Nos. 15, 16, 18, and 19, St. Dunston's road, Mile end, producing £67 12s. per annum, term 82 years unexpired, at £18 per annum—£370.

NOVEMBER 3.

At the Mart.—By Mr. Charles Lindo.—Leasehold four houses, one with shop, situate in Markfield road, Tottenham, term 99 years from 1865 at £8 per annum—£190.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold warehouse, No. 30, St. Paul's churchyard, let on lease at £600 per annum, term 80 years from 1854, at £350 per annum—£3,200.

NOVEMBER 6.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Leasehold stabling, No. 8, Somers mews, Hyde Park, term 63½ years unexpired, at £5 per annum—£620.

At Garraway's.—By Mr. R. Reid.—Leasehold residence, known as Wellesley House, Church road, Upper Norwood, annual value £175, term 99 years from 1864, at £32 per annum—£1,650.

Leasehold residence, No. 43, Adelaide road, Haverstock hill, let at £75 per annum, term 77 years unexpired, at £2 per annum—£940.

Leasehold residence, No. 24, Albert street, Regent's Park, let at £52 10s. per annum, term 73 years unexpired, at £5 10s. per annum—£680.

Leasehold house, No. 21, Campbell street, Hall Park, Edgware road, annual value £38, term 70 years unexpired, at £7 per annum—£335.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Joseph Ingall, Charles street, City road, house decorator, November 26, at 12—Alfred Muncey, East Acton, architect, November 25, at 12—John Barnes, Gordon road, Peckham Rye, carpenter, November 24, at 1—William Crimp, Dale road, Kentish Town, carpenter, November 16, at 11—Mary Howard, Woolwich, contractor, November 18, at 12—Amos Scholfield, Jamaica Level, Rotherhithe, builder, November 24, at 1.

TO SURRENDER IN THE COUNTRY.

Owen Davies, Dolgelly, builder, November 23, at 11—William Jones, Maescaled, builder, November 23, at 11—William Joy, Tonbridge, plumber, November 23, at 10—Henry Thomas, Maesteg, carpenter, November 23, at 11—John Woolfrey, jun., Taunton, builder, November 21, at 12—Arthur Barrett, Donhead, St. Andrew, Wilts, stonemason, November 19—William Baxendale, Collyhurst, joiner and builder, November 26, at 11—George Winstone Broad, Horfield, Gloucester, builder, November 20, at 12—Edward Charles Meddle Walker and David Allen Jones, Liverpool, timber merchants, November 18, at 11—Abraham Willett, Tranmere, plumber and glazier, November 14, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 15, J. and W. Weeks, Dartmouth, builder—December 2, W. Whitehead, Sheffield, brick manufacturer—December 12, G. T. Spalding, Eaglesthorpe, brickmaker—December 12, A. Richardson, Peterborough, engineer—November 27, F. S. Donnelly, Russell road, Peckham, builder—November 25, E. Pike, Church street, Shoreditch, carpenter—November 27, C. F. Phelps, Russell road, Kensington, builder—November 17, J. Eaby, East Ham, building contractor—December 14, H. Ventham, Chapel street, Bedford row, builder—November 24, T. Gregory, Alfreton, Derbyshire, builder—November 23, T. and W. English, Peterborough, painters—November 28, A. Thick, Woolston, Hants, builder.

PARTNERSHIPS DISSOLVED.

Clegg and Taylor, Rochdale, joiners—Atkinson and Holmes, Noel street, Soho, gasfitters—Baker and Waldron, Battersea square, carpenters—Coates and Fletcher, Thrapston, builders.

DIVIDENDS.

November 20, B. Bottomley and G. Spencely, Halifax, stonemasons—November 20, F. Calvert, Halifax, plumber—November 16, D. G. F. Macdonald, Brighton, surveyor—November 25, W. Brown, Maryport, joiner.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

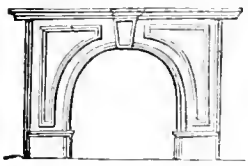
TIMBER, duty 1s per load, drawback, 1s.

	£	s	£	s		£	s	£	s
Teak ....load	£10	10	12	10	Archangel, yellow ..	£11	0	£12	0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	0	12	0
,, yellow pine..	3	5	4	8	Finland	6	5	8	0
St. John N.B. yellow	0	0	0	0	Memel..............	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	0	9	10
,, birch........	3	15	4	15	,, white	8	0	9	0
,, elm	4	0	4	17	Gefle, yellow........	9	0	10	10
Dantzic oak	4	5	5	10	Soderham	9	0	10	10
,, fir	2	15	4	0	Christiania, per C., 12 ft. by 3 by 9 in.				
Memel fir	2	15	3	0					
Riga................	2	15	3	0	yellow	10	10	13	0
Swedish	2	2	2	8	Deck Plank, Dantzic,				
Masts, Quebec red pine	4	0	6	10	per 40 ft. 3 in.	0	14	1	9
,, yellow pine..	4	10	6	0	PUMICE STONE pr ton	6	0	8	0
Lathwood, Dantzic, fm	5	10	6	10	OILS, &c.				
,, St. Petersburg	7	10	8	10	Seal, pale....per tun	36	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	10	0	0	0
					Cod	37	0	0	0
					Whale, Sth. Sea, pale	38	0	0	0
Quebec, white spruce	13	0	15	0	Olive, Gallipoli......	48	0	73	0
St. John, white spruce	13	0	15	0	Cocoanut, Cochin, ton	52	0	55	0
Yellow pine, per reduced C.					Palm, fine	44	5	45	0
					Linseed	30	5	34	0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	33	0	0	0
2nd do......	11	10	12	10	Cottonseed..........	29	10	0	37

METALS.

		£	s	d	£	s	d	
LEAD—								
Pig, English	per ton	21	5	0	0	0	0	
,, Spanish Soft	do	18	10	0		0	0	
Shot, Patent	do	22	10	0	22	15	0	
Sheet	do	20	0	0	20	15	0	5
White	d	27	0	0	30	0	0	
COPPER:—								
Sheet & Sheathing, & Bolt	per ton	78	0	0	80	0	0	
Hammered Bottoms	do	81	0	0	0	0	0	
Flat Bottoms, not Hammered ..	do	81	0	0	0	0	0	
Cake and Tough Ingot	do	70	0	0		0	0	3
Best Selected	do	75	0	0	76	0	0	
Australian	do	77	0	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7	
IRON:—								
Welsh Bars in London	per ton	6	10	0	6	15	0	3
Nail Rod	do	7	7	6	7	10	0	
Hoops	do	8	5	0	9	0	0	2½
Hoops, Single	do	8	0	0	9	0	0	
Staffordshire Bars........	do	7	7	6	7	15	0	
Bar in Wales	do	5	15	0	6	0	0	3
Nailrods	do	7	7	6	7	10	0	2½
Foundry Pigs, at Glasg. No 1 ..	do	2	13	3	2	17	6	nett.
Sweedish Bars	do	10	10	0	10	10	0	2½
TIN:								
English Block	per ton	95	0	0	0	0	0	
do Bar	do	96	0	0	99	0	0	2½
do Refine	do	97	0	0	0	0	0	
Banca	do	0	0		97	0	0	nett
Straits	do	92	10	0	92	0	0	
ZINC:—								
English Sheet	per ton	25	10	0	25	10	0	2½
*Devaux's V. M. Roofing Zinc	do	27	0	0		0	0	
STEEL:—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
SPELTER:—								
On the Spot	per ton	20	0	0	0	0	0	
QUICKSILVER	per btl	6	17	0	0	0	0	
REGULUS OF ANTIMONY								
French	ton	43	0	0	0	0	0	

* And 4 per cent. discount if laid upon the new system



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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 20, 1868.

ASSOCIATED ARTS INSTITUTE.

WE recently gave an account of the opening meeting of the present session of this comparatively new institution and a report of the address of its president, Professor Westmacott. We propose now to make a few remarks respecting each of these, in the same manner as that in which we lately reviewed the proceedings of the longer established bodies of our own profession—the Royal Institute of Architects and the Architectural Association.

In the first place, we fully recognise the wants to fulfil which this society has been established. That social intercourse and means of interchaugiog ideas supplied to architects by the flourishing institutions we have named, and many others which exist in the provinces, in Scotland, and in Ireland, seem hitherto to have been but very sparingly afforded to painters and sculptors. The Royal Academy and other societies of artists have quite different objects in view, viz., the exhibition and sale of executed works, and they are besides comparatively limited, and, in fact, closed to all but their own members. It cannot be questioned that architects and engineers have benefited greatly by the advantages of the kind referred to that they enjoy, while considerable public services may be traced to them; the success which is so marked a feature of all the societies established by these professions is perhaps the best proof that can be adduced as to their having been needed.

The want of similar opportunities has, we think, tended greatly to that condition of art in England which is thus summarized by Professor Westmacott: "We see much of originality of art arising from each artist pursuing the bent of his own inclinations, but all must admit that there is a great deal of want of association in all that they do." The truth of this observation must be patent to everyone who compared the gallery of modern British art at the Leeds Exhibition with either the ancient or foreign ones, and it was equally observable and very generally noticed in the International Exhibitions of London and Paris. On the continent a species of centralisation under the patronage and supervision of Government exists as a corrective for this particular evil. Artists are there educated in an academical groove which compels them to adopt a kind of unity in their practice. Such unity, it is true, is neither to be altogether admired or desired; that which we seek is voluntary and intelligent, the result of conviction and not of compulsion. Yet how shall a man hear if there be none to preach? The purpose of this class of associations is to provide the pulpit and to bring together the preacher and the hearers; but the Professor, rather unnecessarily, in our opinion, thought it incumbent upon him to apologise for this function of the Associated Arts Institute; for, in alluding to the existence of prejudices against such societies on the ground that they often ended where they had begun—in talk, he deprecated the idea of this being a debating society, and said "its members never meet until their work of the day is finished, when they meet to exchange opinions." For our part we confess the distinction seems to be one without a difference. We presume that the same might be said of every society of the kind; their meetings usually are held in the evenings, so as not to interrupt the business of the day, and we imagine that the method of exchanging opinions must be the same in every case, except it might be among the Quakers. We would advise the Professor at once boldly to admit the fact that it is for talk and the benefits accruing from it alone that the society has been formed, and that unless the members intend to exercise this vocation or that of listeners, they had better stay at home.

We can well remember, as an especial privilege, the having been admitted in years past as one of a brotherhood of artists who met in their own rooms without such formality, nor should we be consistent with facts if we gave an impression that anything else than talk was the main attraction of those assemblages; and we can at least speak for ourselves and attribute no small share of the knowledge we possess, of the principles we have adopted, and of the zeal which has enabled us to buffet with the world for those principles to the result of those discussions; and it is generally acknowledged that the entirely changed and improved character of the works annually exhibited may be traced to the effect wrought by those reformers, many of whom are now eminent, and we think that they were in no slight degree influenced by the agency which we have pointed out. We can recall to mind also many pleasant summer excursions to a locality frequented by young painters, and believe that we can attribute almost as much good to the criticisms and discussions which whiled away the evenings as to the more solitary work done during the days, for men may, and often do, go muddling on by themselves upon a wrong tack and be only wasting time, while they may get their eyes opened in a moment to the perception of the right one when in contact with others.

Now, such an association as the one we are noticing supplies in a regular and organised manner those opportunities which can only be enjoyed otherwise in a limited and desultory one, and, in a Darwinian sense, it will act far the more powerfully, bringing more and differently constituted minds to bear on the same subject; for it is but natural that in the meetings of friends it will be mainly "birds of a feather that will flock together," and then they foster each other's prejudices rather than confute and disperse them. In the more general meetings of societies, on the contrary, all are not likely to be of one mind, and every subject is sure to be viewed, as it should be, from various and even opposite points.

Had the young pre-Raffaelites, whom no one can deny to have left their mark on the age, been obliged to wrangle in such an arena, to maintain their new doctrines among a larger and less sympathetic circle, they would have had fewer pricks to kick against in actual life; for most of what has been proved to have been chaff by the painful experience of failure would have been winnowed away, and what all now allow to have been wheat would, perhaps, have been more readily acknowledged and prized. As it was, having none to contradict them, they persuaded themselves they were wholly right, and though the truths for which they fought have largely prevailed, they have been obliged to give up as error much of that which they put forward then with equal pertinacity, and which greatly retarded their own progress and impeded the good which they might have been able to effect.

It is, however, not only with reference to their own brethren in art that painters and sculptors need to learn and practice that "renunciation of self" inculcated by Professor Westmacott; they require to have far more intimate relations and sympathies with the public than they have at present, and also with the professors of other branches of art, and particularly with architects. All suffer alike by the isolation with which they have been so long content, and there are few better means of counteracting this evil than such associations afford. At present it seems all haphazard as to whether the pictures painted by artists are such as the public need, so that, when finished, they may or may not be sold. We think we should be tolerably safe in saying that the majority are practical mistakes, and that even if purchasers be found, the pictures prove unsuitable to the positions or the light which alone can be provided for them, so that a grievous waste of power is the result. How much of this might be obviated if there were more of communion between artists and their patrons!

Another evil is that painters are occupying themselves in the multiplication of *tableaux de genre* upon petty canvases till they become a drug in the market, while the decoration of our walls and our windows, which we do want painted, are left in the hands of mere tradesmen, and too generally are disfigured with mere caricatures of art. The wholesome fusion of the amateur and artistic elements contemplated by the Associated Arts Institute may therefore be productive of mutual advantages, and the interchange of ideas, by which the former class no doubt will allow that they at least will benefit, may, we think, act not less beneficially on the latter.

Considering the short period which has elapsed since the foundation of the society, it has met, we think, with an encouraging degree of success, and certainly seems to stand alone among societies of the kind in point of economy; and although it is contemplated to double the amount of subscriptions (now only five shillings per annum), the advantage of so doing will be obvious if it will enable the discourses and discussions to be published. There can be little doubt that there will be no lack of subjects suited to the special consideration of its members. The history of ancient art, the lives of painters and sculptors, the characteristics of various schools, the best means of preserving or restoring those works which have been handed down to us from past times, the experiences of living artists as to the various methods of painting, particularly with reference to architectural decoration and its permanence, the value of the various pigments manufactured for them, and numerous other questions may be debated at the meetings of the Institute with great practical advantage.

GEOMETRICALLY DETERMINING THE STRESSES IN GIRDERS AND ROOFS.

SOME time ago, in 1865-6, Professor Culmann, filling the chair of Civil Engineering at the Zurich Polytechnic school, published, under the name of "Graphical Statics," a geometrical mode of determining the stresses in structures which deserves the greatest attention from practical engineers and architects. It is a process in which geometrical construction is substituted for complicated calculations; or, in other words, by which a great saving in time can be effected, together with a self-evident avoidance of liability to error. It will be seen that this process enables the architect or engineer to instantly note the effects of any alteration he may chance to make in his designs. As is seen one example we have chosen is that of the well-known case of a common Warren girder.

We are often asked to indicate the means of determining the strengths of frames, and the simple and yet correct plan we explain may serve as a general answer to a great number of such inquiries. In order to do this we have been obliged to begin by stating the principles on which these constructions are based; and we will proceed as soon as possible to their practical applications. These extremely useful and simple methods are not so generally known in England as they deserve to be, though on the continent, and especially in Switzerland, they are beginning to be very extensively applied. A very particular advantage of this method is its applicability to cases which cannot be easily, if at all, reached by calculation. We have thus been enabled to apply it to the determination of earth pressures in general, as in embankments and tunnels, &c., to scaffoldings, &c.

The basis of the method is simply that of the

almost popularly known principle of the parallelogram of forces. It is well known that a force can be geometrically represented by a *straig t* line running parallel to the given force, and denoting the amount of the force by its length. Of course a line *per se* cannot exactly denote a force, but if the course of the force or its direction from (say) right to left be also held to be indicated by the line, then all the required qualifications are given. Let us suppose, for instance, that we have a number of forces acting in a plane upon the same point. We then have, as indicated in the following diagram, to find the resultant of any number of given forces 1, 2, 3, 4, 5, acting upon one point, as indicated in fig. 1 :—Draw a polygon O *a b c d e* with its sides 1, 2, 3, 4, 5, parallel to the directions and equal to the magnitudes of the forces. These must be so arranged that if we indicate the courses of these forces in all the sides by arrows, all these arrows must point in the same course round the irregular polygon. The line R, closing this polygon by joining the origin O with the end *e*, represents the required resultant in direction and magnitude.

FIG. 1.

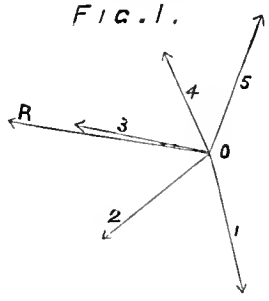
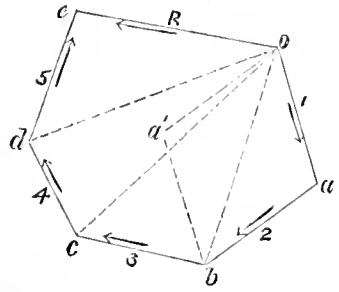


FIG. 2.



This resultant is to be taken in a course opposite to the curve of the given forces. Any one of the diagonals in the polygon represents the resultant of all the forces placed between the two points formed by that diagonal. This polygon may be termed the "polygon of forces," and it can be proved by successively combining the forces according to the principle of the parallelogram of forces.

If the polygon of any given number of forces, acting upon the same point, is closed, these forces will balance each other ; and *vice versa*. This is substantially the same proposition as that stated by Dr. Rankine, par. No. 53 of his "Applied Mechanics."

To determine two forces of given direction so that they may balance any number of known forces, all acting upon the same point, construct the polygon of the given forces and close it by two lines parallel to the directions of the given forces. These lines taken in the same direction round the polygon as the others represent the required forces. The second principle is a consequence of the first, and the third is easily proved by the second. With the assistance of these principles it is easy to ascertain the stresses on a Warren girder. To explain the process it will be sufficient to determine the stresses in a small girder constructed with only four divisions in the top beam, as shown in fig. 3. There will be no difficulty in afterwards extending this to larger girders.

We will designate its parts by numbering the connecting points, and by calling each bar lying between them by the numbers at its two

FIG. 3.

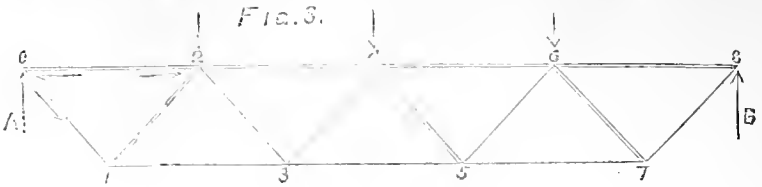
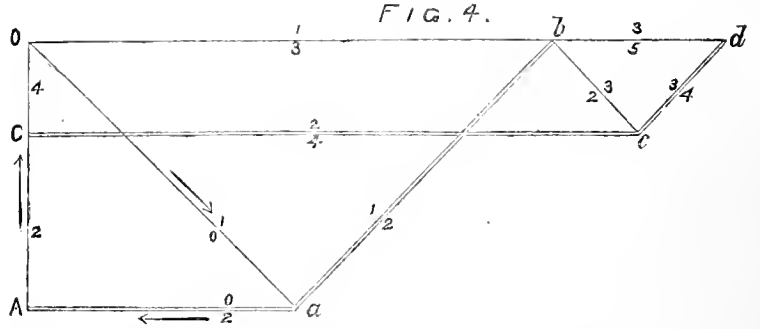


FIG. 4.



ends. We assume that the girder is loaded with ten tons at each connecting point of the top ; that is to say, at the points 2, 4, 6 ; while the resistances A and B of the supports act upon the extreme ends 0 and 8. As the load has been assumed to be uniformly distributed, each of these two resistances is equal to half the entire load of 30, or equal to 15 tons.

It is a necessary property of any structure that all the forces acting upon the same connecting point should be in equilibrium ; and we employ this property to ascertain the stresses in the different bars. If all the forces acting upon such a point are known with the exception of two, these two can be ascertained by means of the last principle stated. We begin at the point O, where the resistance A, equal to 15 tons, acts upwards, and we will proceed to determine the stresses in the bars 0 1 and 0 2, the directions of which are given. We draw the vertical line OA, fig. 4, parallel to the force A in fig. 3 ; and make it, by any scale, equal to 15 tons. The line A *a* is then drawn from A parallel to the horizontal bar *o*2 ; and line O *a* parallel to the sloping bar *o*1. These intersect one another at *a*. Therefore, the lines A *a* and O *a* respectively give the required amounts in tons of the stresses on the bars O 2 and O 1. They are of 15 tons and 21.2 tons. The curves of these forces only remain to be determined in order to know whether the bars have to sustain tension or compression. For this purpose, as we know the course of the force O A, which is indicated by an arrow, we have only to follow round the polygon of forces, which is in this case represented by the triangle A O *a* A, and to draw arrows in the directions in which we follow the sides O *a* and A *a*. By drawing other arrows in fig. 3 parallel to the corresponding arrows in fig. 4 we see that the stress in the bar 0 2 in fig. 3 acts against the point 0 ; and that the bar 0 2 has consequently to undergo compression. Further, the force in 0 1 strives to pull the point 0 towards 1, testifying to a tensile stress. For the sake of clearness we shall henceforth indicate tension by a single and compression by a double line, both in the elevation of the Warren girder and in the polygon of forces. By this means the course of the forces can be seen both in the elevation and by comparing both figures also in the polygon of forces. We must observe that in the elevation the stress acts on an extremity of the bar in a sense opposite to that in the other.

We now come to the point 1. We have here, besides the last determined force in 0 1, the unknown stresses in 1 2 and 1 3. The stress in O 1 is given in fig. 4 by the line 0 *a*, and its sense is now contrary to that indicated by the arrow. Proceeding as before, we draw O *b* parallel to 1 3 and *a b* parallel to 1 2, and cause them to intersect at *b*. The lines O *b* and *a b* give the stresses in 1 3 and 1 2 of 30 tons and 21·2 tons respectively. We determine the courses or senses of these stresses from the known sense of 0 1, following round the triangle *a* O *b a* in the direction given by the order of these four letters, and we find that the bar 1 3 is in tension and the bar 1 2 in compression.

In the points O and 1 only one known and two unknown forces were in action ; but in the point 2 three known forces (the stresses in O 2 and 1 2 and the load of 10 tons) and the unknown stresses in the bars 2 3 and 2 4. To ascertain these, set off from A to C in the line A O the length representing 10 tons and C *c* and *b c* parallel to 2 4 and 2 3. These two lines then give the magnitudes of the required forces, because the sides of the polygon C A *a b c* C are parallel and equal to the forces acting on the point 2. They are also taken in the right sense, which is the reverse to the order of the letters C A *a b c* C. We find that 2 3 has to sustain a tension of 7·1 tons and 2 4 a compression of 35 tons.

The same proceeding is to be used at the point 3 4. The two known forces (1 3 and 2 3) are already placed together in the right curve in the diagram fig. 4 ; they are represented by the lines *c b* O. The lines *c d* and O *d*, drawn parallel to the directions of the unknown stresses through C and O, meet each other in *d* and give the stresses in the bars 3 4 and 3 5, amounting to 7·1 tons and 40 tons respectively. The first is a compression, the second a tension bar. This gives us the strains up to the middle of the girder, and as the girder and the load are symmetrical we do not require to continue the diagram.

This fig. 4 may be called the diagram of forces. The polygons for each connecting point in the first half of the girder are laid down in it, and, observing how they are combined, we find that the polygons for the preceding points give the forces always arranged as required for the construction of the polygon of forces for the following point. The whole diagram hence contains each force only once, while every line would have to be drawn twice if we construct a separate polygon of forces for each connecting point. What makes this diagram of forces so very useful is that there is a minimum number of lines to be drawn, and that the construction can be rapidly carried out without any liability to error.

In conclusion, we may add that, should we meet with the requisite encouragement from our readers, we intend to give several other practical applications of the method, as it appears to us of much practical importance.

PORTLAND CEMENT.*

PORTLAND cement, after passing through a severe ordeal, involving testing, analysis, and the alternate condemnation and

* A Practical Treatise on the Manufacture of Portland Cement. By HENRY REID, C.E. To which is added a translation of M. A. Lipowitz's work, describing a new method adopted in Germany of manufacturing that cement. By W. F. REID. London: E. and F. N. Spon, 48, Charing Cross. 1868.

approval of many of those who considered themselves judges of such matters, may now be fairly ranked as among the most important of our constructive materials. It would, in all probability, have arrived at its present rank some years previously but for the reluctance of manufacturers to submit it to fair trial and experiment. The majority of them regarded their credit as affected by any imputation cast upon the quality of their goods, and it was not until necessity compelled them to submit the material to actual proof that they discovered their error. Manufacturers now, at least in a large number of instances, test their cement at the works, and are, therefore, in a position to furnish it of the strength that may be required. In the volume before us we have a complete history of the manufacture of Portland cement, and of the various examples of construction to which it has been applied. Some of our readers who are not professional men might desire to know briefly what this cement really consists of. It is made from the deposits of chalks on the shores of the Thames and Medway, mixed with alluvial clays from their estuaries and creeks. The composition of the former ingredient is well known, being simply a carbonate of lime; that of the latter includes silica, alumina, carbonate of lime, oxide of iron, and soda and potash. Let us now follow the various processes that these two ingredients are subjected to before they constitute actual Portland cement. The first operation consists in "washing" them, which is accomplished by a wash mill, and signifies the proportionate and due admixture of the above named components. The liquid is kept in a state of continual motion by the action of the mill, while, at the same time, the knives cut, and the attrition of the substances is thus ensured. From the mill the semi-fluid material is transferred to the sample kiln, where it remains from four to five hours. The object of thus "sampling" it is to ascertain whether the correct proportions of the ingredients have been arrived at. An experienced workman can tell by the colour, general appearance, and other signs intelligible to the practised eye whether the sample is properly constituted or otherwise. A register should be kept of all the samples, both those that have been tried in water and by air, and none should be destroyed before the expiration of a month at least. The German method of preparing the raw material differs from that employed in England, in it not being mixed up by the aid of water, but by machinery. The former may be termed the dry, and the latter the wet method. It would be out of place here to enter into the relative merits of the two plans, but it may be observed that Mr. Reid, on the whole, is in favour of the English system.

After the washed materials have remained a sufficient length of time in the "backs" or reservoirs to become partially consolidated, they are wheeled in barrows to the drying plates, where they are dried by the waste heat from the ovens for coking the coals used in burning the cement. The author draws attention to the expensive nature of this part of the manufacturing process, owing to the wear and tear occasioned by the constant great heat maintained and the alternate removal and replacement of hot and cold materials upon the drying plates. The best and most refractory bricks and tiles are rapidly destroyed by this intermittent action. From the drying plates to the kilns is the next step. The latter, after undergoing almost innumerable alterations and modifications, according to the fancies of inventors and patentees, have returned nearly to the same form they were originally constructed in. They hold from ten to seventy tons, their absolute capacity of course depending upon the extent of the manufacture and the rank of the firm. To drive off the carbonic acid, and to effect a partial vitrefaction of the material, are the objects of burning the cement or "clinker," as it is called, previously to the operation of grinding. The loading the kilns is performed by first laying down a small quantity of brushwood, and on the top of that a proportionate quantity of coke, and then filling up the kiln with successive layers of coke and raw material. No rule can be given for determining the time that may be required for burning the contents of a kiln, and it is also a difficult matter to arrive at a fair estimate of the cost. Mr. Reid mentions that under ordinarily favourable circumstances the fuel might be put down at about six shillings per ton. He also, very justly, comments upon the clumsy and inconvenient character of the kilns as constructed at present, and we join with him in hoping that a more satisfactory plan of accomplishing a very simple operation may be soon introduced. The burning completed, the kilns are drawn or unloaded, and the contents transferred to the grinding mill, to undergo the last step of being ground into the powder constituting Portland cement. Where crushing rollers are used for the above purpose they are capable of performing all the work themselves, but where edge runners are employed the lumps of clinker, which come from the kilns in all shapes and sizes, must be first reduced to smaller dimensions. This is best accomplished by a stone-breaking machine, which should have a power of about three horses. This method is preferable to the adoption of crushing rollers, where the material is very imperfectly prepared by manual labour for the machine, which is liable to be overstrained by the excess of work imposed upon it. There is a handy little American machine termed a "cracker" for reducing the clinker to a suitable size for the crushing machine. In whatever manner it may be accomplished there is room for improvement in this particular branch of the art.

Our author contradicts the usual notion entertained respecting the liability to deterioration of Portland cement by exposure to the air, and alleges that he has used that material after lying for two years in a well covered weatherproof building, and found it equal in every respect to that fresh from the manufacturers. From this there appears to be no especial advantage gained by storing up cement in casks, but quite the reverse, as wasting of the contents frequently takes place if the casks have been filled direct from the grinding mill, owing to the shrinking of the material in cooling. The operation of testing the cement may be considered as embracing three heads—firstly, the tensile resistance; secondly, the compressive strength or resistance to crushing; and, thirdly, the transverse strength or resistance to cross strain. As to the test of durability the fact is that the material has not been employed for a sufficient length of time to enable us to arrive at a conclusion upon the point. But from experiments instituted by Mr. Grant, it has been found that a period of twelve months is sufficient to more than double the strength of cement.

Among the various applications of the cement proper is that of employing it as a coating to the interior of iron vessels to prevent oxidisation and preserve the iron from corrosion. The use of the material in the shape of concrete, and its adoption by architects and engineers in retaining walls, harbour works, piers, foundations, and lately in house building, are too well known to require comment. Mr. Reid advocates its application to the formation of the surface of roads and streets, and instances two examples, one in Inverness and the other in Edinburgh, where the method was attended with success. He admits that in the case of St. James's Park the attempt was an unmitigated failure, but accounts satisfactorily for the want of success. At the same time we consider that further information is wanted to enable us to arrive at a decision upon this point. The second portion of the volume consists of a translation of a German work upon the same subject by M. A. Lipowitz, which contains a description of an endless kiln, and plan and sections of the machinery required. The plates are well lithographed, and the whole book sustains the reputation of the well-known publishers.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday evening last, at an ordinary general meeting of the Institute (Mr. Clarke, vice-president, in the chair), Messrs. Edmund B. Ferrey and John Noyes were duly elected associates. A letter was read from the American Society of Architects, thanking the Institute for the gift of its "Transactions" to the library of the former, and asking acceptance of a series of photographs illustrative of the present condition of American architecture. Several donations in books and money to the library were announced, and a letter was read from Sir Sydney Smirke, stating that the Royal Academy would remove to its new rooms and hold its exhibition there next March, so that architects would be no longer cramped for room. There would be fourteen galleries, not one being less than 41ft. by 31ft. Sir Sydney Smirke expressed a hope that architecture would be well represented on that occasion as one of the "Three Sisters."

DISCUSSION ON TERRA COTTA.

The CHAIRMAN said that towards the close of the last session an interesting paper was read by Mr. Charles Barry on the use of terra cotta in building as exemplified in the new works at Dulwich College. So much interest was excited by that paper that it was resolved to adjourn the discussion of the subject to a meeting this session. He would first call upon Mr. Barry to open the debate.

Mr. BARRY said that it was commonly assumed that terra cotta was nothing more than baked clay, or baked clay and sand. Such a material did not deserve the name of terra cotta, and was not a worthy material for building purposes. An examination of the ancient terra cotta would show that the best Greek and Roman vases contained other elements than clay and sand. Great caution should be exercised by the architect in examining the terra cotta supplied, especially in large blocks, for when blocks were of considerable size some makers were tempted to make them of bad material and coat them over with good stuff. It was important that the material should be so compounded as to become homogeneous, and in producing large blocks it was essential that a face should be produced which would dry equally. One fruitful source of bad work in terra cotta was the insufficient time given to air-drying. This was so essential to the durability of the work that it could not be passed over slightly. The character of the manufacturer must be the main guarantee for the architect in good work. It had been stated by some that 3,000 deg. Fah. was the temperature necessary to properly burn terra cotta. One good test of the heat necessary was to fire it at the heat at which soft iron melted readily in the furnace. Faraday stated this to be 1,899, whilst Dr. Percy put it at 2,300. Terra cotta was far less a sorbent than any kind of stone.

Mr. BLASHFIELD said that Mr. Barry had taken such a deep interest in the matter that it would be felt one day that he had contributed very largely to the adoption of a new material of great value in architecture. His (Mr. Blashfield's) acquaintance with pottery grew from his intimacy with the late Herbert Minton, who had a patent for making buttons from porcelain. He pushed upon Minton the importance of making architectural pottery, and two or three and twenty years ago got him to make a block of bricks of an ornamental character and enamelled surface. He had great trouble to make him keep up with geometrical patterns. After some two years of experiment, Herbert Minton found that the machine for making buttons (made as the buttons were of dry powder) was the true machine to use, and the true way of working to make *tessræ*. The application of that machine was found to be very imperfect, and it was a long time before Minton could make an hexagonal tile 3½in. in diameter. Ultimately squares of 6in. were made. In 1850 he (Mr. Blashfield) began to make terra cotta. Any merit that his work might have was due primarily to his acquaintance with Mr. Minton, and to the experience he (Mr. Blashfield) had gained from observation in Staffordshire. His ware was more of a

pottery ware than the ware which was generally received as a building terra cotta. It was more the class of ware of which the encaustic tiles were made. It contained other elements than clay and sand—that is, it contained "pegmatite," which was a vague flux, and by the very careful use of old ware with these a body something like the Minton tile was gained, rather than the ordinary terra cotta of the present day. In doing this a larger expense was incurred for fuel than would be the case in the make of the open porous ware which was made for common terra cotta. The quantity of old ware which was mixed with the new materials was not determined. It would be a matter of the greatest possible utility if the authorities at South Kensington would call to their aid some scientific men to ascertain what the different qualities of clay would bear. In the manufacture of Portland cement there very often ran out of the kiln masses of a substance much resembling glass. In twelve months that mass began to speckle. After becoming speckled it began by degrees to give way, and then it went to powder. If this was set in water it became a cement that weighed 130lb. to the bushel, and took eighteen hours to set, but when it did set it was very hard. Without a flux in earthenware the body could not be held together. Chemists had examined old china and found a very large quantity of potash. In the Etruscan vases a considerable quantity of magnesia and peroxide of iron was found. These were fluxes. In some of the old Greek vases there was almost enough peroxide of iron to have brought them to a metallic state with the magnesia. In the old china manufactured by the Chinese there was combined a vast portion of "pegmatite," or China stone. In the wares he (Mr. Blashfield) had made of late he had tried as far as possible to imitate the mode of making porcelain. He had used the Dorsetshire clays with a given amount of flint, a given amount of old ware, so much glass, and so much China stone. With regard to the true ware he had to depend a great deal upon an operation which he performed after the ware had been air-dried. When it was quite dry he placed it in the hands of masons to cut and dress it and bring it to the desired form. It often happened that the material had really to be carved in its more ornamental portions. When perfectly dry the fine film which prevented some of the fixed air getting out was removed, and the ware was put in the oven, whence it came out all right. If a piece of the ware was put in the oven before all the surface was taken off it generally came out badly. If architects would encourage further examination into the use of certain materials, such as old broken ware, with pottery, or if the Government would do so at South Kensington, it would be of the greatest possible value, because certain facts as to the proper proportion of materials to be used in the manufacture of terra cotta might then be arrived at.

Mr. Redgrave was glad to be able to bring under the notice of the meeting some terra cotta largely used at Kensington, and which was entirely different in its nature to that used at Dulwich College. The question was not so much which was the best clay as which was the best terra cotta. Mr. Blashfield had brought his terra cotta to the highest degree of perfection. The goodness of terra cotta undoubtedly consisted in the firing. The common clay bricks burnt at Woolwich and Kensington were all terra cottas, and there were buildings in London built of these bricks which had lasted two or three hundred years entirely through the proper burning of the bricks. The clay of which the terra cotta which was used at Kensington was made was a clay found in the coal measures, well known as fireclay. The terra cotta which was being used at Albert Hall was almost entirely made of pure clay. Mr. Blashfield, however, thought this likely to decay. He (Mr. Redgrave) was glad that it became a question whether a mixed material or a pure material was most advantageous for the use of the architect. One great advantage of the pure material was that there was an unvarying rate of shrinkage; but, with the other material, unless the manufacturer and his workmen were most careful, they were liable to a false mixture, and consequently to a varying rate of shrinkage. Terra cotta, which was a brick brought to a great state of perfection, should be used in brick buildings. It might be used in stone buildings, but there it was a failure. Whether it was well laid or not, it was perfectly capable of receiving a glaze, and that glaze might be of various colours. With a perfectly imperishable vitreous glaze, which was most suitable to the architecture of London, terra cotta would meet with great favour. It might be brought to any degree of perfection by filing or grinding, and then might have its surface glazed, making it impervious to the action of the weather. Any colour might be attained at a very moderate cost, it needing only a second firing. Terra cotta must be a material in itself. It must not be a rival to brick or stone. It must be treated as a material the architecture of which was a speciality. As terra cotta was used in Italy a most beautiful surface, a variety of tint, and a high degree of colour could be attained—results which could not be arrived at in any other material. The failure of the use of terra cotta so far was due to imperfect knowledge.

Dr. Medlock had some acquaintance with the materials used in the manufacture of terra cotta and Portland cement. The latter was manufactured generally of three parts chalk and one part Thames mud. These were ground together and dried on a floor and burnt in a kiln. The cement made with the grey chalk at Wouldham was generally stronger and more durable than that made from the white chalk. With regard to the composition of terra cotta it was very difficult to express an opinion as to the proper compounds or the proportions of clay to be mixed to produce a certain material with an unvarying degree of hardness. It was done by "rule of thumb." Although the manufacturer might have the clays analysed he knew nothing of their fusion points, or whether they would form a flux. The manufacture of terra cotta was merely a matter of practical experiment. We knew nothing of the silicates, except that they combined in twenty, thirty, or forty different proportions. We knew nothing of the way in which they combined. The whole question of porcelain and pottery manufactures required to be most thoroughly investigated. As a chemist he said that we knew nothing of it. He hoped the time would come when all these questions would be examined by competent scientific authorities.

Mr. Canning characterised Mr. Blashfield's wares as a very successful issue of the "rule of thumb," considering that really and truly nothing was known of the materials which had to be dealt with. He (Mr. Canning) had to deal with the simple fireclay—a clay that was compounded by the Great Manufacturer, who had laid it in the coal measures to be modelled as the architect directed. This was done with a little of the same material burnt and mixed with it. He thought that if the manufacture of terra cotta was to be surrounded with many intricacies and difficulties it would never be brought to a convenient economical cost. The first object in the manufacture was durability. There could be no economy in using an article which was not permanently good. After twenty years' experience the terra cotta made from pure fireclay had not been found subject to any decay. The next thing was the colour. Fireclay produced an uniform colour of hard terra cotta; the tint was agreeable. His glazed terra cotta, which he named "Della Robbia," was the same as that made for South Kensington, which was made in an ordinary oven and fired three times.

Mr. Etheredge, in reference to a newly-found deposit of terra cotta clay which had been alluded to in Mr Barry's paper, said that it was the largest deposit in the world. It was of a nearly pure red colour, the same as that now used at Naples and throughout Italy. The quantity was positively inexhaustible. It stood 1,800 or 2,000 deg. uncommonly well. This deposit was found at Motcombe, in South Devon. The colour was not at all changed in the furnace. This was one of the most important discoveries made of late, for all Europe was at a loss for fireclays. At the present there was no such thing as a pure terra cotta clay. This was one of the softest clays imaginable, and some of the most beautiful objects in art had been attained by it. The shrinkage was scarcely perceptible.

Mr. Blanchard had seen the Motcombe clay, and it deserved great attention.

Mr. Doulton said that a simple test of the durability of terra cotta was to take a sharp-pointed instrument. If the terra cotta would turn the point of the sharp instrument it would be imperishable. It was undesirable for architects to seek for terra cotta decoration where there were many straight lines.

Mr. Page, C.E., said that he looked upon the works at Dulwich College as a revival of the art of building in terra cotta. As it partook of the nature of stone it might be introduced in a considerable measure in all buildings such as bridges. It was a material with which granite could not compare for durability. An examination of the balustrades of Waterloo Bridge would show the decay which was taking place there. He hailed with great pleasure (as an engineer who had paid great attention to art, and who hoped to see one day no engineering work which was not a work of art) the revival of the use of terra cotta.

Mr. Hayward narrated his experience of the use of terra cotta at considerable length, differing from the opinion that terra cotta was only suitable for brick architecture, for he had used it with success in conjunction with granite. Three triple-light windows, with balconies over, all in terra cotta, only cost £19 13s., and two single-light windows came to £4 7s. In parts where it was necessary to fill in the hollows, powdered terra cotta and Medina cement were used, at an additional cost of one-fourth the original price of the terra cotta. Mr. Blashfield's ware was used, and not one block out of £400 or £500 worth had been rejected. He (Mr. Hayward) had built granite on terra cotta, and if it should be found to fail he would let the members of the Institute know for their guidance. Of the durability of terra cotta there could be no doubt. The tower of Layer Marney Church, in Essex, of the date of 1521, contained a quantity of terra cotta in excellent preservation. He wished to know whether it was necessary that terra cotta should have such an extremely hard surface that it turned the edge of the chisel, and whether if terra cotta could be chipped by a chisel it would be a proof of inferiority in quality, because he had always understood that it was one of the advantages of terra cotta that it would bear to be chipped properly, and that if it was to be chipped accidentally it would not suffer any more than would stone.

Mr. Blashfield said that he did not think that hard-burnt terra cotta could be cut with economy, though a skilful mason might carve it.

Mr. Hayward: I want to know whether the fact of being able to carve it will militate against its durability.

Mr. Blashfield said it would not when "air-dried."

Professor Kerr moved a vote of thanks to Mr. Barry and to Mr. Blashfield, and the other manufacturers who had taken part in the discussion. When Mr. Redgrave argued that a natural clay was of necessity superior to an artificial clay his argument was scarcely borne out by facts. Artistically speaking, if the natural material was equally good with the artificial material, the natural one would be preferred. There was a certain capability of refinement in terra cotta which was very pleasing, but, looking at the nature of the material, it was certain that perfect refinement such as that attained in stone could not be attained. The question was whether we ought not to be satisfied with a little roughness, and let the more classical and refined work be given to the stonemason. Such was the late Captain Fowke's theory. Mr. Blashfield prefers to carve the surface of his work before burning. The question arose whether some other process could not be resorted to to serve this object of Mr. Blashfield's without sacrificing the artistic effort which was preferred at South Kensington. It might safely be said that the use of a red material as the sole material in a façade would be somewhat embarrassing, whereas the buff colour of the South Kensington models would be quite in accordance with the received notions of effect. The reds and the buffs might be used in combination. If the deposit of clay referred to by Mr. Etheredge was all of a red colour it would not supply the demand for terra cotta.

Mr. Barry was gratified to find he had started a subject which had attracted so much interest. He had indicated in his paper the way in which architects could assist in acquiring knowledge of the nature of terra cotta and its adaptability for building, and if some members of the Institute would go over the same ground as he had gone over, great good would result. The work at Dulwich College was produced in an essentially different manner to that made for Kensington. All the decorative work for Kensington was produced by casting in moulds. Now he thought that one of the advantages of the use of terra cotta was, that it gave facilities for having original works from the hands of artists, so that if high-art workmen were employed great beauty was attainable. This was infinitely superior to any work from moulds. When Dr. Medlock said that nothing was known about terra cotta, he (Mr. Barry) hoped he only spoke as a chemist, for practically a great deal was known, and whether

from "rule of thumb" or not, compounds had been found which were very durable. Unless, however, the material was homogeneous throughout its whole body, it would be worthless.

After some further remarks by Mr. Blashfield and Professor Kerr, the vote of thanks was unanimously accorded, and the discussion, which was unusually protracted, closed at half past ten o'clock.

FRESCO PAINTING IN GERMANY.

A WRITER in the *Pall Mall Gazette* says:—Fresco painting having been persistently practised in Germany for full thirty years, it is natural that the art has by this time extended over a wide area. Thus, as far north as Aix la-Chapelle do we come upon a series of eight wall pictures covering a surface of 3,000 square feet. These historic compositions, which commemorate the reign of Charlemagne—bold in conception, original in treatment—were commenced by Alfred Rethel more than thirty years ago. It is possible that the pigments may be deemed somewhat opaque, the colours crude, and the execution rather scratchy. Yet no one will venture to assert that the works are other than when they came from the artist's hands. They are substantially scatheless. They have, in short, escaped all that has befallen our English frescoes. They have not blistered, they have not peeled away; the colours do not lie on the surface loose as dust, to be brushed off from the walls. The sole injury I noted was an accidental scratch or scrape from a nail or ladder.

In like manner I am glad to report that Professor Bendemann's elaborate frescoes, which ten years since I saw in process of painting in the royal castle of Dresden, are well preserved. There are few more satisfactory and impressive examples of mural decoration in Europe than this grand throne room and its companion ball-room. On close examination a slight abrasion, crumbling away, or discoloration of the surface, may be detected in a monochrome frieze at the ceiling; that must be admitted. Perchance damp may have entered through a broken tile, or the mortar may at this spot have had something wrong in its constituent parts. The injury, at all events, was the result of a partial, not of a prevailing cause. There is, in short, every likelihood that these frescoes will, if tolerably well cared for, last for centuries yet to come.

The city of Spires I visited in order to make acquaintance with an imposing assemblage of frescoes, known to me only by engravings—the wall pictures wherewith Schraudolph, an illustrious disciple in the school of German spiritual art, has decorated the nave, transepts, and choir of the cathedral. In honesty I am bound to admit that while these mural decorations at Spires were only too crude and new, here and there slight discoloration was apparent. An opera-glass only could disclose the change, and the total damage would scarcely average one square inch in 20ft. It is just possible that this slight yielding to destructive agents may be the precursor to wider operations. Still I incline to the opinion that the damage is partial and accidental.

Remagen on the Rhine I revisited not without misgivings; but I found that since 1858 not the slightest change has appeared in the surface or quality of the frescoes. This absolute state of preservation was all the more unexpected from the extreme delicacy of the frescoes; they are not so much broad and sketchy as detailed, softly rounded, and highly elaborated.

To the above report may be added a word on the condition of the grand and gigantic "water glass" wall paintings now completed by Kaulbach in Berlin. It is well known that on the failure of frescoes in the Palace at Westminster the "wasserglas" process was adopted as a substitute, yet it is now understood that Mr. Maclise and Mr. E. M. Ward are dissatisfied with the results. It may, then, be important, not only that our artists, but that the House of Commons who have voted supplies, should learn that both Kaulbach and the people of Berlin are and have good reason to be perfectly content with the newly discovered process as exemplified in the vast "Treppenhaus" of the Museum. The effect is admirable, and the first picture executed is as sound as the last.

The above recital of facts seems to substantiate the following conclusions:—1. That in-door frescoes stand well in the German climate—a climate worse than the Italian, and equally as bad as the English. 2. That out-door frescoes in Germany, as in Italy, fall a prey to the elements. 3. That frescoes in Germany, when not maltreated, are as permanent as easel pictures. 4. That thus it would seem that the Germans, more fortunate than the English, have really discovered and revived the lost art of Italian fresco painting, and that the art thus revived is zealously practised down to this very moment. In proof of this last assertion I may quote four vast frescoes recently executed in the new museum of Cologne, by Professor Steinle, the master of our English Academician, F. Leighton. Also must not be forgotten a wide acreage of wall paintings designed and completed within the last five years in the National Bavarian Museum at Munich. These recent achievements indicate that in Germany faith remains unshaken in the permanence of the fresco process.

It is fair that I should add as almost a solitary example of the endurance of fresco in England, certain wall pictures by Mr. Watts, in the dining-room of a private dwelling in Carlton-terrace, London, where, be it observed, gas is not burnt. When I last examined these works, some six months ago, they were as fresh and uninjured as any frescoes in Germany.

ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting took place on Friday evening last, Mr. W. White, F.S.A., president, in the chair. After the nomination of some new members, a vote of thanks was passed to the contributors of drawings and other objects of interest at the late *conversazione*, Mr. Phené Spiers remarking, in reference to the embroidery exhibited by Mr. Brangwyn, of Bruges, that it had been brought to its greatest perfection by a present member of the Association. Mr. Brangwyn only left England four years ago to establish himself as an architect, and had established a manufacture of embroidery, the design of the ornament of which carried off the gold medal at the Paris Exhibition.

Mr. J. D. MATHEWS said that by the kindness of the architects, Messrs. Lee Bros. and Payne, the members of the Association would visit the works at the new Her Majesty's Theatre on Saturday (to-morrow) at three o'clock.

Mr. SPIERS said that at the next meeting a report of the Architectural Alliance upon architectural education would be brought forward, and he should also take the opportunity of bringing forward the Society of Arts' report upon technical education.

Mr. M. DIGBY WYATT, F.R.I.B.A., F.S.A., &c., then read an elaborate paper on "The History of the Manufacture of Clocks, and of the Structural Arrangements made for their Display and Preservation, with Practical Rules for the Guidance of Architects in the Present Day." After giving an interesting sketch of the history of clock-making, which was the first division of his subject, he proceeded to the second section, stating that

It was not until a comparatively recent period that the architect had anything to do practically with clocks, since, although powerful instruments with large dials are frequently to be observed on Lombard and Romanesque campaniles in Italy, as at Cremona, Verona, the Palazzo Publico at Sienna, the turret of the townhall at Piacenza, the campaniles of Santa Prassede at Rome, and, indeed, in many Gothic towers as well, they invariably appear as subsequent additions and interpolations. The usual mode of adding the dial was simply to carry the main arbor of the clock through the wall, and either painting figures upon its surface or attaching a large metal ring to it, so as to make a level vertical frame corresponding with the orbit travelled by the extremity of the single hand showing the hours. As so added the clock dials rarely offend the eye, but where, as in the magnificent old campanile of Pistoia Cathedral, the whole of the lower part of the tower, which Giovanni Pisano intended to be in perfect repose, is disturbed by a great architectural frontispiece in stone or stucco, with heavy members surrounding and exaggerating the apparent anachronism, the effect is most objectionable. In speaking of the mediæval towers of his own country, M. Viollet le Duc makes the following observations on the apparent absence of provision for indicating the passage of time on the exterior of ecclesiastical structures: "On the towers of churches," he says, "from the twelfth to the fourteenth century, no space is arranged for dials which can be seen from a distance. This leads us to suppose that before the fifteenth century, if the chimes gave notice of the hours to the inhabitants of the towns there were no exterior dials. We do not meet with any until towards the end of the fifteenth century. They were then covered by small projecting roofs, and made either in wood or in lead, and decorated in colour." He (Mr. Wyatt) had not in any other country been able to find any deviation from what M. Viollet-le-Duc had observed with respect to France. One might, however, be misled occasionally where clock faces have been inserted into openings not originally intended for them, and be thereby induced to imagine that a clock occupies a setting intended for it by the architect of the structure. A good illustration of this occurs on the west front of Bayeux Cathedral, where the clock occupies what has apparently been the round window or rosace of a gable. In the same way he was somewhat uncertain about the clocks of St. Stephen's, Vienna, of the Freiburg steeple, and of the Townhall at Brussels. They may or may not have been intended to be placed where their dials now appear; but if either of them should have been so intended, it would be a decidedly exceptional case. Until better informed, Mr. Wyatt was inclined to believe that the architect's original connection with the clockmaker was limited to finding a chamber or safe depository for the clock, such as the Westminster clockhouse might be supposed to have been. Often this even might not have been necessary, as many clocks still retained their original positions, simply standing, as an organ might, as a piece of furniture in a church. The next stage was to connect the clock with the bells, so as to record time by striking upon them with a hammer. This naturally brought the clock into a chamber or a portion of the tower underneath the bells. Such appeared to have been the case at Exeter Cathedral in 1376-7, when costs were mentioned as having been incurred "for the room in the Northern tower newly to be made for the clock." At a later date, towards the end of the fifteenth century, they were found occupying the same relative position to the bells, but with the addition of external dials. Thus, at Prague, at the foot of the great tower of the old Townhall, there was a very remarkable clock with two large dials, one over the other, the lowest being raised but little higher from the ground than the height of a man, and the upper one being placed immediately above the lower one. These dials were inserted in stone frames elaborately carved, and of a structure apparently contemporaneous with that of the adjoining beautiful chapel, the date of which was about the middle of the fifteenth century. At a somewhat later date, at Basle, the dial of the Townhall clock was found to be regularly inserted in contemporary Third Pointed tracery. A more imposing example (now unfortunately destroyed) existed at Nuremburg, in the old Schau-Amt, or office of civic control, erected in 1522, opposite the Rathhaus. This clock turret was of very elegant Gothic design.* These were the most important examples Mr. Wyatt had been able to trace of the mediæval architect's practice in the incorporation of external dials into his architecture; but of the Renaissance architect's mode of dealing with the problem abundant illustration was afforded. The well known clock tower and clock of the Piazza of St. Mark's at Venice, erected in the year 1496, was amongst the most picturesque treatments of the subject. The clock chamber of the Château d'Anet, with its dials over the nymphs of Benvenuto Cellini, was very well designed, as, indeed, was the dial framework of the clock of the Palais de Justice of Paris. The interesting old *grosse horloge* of Rouen, in another style, was little less pleasing. The example of Italy was speedily taken up in the other countries of Europe, and she declined in the sixteenth and seventeenth centuries in the cultivation of the arts; the free cities of Germany, the Hanse Towns, and the great centres of Flemish and alternately of Dutch industry, took her place. Speedily the towers of hotels de ville and the leading old churches had clock dials added to them, but it was comparatively rare to treat them in any other way than as obvious additions and interpolations, and little or no effort was made by the architects to make them assimilate to the original architecture of the buildings to which they were added. As far as could be made out from early views of Nonsuch, the clock turret and dial were upon a large scale and of elaborate

* See an engraving from a drawing made by his uncle in Heideloff's "Ornamentik des Mittelalters."

design. It was probable, however, that the clock contained in the maoly campanile of Sir Thomas Gresham's original Bourse, christened the Royal Exchange by Queen Elizabeth in 1569, was by far the finest public clock in England at that date, since, judging by Hollar's accurate views, its dial must have been of very large dimensions so as to have been conspicuous at the great height at which it was raised above the ground. It was treated honestly, as it should be in a campanile, with a story to itself, with a balcony to allow a ready access to its face, and with a lofty belfry over to hold the carillons, which, no doubt, Sir Thomas had caused to be contrived in emulation of those then just introduced in Antwerp and other cities of the Low Countries. In the second Royal Exchange, reared by Jarman, the City Surveyor, immediately after the Great Fire, good accommodation was also provided for a clock, which was introduced as an elegant pavilion in the line of balustrading over the great window of the first story of the tower. When the campanile was rebuilt in 1821, in a style far beneath that adopted by Jarman, the modern architect showed himself quite incapable of appreciating either what the clock for such a structure should be or how to weld in his dials properly. He made it much too small, and then pinched it in on one of the octagonal faces of the base of his belfry between two boldly-projecting trusses, as though, ashamed of its poverty, he would fain do his best to hide it. In the present structure the clock turret is the portion of the building least pleasing. The accommodation provided was, however, good. As might be expected from an original member of the Royal Society, a profound mathematician, and an able mechanician,* good accommodation was not wanting in several of Sir Christopher Wren's principal churches for large clocks. Wherever he could, however, he avoided the architectural difficulties of the incorporation of the dials in his masonry. At St. Paul's the problem was evidently a difficulty to him, and his mode of dealing with it was not satisfactory. In the first place, his provision apparently for two clocks instead of one, for the sake of symmetry alone, was a mistake, and in the second, the prominence given to the curved form of the stonework over the dials disturbed the repose and apparent stability of that portion of the tower as a base for the belfry story. At St. Olave's, Jewry, he was more successful, making a distinct feature of the dressings to his clock dial, immediately under the belfry. In the same way the dial dressings of St. Bride's, Fleet-street, though very plain, are satisfactory. In the beautiful steeple of St. Mary le-Bow no provision was made in the structure for dial faces, but the design of the projecting beam and clock case was picturesque, sensible, and not unworthy of Wren. In Christ Church, Newgate-street, and St. Nicholas Cole Abbey, Fish-street-hill, the clock dressings were treated much as they are at St. Olave's, Jewry. In one or two other minor cases, as at St. Margaret Pattens, St. Clement's, Eastcheap, and St Mary Somerset, Thames-street, Wren appeared to have made provision for clocks which had not been supplied. In some cases, in which he seemed to have omitted any provision for clocks, and in which clocks had been subsequently added, anything but agreeable architectural effects had been produced. Thus in the church of St. James, Garlickhithe, the clock dials, surmounted by a quaint figure of St. James, were carried on a heavy beam, apparently poked out through the windows of the first-floor of the tower. The beautiful campanile of St. Magnus, London Bridge, was similarly disfigured. In St Lawrence, Jewry, a church with one of Wren's finest eastern ends, the tower was disfigured by dials with sham stone dressings, stuck, as it were, against each of the faces of the belfry windows. At St. Swithin's, London Stone, the dials formed a strange excrescence such as could never have been contemplated by Sir Christopher, flourishing out from one angle of the church with an evident desire apparently to fly away from it. The projecting beam and dials of St. Edmund's, Lombard-street, were equally an obvious afterthought. How far Wren may have been party to these somewhat bungling additions to his buildings cannot now be told with any certainty, since in exceptional cases only did the clocks themselves afford evidence on the point. Among Wren's immediate successors, Gibbs, perhaps, dealt with his clock dials better than any other architect. Those of St. Martin's-in-the-Fields, and of the new church in the Strand, were well-proportioned and conspicuous, without in any wise running counter to the forms or lines of the architecture. In Hawkesmoor's case, the St. Mary Woolnooth clock, the dials of which were carried out on a beam, was not in itself ugly or unpicturesque, but it was in nowise agreeably supported by or connected with the masonry of the structure. In more recent times still no great progress had been made, and in quasi Classical buildings, Mr. Wyatt could scarcely recollect an instance which speaking as an architect only, one would not have felt relieved if all external evidence of the existance of a clock could have been blotted out. He was strongly of opinion that this need not have been, and certainly for the future need not be. With the facilities for the use of external colour which were now brought within the architect's reach by the abundance of coloured glass, encaustic tiles, faience, and especially coloured enamels on large surfaces of iron, it was his fault, and nobody else's, if dials remained ugly or indistinct. With the ease with which he might now get a fair measure of stone or wood carving well executed, and ornamental terra cotta or metalwork supplied, he had no business to leave his clock faces without suitable dressings, or its aspect, as well as its going qualities, to chance or the clockmaker. All that was wanting was that he should bestow upon its design the same care and foresight he did upon other features of his building. If he ignored it at first, and was ultimately obliged to deal with it, he might rely upon its having its revenge for the neglect, and telling of his forgetfulness to the end of time. The architect should remember that his work should not be considered done when he had made a round hole in a wall to be filled up with a clock face, even in the best and most convenient situation, as had been done at the Horse Guards, and in a hundred other places. In whatever style he might be working, models were not wanting of circular panels or windows surrounded by most beautiful framework, borders, or tracery, and there was no reason why his clock dials should not be equally well cared for. There was no absolute limitation of the dial to the circular form; a square, an octagon, or any polygon in which a circle might be regularly inscribed, would do just as well as a circle for the bounding form of a clock dial, so that there was ample scope for the exercise of fancy on the part of the architect, who was certainly, in his treatment of turret clocks, far behind the industrial artists who had from the fifteenth century to the present time lavished all the resources of good art and perfect workmanship upon portable and house clocks generally. Much of this inattention to beauty in externals was to be associated with that kind of prejudice which held, if not theoretically at least practically, that science and art in their highest forms of development were incompatible, a form of prejudice somewhat countenanced by Mr. Denison's observation, "that the value of the inside of a clock generally varies inversely as the decoration of the outside." If this was true "more's the pity," since there was no reason why the ratio should not be direct instead of inverse, as it certainly was in the days when the workmen of Venice, Augsburg, and Nuremburg, and subsequently of Paris, led the trade. He (Mr. Wyatt) would remind them of that most beautiful design made by Holbein for the clock to be given by Sir Anthony Denny to Henry VIII. Had we any reason to doubt that the best work then to be procured would be put into that case? He might also remind Mr. Denison that the finest turret clock in the world, with the design of which his name must ever be honourably associated, was placed in the most beautiful clock tower, and had the most beautiful dials ever yet made for any clock of anything like the same dimensions and importance. Of course he (Mr. Wyatt) alluded to Westminster. One of the most novel modes of exhibiting time on a large scale, without interfering with simple architectural structure, was that suggested by Mr. Owen Jones for the central feature of the south elevation of the Exhibition of 1851, and ultimately carried out. At each of the intersections of the thirteen main radiating ribs of the semicircular face-work which formed the vertical end of the semi-cylindrical glass vaulting of the great transept, with the semicircular ribs embracing three 8ft. bays of the facework, Mr. Jones placed a figure, No. 12 occupying the highest intersection, and No. 6 each of the two intersections on the level of the horizontal chord of the semicircular arc. The hand or radius, 12ft. in length, starting at 6 on one side (representing 6 a.m.) rose, passing figures 7, 8, 9, &c. (a.m.), until it reached its highest point at noon, whence, like the sun, it descended through 1, 2, 3, &c. (p.m.), until it sank below its horizontal line at 6 p.m., only to rise and recommence its work the following morning at 6 a.m, having, in the interim, traversed a similar semicircular orbit. As a novelty this was fresh and suggestive, but owing to the number of lines radiating from the same centre as that from which the hand radiated it was difficult to recognise at a glance from any distance the correct position it occupied.*

[It appears that the condition of this society is even more flourishing than we described it in our article of last week, for inadvertently we gave its numbers as they were at the commencement of the session 1867-68, instead of the present session 1868-69. It appears that no less than 116 members joined during the past twelve months, so that taking into account the number of resignations, &c., the total at the opening meeting amounted to about 470.]

* Wren was a fellow-student with Huyghens of the law of impact, and, no doubt, of the theory of the pendulum also.

GLASGOW ARCHITECTURAL SOCIETY.

THIS society met on Monday evening, Campbell Douglas, Esq., I.A., the president, in the chair. A paper was read by Horatio K. Bromhead, Esq., I.A., on "the Antipathies of Architectural Grammar," in which the author sought to show how architectural ornament ought and ought not to be combined, and to lay down the following propositions:—

Proposition I.—The origin, continued existence, and increasing isolation of the various styles of architecture indicate the opinion of many ages as most remarkably decided in asserting that there are sympathies and antipathies among architectural forms and colours that a correct taste cannot ignore, and that there are varied wants and requirements that have demanded and maintained a variety of style.

II.—An architectural work should not have a single detail of form or colour that is not in harmony with every other detail, and with the use and situation of the work, but should be treated as a harmonious whole.

III.—A new discovery, feature of design, method of construction or colouring, material for execution, or locality for erection has often caused a transition time of modification, finally resulting in the rejection of a previous feature and the production of a different style of architecture that avoids the discords occasioned by the novelty. Transitional styles are therefore of confused and imperfectly developed grammar; and a combination of styles containing unmodified parts of two or more distinct styles is flatly discordant and ungrammatical, and much to be condemned as a violation of æsthetics.

IV.—Architectural features, when used in several styles, though retaining the same name and skeleton, should not be so used without being modified in detail and outer form, so as to possess a sympathetic character for each style. The principles and methods of colouring should also be subject to this proposition.

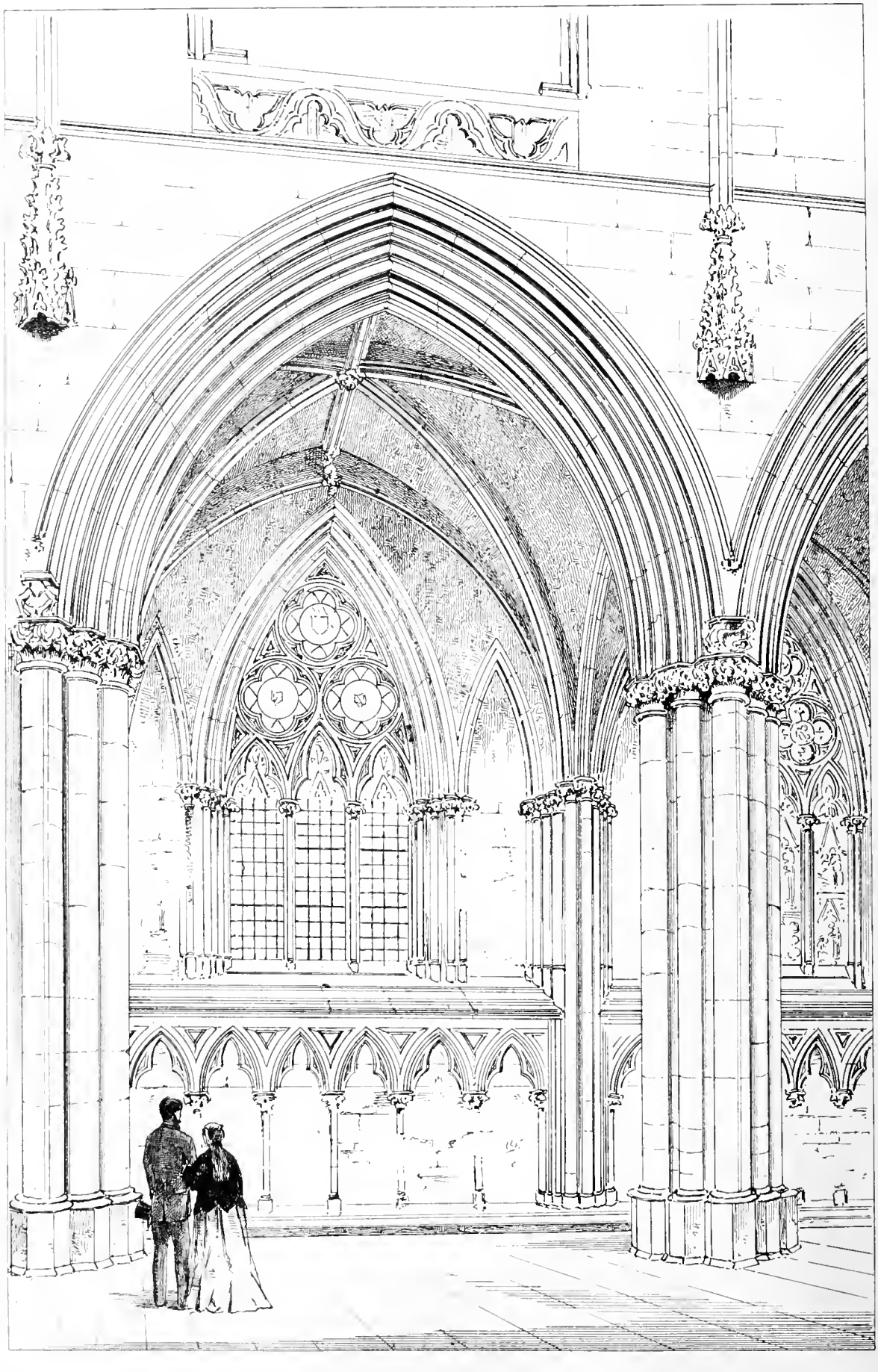
V.—If a well known feature or detail that is to be found in many buildings is very seldom to be found in the same building with another well known style, feature, or detail, without modification, the combination without the customary modification is a discord that requires marked and careful sympathetic modification to become grammatical.

After some few closing remarks Mr. Bromhead concluded his reading, which was very well received by the meeting.

SKETCH FROM THE CHOIR, SELBY ABBEY.

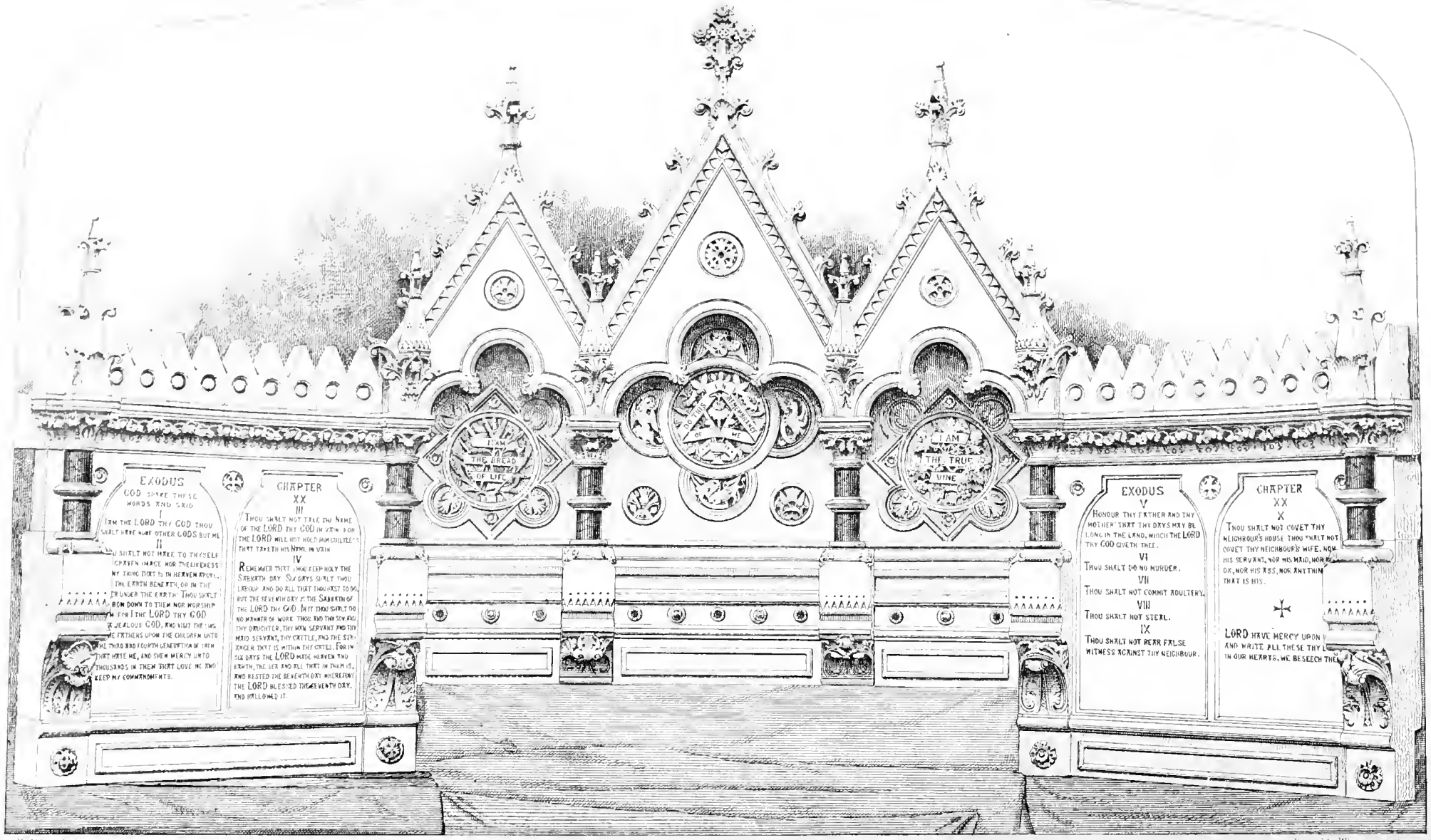
WE give this week a sketch of one bay of the choir of Selby Abbey. Our readers will remember that the large abbey church of Selby is on a cathedral scale. The nave is Norman, and the choir was built at that period which is usually considered to be the zenith of our mediæval architecture; and perhaps it would be difficult, amongst all our cathedrals, to select anything more beautiful for correctness of proportion and delicacy of detail than this part of Selby. The foliated caps and canopies are very much choked up with whitewash; but enough is visible to show that they are fine specimens of the full and rich detail of the period.

* To be continued.



Printed by Whiteman & Bass

One Bay in Aisle: Selby Abbey Church.



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Reredos, Christ Church, Bradford, nr. Manchester. — J. LOWE, ARCHT MANCHESTER.

THE SPACE FOR ARCHITECTURAL DRAWINGS IN THE NEW ROYAL ACADEMY.

IT has, we learn, been officially announced to the Council of the Royal Institute of Architects that the new exhibition rooms of the Royal Academy will be completed and opened for the reception of works next March; and this intimation has been accompanied by a gratifying assurance to the profession that their works will no longer be condemned to be crowded into a mere passage room as hitherto. There are there, it appears, no less than fourteen galleries, at least 41ft. by 31ft., all of which are equal in point of light and position, so that architects may rely on justice being done to their productions in future. It is hoped, therefore, that architecture will be well represented on the occasion of the opening of the new Royal Academy. How far these new facilities may operate upon the prospects of the ensuing Architectural Association we cannot venture to predict; it is obvious, however, that there will be still a large class of the more practical and not the least useful descriptions of drawings for which admission to these new galleries can hardly be expected or desired, so that, doubtless, the energetic committee of that Institution will find the necessity for their labours will not be superseded. If, therefore, they lose some of the more attractive of the perspective views of buildings, which their authors will doubtless prefer to send to Burlington House, they must seek to develope that kind of careful and purely architectural delineation of designs which was so well represented by the splendid drawings sent by Mons. La Meire to the last Architectural Exhibition. Should they succeed in so doing we venture to anticipate that architecture will gain even by the separation of the two classes of drawings, for by the indiscriminate mingling of them it has often been felt that both have suffered.

IMITATION IN REFERENCE TO THE STYLE OF ECCLESIASTICAL BUILDINGS.

A FIERCE contest is going on about the reproduction of ancient styles and the propriety of abandoning anachronisms for a new style of the day. It is said that when some time hence London shall be as Nineveh, and the antiquary comes here to examine its relics, he will say such an edifice appears to be of William Rufus, such a one of Edward I., and at length he will find inscriptions or other evidence certifying the building to be of this day of Queen Victoria, and he will be much horrified at having been so deceived and at the want of truthfulness in the art of this century. All will pity much this archæologist, whether he come from Lake Nyanza or the Kara Korum range to improve his mind and instruct the future generations of a thousand years hence, and yet with all this sympathy we doubt whether any one of this present day will abstain from gratifying himself to ensure the gratification of the virtuoso of posterity, or whether, as we are so callous to the enlightened criticisms of competent men of our own country and the continent, we shall be sufficiently heedful of the criticism of those we know nothing about, and whose existence hereafter is highly problematical, should they find anything to exercise a judgment upon. Before the verdict of the coming time can be given, already will most of the works that are obnoxious to judgment have passed into ruin and oblivion, and some of the very worst examples will become the earliest victims.

We are apt to be too careful of futurity, and to assume for our works too great a durability, whereas the life of architecture is by no means assured even in the case of its best examples. This is well enough seen if we make an enumeration of the best temples of Greece or the best edifices of Rome. Of some of these we have relics, but of some we are so deficient as to be utterly unable to reconstruct the plan or outline. Even in the case of a monumental work this is so, for the life of any such building is exposed to vicissitudes, fire, earthquakes, war, change of religion, and so many incidents of casualty. Other smaller buildings are liable to removal because the site is wanted for other purposes. The same influences prevail in our days, and no architect can be assured that his works will be preserved. There was the old Treasury, in Whitehall; Sir John Soane refaced that, and Barry effaced Sir John Soane, and now Barry is doomed to give way to a Palace of Government. Then Sir John Soane laboured on the College of Surgeons, again to be encountered by Barry, and within a very brief period Sir John Soane's law courts at Westminster will be demolished by the younger Barry. There is Burlington House now being moved stone by stone; and who can tell what will be done with the National Gallery, or even the Post Office, for an adjunct to the latter is arising on the other side of St. Martin's Le Grand, which may be connected? No one would have dreamed of the wholesale destruction of Wren's buildings consequent on the removal of the City churches, and thus this prolific architect is threatened with the diminution of his monuments.

While the casualties of time very much reduce the value of what may be called the life assurance of a building, it is open to question, after making a good allowance for artistic qualifications, whether its utility is not one main characteristic after all in a short life or a long life. There are many circumstances indeed which tend to limit the pre-eminent consideration of style besides utilitarianism. Conventionality is one of these, particularly in reference to ecclesiastical architecture. In respect to this department there has certainly been a dominance of style. The reason we have Roman styles in their present state must be traced to the effect of Greek influence on the worship of Rome—an influence altogether apart from the literary influence, which may be considered of later date. The conventional idea of a Greek temple passed into Roman traditions, although there was a great difference in the local relations of a small Greek sovereign city and those of the Roman metropolis or of a Roman colony.

The same influences are to be defined in Egypt, acting even down to a later date, when first Greek modifications were adopted and afterwards Roman. So, too, with regard to Assyrian, Buddhist, or whatever class of worship we may refer to. This is assuredly less a matter of nationality or chronology than of religious faith. We see it strongly in the case of Mussulman structures, for, notwithstanding the various nationalities which have adopted the Mahomedan faith, we trace resemblances throughout. The divisions of race are great: the Arab is a Semite, the Persian an Indo-European, the Turk a Turanian. The architecture of Constantinople is anomalous in every respect. Santa Sophia is a Byzantine structure converted into a mosque, and yet is made to bear a nearer relationship to Cairo and Assyrian than to Christian or Grecian art. The consistency that it claimed is very questionable in most instances, and where it obtains it may, in reference to the general history of art, be considered as exceptional.

Traditions of art particularly affect religious edifices. The form and structure of churches in this country are the development of what is regarded by the high vulgar and the low as the suitable style for such buildings. Notwithstanding all that has been done from the time of Wren in Italian, and the Georgian outburst for Classic, the Classic and Italian styles have not been able to keep their ground or suppress their mediæval rivals. A natural example of reverence for tradition in art is to be found in the Greek church in London Wall. The congregation naturally preferred Byzantine, and such is the style adopted. They would have felt themselves schismatics in another structure.

One question is how far it is legitimate to comply with these popular conventionalities, and another is as to the practicability of our inventing anything which may serve as a new substitute and make the Victorian era better than the Caroline or Georgian era have been marked. Whether rightly or wrongly we shall experience mediæval influences in ecclesiastical architecture, and we have yet to learn what modification of it we can successfully accomplish.

REREDOS, CHRIST CHURCH, BRADFORD, NEAR MANCHESTER.

THE reredos which has just been completed is executed in Caen stone, relieved with polished shafts of Devonshire and Derbyshire granite. The principal features are the three gablets, the middle one containing a carved panel with the words, "Do this in remembrance of Me," and the emblems of the four Evangelists, and the other two contain respectively carved panels with the words "I am the Bread of Life," and "I am the True Vine." The panels at the side contain the Commandments. The whole has been executed by Messrs. Williams, sculptors, of Manchester, from the designs of Mr. John Lowe, architect, of Manchester.

SCHOOL OF ART.

On Tuesday week, the annual meeting of the Newcastle-under-Lyme school of art took place. The report stated that, although a financial deficit of £30 existed, yet the year past had witnessed great improvement, both in the subscription list and the general condition of the school. The report of the head master (Mr. J. R. Bacon) showed that out of the drawings which were finished in the school during the previous twelve months and sent to London in April to be examined, the works of ten students were satisfactory, three obtained prizes, and one honourable mention. At the National competition, at which about 100 schools compete for 10 gold, 20 silver, and 30 bronze medals, one bronze medal was awarded to this school. Two of the students, viz., W. P. Rhodes and F. J. Watkin, have been appointed free students, the Science and Art Department paying their fees for twelve months. The reports were adopted, and the prizes then distributed. It is believed that the deficit of £30, before alluded to, will be speedily cleared off.

ARCHÆOLOGY.

An antiquarian discovery has just been made in Hanover. Some soldiers, in digging a trench at Hildesheim, found about 50 vases, cups, candelabras, and other objects in massive silver, and richly chased; they are evidently the work of the Greek artists, and apparently date from the time of Augustus. Among them is a goblet, with ornaments in relief, representing Hercules strangling two serpents; and a second, with satyrs, bacchantes, and other similar figures.

Building Intelligence.

CHURCHES AND CHAPELS.

Ambrosden Church, Bicester, which has been undergoing a thorough and substantial repair, was reopened on Tuesday week. The restoration of the church has been ably carried out by Mr. C. N. Beazley, of Guildford-street, London, and the work has been executed by Mr. Lewis, of Bicester. The church consists of a spacious nave and south aisle, and a chancel of fine proportions; the latter being a good specimen of the Perpendicular style of architecture. The tower, originally Norman, has buttresses and parapet of the Perpendicular period; and the nave, originally of the Middle Pointed style, has a clerestory of the fifteenth century. The cost of the restoration is £1,400.

On the 7th inst. the memorial stone of a new Wesleyan Methodist Chapel was laid at Westhoughton, by Mr. J. Bell. Mr. George Woodhouse, architect, of Bolton, has designed the chapel, which is of a very plain character, and built of concrete, moulded by the patent apparatus of Mr. Charles Drake, of London, under the immediate superintendence of Mr. John Drake, and will be plastered over with stucco, lined to imitate stone. The entrance will be by a porch beneath a tower 15ft. high. The chapel is expected to seat about 300 persons, and a gallery will provide accommodation for an additional hundred, including the school children and the choir. The entire cost of the building is about £850.

Yesterday week a new Congregational Chapel was opened at Blyth near Newcastle-on-Tyne. The style is Gothic, of an early type, and the materials used are red bricks with chiselled stone dressings. The plan consists of nave and transepts, with galleries at each end. The cost is about £1,700, and the chapel seats 500 persons. Mr. T. Robson, of Newcastle, is the architect, and Mr. J. Nairn, of Blyth, the builder.

A new Wesleyan Chapel was opened at Pilsley on Tuesday week. The style is Gothic, of the early part of the fourteenth century, and it is built of clean pressed bricks with local stone dressings. Two schoolrooms are attached, available as transepts during service. The cost is £750, exclusive of fencing, walls, and cartage. Mr. S. Rollinson, of Chesterfield, is the architect, and Mr. G. Heath, of the same place, the builder.

The monthly meetings of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels for the present session were resumed on Monday at the society's house, No. 7, Whitehall, S.W.: the Right Hon. the Earl of Romney in the chair. Grants of money, amounting to £855, were made in aid of the following objects, viz.:—Building the new church of St. Matthias, Earl's court, Kensington; rebuilding on a new site the church at Mistley, near Manningtree, Essex; enlarging or otherwise increasing the accommodation in the churches at Birstall, near Leicester; Bishop Stortford, Herts; Bradfield Combust, near Bury St Edmund's; Brede, near Northiam, Sussex; Bucknell, near Shrewsbury; Burrington, near Chumleigh, Devon; Discord, near Presteign, Radnor; Hellingley, near Hurst Green, Sussex; Llanbedr Paincastle, near Hay, Brecon; Llanfwrog, near Ruthin; Llanbadarn Fawr, near Aberystwith; Marlborough, near Kingsbridge, Devon; Mordiford, near Hereford; Quainton, near Winslow, Bucks; and Terrington, near York. Additional aid was voted towards building the churches at Fylingdales, near Whitby, and Traveller's Rest, near Barnstaple; rebuilding the church at Weston Patrick, near Odiham, Hants; enlarging and restoring the churches at Eaton Socon, near St. Neots; St. Lawrence, Reading; Shadoshurst, near Ashford, Kent; St. Margaret's-at-Cliffe, near Devon, and Sutton, near Rochford, Essex. The society likewise accepted the following trusts as repair funds for Halliwell St. Peter, near Manchester; Eastover Christ Church, near Bridgewater; St Stephen, North Meals, Chester; for a consecrated mortuary chapel, Cambridge, and a legacy of £1,000 bequeathed by a lady for the restoration of the church at Ramsden Crays, near Billericay, Essex.

BUILDINGS.

At a meeting of the Halifax Board of Guardians on Wednesday week, the various tenders for the enlargement and alteration of the Halifax workhouse were submitted, and that of Mr. Jonathan Charnock, of Hall-street, Halifax, accepted. The amount specified is £6,845, and his contract includes the stone, brick, joiner, carpenter, slating, plastering, plumbing, glazing, and painting works required. The operations are forthwith to be commenced, and to be completed by September 1, 1869. Additional land has been purchased for the site, and the plans for the alterations have been prepared by Mr. Oates, architect, Halifax, who was yesterday week appointed the superintendent of the works. The new buildings will be mostly for hospital use, on the pavilion plan, separate buildings for males and females, each three stories high and 100ft. long, all the wards being lofty and 22ft. wide. Distinct hospitals for males and females, each containing four spacious wards, will be erected for fever and infectious cases. Then there will be day rooms, dormitories, bath rooms, nurses' rooms, lavatories, &c., arranged on the most efficient plans, and in accordance with the instructions of the Poor Law Board. It is likewise intended to erect new kitchens, to be fitted with the most modern appliances for cooking, &c. The total cost will probably reach nearly £ 0,000.

The opening meeting of the session of the Royal Institute of the Architects of Ireland was held last evening at eight o'clock to receive the annual report of outgoing council, and treasurer's statement of receipts and expenditure, and to elect officers and council for the ensuing session. The silver and bronze medals awarded by the council at the close of last session were to Mr. Samuel P. Close, associate, and Mr. William Sterling, fellow, respectively.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—W. Stone Co.—C. G.—E. and Co.—W. M.—J. P.—C. T.—J. H.—S. W. and Co.—H. C.—W. S.—W. W.—H. D.—M. G.—J. P. S.—F. C.—I. C.—W. I. C.—I. H.—H. C.—W. S.—"Clerk."

PATENT.—It will all depend on the nature of the improvements you have made.

ERRATUM.—In article in last week's number, on "St. Paul's, Past and Present," on page 779, top of column 3, read "and *not* art had accomplished the work;" for "and art had accomplished the work."

Correspondence.

"ROOF COVERINGS AND EXTERNAL DESIGN."

To the Editor of the BUILDING NEWS.

SIR,—With your kind permission I will make a few observations on an article under the above heading which appeared in your last issue:—

The writer there remarks, that "*green slates* have a doubtful reputation for durability." I readily admit that some kinds of slate are porous and non-durable, but when reading the article in question, it struck me that your correspondent probably had not seen at "the Museum of Building Appliances" (9, Condnit-street), a specimen of olive green slate, of "Gane's eureka tint," a slate that unquestionably possesses all the requisite properties for *strength* and *durability*. These slates (which are made in regular sizes) are *stout*, and show the edges much more distinctly than the ordinary slate, the thick raised edges showing (especially where small sizes are used) *strongly defined lines*, which add so much to the beauty of a roof.

Fifteen years' experience in various kinds of roofing convinces me that these slates are among the very best coverings for buildings we have—not only for durability and strength, but for effective appearance; and I think that, if your correspondent of last week will inspect the slate referred to, he will find its texture *close* and *hard*, in contra distinction to the porous slate frequently used. Apologising for thus troubling you, I am, &c.,

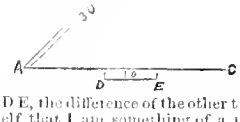
ANTI-TILE.

Intercommunication.

QUESTIONS.

[1128.]—CALCULATION OF PRIME COST.—Will any of your building friends favour me with the subjoined information? I have a house to build, the estimate for which is £600, and shall require to know on closing my books what I shall gain or lose by the undertaking. The materials I shall purchase and the labour I shall pay for will cost various prices, and some of it will be sent to customers at my usual day charges. Should the material and labour supplied to the house be placed through my books at the selling price? and is my gain or loss constituted by the difference between the selling price and the estimate? or, if not, how should I calculate it, when it is evident that the prime cost cannot be got at only by a distant approximation?—HENRY W. BADGER.

[1129.]—TRIANGLES.—Could any correspondent inform me whether it is possible to solve the following problem?—Given A B, one side of a triangle, = 30°: the angle, B A C,



= 40°; and D E, the difference of the other two sides, = 10°. I flatter myself that I am something of a mathematician, but I have not been able to solve it.—R. F.

[1130.]—CEMENT RECIPE WANTED.—Would you kindly inform me, through "Intercommunication," of a good substance that will make India rubber and wood stick well together when exposed to the wet? and oblige—A CARPENTER.

[1131.]—FRESCO PLASTER.—Will any of your readers kindly inform me of the materials of which the plaster for fresco painting is composed, and if the ordinary painters' dry colours are proper to use for the purpose.—A. O. F.

[1132.]—REMOVING WHITEWASH.—I want an efficient process for removing coats of whitewash from old stonework, plain and moulded, without injuring the face of the stone.—A. O. F.

[1133.]—CHIMNEYS.—The owner of a spot of land adjoining my house has lately erected a residence thereon, and has built the end wall abutting and considerably higher than my chimneys. The effect of this is to obstruct the free passage of smoke, which I have enjoyed upwards of fifty years, and renders it impossible for me to have a fire, which at this season of the year is exceedingly inconvenient. Will any of your readers be kind enough to tell me if I have a remedy against my neighbour? and I should be glad to know of any similar cases which have had judicial judgment.—B. W. R.

[1134.]—LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.—Will some one kindly inform me, through "Intercommunication," where I can buy deals at the prices quoted in the BUILDING NEWS? and oblige—A YOUNG BUILDER.

[1135.]—QUESTION IN STATICS.—Suppose an uniform heavy rod, 5ft. long, is placed in a hemispherical bowl (unfixed) of 4ft diameter, in what position will it rest? I have been told that the above problem admits of an easy solution, but I am not able to work it out. Could any ingenious reader help me out of my difficulty?—RODNEY.

[1136.]—PUPILS' ARTICLES.—I have been in the office of an architect and surveyor (holding a public appointment and of moderate private practice) as clerk for about four years, but seeing the advantage obtained in after life by having passed through articles, I am desirous of doing so under the gentleman with whom I am at present serving. He has rather an objection to receiving pupils, as a rule; but having known me for a long period he would make an exception in my case, and has left me to tender a statement of what terms, &c., I would propose. I have attained a tolerably accurate knowledge of the profession generally, both outdoor and office work, and am in receipt of a salary of £100 per annum; aged 20. Under these circumstances, I am anxious to know what would be fair terms to both on the following heads: Duration of articles; amount of premium, and whether returnable as salary; and any other points which perhaps some of your many subscribers could suggest, if you would kindly make the case known in the way I have mentioned.—CLERK.

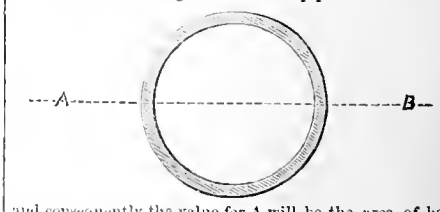
REPLIES.

[1091.]—ANCIENT WRITING MATERIALS.—One of the most ancient methods of recording events in writing was by the use of the "stylus" and brazen tablets. The former was a kind of metallic pencil, pointed at one extremity with steel, and blunted at the other. The tablets were merely thin sheets of brass, upon which were written by the sharp end of the "stylus" whatever was required. The blunted extremity was for the purpose of rubbing out or erasing any erroneous mark or letters. Our word paper is derived from the Latin term for a certain description of broad-leaved plants "papyrus," which was subsequently used as a medium for writing on. The bark of trees was a favourite "paper" among savage nations. When the Spaniards conquered Peru, the news of their invasion was carried into the interior, not by writing, but by drawing a description of their appearance upon leaves and the bark of trees. In the same manner the Indian chiefs describe what is termed their "totem."—HAYLEY.

[1092.]—LIQUID INDIAN INK.—I have heard it stated that a little vinegar mixed with Indian ink will keep it moist, but I cannot say I ever tried the experiment, so that "T. E. B." must take the statement for what it is worth. Every draughtsman is well aware of the trouble and annoyance caused by the fact that ink will dry up. The only real remedy is to bear with it. Never mind the trouble, but mix your ink fresh every day you use it. It is the only safe plan if you have to wash your drawing over with colour.—S. S. P.

[1092.] In reply to "T. E. B." on the above subject in the BUILDING NEWS of October 30, I have found by experience that the best way to preserve Indian ink in a liquid state without evaporation is as follows:—Having rubbed sufficient Indian ink to complete the work in hand in an ordinary colour saucer let "T. E. B." place the same in a deep plate or other vessel containing a small quantity of water, then over the ink saucer invert a glass tumbler so that its edge shall rest in the water. "T. E. B." will readily understand the principle of the above. Indian ink can in this way be preserved from evaporation for weeks and even months.—A. E. PEARSON.

[1093.]—IRON PIPES.—Your correspondent "Alpha" may calculate the strength of his pipe by the usual formula—$W = \frac{A \times D \times C}{L}$; bearing in mind that the neutral line A B in the figure divides the pipe into two halves,



and consequently the value for A will be the area of half the mean circumference of the pipe multiplied by the thickness. All the dimensions will be in inches, and the value of C for cast iron is equal to 25.—BETA.

[1096.]—STIFFNESS OF BEAMS.—Upon the authority of Tredgold, Molesworth, in his excellent little pocket-book, gives the following rule for the stiffness of beams:—Let B = breadth of beam in inches; D = depth, also in inches; L = length in feet; and W = load in pounds. Putting C for the constant, we have $D = \frac{\sqrt[3]{L^2 \times W \times C}}{B}$. The values of the constant C are as follows, for the different timbers:—Fir = 0.01; ash = 0.01; beech = 0.013; teak = 0.008; elm = 0.015; mahogany = 0.02; oak = 0.013. When the beam is uniformly loaded, instead of W use W × 0.625.—ARCHITECT.

[1098.]—SIZE OF BOLTS.—Having erected pillars in a position similar to that mentioned by "Contractor," I am in a position to inform him that bolts 2in. in diameter will answer perfectly well. I would advise him to have lugs cast upon the pillars to receive the nuts of the bolts, and to use cast iron bed plates, instead of a strap, underneath the concrete.—ENGINEER.

[1100.]—A WASH TO CONFINE SANDSTONE.—Let "W. H. Fowles" give his walls a good double coat of paint, and he will find they will soon cease to give off any dust.—T. E.

[1104.]—APPRAISER'S LICENCE.—There is no question but that you must take out a licence. The difference between you and a clerk is, that the latter performs his duties for his master, and is for the time being his representative and proxy. The master has a licence, and since you are now in that position you must protect yourself in a similar manner.—CLERK.

[1105.]—CENTRIFUGAL FORCE.—The angular velocity may be thus calculated:—Let W equal the weight of the body in pounds; R = radius in feet, or distance from the centre of motion; F = centrifugal force or angular velocity in pounds; N = number of revolutions in a minute; then $F = W \times R \times N^2$. This is sufficiently accurate for practical purposes, although not the exact theoretical formula.—ARITHMETICIAN.

[1109.]—LAND SURVEYORS' CHARGES.—In reply to "X.," I beg to inform him the general practice is an agreed sum for the survey and plan, either in the lump or as per acre. This, of course, would depend upon the position of the land, and whether contained within a ring fence or in detached pieces. If a moderately open country, and lying altogether, 5s. an acre, or £5 the whole, would be a fair charge for survey and plan showing proposed roads and building plots. For after management, a percentage upon the sales effected is the usual course, and varies from 2½ to 5 per cent. If land is sold to speculative builders, and advances made as the buildings progress, it is usual to charge an additional fee for each certificate granted. "X." would also require levels taken and sections of the proposed roads made.—H. H. H., Liverpool.

[1119.]—MEASUREMENT OF BRICKWORK.—Your correspondent, who signs himself "B B.," can prove the correctness of his own measurement with that of the other surveyor by multiplyiog his number of statute rods by 11½, which result will reduce his rods to cubic yards, there being 306 cubic feet, or 11½ cubic yards, to one rod of reduced brickwork.—ARCHITECT, Strand.

[1119.]—In reply to the question propounded by "B. B.," in your impression of the 13th inst., about comparing the results of measurements of brickwork in cubic yards with those in statute rods, I offer for his perusal the following: 11½ cubic yards, or 306 cubic feet of brickwork equal one standard rod; or, if "B. B." reduces the other surveyor's results to cubic feet, and takes 8-9ths of this sum, he will obtain the standard of thickness. Example: Suppose 230 cubic yards—

(1) 230 cub. yds. ÷ 11½ = $230 \times \frac{3}{34} = \frac{690}{34} = 20\,5\text{-}17$ st. rods.

By (2)

230 cub. yds.			
27		9)49680	
		272) 5520(20 5 17	st rods,
1610		544	[same as
460			[above.
6210 cub ft. × 8 ÷ 9		80	
8		$\frac{80}{272} = 5\text{-}17.$	
49,680			

MARTIN B.

[1119.]—"B B." can compare the results by multiplying his measurement, which is in standard rods, by 11.37, which will reduce his to cube yards.—C. D

[1119.]—If "B. B." will take the trouble to look in "Laxton's Price-book," he will find the number of cubic yards in a statute rod of brickwork to be 11½. "B. B" will do well to consult "Laxton" a little more before attempting to measure up work after another surveyor, and not fill up your valuable columns with so simple a question. Or he might have found it for himself if he had multiplied 272, the number of superficial feet in a rod of brickwork, by its thickness, 1ft. 1 in., giving 306 cubic ft. = 11½ yds. cubic.—D.

[1119.]—As there are four times the quantity of brickwork in a yard cube that there is in a rod of 8ft. superficial by 9in. thick, so let "B. B" multiply the cubical quantity by 4, and the answer is in rods. Proof: Suppose a wall 30ft. by 15ft. 9in. thick = 50 rods superficial = 12½ yards cube. Then 12½ by 4 = 50. I admit, however, that this is taking it to a great nicety.—H.

[1119.]—To reduce cubic yards of brickwork to feet superficial, 14in. thick, multiply by 36 and deduct one fourth; or multiply by 27 and deduct one-ninth.—J. K.

[1120.]—FALLING BODIES.—In answer to "Student"—1st. It has been ascertained by experiments that a dense or compact body when falling freely passes through the space of 16ft. 1in. during the first second of time. For example: Suppose a dense body falls 144ft.; divide the number by 16ft. (leaving out the odd inch for the sake of even numbers), which will give 9, then extract the cube root = 3 = the number of seconds in falling, as near as possible. 2nd. A light body will fall with the same velocity as a heavy one, provided it is of the same material and quality. If the atmosphere were removed all bodies, light or heavy, large or small, would descend with the same velocity. For instance, when a piece of coin and a feather, or any other light substance, are let fall at the same time from the top of the exhausted receiver of an airpump, they would fall at the same rate, and touch the bottom together. 3rd. In answer to queries 3 and 4, all bodies in descending continue to increase their velocity, as the attractive quality of the earth increases as the distance decreases. No positive rule can be given as to the increase of velocity in the descent of bodies on account of the changes which take place in the atmosphere, which renders the resistance variable.—G. W., Tonbridge.

[1120.]—If "Student" had consulted the most elementary treatise on dynamics, or bodies in motion, he would have found the rule for calculating the rate at which bodies descend from a fixed point. I give it under, condensed as much as possible, so as not to trespass on your space.

1. Space.—The space described in a certain time is equal to the product of the square of that time and the space fallen through in one second (16·0 ft., in the latitude of London); or, if the velocity and time are given, it is equal to one half the product of the velocity and time; or, if the velocity only be given, it is equal to the square of that velocity divided by twice the velocity acquired in falling one second (32·19ft.).

2. Time. The time of falling is equal to the velocity divided by twice the space fallen in one second; or it is equal to twice the space divided by the velocity, or it is equal to the square root of twice the space divided by the velocity acquired by falling one second.

3. Velocity.—The velocity is equal to the velocity acquired by falling one second multiplied by the time of falling; or is equal to twice the space divided by the time, or it is equal to the square root of the product of twice the space and the velocity acquired by falling for one second. Putting s for space, t for time, and v for velocity, we have:—

1 $s = 16.09\,t^2 = \frac{1}{2}\,t\,v = \frac{v^2}{2 \times 32.19} = \frac{v^2}{64.38}$

2 $t = \frac{v}{2 \times 16.09} = \frac{v}{32.19} = \frac{2\,s}{v} = \sqrt{\frac{2\,s}{32.19}}$

3 $v = 32.19\,t = \frac{2\,s}{t} = \sqrt{2 \times s \times 32.19} = \sqrt{64.38\,s}$.

I do not carry the decimals any further, as they are quite true enough for all practical purposes.—MARTIN B.

[1120.]—"Student" will be able to solve all questions relating to falling bodies by means of the following formulæ:—

$$v = g\,t + v^1 \quad (1)$$

$$s = \frac{g\,t^2}{2} + v\,t \quad (2)$$

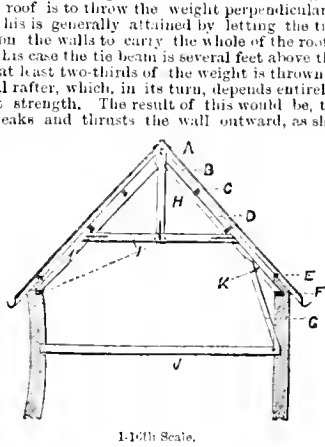
$$v^2 - v^{1^2} = 2\,g\,s \quad (3)$$

$$v^{1^2} - v^2 = 2\,g\,s \quad (4).$$

Where v = velocity in feet per second, v^1 = the initial velocity, t = time in seconds, s = space described, g = measure of the force of gravity, which is the velocity acquired by a body falling freely from a state of rest in a vacuum in one second, and which is taken in the latitude of London at the sea level, = 32·2ft. If the body is acted on by gravity alone $v^1 = 0$ in these equations; if projected downwards, with an initial velocity, v^1 = positive; if upwards, negative; 3 and 4 are simply deduced from 1 and 2, and are used according as the body is projected downwards or upwards with an initial velocity. If the resistance of the air be removed, all bodies under the action of gravity would fall through the same space in the same time, consequently gravity accelerates all bodies equally.—C. D

[Similar answers have been received from "J. B. P., Aberdeen," and "W. J. Dray."—ED. B. N.]

[1122.]—ROOF CONSTRUCTION.—I have ventured to send you a sketch showing the construction of a roof that has puzzled "A Beginner." The tendency of every roof is to sink down into the rooms below, or the pressure of the walls outward; and this is caused by its own weight and the pressure of wind acting on one of its sides. The great aim in every roof is to throw the weight perpendicular on the wall. This is generally attained by letting the tie beam resting on the walls to carry the whole of the roof above. But in this case the tie beam is several feet above the wall, so that at least two-thirds of the weight is thrown on the principal rafter, which, in its turn, depends entirely on its inherent strength. The result of this would be, that the rafter breaks and thrusts the wall outward, as shown in

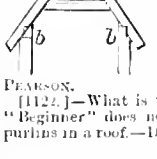


1-16th Scale.

A, Ridge, 7in. by 1½in. B, Rafter, 3in. by 2in. C, Purlins, 8in. by 4in. D, Principal Rafters, 7in. by 3in. E, Wall plate, 4½in. by 3in. F, Pad, 9in. by 2in., 2ft. long. G, Strut, 7in. by 3in. H, King Post, 4in. by 3in. I, Tie beam, 7in. by 3in. J, Joist. K, Strap.

left-hand side of sketch. An iron rod, as dotted, would, in a measure, counteract this; but this, in its turn, being subject to extreme variations of temperature, would expand and contract. I have, therefore, suggested a strut, tenoned into joists, and supporting the principal rafter at the point of its liable deflection, and thus making the joists do duty as a tie beam, and throwing the whole weight dead on the walls. Common rafters and purlins are subject to cross strain; in the figured dimensions I have made the former small, because the bearing is little, but the sizes of purlins must be arranged according to the length of bearing; the figures named would be safe for 8ft. Principal rafters are subject to cross strain and compression; strut to compression only; king post and tie beam to tension.—H.

[1122.]—In answer to "A Beginner," in the BUILDING NEWS of November 13, the collar would be in a state of tension, as the thrust of the principals is outward. Purlins are necessary, and should be placed as in the subjoined sketch or a purlins h h plates). The purlins should be 7in. by 4in., plates 4in. by 3in. There is no necessity for joining the collars at the intersection of the roofs.—A. E. PEARSON.



[1122.]—What is the length of the proposed building? "Beginner" does not exactly understand the use of the purlins in a roof.—D. Y.

[1123.]—WAR DEPARTMENT CLERK OF WORKS.—In your "Intercommunication" column of the 13th inst., a "Constant Subscriber" wishes to know how to obtain an appointment as clerk of works to the War Department. The writer of this reply, as holding that situation himself, can, from his personal experience, inform your correspondent that no fresh appointments have been made for eight or nine years, and that it is also generally understood that the civil branch of the Royal Engineer Department are to be allowed gradually to disappear. There have been many temporary clerks of works employed on various large works, but their services are liable to be discontinued at any time.—FIFER.

[1126.]—CIRCULAR GAS TANK.—Reservoirs at Penbridge, near Tunbridge, have been successfully lined with Pyrimont asphalte, to avoid the escape of water. Why not line your gas tank in the same manner? It seems impossible, from the description of a work so well done as yours appears to be, to account for the great escape of water from the tank.—J. J.

BUILDING AND LAND SOCIETIES.

AT a meeting of the members of the insolvent Victoria Land and Building Society held in Birmingham on Wednesday week, an offer by the directors to pay £7,500 in release of all claims against them was unanimously accepted.

WAGES MOVEMENT.

THE Bolton Branch of the General Builders' Association has issued to the Bolton Operative Stonemasons' Society a circular notifying the following alterations of rules, to come into force on May 1, 1869:—1. The rules relating to reckoning of time, and quarter time, and payment of wages, are to be abrogated and rescinded, and in lieu thereof wages will be paid at the rate of 7½d. per hour. 2. Any rule or custom forbidding or interfering with the employment or use of machinery or machine worked materials is to be abrogated and entirely done away with. 3. Any rule or custom forbidding or interfering with the introduction or use of stone worked at the quarry, or anywhere else than the place where it is to be used, is to be abolished and done away with. 4. That all trade rules, disputes, demands, and differences shall be settled for the future by consultation or arbitration, and proper courts shall be constituted for the purpose. The masters further state that they are prepared at any time, upon six days' notice from the men, to meet them and appoint arbitrators, and select the umpire. And they are willing to leave to the decision of the arbitration court thus appointed, all future settlement of trade rules and disputes, demands, and differences. Circulars to the same purport (as far as the wording is applicable) have also been forwarded to the joiners, painters, plasterers, and plumbers in this town.

The Wakefield Branch of the General Builders' Association has issued a notice to the operatives of the trade, notifying that on and after May 1 next, the rules relating to the reckoning of time and quarter time and the payment of wages are to be abrogated and rescinded, and in lieu thereof to be calculated and paid for by the hour, and that all trade rules, disputes, demands, and differences shall be settled for the future by consultation or arbitration, and proper courts shall be constituted for that purpose. The masters are prepared at any time, after six days' notice from the men, to meet them and appoint arbitrators and umpire. And they are willing to leave to the decision of the arbitration court thus appointed, all future settlement of trade rules, disputes, demands, and differences.

The stonemasons and labourers in the building trade of Wolverhampton have had notices given by the masters as to a proposed alteration of rules. The notices provide for all disputes being settled by arbitration and for the constitution of courts for that purpose before the 1st of May, when the masters require the proposed new regulations to come into force. This section of the trade has not yet adopted the system of arbitration which has worked so admirably under Mr. Kettle in the other branches.

STAINED GLASS.

A STAINED glass window has been erected in the Episcopal Church at Stirling to the memory of the late Colonel Priestly, of the 42nd Royal Highland regiment. The window is from the establishment of Messrs. Ballantine, of Edinburgh.

St. Mary's Church, Cowes, has just received a great addition to it in the shape of a handsome stained glass window, which has been presented by Lady Fellowes and Mrs. Parker as a memorial window. The subjects illustrated are "Moses striking the rock," "The Baptism of our Lord," and the "Passage of the Red Sea." In the tracery piece over the other windows is a large quatrefoil, in which is depicted "Our Lord in Majesty." The treatment of the whole of the subjects and ornaments are in the early Gothic type, harmonising with the building.

LEGAL INTELLIGENCE.

A BREACH OF THE BUILDING ACT.—At Clerkenwell, on Wednesday, Mr. William Thomas Purkiss, of 29, Bellevue-villas, Seven Sisters'-road, was summoned by Mr. John Turner, the district surveyor of the eastern division of Islington, for having erected a building at the rear of No. 40, Grafton road, after the same house had been built, with walls only 4½in. thick, the door frame flush with the face of the brickwork and the roof covered with boarding, contrary to the rules of the Metropolitan Building Act. Mr. Purkiss not being in attendance at the time mentioned in the summons, the magistrate, after deferring the hearing until the other summonses had been disposed of, then considered the case, when Mr. Turner stated the building was erected at the end of the beam building of the house, between it and the dust-bin; that it was about 8ft. in length and 4ft. wide, and about 4ft. 6in. high, and that there were eleven other buildings exactly of the same construction added at the rear of the other houses erected by Mr. Purkiss in the Grafton-road. The service of the notice to amend having been proved, the magistrate said the question

with him was, whether this was a building within the meaning of the Act, when, upon his referring to the statute, he decided it to be so, and ordered that the said building be amended as required by the district surveyor, or removed within the period of one month, and that 12s. 6d. costs be paid. A second summons for a similar building at the rear of No. 2, Gloucester-road, was then gone into, when Mr. Turner explained the building in this case was larger than the former, and there were eight others similar in construction at the rear of the houses erected by Mr. Purkis in the Gloucester-road. The magistrate made a similar order and award of costs as in the preceding case.

DISPUTE BETWEEN A BUILDER AND THE BOARD OF WORKS.—A case of some interest was heard before Mr. Ingham at Wandsworth, on Wednesday, upon an adjourned summons against Mr. Joseph Liddiatt for building houses in the Bridge-road, Battersea, beyond the line of frontage as determined by the superintendent architect of the Metropolitan Board of Works. It appeared that the defendant began building before the line of frontage was determined, and afterwards completed his houses. On proceedings being taken against him, he memorialised the Metropolitan Board to allow his houses to stand, but they declined to make any order, and the magistrate was now called upon to have them demolished. Two cases in point were cited. One was a case which had been heard in the Court of Common Pleas, and it was read in support of the defendant's objection. In that case the judges were of opinion that the decision of the superintendent architect was not final, and that the magistrate had power to review it. The second case was of later date, and was heard in the Court of Queen's Bench. It was read by Mr. Corselli's, the clerk of the local board, in support of the summons, and it was to the effect that the judges held that the decision of the superintendent architect was binding upon the magistrate.—Mr. Ingham said his own opinion was that he was bound by the decision of the superintendent architect, and that he was called upon to determine whether the buildings were beyond the line. He recommended the defendant to apply again to the Metropolitan Board. He did not think he ought to be punished in that serious way by the destruction of a large quantity of valuable property for having been obstinate.—The summons was then adjourned for a month to enable the defendant to make the application, the magistrate giving him permission to use his remarks.

THE CROSBY BRICKKILN BURNING CASE, LIVERPOOL.—On Monday Mr. Serjeant Wheeler gave his final decision in the case of De Costa *v.* Humphreys. The case, which was tried before his Honour and a jury on the 28th ult., was an action by Mr. De Costa, shipping agent, of Liverpool, against Mr. William Humphreys, brickmaker, at Crosby. The plaintiff, whose residence is near the defendant's brickkiln at Crosby, complained that the brickkiln was a nuisance to him, and had injured the fruit and trees in his garden, and the smoke and vapour from the brickkiln and chimney had also penetrated into the house, to the injury of his family's health. He claimed damages for the loss of fruit, damage to his trees, and the offensive smell and annoyance to the house, amounting to £50. The final decision was postponed until Monday, when his Honour directed a verdict to be entered for the defendant, with costs. The case excited considerable interest amongst the parties concerned, as well as the inhabitants at Crosby, as an opposite verdict involved the closing of the brickkiln and works altogether, the defendant stating that he could not do more than he had done by the introduction of machinery in order to condense the smoke and vapour so as to prevent its being an annoyance to the neighbourhood.

NOTICES OF BOOKS.

Report on the Proper Principle of Drainage to be Adopted in the towns of Oxford, Eton, Windsor, and Abingdon. C. B. EWART, Lieutenant Colonel, Commanding Royal Engineer, London District. Printed by order of the Secretary of State for the Home Department.

IN pursuance of instructions received from the Home Secretary in June last, Colonel Ewart visited the towns above named, and carefully investigated the arrangements already existing for the disposal of sewage, examining the country in the immediate vicinity to such an extent as he deemed requisite.

Dismissing as either pernicious or impracticable the cesspit, earth-closet, and purifying systems, he proceeds to consider the three systems of carriage of sewage by water, viz, the "joint system," the "mixed system," and the "separate system." Under the joint system, all the rain which falls within the drainage area is carried into the same sewers as the sewage matter, and passes with it, in a polluted state, to the outfall. Under the separate system the sewage is carried in separate sewers, and the rainfall passes into the rivers or is absorbed by the surface on which it falls. The mixed system is a modification of the first two systems, under which a portion only of the rainfall passes into the sewers, the rest being carried into natural channels. Colonel Ewart's objections to the joint system are, the insufficient size of the sewers, the accumulation of sand and other street material carried into them by the surface water at the bottom of the sewers, the injurious effluvium which proceeds from this mass of stagnant matter and forces its way into streets and dwelling-houses, and the danger to the public health from the overflows. He also considers that these objections equally militate against the mixed system. He therefore recommends to the Home Secretary the separate system as the proper method to be applied to the towns comprised in his report, and advises that a complete system of sewers should be at once laid out to receive all the sewage matter, that the rainfall should not be allowed to enter into these sewers, but either be stored for domestic use or allowed to run into its natural channels, that a complete system of water supply should be provided where it does not at present exist and that the water and sewage works of each town be, if possible, under the control of the same local authority. He further recommends that a sufficient area of land be selected and obtained for the purpose of irrigation, the quantity of land requisite being, he calculates, one acre to every 100 of the population, in order to admit of farming the lands subject to a judicious rotation of crops.

The A. B. C. Sewage Process. Second edition. Elliott Stock, 62, Paternoster-row.

THIS pamphlet contains accounts of the experiments recently made at Leicester, Tottenham, and Leamington on the purification and utilisation of sewage.

The A. B. C. mixture (so called from the initials of the three principal ingredients—Animal-charcoal, Blood, and Clay) is a compound which, when dissolved in either sewage or water, and added to the sewage, is said to produce an immediate precipitation of the greater part of the injurious matter in the form of large flakes, which rapidly fall to the bottom; the supernatant liquor being then allowed to flow into a tank, a small quantity of a solution of perchloride of iron is added to it, and this precipitates the sulphuretted hydrogen dissolved in the water, and removes the last traces of smell. To these four ingredients it has been found desirable to add a proportion of alum, which is said greatly to accelerate the process.

We have before alluded to the experiments which have been made, and, therefore, now only extract what are said to be the actual results:—

1.—The sewage contained 43.02 grains per imperial gallon of organic matter. Of this the A. B. C. process precipitated 33.33 grains, leaving only 9.69 grains in the water, and this from an average of fifty samples taken at intervals during the progress of the experiment.

2.—Hitherto the lime process has been acknowledged to be the best, and the Leicester mode of conducting it to be the best of its kind. The A. B. C. contrasts most favourably with this, inasmuch as, from samples taken at the same time from each, the water contains as follows:—

Water from the A. B. C. contained 9·69 grains per imp. gal.
" " lime " 16.18 " " "
having precipitated from the sewage the following proportions:—
Organic matter precipitated by the A. B. C., 77.48 per cent.
" " " lime 62.39 "

There are also other alleged advantages, for which we must refer our readers to the pamphlet. We think there is little doubt of the efficacy of the A. B. C. mixture, but we fear there is a danger of a speedy exhaustion of the supply of its chief component part.

A Rudimentary Treatise on the Manufacture of Bricks and Tiles, containing an outline of the principles of Brickmaking. By EDWARD DOBSON, A.I.C.E., M.I.B.A., author of the "Art of Building," "Masonry and Stone-Cutting," "Foundations and Concrete Work," &c., &c. Revised and corrected by CHARLES TOMLINSON, F.R.S. Fourth edition. With additions by ROBERT MALLET, A.M., F.R.S., M.I.C.E., &c. With illustrations. London: Virtue and Co., 26, Ivy lane. New York: Virtue and Jorston. 1868.

MR. DOBSON'S name is too well known in connection with other volumes of the "rudimentary series" to require that we should do more than state that the present edition of "bricks and tiles" has been carefully revised, and contains valuable additions to the contents of its three predecessors. The author has done everything in his power to render the information he lays before his readers complete and reliable. He mentions in the preface that, with a view of collecting accurate and precise details of the manner in which the process of brick and tile making was carried on in different localities, he drew up a series of questions and distributed them among those most likely to assist him in his researches. Some of these naturally went astray, but the majority were returned, containing valuable particulars and a large amount of practical information. After investigating what may be termed the general "art of brickmaking," examples are given of the method of conducting the operation in Holland, in Nottingham, Staffordshire, Great Grimsby, Suffolk, and London. Every district has, as may be expected, some little point of practice or usage, as it might be termed, differing from those of its neighbours, but the main features are very similar in all. A description is also given of the application of machinery to the same purposes and the recent improvements introduced since the year 1863, including Whitehead's improved clay-crushing and grinding roller mill, and other machines by the same maker. The manufacture of tiles is also treated of, particularly those of an encaustic character. This description of tiles has lately come very much into use, especially for pavements, borderings, and a variety of other useful and ornamental purposes. In fact, a work treating of brick manufacture could scarcely be regarded as complete were this branch of the subject altogether omitted. The same remark holds good respecting drain pipes, an enormous quantity being now employed in drainage and other sanitary works. For pipes of limited size up to about 18in. in diameter, they constitute the best means that could possibly be used for accomplishing the required object. The amateur or professional man who may desire to thoroughly "make up" the whole art and science of brick and tile making, will find that in Mr. Dobson's work it is treated in a manner which will enable him to master all the branches with the least amount of labour and trouble to himself.

A Practical Treatise on Heat as applied to the Useful Arts, for the Use of Engineers, Architects, &c. By THOMAS BOX, Author of "Practical Hydraulics." London: E. and F. N. Spon, 48, Charing Cross. 1868.

UNDER the above title we have a valuable little volume which combines the scientific and the popular style in a very happy mean. It is capable of being studied as a text book and also read as an interesting treatise. The aim of the author has clearly been to enlist the attention of his readers, and to facilitate the acquisition of knowledge by divesting the necessary medium of many of its unattractive features, not to use any stronger term. All the usual standards have been adhered to, such as the "unit of heat," "specific heat," "unit of temperature," and others, so that anyone who has investigated the subject of calorie in different works will find himself quite at home in the present. Most of the practical applications of heat to industrial, manufacturing, and useful purposes are investigated, and explanations given of what may, at first sight, appear to be unaccountable. The theory of combustion is exemplified by allusion to steam boilers, the relative effect they produce in proportion to their size, whether they are long or short boilers, and the necessity there exists for the proper regulation of the fire and the blast. Chapter V., on chimneys, will be found exceedingly well illustrated by examples, and the author draws a comparison between them and the discharge of pipes, which, to all intents and purposes, they really are, only we are accustomed to regard a pipe more as a medium for the conveyance of water than of air. The much-vexed question of heating air is entered into, and the various methods of accomplishing the operation described. They may be briefly summed up as consisting of the use of open fireplaces, stoves, steam pipes, and hot water pipes. The last method, upon the whole, would appear to be the preferable one, and is that which has been employed in the majority of instances with respect to churches and other public and private buildings.

Passing on to chapter XII. we come to the transmission of heat and laws of cooling. Heat may, generally speaking, be transmitted in three different ways—by radiation, conduction, and reflection. From a table, constructed from the formula of Mr. Cauchy, by which the temperature attained at a given depth by any substance in a given time may be calculated, sand is the most difficult substance to heat, and air the easiest. There is also an excellent table giving the loss of heat by horizontal pipes, of different diameters, cased in woollen felt or cotton wool, and covered by thin canvas or a jacketing of some non-conducting material. The loss occasioned by radiation is calculated from the well-known formula of Dulong and Petit. It would, in fact, be impossible to write a treatise on the laws and applications of heat without borrowing from the French *savans*, as they have been more assiduous than ourselves in furthering the cause of all the sciences, both pure and applied. Dulong and Petit, Péclet, Pouillet, Ganot, and many others, have been foremost in conducting experiments

and deducing formulas and laws, not only with respect to the subject of caloric, but of every other branch of physical science. The question of ventilation, one of the most important that can possibly arise, considering its influence upon the sanitary welfare of the inmates of large cities and towns, is treated as it undoubtedly deserves, and particular notice made of the best means to effect the adequate ventilation of schools, churches, and hospitals. The volume concludes with a chapter upon winds, and their action upon general ventilation, and as purifiers of the atmosphere. There are abundance of practical examples adduced as illustrations of the rules laid down, and anyone, by due attention and study, can thoroughly master them all. The volume is printed in capital type, and its whole style and get-up are such as to recommend it to the amateur, the student, and the professional man.

Our Office Table.

Some additions have been made to the Egyptian Saloon in the British Museum in the shape of some interesting statues, and a picture said to represent Thermuthis, the daughter of Pharaoh, who saved the infant Moses.

On Monday, the 9th inst., Benjamin Armitage, Esq., presented the International College, Spring-grove, with marble busts of H. R. H. the Prince of Wales and of Mr. Cobden, sculptured by Mr. M. Noble. A further portion of the college buildings is now being erected by Messrs. Holland and Hannen, at the cost of about £10,000, under the superintendence of the architects, Messrs. Norton and Massey.

The death of Edward Hildebrant, the celebrated painter, which we announced three weeks back, is followed by the appearance of six beautiful chromo-lithographs after water-colour paintings by him. R. Wagner, of Berlin, is the publisher, and the agents for England and France are Messrs. Goupiel and Co., of Southampton-street. Additional interest attaches to these souvenirs of the deceased artist from the fact that the proprietor of the originals, from a chivalrous desire for the spread of the fame of Hildebrant, of whom he was an intimate friend, has freely permitted them to be reproduced. They, moreover, widely differ from the general run of chromo-lithographs. The usual hard and harsh outlines are altogether removed, and the softness of the colours is beyond anything yet attained.

Notice has been given that application is intended to be made to Parliament, in the ensuing session, by the Mayor, Aldermen, and Commons of the City, for leave to bring in a Bill to empower the Commissioners of Sewers for the City of London and the liberties thereof, to require gas, water, telegraph, and other companies and corporations, societies and persons, to make use for the purpose of laying down, after the passing of the intended Act, gas, water, and other pipes, tubes for telegraph wires, and any other pipes or apparatus in any subway already formed, or in course of construction, or to be formed in or under any of the streets. To restrict the breaking-up of the surface of any such street. To require the alteration and the removal into the subways of pipes, tubes, wires, and other apparatus laid before the passing of the intended Act, and to prohibit the continuance and maintenance, except in the subways, of pipes, tubes, wires, and other apparatus laid before the passing of the intended Act. To empower the Commissioners to execute works, and to remove pipes, and to place pipes in the subways, and to break up the soil and pavement for that purpose. To provide for the maintenance of the pipes and apparatus in the subways by the parties to whom they belong, and for the supervision thereof by the Commissioners and their officers; and to vary and extinguish all rights and privileges of any company, society, corporation, or person which would interfere with the objects of the intended Act.

Pilgrims to Jerusalem will in future find the Holy Sepulchre restored, and the interior bronze decorations completed ere long. The painting of the cupola is finished, and the railings of the "gallery of lamps" are about to be sent from Paris. France—in fact, the Empress—has taken a leading part in this work.

The Smithfield Club Cattle Show is to commence at the Agricultural Hall, Islington, on Monday, December 7, and will continue open during the four following days. The aggregate amount of the prizes is £2,300.

The Home Secretary, it is stated, proposes to transfer from the police to the Metropolitan Board of Works the supervision of dangerous structures in London. The Board have, in answer to inquiries, signified their willingness to undertake the duty.

The Spanish Minister of the Colonies has directed that materials imported from abroad for roads, railways, and other public works in Cuba, Porto Rico, and the Philippines shall be exempt from duties.

Mr. Taylor, the pastor of a Baptist congregation in Kenosha Wisconsin (U.S.), is justly entitled to the appellation of a working minister. The tall spire of the edifice was greatly in need of a coat of paint; a painter by trade could not readily be found to undertake the difficult job, therefore Mr. Taylor proceeded to do the work himself. The church spire is tall and slender, the ball on the top of the rod being 100ft. from the surface of the ground. He succeeded, with a little help, in raising a slender ladder from the bell deck, reaching nearly to the brackets below the top ball of the spire. On this he ascended, and, standing on the small iron brackets, gave the ball two coats of paint. The most difficult part of the work, however, was to paint the long space of the spire below him. By the help of a line he drew up a rope, fastened it round the rod and then around his body, and swung off fearlessly from his standing place. By readjusting and lowering himself in the ropes as occasion required, he was enabled to swing himself around on all sides of the spire, giving a good coat of paint all the way down to the deck. This is, perhaps, not the first time a daring feat of this kind has been performed, but very likely there are few men unpractised in performances on the rope who would venture to dangle in the air at such a fearful height.

The Poplar District Board of Works have taken action under Mr. Torrens' Act. Two houses in Barr's-alley, Robin Hood Lane, were reported by the medical officer as unfit for human occupation. They were visited by the surveyor, who describes them as having two rooms each: they are approached by a covered passage 20ft. in length and 2ft. 9in. in width; the ground floor of both is below the surface of the ground; the ceilings are about 6ft. high; the bricks and plastering are decayed from damp, and the smell is offensive. The privy is in bad order, and the drainage defective. Houses and privy are devoid of water. There were a man, his wife, and four children in each house. The board passed a resolution ordering the landlord to demolish the houses within a period of three months.—*Lancet*.

At the annual general meeting of the Royal Scottish Academy of Painting, Sculpture, and Architecture, held in the library of the Academy, at Edinburgh, on Wednesday week, Mr. J. Dick Peddie, architect, was elected associate of the Academy.

Velocipede building now forms an important branch of trade in Paris. There are not only manufactories of these new locomotives, but there are foundries where the iron work of which they are composed is cast. One of these employs 250 workmen, and finishes off twelve velocipedes per day for a coachbuilder of Lyons, who sells them at the rate of twenty per day. An expert driver can do ten miles and a quarter (that is, sixteen kilometres) in an hour, but the average rate of travelling is ten kilometres in the sixty minutes (that is, six miles and a half), and with the same fatigue which would be experienced by walking at an ordinary pace during that time. The effort a man makes to advance 3ft. will carry him 9½ft. forward on a velocipede, but naturally on condition that his machine is well built and works easily. The ordinary price of a good one is £12.

The Metropolitan Board of Works has authorised the establishment of telegraphic communication between the firemen's station at Westminster and the new fire brigade station in course of erection in Adelaide-road, St. John's Wood, at an annual cost of £40, and between the latter station and that at Hampstead, at an annual cost of £20.

The Board of Works has just completed the re-paving of the Parliament Square, Edinburgh, and on Wednesday a stone, marked "I. K., 1572," within an oval, was set to mark the burial-place of John Knox.

The twenty-first annual dinner in aid of the Builders' Benevolent Institution will take place on Thursday next, at the Freemasons' Tavern; George F. Trollope, Esq., the President of the institution, in the chair.

The *Echo de Saone-et-Loire* gives the following interesting details:—Commandant de Reffye, orderly officer of the Emperor, and M. Bertrand, Conservator of the Museum of St. Germain, delegated by his Majesty, lately arrived to ascertain the results of the latest excavations at Beuvray. A Gallic mural rampart, with all its details of construction, answering to the description given by Cæsar, has been traced out over a length of 500 metres, and the entire system of the fortifications of the place has been laid bare. The foundations of the works are everywhere preserved, and the visitors themselves were able to take for the museum the iron clamps remaining in the woodwork. They saw, still in their original position, in the centre of the right redoubt, thirteen cinerary urns placed in a line, and containing ashes. A not less curious discovery is that of a sort of arsenal, which has furnished information, hitherto unknown, respecting the military condition of the Gauls. Smelting furnaces and forges of a rude construction were attached to the buildings which commanded the entrances. Four hundred Gallic medals, and a single Imperial one, bearing an early date of the reign of Augustus, already form an historical series of some considerable interest.

The *Lancet* regrets to hear that the staircases of the new St. Thomas's Hospital are to be constructed of Portland stone, a substance too soft to withstand the wear and tear of traffic, and believes the combination of wood and metal (Hawksley's patent), similar to that in use at the metropolitan stations, would be found to answer better.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Geographical Society, 8.30.
Society of Arts.—Opening meeting, 8.

TUESDAY.—Institution of Civil Engineers.—Discussion on, 1st, Mr Henderson's paper on "Lighthouse Apparatus and Lanterns;" 2nd, "Roman Rock Lighthouse, Simon's Bay, Cape of Good Hope," by Mr. J. F. Bourne, M. Inst. C.E.

WEDNESDAY.—Society of Arts.—"A Glance at the Past and Present of the Society of Arts, with some Suggestions as to the Future," by S. F. Davenport, Financial Officer of the Society.
Geological Society, 8.

FRIDAY.—Architectural Association.—Annual reports and discussion thereon.

SATURDAY.—Associated Arts Institute.—Exhibition of sketches, subject, "The Tempest," [illegible]; and a meeting—Discussion, Question, "Does the Literature of a Nation to any extent influence its Art?"

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

603. R. HEATHFIELD. IMPROVEMENTS IN THE MANUFACTURE OF CUT NAILS. Dated February 22, 1868.

The patentee claims manufacturing cut nails from hoops or strips of iron [illegible] steel, the edge or edges of which are rounded or bevelled or are of a V or diamond shape in cross sections, substantially as described and illustrated, whereby the nails cut from the said hoops or strips are more readily driven than [illegible] nails.—Patent completed.

610. T. LYTHGOE AND H. THORNTON. IMPROVEMENT IN THE CONSTRUCTION OF WALLS, FLOORS, AND ROOFS FOR DWELLING HOUSES AND OTHER STRUCTURES, AND [illegible] APPARATUS [illegible] THEREIN. Dated February 26, 1868.

The invention consists, first, in lining the wood or other frame or mould into which the concrete is filled with an improved compound having a hard and smooth surface. Second, in forming the outer and inner surfaces of the wall of fine concrete, which is run in between the outer frame or mould and a small inner frame. Third, in certain improved apparatus employed in the construction of walls and other parts of buildings made of concrete. Fourth, in attaching to the inside of the frame or mould triangular or other shaped projections placed horizontally and vertically, or otherwise, which projections produce corresponding recesses in the face of the building in imitation of the joints of the stones or panels or other designs, and in making recesses in the mould to produce ornaments

or other designs in relief. Last, in certain improved modes of constructing floors and roofs with bars of T-iron and concrete.—Patent completed.

674 H. CHAMBERLAIN, J. CRAVEN, AND H. WEDEKIND. IMPROVEMENTS IN BURNING BRICKS, LIME, CEMENT, &c. (Partly a communication.) Dated February 24, 1868.

This invention relates to two previous patents dated respectively December 22, 1859 (No. 2918), and June 24, 1864 (No. 1566). According to the present invention, it is proposed to combine with kilns constructed on the principle set forth in the specification of the patents before referred to, a system of forced combination obtained by the employment of a fan blower or exhauster situate on the outer or inner circumference, or on the top of the burning chamber of the kiln, and dispensing with the use of the usual chimney and smoke chamber.—Patent abandoned.

687 T. S. WHILOCK AND H. HARFORD. IMPROVEMENTS IN FASTENINGS FOR WINDOW SASHES. Dated February 28, 1868.

In constructing fastenings for window sashes, the inventors place across the channel in the frame of the window in which the lower sash works a metal bedplate in a dovetail recess, in which a dovetail plate slides horizontally. The dovetail plate is fixed to a vertical bar, which also slides horizontally, the bar having on its inner face two projecting pins or studs. The bar works in an opening made in the bead ing on the outer edge of the channel in which the lower sash works. The sliding bar is pressed inwards by a spring, so that when the bar is in its normal position, it fills up the opening in and forms a continuation o the beading. By means of a small bolt on the side of the window frame the sliding bar described may be fixed or rel ased. On the inner side of the lower sash a series of holes is made, with any two of which the pins or studs on the sliding bar may engage and thereby fix the sash in its closed position, or fix it at any required height in the frame. In order to unfasten the sash, the small bolt is first withdrawn, so as to liberate the sliding bar, when the latter may be pressed outwards, so as to withdraw its pins or studs from the holes in the sash. The sash may now be raised or lowered to the required extent, after which the sliding bar is loosed from the hand, when it is pressed back or inwards by its spring. The studs or pins on the sliding bar are thereby made to engage with the holes in the sash, and fix it in its closed or adjusted position. By shooting the small bolt the sliding bar is fixed.—Patent abandoned.

678 J. LEACOCK. IMPROVEMENTS IN PAVING FOR STREETS, ROADS, AND WAYS. Dated February 28, 1868.

This invention has for its object the construction of paving by using blocks or pieces of granite, syenite, or other suitable material, provided with holes in the same, and disposed in series or sets combined in one block, the holes forming the sets or rows to be sufficiently close to each other to be capable of being easily opened by a tool, so that blocks prepared in accordance with this invention shall afford a safe foothold for horses and other such like animals, and yet present such an even surface as required for wheels to travel on; and in case of severe traffic the level will be retained in proportion to the surface of the blocks, as against the single set, or about (say) twelve times to one.—Patent completed.

705 W. ROLLO. IMPROVEMENTS IN THE ARRANGEMENT AND CONSTRUCTION OF WATER-CLOSETS. Dated March 2, 1868.

This invention consists in using an air vessel of special construction to which the branch pipe from the water supply main pipe is directly connected, and the necessity for using a tank or cistern situated at a higher level than the pan of the closet is avoided.—Patent abandoned.

714 W. E. GEDGE. A MINERAL PAPER-HANGING INTENDED TO PRESERVE APARTMENTS FROM DAMPNESS. (A communication.) Dated March 3, 1868.

This invention consists in the preparation and application of a paper hanging termed by the inventor "mineral paper," the object of which is to preserve apartments against damp without suppressing it, and by means of coats of paint applied on a paper of any kind and of any size. This painting must be composed only of materials obtained from lead, such as minium or red lead, ceruse or white lead, litharge, calcined ore or lead ashes, which may be applied with any of the liquids used in painting. This paper bears a relief, forming ridges, this relief being composed of sand or of any material which is not decomposed by damp. These reliefs in ridges permit the damp to circulate without being constrained to rise again or to descend.—Patent completed.

718 J. BARKER. CERTAIN IMPROVEMENTS IN THE METHOD OF CONSUMING SMOKE, AND IN THE APPARATUS CONNECTED THEREWITH. Dated March 3, 1868.

The patentee claims, first, the novel employment, adaptation, and use of regularly feeding the furnaces of steam boilers with fuel by means of revolving shovels in connection with the mechanism described, or any slight modification thereof. Second, the novel employment and use of gas burners situated in the flues of boilers for the purpose of consuming smoke, together with the general arrangement of mechanism constituting these improvements, as described.—Patent completed.

722 J. MANLY. IMPROVEMENTS IN THOSE KINDS OF NAILS WHICH ARE USED UPON FURNITURE. Dated March 3, 1868.

The patentee claims the combination of a cast head with a wire, point, or shank in the manufacture of certain kinds of nails, affixed or put together by pressure, substantially as set forth and described.—Patent completed.

723 W. SPENCE. IMPROVEMENTS IN MACHINES FOR MAKING NAILS. (A communication.) Dated March 3, 1868.

This invention relates to the manufacture of nails from metal in a cold state, and consists in taking a bar drawn to the requisite section for the nails to be made therefrom, then removing from the same a series of small portions corresponding with nails of different dimensions, afterwards taking from another face of the bar another series of small portions, answering the purposes of brads; and last, in forming a series of larger nails.—Patent completed.

720 H. KENNEDY. AN IMPROVED MACHINE FOR CUTTING FILES. Dated March 3, 1868.

This invention relates to a machine wherein the file blank is supported below a vibrating cutter, which, by a succession of blows, forms the teeth from end to end of the said blank, either the cutter or the blank being caused to travel in the direction to cause the teeth to be cut regularly from end to end of the same. The nature of the said invention consists, chiefly, in regulating, controlling, and varying the movements of either the cutter or the file blank so that the teeth cut in the latter are not exactly parallel with each other; also in the peculiar construction and arrangement of the mechanism for supporting and adjusting the file blanks, in the novel formation of the cutter, and in the mode of and means for operating and adjusting the same.—Patent completed.

740 E. CLIFTON. IMPROVEMENTS IN ADJUSTABLE DOOR HANDLES. Dated March 4, 1868.

This invention relates to door handles or knobs and spindles which are capable of adjustment to the thickness of the door. The patentee employs the ordinary square spindle, one end of which may be permanently fixed into one knob, and the other end having screw threads formed on the angles to screw into the other knob, which is by preference (but may or may not be) bushed with metal. In order to secure the knob when screwed on the spindle to the thickness of the door, he applies a cotter in which is a slot hole, one part fitting the square of the spindle and the other part being round or sufficiently wide to allow of the spindle turning therein. This cotter is either fitted into a dovetail slot formed across the face, or that part of the knob towards the door, or it may be passed through a slot formed in the shank of the knob. The said cutter may be held in position by the rose or washer, which may be either screwed on the knob or on the door, or the said cotter may be made to spring, and thereby remain or keep in position, so as to hold the handle as adjusted to the door.—Patent completed.

743 A. M. CLARKE. IMPROVEMENTS IN PAVING ROADS, STREETS, OR WAYS. (A communication.) Dated March 4, 1868.

This invention relates to an improved system of metallic paving for roads, streets, and ways. The paving is formed of blocks of cast iron of about 8in. square, having four or other number of perforations at their centre for allowing the rain water to run through. The surfaces of these blocks are further grooved at right angles, the said grooves communicating with deeper cross channels, which are inclined so as to conduct the water to the holes above mentioned. The surface may further be steeled if desired. The interior of these blocks is so arranged that the ribs at the angles form ducts for the rain water.—Patent completed.

Trade News.

TENDERS.

ACTON.—For the erection of a public house, stabling, &c., Acton lane, Acton, W., for Wm. Williams, Esq. Mr. Edwd. Monson, jun., architect. Quantities supplied by Mr. D. W. Young:—

Harding	£1565
Messrs. Chamberlain	1339
Adamson and Son	1328
Wright (accepted)	1209
Welch	1195

CHEDDAR VALLEY.—For erecting the Axbridge Railway station:—

Brock, Bristol	£2700 0 0
Searl, Bridgwater (accepted)	1843 13 9

COWES, ISLE OF WIGHT.—For erecting new baths at Cowes, Isle of Wight. Quantities supplied:—

Chinnock	£4365
Nightingale	4567
Wheeler	4180
Stephens	4100
Thomas	3903

ILMINSTER (Somerset).—For the erection of a minister's house, schoolrooms, &c, in connection with the Congregational chapel, Stoke-sub-Hamdon. Mr. R. C. Bennett, architect:—

Tucker	£2077
Wilton	1986
Pudding and Rendall	1980
Chapman	1600
Staple and Bartlett (accepted)	1488

LONDON.—For erecting model dwellings, Grosvenor-mews, Bond street, for the St. George's parochial association. R. H. Burdon, architect. Quantities supplied:—

Morris	£2945
Patman and Fotheringham	2875
Fish	2630
Gammon and Son	2685
Longmire and Barge	2643
Stoner (accepted)	2615
Keys and Head (too late)	—

NORTH WOOLWICH.—For building five cottages and finishing five carcasses, near North Woolwich Gardens. Messrs. W. and T. Stone, architects:—

Batterley	£1625
Davis	1500
Clark	1266
Perry	1120

STANTON DREW.—For erecting a parsonage:—

	House.	Stables.	Roads.	Total.
Beavan	£1814 0	£289	£85	£2188 0
King	1759 0	260	29	1979 0
Davis	1570 0	290	—	1860 0
D. C. Jones	1555 0	242	25	1832 0
W. Jones	1520 0	225	40	1785 0
Brock	1423 10	203	20	1646 10
Hayes and Sons	1143 0	150	20	1613 0
Diment	1283 0	225	21	1535 0

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

PRIORY ESTATE, DOVER.—December 15.—For laying out about 13 acres of building land. Premiums of 50 and 20 guineas. Mr S. Finnis, Biggin-street, Dover.

NORTHAMPTON.—November 23.—Designs for the erection of a new central hall at Free Grammar School. T. B. Housman, secretary, St. Giles square, Northampton.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

LEICESTER WATERWORKS.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green-street, Leicester.

PENZANCE.—November 28.—For the improvement of the harbour of Mousehole, in the parish of Paul, near Penzance, in Cornwall. Rodd and Cornish, solicitors to the Commissioners, Penzance.

ROCHDALE.—November 24.—For lighting the new town-hall with gas. Z. Mellor, town clerk.

ROCHDALE.—November 24.—For warming and ventilating the new townhall. Z. Mellor, town clerk.

TOWER SUBWAY COMPANY.—November 30.—For the construction of lifts. Mr. P. Barlow, engineer, 26, Great George-street, S.W.

MARYPORT.—November 30.—For laying street gas mains, and for excavating, restoring, and sustaining the streets. J. Barwise, Harbour Office, Maryport.

November 30.—For the erection of a block of model buildings, near Tottenham Court-road. Mr. S. Legg, architect, 32, Bedford row, W.C.

HAMPTON COURT AND WALTON BRIDGES.—December 16. Tender for tolls. Mitra, Hamoton Court.

CHELSEA.—November 24.—For the construction of about 640ft. run of brick sewer. C. Lahee, Vestry hall, Kings road, Chelsea.

ADMIRALTY.—November 24.—For the supply of iron chain cables, &c. A. Brady, Registrar of contracts.

ST. JAMES'S CHURCH, GREAT YARMOUTH.—December 12. —For the erection of a portion of this church. J. P. Seddon, architect, 12, Park street, Westminster.

REIGATE.—For completing a residence at Reigate. J. F. Matthews, London road, Reigate.

ST. MARY ABBOTT, KENSINGTON.—For the construction of about 1,100ft. of brick sewer. Mr. J. Whitchurch, surveyor, 7, Lincoln's Inn Fields.

STREATHAM.—December 1.—For the construction of about 3,480ft. of brick sewers. A. A. Corsellis, Battersea rise, Wandsworth, S.W.

STOKE-ON-TRENT.—November 24.—For certain alterations and additions required at the Spittals Workhouse, in adapting and converting the old school buildings into sick and other wards, together with the other works connected therewith. C. Daniel, clerk to the guardians, Parish office, Stoke-on-Trent.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

W. King, York road, Wandsworth, stonemason—C. Cornes, King street, Hammersmith, carpenter—Joseph Moores, Poole, plumber—Charles Thomas, Alexandra road, Kilburn, plasterer.

TO SURRENDER IN THE COUNTRY.

R. Martin, Liverpool, contractor—J. Chesworth, Liverpool, estate agent—H. Halton, Hyde, Cheshire, joiner—D. Long, Hunstanton, Norfolk, carpenter—J. Foster, Leeds, plasterer—C. J. Welsh, Springbourne, Hampshire, painter—William Brooks, Barnley, plumber and glazier—John Emson, Wolverhampton, gas engineer William Robinson Levens, Middleton, builder—Henry Sharman, Ellesmere, builder.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 2, R. Payne, Little Pulteney street, Golden square, bricklayer—December 2, A. Powley, Warren street, Tottenham court road, plumber and glazier—December 4, T. Llewellyn, York street, Walworth, builder—December 4, S. Callard, Ashdown street, Kentish Town, builder—December 4, G. H. Hall, Willesden, builder—December 8, S. Benn, Great Horton, plumber and glazier.

PARTNERSHIPS DISSOLVED.

J. Whitehead and W. Helliwell, Halifax, chimney repairers and lightning conductor makers—W. Kellett and R. Kellett, Wigan, Lancashire, land and mining surveyors—Jemingham and Coleman, Peckham Rye, builders—Edwards and Co, Stainland, Yorkshire, stonemasons—Smith and Ward, Fenton, builders.

DECLARATION OF DIVIDENDS.

W. Sheppard, Gloucester, builder and contractor, first div. of 7s. 3½d., any Wednesday.

SCOTCH SEQUESTRATION.

Richard Lees, Edinburgh, builder, November 24, at 1

BANKRUPTCIES ANNULLED.

W. Miller, Lewisham, Kent, builder—C. Simonds, Euston road, Middlesex, builder.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 27, 1868.

MODERN ARCHITECTURE.—THE PHILOSOPHY OF FAILURE AND THE SECRET OF SUCCESS.

IT will be admitted by intelligent observers of all parties, cliques, and schools that modern architecture regarded from an art point of view is not a success. We have huge edifices, triumphs of engineering skill imposing piles of building resplendent with trophies of the stone-carver's craft, and magnificent erections of iron and glass, marvellous as specimens of metalwork, and gorgeous in their effect. Nevertheless we have no distinctive and satisfactory style, no precise principle of construction, no characteristic method of ornamentation, and no practical power of realising that idea of *beauty* which hovers in thought before the mind of every intelligent designer, which all true architects strive to grasp and make their own, and without which there can be no permanent pleasure in art work, no enduring satisfaction, or effectual fame. It is, therefore, of the last importance to search out the source of this failure. Until we discover the fault it is vain to hope for improvement.

It may seem but the repetition of a hackneyed truism to assert that the *true* and the *beautiful* are inseparable. Yet if we are not greatly deceived it is because in modern architecture these two qualities are regarded and treated as separable that the practice of art is a failure. As a matter of fact the attainment of beauty is proposed as an object altogether apart from the consideration of truth. For example, an architect sits down to design a building required for a specific purpose, and to be erected under certain prescribed conditions of cost, construction, ground plan as determined by the site, and accessory surroundings. What is his intention? What the task which he proposes to himself? First, he either resolves to adhere closely to his instructions and designs his building on a purely utilitarian principle, trusting to his ingenuity to make it beautiful by a subsequent process of ornamentation; or he struggles with the difficulties presented by his instructions, and contrives to eke out a tower here or a façade there, in order to give what he is pleased to describe as an artistic effect to his work, or, in other words, to make it appear beautiful. The supplementary application of ornament, of course, serves, as in the former case, to cap the process of beautifying. Now, we contend that in both of these methods of work truth is sacrificed; the realisation of the idea of beauty is proposed as an independent object, and hence the inevitable failure. The man who builds with a simply utilitarian object, regardless of beauty, and then adorns his building to make it captivate the eye with an appearance of beauty is practising an æsthetic fraud. His edifice is not beautiful in itself, he is conscious of its defect; hence he labours to give it a meretricious aspect by means of ornament. Is it wonderful if he fails? Is it strange if the art instinct of the public sees through the deception and rejects the sham? Again, the designer who distorts the constructional parts of his work with the aim to realise something of beauty is no less untruthful, inasmuch as the façade or the tower he contrives to produce are not necessary—they form no integral part of the utile edifice. The public eye quickly detects the artifice, discovers its hollowness, and, in contempt of the designer's disregard of truth, despises his work. In illustration of these supposed classes of work, and in proof that they are not imaginative, it is only necessary to instance the numberless hotels, stations, warehouses, and public buildings scattered throughout the country which in themselves are ugly, but to the perverted vision of a vitiated taste are made tolerable by an incrustation of cornices, carved friezes, statuettes, intricate metalwork and elaborate ornament. These are examples of buildings erected without a thought of beauty and beautified afterwards. The class of works which are untruthful in their form, and ape beauty rather than possess it, may be illustrated by the twelve or fourteen-roomed houses fashioned like castles, the insurance offices and banks built to resemble edifices of great civic importance. The cloistered bath and wash houses, the club houses and reading rooms, like Greek or Roman temples, the divans like ducal palaces, and the parish churches in town and country constructed as cathedrals—all these things are *deceptive*, and it is because they transgress the principle of truth and regard the attainment of beauty as an object to be gained apart from truth, and even in violation of its immutable and universal laws, that they are failures.

But a practical view of the question requires that we should make some attempt to answer the question, What is *truth* in relation to architecture? The affirmation of mere general propositions, however convincing, can serve no useful purpose. Confessedly, it is a task of great difficulty to define the precise conditions of architectural truth. On the first blush of the matter it is self-evident that there must be purity of intention in the design. If a man sets out with the purpose of building a barn, it must not be a Swiss villa or a Chinese joss-house that he plans—it must be a barn pure and simple. The practical error takes its rise in the false notion that certain objects are more respectable and pleasing than others, and, falling into the vicious practice of flattery, the architect deems it more complimentary to the feelings of his client or considerate to public taste to make his barn look like something very charming, in the shape of a light and graceful out-building, precisely on the same principle that he continues to render a twelve or fourteen-roomed house something like a castle. Now, truth would forbid all such misrepresentation of fact. Then, again, truth would interdict all meretricious ornament—that is to say, it would deter the use of embellishments properly so-called. It would require a grandeur, and a style and degree of ornamentation befitting the nature of the building and the purpose to which it was to be applied, but it would not allow the enrichment of a plain mass with a view to raise it to the pitch of beauty supposed to be possessed by a building of more elaborate figure. The ornament prescribed by truth would be suitable in kind and quantity to a mass of the form which it was proposed to decorate, and neither intended to conceal nor pervert its figure. If these two fundamental conditions of truth in architecture are fairly and honestly interpreted and applied—first, purity of intention in design, and, second, perfect consistency in the use of ornament—the inevitable consequence must be that the designer will be compelled, if he seeks *beauty* at all, to alter it in the original arrangement and configuration of the various parts of his building in its masses, and in close connection with absolute truth. This at once brings us face to face with the practical aspect of the subject. It is because architects design their works as objects of utility first, and then attempt to make them beautiful afterwards, that they fail. It is in the abandonment of this erroneous policy, and in the adoption of a method seeking beauty in the arrangement of masses, that we shall find the secret of success. A very little quiet thought and unprejudiced observation must suffice to convince any intelligent man that this view of the case is substantially correct. How numerous are the examples of good work marred by the vicious practice of subsequent enrichment. Take, for instance, three well known buildings; first, Salisbury Cathedral. No one who is well versed in architecture, or endowed with a faculty of eclectic taste properly cultivated, will, we presume, be found to estimate that building as a very noble or pure work of art. It is admitted by all to be weak, especially at the west front, and generally spoiled by the redundancy of its accessory masses and ornamentation. Nevertheless, let any one examine the masses of Salisbury Cathedral in the dull light of the evening or in the early morning, when the details are obscured; let him compare the spire with the base line and the general mass with its several parts, he will detect a harmony, a rhythm, and a consequent beauty which is altogether masked and rendered ineffectual by the mistaken character of the system of ornamentation. A still more striking illustration of our idea is to be found in the mass of the Victoria Tower of the Houses of Parliament. Seen in the dusk there is a grandeur and imposing effect produced by that structure which is altogether lost when viewed in a strong light, with its miserable details, so much below the mass in point of excellence, visible. St. Paul's Cathedral and the river elevation of Somerset House are equally notable examples of this marring of masses by injudicious efforts to enrich and ornament. Had the several architects of the works to which we have referred been content to treat their original conception without striving to make them appear more beautiful than their intrinsic form had rendered them the effect would have been *truthful* and infinitely finer. These considerations obviously point to conclusions that it is on the attainment of beauty in the management of his utilitarian design that the architect should concentrate his care and skill. This was the principle on which the designers of the best and purest epochs in the history of art acted. The works which have been preserved for us from the thirteenth century are eminently *truthful* in their intention. They tell the story of their use without disguise or prevarication. They do not seek to appear more noble or higher in the scale of beauty than they are placed as respects the arrangement, configuration, and balance of the masses of which they are composed. The ornament is never excessive, it never belongs to a class of building more elevated or elaborate than that to which it is applied; it never suggests the idea that the designer aimed to make his work look *enriched* or beautified. Simplicity and truth are characteristics of a style which all accept as thoroughly honest and pre-eminently respectable.

The error into which the Gothic revivalists have fallen is that they have attempted to reproduce the *form* of mediæval work but neglected the *spirit*. Now it must be evident that much of the architecture which we admire in its place, amid the associations of the thirteenth century, would be anachronic, however skilfully reproduced in the nineteenth century. What we want is a revival of the old spirit of manly out-spoken honesty and the love of truth which animated the old art-architects. Special developments of art are inseparably connected with conditions of time, place, and circumstance. We cannot live, and dress, or build as they did who lived in the thirteenth century, but we can subject ourselves to the same pure and simple influences of truth which swayed the minds whose creations we so thoroughly appreciate. We can pursue their method, we can eschew our modern mistake in divorcing the ideas of truth and beauty, and we can strive for that primeval phase of excellence which consists in the production of harmony and simple elegance. When we have mastered the principle of such a revival, and embodied it effectually and truthfully in the practice of art, then, and not until then, shall we have studied to some useful purpose the philosophy of failure and discovered the secret of success in modern architecture; then, and not

before, will be a reasonable prospect of developing a respectable style suitable to the necessities of the nineteenth century, and worthy of being handed down to posterity as an expression of our national taste and a register of our intellectual progress.

COLOURING SHOW DRAWINGS.

NEITHER the engineers nor the architects can consider themselves perfect in their respective professions unless they are first-rate draughtsmen; their knowledge in other branches and the ideas they may originate are alike useless unless they have perfect ability to transmit those ideas to the minds of others. No man either can consider himself a first-rate draughtsman unless he can both colour and shade well, unless, in a word, he has a certain amount of artistic knowledge and taste. The former may be acquired, but the latter can only be cultivated; it can never be created by education.

Drawings are usually placed in two classifications—line drawings and coloured drawings. Many professional men have a dislike to coloured drawings, and we fancy this dislike is more prevalent in Great Britain than on the continent. Certain it is that our continental neighbours pay more attention and devote more study and instruction to this matter than we do. Allowing for this dislike amongst us, it cannot be denied that a good line drawing, when properly coloured and shaded, has a pleasing effect, and is also the clearest possible exponent of a particular arrangement of parts. The colouring and shading give a distinctness to each separate portion of the whole.

The preparation of a first-class finished drawing is a matter involving at once labour, skill, and exceptional care, and, added to all these, experience; we must know beforehand to a great extent what effect each particular colour and every variation of tint will have on the general appearance of the whole. A drawing, to be the very best of its kind, must be commenced with that view; the finish can never be an afterthought. Care must be exercised at the outset in the purchase of the paper. Incontestably the best paper for such a purpose must be hand-made, and no paper enjoys wider or more deserved popularity in either of the professions than Whatman's. Some persons like it rough, others prefer it smooth; for our own part, we do not think any arbitrary rule can be laid down. The person about to execute the drawing must judge of what will suit his particular subject best. For very large work, a somewhat rough paper is very suitable, but for small pictures, the sort known as middling, or that which is the same quality as what is afterwards "hot-pressed," answers best. When the paper is to be strained, as indeed it should invariably be for finished work, "hot-pressed" answers very well, as the wetting takes a little of the size and very smooth face off the paper, leaving it sufficiently rough to take either flat tints or stippling with great facility. When the paper is being purchased, it should be, if possible, three years old; this is unfortunately, however, a matter of much difficulty, as there is but little old paper in the market, and the only means to obtain it is to try at some of the little out-of-the-way stationers, who may have old stock on hand. Old paper is best, because it is harder and more set than the new papers, it is not so "fluffy" and rotten, and bears stippling and washing much better. The sheet should be held on nearly a level with the eye, in a horizontal position, and opposite a strong light, to detect any flaws or imperfections in the paper, and which would often escape any but a careful scrutiny until strained, when the wetting would render it at once apparent when the sheet had become dry again; and sometimes the defect would not be visible till the picture might be more than half completed.

Having secured a good sheet of moderate thickness, the next step is to strain it. This is ever a troublesome and difficult matter to do successfully. It is not a thing that can be half done or indifferently done, because if not well done it is almost better left undone. The paper should be laid down on the board to which it is to be secured, with the face to be drawn on placed next to the board, which should of course be spotlessly clean and clear of the remotest trace of dust. The sheet should be then thoroughly wetted on the back with a large flat brush, such as is used for copying letters, and this being done, be turned over and the opposite side should be treated similarly. Some persons advise its being then wrapped in a clean cloth, and left so for at least half an hour. We confess we prefer to let it lie flat, and perhaps to lay a clean damp cloth over it, as being less likely to crack or injure the face, on the preservation of which depends much of the success of the colouring. The board should be at least an inch and a half larger than the paper both in breadth and length. The paper should be set as nearly square as possible, without resorting to a tee on the board. The edges should be all rubbed with hot strong glue for about a width of half an inch all round, on the side next the board, and the glue should be laid on with a small brush; and the draughtsman ought to begin at the centre of the length of the margin, and work to each end, doing the same on all the edges; and then, without any attempt to pull the paper, merely to let the margins rest down on the board, and, by means of a long straight edge, to press the glued parts down all round, so as to secure it firmly to the board. The whole should be left so for half an hour, care being taken to watch that no "cockling" of the glued edges took place by using the straight edge when necessary. After this the board may be leant against a wall for an hour or two, and then being laid on the bench a piece of old clean news or other smooth paper to be laid down so as to cover the whole of the paper. The following day the paper should be ready for use.

We have already stated that a good drawing must be commenced with the view that it should be so, and now the draughtsman must exercise all his skill to preserve his paper from soil or mark, and, above all, to avoid the use of rubber by every means in his power, as it spoils the paper for colour and renders it apt to pick up dust. In "inking in" his drawing, he must carefully avoid putting in any dotted lines till after the colouring has been completed, as the ink will wash up. Some persons wash the drawing over with a damp sponge after it has been "inked in," and this removes all superfluous ink, and leaves it ready for colour without any danger of the ink washing up. This proceeding is, however, defective, because the ink is liable to "smear" all over the paper, making the remedy worse than the disease.

In using the colours there are two distinct processes in finishing a drawing, viz., "tinting and shading," and it is optional which may be done first, but it is best as a rule to begin with the latter, as then the face of the paper is clear, and there is no chance of the shading colour and the body tinting mixing or washing up. In shading the draughtsman must consider attentively the character of the structure to be finished up, to study the relative position of the various parts, and to labour to make the picture at once as elegant and as distinct as possible. A great point in these drawings is that the shading should be forcible without being heavy. Shading is a very tedious operation to execute properly. Two modes may be adopted, each of which may be modified to suit the habits of the draughtsman. One of these modes is most applicable to large surfaces, and it consists in putting in successive works of the shading tint, carrying the first tint about half way over the surface, or nearly so, and then softening it off with a clean damp brush. This, and indeed the first three coats, should be very thin indeed, only enough to tint the paper, and then they may be gradually strengthened. Each successive coat should be narrower than the last, until it makes the shaded surface darkest in a line a little removed from the edge of the surface; and the shading should be perfectly smooth and flat, and melt away gently into the white light, which should be nearly midway between the centre and the line or edge next the light.

PAINTING ST. PAUL'S.

ART at all times has been naturally divided into the two great divisions of past and present, but never, it is certain, with that distinctness and wideness of difference that it is now in these days of rapid change. In old times the change was from one phase of a style of art to another phase following and growing out of it; in these modern times it is a change of *principles of artistic action*, as well as a change in styles of art. In old days this at least may be affirmed, that the works produced bear on the face of them evidence of the individuality that brought them into being, while the whole of the work professing to be fine art in these latter days is the result of a system of manufacture and the consequent *absence* of this so much prized and expressive individuality. Hence does it become more and more interesting and important every day to help and preserve all—and little enough it is—that remains to us of this individuality of artistic expression as exemplified in the works of the past, and it is this consideration which makes St. Paul's a building of very peculiar signification and interest, and what is now being done in it one of the most important practical art problems of this generation. If the subject wearies the reader it ought not to do so, and we feel that no small good will be done to the cause of art and artists if by any argument and possibility we shall succeed in bringing again to the light of day any—however small—section of the actual and real stone walling of the interior of St. Paul's Cathedral, and at the same time point out what might have been and perhaps yet may be done to *decorate* it. You cannot pull down St. Paul's and put up another building in its place, or put up a pole advertising the waste ground on which it stood "to let," like the site of a common city church, but it is possible to completely destroy the whole art value of this great cathedral by dint of ignorant experimenting, and by efforts to do something when you do not know what to do.

I should like to begin this somewhat difficult subject with an art axiom or common-sense truism, so as, if possible, to carry the reader fairly into the subject, and make him at least agree with the main proposition before us, which is, how to decorate St. Paul's artistically, and so as to vitally interest the general public mind in it, and increase, if possible, the beauty of the interior of this greatest of England's churches. I would begin by saying that it is the duty, the bounden duty of the public, and of the public authorities who represent them, and who do their technical and professional work for them, to employ the very best art means the age affords. If the Royal Academy, as most people admit, contains within it the best and highest of the artistic capacity which the time and country has produced, and St. Paul's be the noblest of our buildings, then I humbly submit it was the duty of the Dean and Chapter of St. Paul's, and of those whom they employed to advise them, to call in the aid of the *painters* of the Royal Academy in the decoration of St. Paul's Cathedral. No one, I think, will dispute this intelligible and perfectly common-sense truism. It would have seemed only a fair and simple act of ordinary patriotism to have solicited from among the Royal Academy body of artists, designs at least for the whole of the proposed painted windows, for the mosaics, and for a painted ceiling and walls. This is not merely to employ an

English contractor or decorator, or manufacturer of mosaic or glass, to do the manual work, and as a matter of business, but to help to realise the idea of employing in the best and noblest place the very best and most able men and artists. Some there are who must surely sympathise with this proposition, and agree that thus much *ought* to have been done. But what *has* been done? If the curious spectator has been surprised, as we feel sure he must have been, with the strange sight of the new organ and the scaffolding which supports it, and the iron girders which will help him to mount up to it, and the common oil paint which hides the stone walls and narrows the dome, and if perchance he hear, or even find, the old organ, and asks but to discover, may be, that the screen has been sold for old timber, yet more, as I think, will such spectator be confounded and utterly dismayed by the sight of the *ceiling* of St. Paul's now in course of being "decorated." To describe it would be impossible, or even to illustrate it by a woodcut, however carefully drawn; the idea can only be conveyed to those who cannot go and see it by the simple statement of the plain facts—that each circular panel (one only is as yet completed) of the ceiling of the east end of this building is painted in *imitation of mouldings* and sunk panels! No one can see such work as this nowadays in a common music hall or new theatre, or even smart public-house, the mere work, as work, being as bad as the design for it. Let no one who can go and see this specimen of decorative art take this statement on trust, and let him take good care to remember where he is while gazing at it—in St. Paul's Cathedral! Now, I think that even Mr. Penrose will allow this much, that when Sir Christopher Wren, the architect of this noble building, designed this ceiling and left these circular panels quite flat and plain, he intended them to be painted, *i.e.*, by a *painter* of some kind or other, and that such painting should consist of figures representative of some action or other, or illustrative of some sacred story. Surely he would have said to Rubens or Raphael or Angelico, "Go *you* and paint that round panel." This was the policy of Julius II. when the ceiling of the Sistine had to be "decorated," and of Leo X. when he found work for Raphael in the Vatican; and of our Charles II. when the Whitehall banqueting-room needed decoration; and it really seems to have been the way universally in the times that are gone by for those who employed art labour of any kind to find out, as if by instinct, the best men of their time, and then to employ their artistic skill and genius in the execution and decoration of the best and greatest works. We seem almost to reverse all this, and our painters expend all their time and talents in providing for the exigencies of the drawing and the dining-room. Cathedrals are either too large or too small for them, and are left to the mere tradesman and manufacturer of art.

To do thorough justice to this important subject would in effect be to write a specification for the entire restoration of the whole cathedral, and I have but space to hint at but one or two needful things. Confining ourselves therefore to the *roof* for the present, we may ask, Is it not a mistake to *gild* ornamental details? Round the circular panels, now so spoilt, Wren with great judgment designed some admirable ornament sunk within bounding mouldings; this has all been brightly gilt, so that the beauty of the details is lost by bright metallic lights and reflections, pretty enough in themselves, but destructive of the modelling of the ornament. This will be plain to anyone who looks at the capitally cut keystones of the arches under the gallery of the dome, where all the fine carving is completely lost under the coat of gilding so injudiciously put over it all, the high lights and bright reflections killing the sculpture. I think it may be laid down as a general and certain rule in artistic decoration, that the metallic gold in an interior should be confined to flat surfaces, to plain mouldings, and to very small ornaments, as where the moulding itself is cut into. The groundwork, for instance, of these circular panels before painting might have been of burnished gold, the figures on it, however quaint or natural, telling from the floor of the church with perhaps a truer force and effect than the simple painting of Rubens in the Whitehall ceiling. The three-cornered panels which make up the space between the circular centre panels and the four semi-circular arches which support them would be of course treated in like manner, and be made parts of the same composition. Surely this subject is worth a little more reflection before the whole roof is covered with "decoration" inferior to good papering. Thus, as it seems to me, there are in St. Paul's three things to be done; first, the whole of the wretched stone-coloured paint to clean off from the walls, thus to make visible and evident the colour of the stone and the real nature of the material of which the building is composed, and at the same time to improve and perfect the sound of it. Secondly, to replace as far as possible the stalls and organ loft and organ, and the old arrangements of the sanctuary or choir, and thus to preserve the idea of the church and the evidence of the motive of its building. And, thirdly, the stone surface being all visible, to decorate the interior bit by bit, and gradually and at the same time help the art of the age and country by giving the *painting* of it to painters—not, it is true, to Buonarroti and Raphael, or to Correggio or Rubens—for the time has not produced them or such as them—but to those whom it *has* brought forth, and in part at least helped and nourished—to Millais, Hunt, Dyce, and others such as them, and take the work out of the hands of mere tradesmen and art manufacturers of coloured glass and decoration. It is to be feared, however, that we have but very faint means indeed in this country of forming even a feeble judgment of what a *painted* building means, for with the solitary exception of the before mentioned ceiling of the Whitehall chapel, there is no building in London coloured by a *painter*, or rather, as we ought to phrase it, an artist-painter. There are plenty of "decorated" buildings coloured all over from roof to pavement, but such work does not and cannot rank higher than paper hanging. Rubens' painted ceiling will give some idea of what such splendid and magnificent work is, and a restored St. Paul's is worth a like effort.

C. B. A.

ASSOCIATED ARTS' INSTITUTE.

AT the usual fortnightly meeting of this Institute, held on Saturday evening, the 14th inst, Mr. A. H. Wall, vice-president, in the chair, Messrs. Charles Hazard and R. G. Box were duly elected members. R. Soden Smith, Esq., M.A., F.S.A., of the Art Library, South Kensington Museum, then read a paper—

ON SOME PHASES OF ORNAMENTAL ART CONSIDERED IN RELATION TO ETHNOLOGY.

During the last session of the Institute, the author read a paper "On the Ethnology of Art," in which he advanced the theory that all art was referable to three classes—viz., instinctive, intellectual, and moral or spiritual art, answering to the degrees of proportional development among the various races of mankind, of man's sensuous, mental, or moral nature. Instinctive art is the subject treated of in the present paper. Though the term "instinctive" cannot wholly be applied to any effort of the human mind which results in artistic feeling, it is the most expressive word the author can use. Architecture has been styled the parent of decoration, and justly so, in a general sense; but decorative art exists where architecture is unknown, and in countries where such architecture as there is is obviously subsequent in introduction or invention to the art now under consideration. Architecture is developed by civilisation, but instinctive art exists where civilisation has not appeared. The aim of such art cannot, therefore, be high; it occupies itself with surface decoration, not as subordinate to, and enhancing the effects of, sculpture and painting, but as the only art known, and, therefore, primary, instead of, as it should be, secondary. Instinctive art does not seek to interpret the aspects of external nature and translate them into a language intelligible to other men; this is the aim set before the landscape painter; it does not seek to reveal the story of human life or betray the secret springs of human action: this is part of the magnificent field open to the history painter. Its work is lower than this. The objects that surround daily life, the utensils of daily work, these are felt to be wanting in something beyond mere utility—something that will in no way hinder their use, something to be superadded to them for the satisfaction and rest of the eye. The results produced by this yearning after ornament are what the author calls "instinctive" art. Though each art is mainly traceable in efforts to decorate surfaces, it also influences form and among certain nations exceeding grace of curve and outline follows from an innate perception of the harmonies of form when the workman has materials sufficiently yielding—a perception analogous to that possessed by many of number, time, and tune. Within its own necessarily confined sphere, instinctive art may attain a perfection appropriate to each phase of art, besides that completion of the whole, that highest perfection which would result were the efforts of all three (instinctive, intellectual, and moral) arts united in their utmost development. The lower perfection (if the phrase is allowable) is gained most readily by instinctive art. It seems to be devoid of the hesitation and embarrassment incident to reflection; it works with a security of reaching its more lowly aim, and with a recklessness unknown in the highest art. Its nature is sensuous; it originates merely in the gratification of the sense, and begins and ends its appeal to man by pleasing his eye, as in colour or form, and satisfying his sense of touch, as in the small diaper on a savage's paddle, giving him a more secure hold. All art (the statement is here a truism) strives to appeal to make itself felt by some special quality or aspiration of man's nature. Instinctive art is not symbolic, for it does not address itself to the intellect; it is not truly æsthetic, for it does not stir the emotions. Its appeal is to man's lower nature. Its limits are best noted by observing its failures. While it confines itself to the outline of a club or the prow of a canoe, to the distribution (with an almost unerring sense of fitness) of a carved diaper, to the disposal in admirable balance of the colours on a chequered mat, to the enriching a surface with the most complex gold filigree or covering it with interlacings almost too minute to disentangle, success follows; but when attempts are made to realise animal or human forms the result is inevitably grotesque failure. The latter subjects of art belong to a nobler range and require the development of higher faculties to handle them safely, and it is therefore observable that instinctive art is often faulty among races of high organisation. Instinct in them is partially superseded by knowledge, and knowledge is not perfect. Instinctive art is limited wholly to conventional forms, whether in the round or the flat. The invention of these forms is probably the result of general as well as particular impressions made by the aspects and objects of external nature acting on certain innate faculties of the mind. For example:—The sense of direction is innate; there is no doubt in the mind about straightness; also, certain curves, as that of an egg, may please or even satisfy the eye. Such a curve is instinctively brought into relation with the innate notion of straightness, and thus an element of ornament is acquired. Again, the play of light among foliage or its glow over a wide landscape makes an impression more or less intense upon the mind. The sense of colour is an instinct with some races, notably with those living in tropical lands, is roused, and finds expression for itself, not imitating any particular object, but striving after a remembrance of the general impression in the combination of the most varied or the most gorgeous tones within their observer's knowledge or reach. Instinctive art in its primary expression deals wholly with forms that have no exact counterpart in external nature; it passes its limits when it strives after direct imitation. In form, its merit is due, first, to keeping with absolute certainty in view the use for which the object is intended, thus obeying a primary law of construction; secondly, to a perception (innate among some races, traditional among others) of the lines which, while se-

curing and furthering use, will most thoroughly satisfy the eye. In surface ornament its merit is due to the complete subordination of the ornament to the general form—to its suggestion of additional excellence in the object decorated, as solidity, toughness, or strength. The defects of such art are its limited range and the low order of faculties to which it appeals, neither influencing the intellect nor moving the heart.

Instinctive art amongst the races ethnologically classed as Malayan (New Zealanders, South Sea Islanders, &c.) is exemplified in collections of weapons and implements and utensils used by those races. The diapers woven in matting made by half-civilised tribes are often excellent examples of instinctive surface decoration. The patterns are geometrical, and the colours few and simple, and the effect is produced by the nice sense of proportion with which they are adjusted. The Chinese (the great representatives of the Mongolian tribe) seem incapable of conceiving moral or spiritual art, and intellectual art is scarcely developed amongst them. It seems doubtful if it is at all indigenous. They are constructors and builders, but can scarcely be called architects. Their instinctive art, though remarkable, is not pure, being mingled with efforts more or less abortive to attain to intellectual art, which their mental organisation prevents them comprehending. Their surface decoration is often marred by the introduction of ill-conceived elements. This especially applies to carving in relief. Scarcely an example, apart from colour, is quite satisfactory. In open work decoration the junction and combination of lines is so strange as to deprive the eye of repose; the spring of curve from curve is often not tangential; and a singular effect (which the author prefers to call Chineseism, for want of a more expressive word) separated Chinese art from that of all the "outer barbarians." With respect to colour, the instinctive art of the Chinese is instructive and admirable. They are colourists of remarkable skill, though surpassed by the Japanese, also a Mongolian race. Colour, as used by these nations, is unlike anything else in the world. Its chief characteristic is its dependence on secondaries and tertiaries, and in the use of some of these (as pale green, pink, and a broken blue) they are unsurpassed by any ornamentalists. They understand the application of the most vivid red, yellow, and the brightest white, but these are applied only in very small quantities in proportion to the broken colours. By the magic of colour the Chinese harmonise the discordant elements of form which intrude into their compositions and conceal errors or failures that would otherwise be fatal. In considerable surfaces of one tone their management of colour is admirable. The senseless uniformity of hue which mars the effect of many a piece of Sévres is skilfully avoided by the Chinese potter. His colour on a vase deepens and ripens in parts, as the sunny side of an apple or cherry, and it palpitates, as do the hues of nature. The source of this effect is at length known to, and sought to be realised by, English and French potters. The sooner it reaches the Saxon potters the better will it be for Dresden. Among the Celts (a race higher in the scale of humanity) instinctive art was developed in the highest degree, while, at the same time, no advance whatever was made by them (while unaffected by foreign influence) in the direction of intellectual art, and while only formless or uncouth efforts, as far as we know, were made in the direction of moral or spiritual art. The Celtic race unmixed does not appear capable of rising to the higher order of art: its conception, much less its realisation, is not within the scope of their powers; but their singular delicacy of touch and flexibility of hand may aid well in carrying out the thoughts of minds more gifted with art capacity. Amongst the Celts of Great Britain, especially of Ireland, the remains of their art are the most remarkable. There are two special directions in which the Celts have displayed their proficiency in instinctive art—viz., metalwork and the illumination of manuscripts. In both these the extraordinary skill with which surface decoration is managed will well repay study, always bearing in mind that it is only another development of that art which the New Zealander or the Papuan displays on his club or his canoe—an instinct or a tradition antecedent to civilisation. If spoken of as excellent and commended as unsurpassed, it should be remembered that it can in no wise appeal to those nobler faculties of the mind which are moved by the sublimity of architecture, the symmetry of sculpture, or the pathos of painting. The author entered at considerable length into the details of Celtic metalwork and illuminated manuscripts, which, from want of space, we are obliged to omit.

A short discussion ensued (Messrs. R. Phene Spiers, Holyoake, G. R. Redgrave, and Lewis Day being the speakers), and Mr. Smith having briefly replied on the different points raised, and a vote of thanks having been passed to him, and another to the various persons who had contributed art objects on the occasion of the late *conversazione*, the proceedings terminated.

THE NEW OPERA HOUSE.

ON Saturday last the officers and a large number of the members of the Architectural Association visited the new Her Majesty's Theatre, Haymarket, now in course of re-erection, and were conducted over the works by the architects. The roofs were first visited. Those of the auditorium, amphitheatre, and stage are flats, covered with No. 16 Vieille Montagne zinc, laid on Croggon's patent hair felt and inch-and-a-half boarding. These zinc flats will be the largest in London. The roofs of grand staircases and saloons of dressing-rooms and of carpenters' shops and painting-room are constructed with iron principals, covered with board and slate. The stage, amphitheatre, painting-room, and carpenters' shops are lit by skylights. The roof of auditorium is carried by four braced wrought-iron girders. These girders are 86ft. in span, and about 7ft. deep in the centre, and weigh about twelve tons each. There are no rooms over the auditorium or stage, the painting-room being placed by the side of the stage, and the carpenter's shop over the dressing-rooms facing the Haymarket. Angle iron ribs form the framing for the dome, and elliptical beams are suspended from the roof and secondary girders. The ceiling is to be formed with half-inch boarding. The next things noticed were the wrought-iron cantilevers for carrying the boxes. Those in the centre of the house have a projection of 12ft. from the columns, the object being to form open tiers of boxes to be used when required for dramatic purposes. There are four full tiers of boxes and a half-circle tier. The length of the auditorium is a few feet less than in the old house. This is partially occasioned by the increased depth of the centre boxes, and partially by the stage being made deeper. The height will be about 10ft. greater than that of the old building. Attention was next directed to the entrance hall and grand staircase. These, in the old house, were placed at the back of the auditorium, but in the new building they have been placed at the north-east angle, next to the Haymarket, the grand staircase being carried up to the half circle tier of boxes and communicating with each tier, instead of stopping at the grand tier level, as in the old house. A stone staircase of communication between all the tiers has also been provided in addition to the grand staircase. The gallery staircase and the principal staircase to the amphitheatre stalls are provided at the north-west angle of the building, communicating with the arcade. There is also an additional staircase provided for the gallery leading to the grand stairs, to be used in case of fire. All parts of the auditorium are in communication with at least two staircases. The passages to the stalls and pit lead out of the principal entrance hall. All staircases throughout the house are of stone, and all passages or landings are constructed on Dennett's patent concrete arches. The royal box has a separate staircase, with retiring rooms, &c., complete. The stage is much increased in size, being about 56ft. in depth by 95ft. in width, and, in addition, there is a scene dock on the east side, under the painting-room floor. The original stage of the old house was about 34ft. by 90ft. The roof over the stage is constructed of braced wrought-iron girders about 56ft. in span. The painting floor is on the east side of the stage, and measures 71ft. by 21ft. It has a cut in the floor on one side for lowering the painting frames, and one on the other side for lowering the scenes on to the stage. The basement under pit floor is devoted to the storage of "properties," &c. The remainder of the building is devoted to offices and dressing-rooms. The only wood floors throughout the building are the floors of carpenters' shops and the floors to the boxes and gallery. Everywhere else the floors are constructed on Dennett's concrete arches, including the whole of the basement floor. A massive wall is carried up over the proscenium. The fronts of the boxes, as well as the surface of the ceiling, will be boarded, and there will be no decoration in relief, so that, as far as possible, the new theatre may possess the same excellent acoustic qualities as its predecessor. The works are being carried out by Messrs. G. Trollope and Sons, from the designs and under the superintendence of Mr. Charles Lee, assisted by Messrs. Lee, Brothers, and Pain, of 3, Whitehall-place, architects, and they are now in a very forward state, and fast progressing towards completion. There is no doubt that the building will be completed in March next.

The members of the Association having expressed their thanks to the architects for their kindness in showing them over the works, the latter signified their willingness to do so again when the works are nearer completion.

CLOCKS, AND THE STRUCTURAL ARRANGEMENTS MADE FOR THEIR DISPLAY AND PRESERVATION.*

THE author said he approached the third and more specially practical part of his subject with considerable diffidence, but he felt that some member of his profession ought to break silence on the subject of architects' alleged ignorance of the obvious requirements for satisfactorily incorporating turret clocks with ordinary structures. He was first led to think of this subject by finding out practically the trouble and expense incurred in making arrangements for the fitting up of a large turret clock in a building in which no special provision had been made for its reception. The clockmaker understood his clock, but he could not realise the particulars given him of the building; Mr. Wyatt understood his building, but could not realise the particulars given of the clock. The consequence was far too much friction before the two working parts could be brought to go well together, and that friction would have certainly proved prejudicial both to the clock and the building if the knot had not been cut, rather than untied, by making a new building specially for the clock, instead of endeavouring to fit the clock to the existing structure, altered to accommodate it. The experience so acquired induced the author to pay some little attention to the matter, and he soon found that the want of sympathy and ready understanding of one another's difficulties which had existed between the clockmaker and himself was by no means singular. In Mr. Charles Frodsham's admirable report on Class XV. of the Exhibition of 1862 (Horological Instruments), he met with the following passage: After commenting on the work of a clockmaking firm who had lessened the value of an otherwise excellent instrument by using too short a pendulum, the reporter observed that the makers in question alleged as a reason that "they seldom found room for a greater length, which we all know is too often the case. Architects generally forget that a clock is a very large piece of machinery, requiring room and fall for the weights—100ft. for a very large clock, and from 30ft. to 40ft. for a small one. Turret clocks may be made well and cheaply at the same time; it only requires three or four good models, because it is the large repetition of the same models that enables the manufacturer to work cheaply and economically." Armed with this expression of Mr. Frodsham's opinion the author set himself to work to tabulate the items of information which it seemed to him most essential that the architect should have at hand for consultation when engaged in designing any portion of a structure destined for the reception of a turret clock, and then endeavoured to collect the requisite data for filling it up. In this he had been unsuccessful, owing mainly to a sudden domestic affliction which befel the gentleman on whose assistance he had most relied. He thought it well, however, to now bring forward the tabulated form he had prepared, with all its blanks, in the hope that some intelligent clockmaker would fill it up or improve upon its form (See next page.)

With reference to the kind of information the author desired to collect for the guidance of architects, in his reply to an application to him for aid, Mr. Frodsham remarked:—"I scarcely know anything of the kind that is more wanted. At present there is no uniform rule of constructing clock rooms, proper channels for the fall of the weights, room for bells and bell hammers, and a score of other provisions. Thus the construction of a turret clock is rendered very expensive. I

* Continued from page 790.

Diameter of dial.	Width of chamber for clock on dial side.	Height of the chamber when clock does not strike.	Height, including striking bell, when it strikes hours and quarters.	Length of chamber for clock.	Height of centre of dial above beams for carrying clock frame, &c., above floor of chamber.	Height of bell above ditto.	Weight of clock complete without bell.	Weight of clock complete with bell.	Length of run for weights below centre of dial.	Length of pendulum.	Height of point of suspension of pendulum above centre of dial.	Number of degrees of angle of swing of pendulum, i.e., arc of vibration.	Internal width of casing for the clock weights.	Length of ditto.
2ft.														
3ft.														
4ft.														
5ft.														
6ft.														
7ft.														
8ft.														
9ft.														
10ft.														

QUERY.—Most convenient situation for run of clock weights?—In 1-dial? 2 dial? 3 dial? 4-dial clocks?

QUERY.—Most convenient position for swing of pendulum below floor of clock chamber in 1 dial? 2 dial? 3 dial? 4-dial clocks?

It is assumed that the dimensions given for the clock-chamber will be sufficient to allow a man to get at all parts of the clock if he can pass up through the floor of the chamber.

N.B.—If this table should be drawn up on the basis of clocks with single dials (and not illuminated) it would be well to note differences due to additional dials, as for two instead of one, four instead of two; or for illumination, if through transparent dials, or for chimes if added.

consider the English marine chronometer a marvel of cheapness, particularly when the various adjustments must be done by an educated scientific man; yet, from the repetition of one or two good models, they are constructed in large numbers at a tithe of the cost of a few years ago. But in turret clocks nearly every order ignores previous, and involves fresh arrangements and new casting patterns." While acknowledging that this might be partly attributable to the architect's ignorance, and the requisite structural wants for good clock accommodation, the author was bound to notice how little effort had been made by horologists to remove that ignorance. One would have thought that to frame a few simple rules for the guidance of architects would not have been a very difficult matter, and yet he altogether failed in meeting with anything of the kind. A little information, and but little, was to be gleaned from Mr. Vulliamy's old pamphlet "Some Considerations on Public Clocks," and rather more from Mr. Denison's treatise, but both were eaten up with personalities and quarrelling. The first duty devolving upon the architect practically would be to advise his client as to the propriety of having a clock at all; upon its best situation if determined upon; as to its suitable size, quality, altitude, and connection or not with bells or chimes. There were circumstances under which the striking was more important than the time-showing, and *vice versa*. The next point the architect had to consider was the relation of diameter of dial to height at which the dial might have to be placed, or conversely, to fix the height suitable for the display of a dial of any given size. The old empirical rule of 1 to 10 had been held to be a safe one by most writers on the subject, although the tables of heights and diameters of leading dials given by Mr. Denison and Mr. Vulliamy by no means uniformly sustained this view. The former considered 1 to 10 to be a minimum, and on a comparison of the best-looking and best seen dials and clock towers he (Mr. Wyatt) was of opinion that 1 to 8 would be a juster proportion than 1 to 10. It was imperatively necessary that the spots marking the positions of the figures on the dials should be real spots, whether the figures were distinct or not, and that the hands, both in form and colour, should offer the strongest possible contrast to the dial. Mr. Denison had many excellent remarks on the subject, but they might be summed up in the above. It was a common practice with the earliest clock faces to cover them with a projecting hood or roof carried on bold brackets. The author was by no means sure that this was a commendable course, since the hood was apt to throw a shadow across the clock face, rendering it extremely difficult at a distance to realise the position of the hands during the busiest hours of the day. It was far preferable to select enduring materials, such as stone, slate, glass, majolica, or enamelled iron or copper, the colours and gilding of which had been fixed by vitrification. In such case rain cleansed without injuring, and hoods of any kind might be dispensed with. In designing diapers or ornamentation for clock dials, care should be taken to keep straight lines out of the pattern, since they had a tendency to hold the eye and distract it from seizing the position of the hands at a glance. The best mode of ensuring the contrast pointed out as indispensable was to make the dial dark and the hands and spots for the figures light, or *vice versa*, and in colour, that of the hands and spots for figures should be complementary to that of the average tone of the dial. It was well not to make a violent contrast between the periphery of the dial and the stone or other framework in which it was set. If this was neglected the eye would run round the exterior before settling on the clock hands. There were three particular points of the architect's practice in respect to the accommodation of clocks in lofty positions, as in upper chambers of towers, in which he would come across dilemmas which would occasion him some trouble. For instance, firstly, he might provide for the support of the heavy clock frame rigid beams of iron or comparatively elastic beams of timber. The advantage of the rigid beams was that the clock would go better in fair weather; their disadvantages were that they communicated instantly to the works every shock, oscillation, or vibration experienced by the tower in stormy weather, and what these amounted to in cases where the tower was slight in its construction, those only could realise who had remained amongst the bells when a gale had been blowing. In the case of the wooden beams the advantages and disadvantages were exactly reversed. The prudent course would be found to consist in providing rigid iron beams for large clocks in very stable towers, or when the clocks were not raised to any great height from the ground, and trussed timber in other cases. Trussed timber beams were better than untrussed, since, however strong the untrussed beam might be, it would in time acquire a "*set*" under the permanent load which might disturb the going of the clock, altering the position of the going part with reference to the dials. Secondly, the architect might provide many air openings for the ventilation of his clock or none. If he adopted the first course, he would leave his clock too much exposed to change of temperature, and the admission of dust and even wind, dirtying and deranging the best mechanism. If he adopted the latter, damp would form and prove nearly as prejudicial. His good judgment, if exercised, would lead him to avoid either extreme, and either to ventilate by derivation, as from a lower thoroughly ventilated chamber through to an upper thoroughly ventilated chamber; or, if direct openings were made from the exterior of the building to the clock, by a system of filtration, in which inclined louvres (as the blades of a Moore's ventilator opened but little) stopped wind or violent draught, and in which wire gauze or finely-perforated zinc arrested the passage of dust, blacks, and other impurities to the works of the clock. Thirdly, for the preservation of the movements from the effects of atmospheric changes, and for preventing the too speedy congelation and clogging or drying up of the oil or other lubricant used, the architect might deem it wise to enclose his clock in a wooden case, to which, however, the following objections existed, viz.:—enhanced risk of destruction in the event of fire; darkness, increasing the difficulty of oiling and repairing; and such an encumbering of the clock chamber as made examination of the state of the clock a considerable trouble, leading to neglect and to consequent rapid deterioration. His best issue from this dilemma would be found in a spacious case of wood, and the enclosure of the movements itself by means of lifting or sliding glazed sashes. Care should of course be taken to ensure that if a rope should break, letting fall a heavy weight, it should either have a clear run to Mother Earth, or be arrested in its downfall by a safe and satisfactory buffer. For this Mr. Denison suggested that "there ought to be a box of at least 2ft. of dry sawdust and shavings, with a cover of wood, or, still better, of stone for the weights to fall on if a rope breaks. Otherwise a heavy weight will go through any number of tower floors, and into the vaults below, as has sometimes happened."*

NEW PATENT VENTILATING CORNICE.

NEW methods of ventilation, differing little in application and not at all in principle from each other, are by no means rare. Few survive the test of experience, principally on account of the tendency of most of them to create that terror to all cold-catching Englishmen—a draught. A new plan has been introduced by Mr. William Potts, of Handsworth, near Birmingham, which at any rate avoids that evil, and seems to have many advantages. Acting on the generally admitted rule that the upper part of a room is the proper place for the admission of fresh air, he uses the cornice as the means of its admission. The cornice is formed of metal—preferably of tin or zinc—with ornamental perforations. It is easily moulded into any form, and may be painted, gilt, or decorated in any way, and can at any time be washed or renovated. It is, moreover, almost, if not quite, as cheap as the ordinary plaster cornice. By dividing the cornice longitudinally about the middle the patentee forms separate air chambers, the hot air escapes by the ornamental perforations in the upper members of the cornice into the channel at the back of it, all round the room, and from thence passes into the chimney or other flue, through a valve or valves opening at will; the cold air, being admitted into a channel at the back of the lower portion of the cornice by a valve or valves communicating externally, or with the hall or lobby, or both, enters the room without draught by passing through perforated zinc or gauze, becomes warm in descending, and expedites the discharge of the vitiated air.

Existing plaster cornices can be easily and inexpensively adapted to the new system, and where architects still prefer to use plaster the effect can be obtained by the usual mode of wood framing. The valves which control the egress and ingress of the impure and fresh air are entirely under the control of the inmates of the house, and can be opened and shut when desired.

We are informed that Mr. John Dale, the architect, is fully convinced of the value of the invention, and has expressed his intention to use it in every room in a very extensive convalescent hospital about to be erected from his designs.

The ventilating cornice is at present fixed at Messrs. Hart and Son's, Wych-street, and at Messrs. Brown and Co.'s, 93, Newgate-street. At the latter place is the best effect produced—from an ornamental point of view. Mr. Brown courteously intimated to us his willingness to show and explain its principles and construction to parties interested in the subject, and we recommend such to see it and judge for themselves.

THE WEST LONDON HOUSE PAINTERS' ASSOCIATION.

ON Thursday week an interesting lecture was delivered by Mr. M. Digby Wyatt, on the "History of Decoration by means of Colour," to the members of the West London House Painters' and Decorators' Mutual Improvement Association, at the St. John's Schools, in Kirkman's place, Tottenham-court-road. The chair was taken by Mr. Edward Hall, F.S.A., and there were present Mr. Crace, the Rev. H. Solly, and others. Suspended on the walls were numerous drawings by Mr. Wyatt of buildings in Italy, and details of

* To be continued.

decoration, as well as specimens of textile manufactures exemplifying Persian, Chinese, and other methods of ornamentation. The lecture, besides treating of the Eastern, Egyptian, Greek, Roman, and later Italian, and the French styles, explained the principles of conventionalism and imitation in decoration, the latter of which was characterised as dangerous, although it embodied the perfection to be attained; whilst the former had the attribute of propriety, and, being more easy of attainment, had come first in the progress of art, and even now was in vogue in some countries. The value of an attention to style was also shown. One characteristic of each style was the harmony that it had in itself; and this harmony should not be omitted as a feature when new productions were required. The audience was afterwards addressed by Mr. Crace, Mr. Solly, and the chairman, who urged the importance of establishing classes for instruction in drawing and other requisites of the house-painter's craft, and who also adverted to the necessity for securing greater durability in painter's work, especially where costly decoration was attempted.

INDIA MILL, DARWEN, LANCASHIRE.

THIS building, of which we give an illustration, is the one in which the art exhibition of August last was held, and presents several noteworthy features, one of these being the largest, if not the highest, chimney shaft in the world. The mill itself is 330ft. long, 99ft. wide, 90ft. high, and contains six stories. The engine house is 80ft. by 28ft., the engine bed containing 20,000ft. of ashlar. The boiler house is 100ft. by 75ft., and accommodates ten boilers. There is also a cotton shed and twist warehouse 100ft. by 80ft. The engineering and mill gearing is being executed by the trustees of the late W. and J. Yates, of Blackburn, all the entablatures and pillars being carefully got out to architectoral proportions, an unusual thing in machinery. The total height of the chimney shaft from the bottom of the foundations to the top of the iron cresting is 310½ft., and from the ground line 300ft. The base is of solid ashlar, 29ft. square at ground line, and 42ft. high. The massive stone cornice to the base is 35ft. long on each of the four sides. The shaft itself is built with red, white, and black bricks, with sand grit-stone dressings, and is 24ft square, and built perfectly plumb. The walls are 3ft. thick at top of stone base, reduced by "set-offs" on the inside to 23in. at the commencement of main cornice, which is 255ft. above the ground. Many of the stones used in this cornice weighed as much as five tons each, and were hoisted by steam power. The balusters surmounting this feature are of cast iron, as also are portions of the four vases at the corners. The crown mould of the cornice at the top of the shaft projects more than three times as far over the wall as it rests on it, and was kept in its place by iron cramps until the cast iron cresting was fixed upon it. This cresting contains about 20 tons of metal, and is composed of more than three hundred castings. There is no bolting nor any particle of wrought iron in this portion of the work, the parts being kept together by slots and lugs. The whole weight of this cresting stands upon the brickwork, and keeps the upper stone cornice firmly in position. There is an interior and totally independent shaft, 180ft. high, to prevent the great heat from the boiler furnaces subjecting the wall of the outer and main shaft to unequal expansion and contraction. Mr. Ernest Bates, of Manchester, is the architect, and the whole of the work has been done by day work by workmen under the superintendence of Mr. Robert Edwards, clerk of the works, no contractor being employed.

THE FEMALE SCHOOL OF ART.

ON Saturday afternoon prizes and medals were distributed to students of this School of Art who had excelled in drawing, painting, designing, and art literature. The students and their friends assembled in the lecture hall of the University College, Gower-street, which was filled to overflowing. Mr. Layard, M.P., presided, supported by Mr. M'Cullagh Torrens, M.P., Mr. Westmacott, R.A., Mr. S. Poole, Miss Gann, the superintendent of the school, and numerous artists.

Mr. S. Poole read a lengthy report, which stated that there were 108 students on the books; 80 students had sent up works for inspection to the annual examination of the drawings at South Kensington, and fourteen had obtained third grade prizes of books, the works of eight students—Misses Banks, Clarke, Ellis, Hewson, Locke, Manly, M'Gregor, and Pocock—being selected for the National Exhibition. Of these students two obtained National Queen's Prizes, and one a National Bronze Medal. Three students—Misses Dixon, A. D. Webb, and M. W. Webb—obtained certificates of the third grade (these certificates being of a much more advanced character than the second grade). A prize of five guineas, presented by Mr. J. H. Walton, for anatomical studies, was awarded to Miss Alice Blanche Ellis. Various vacation prizes, presented by Mr. Henry Bicknell and Mr. J. H. Walton, had been awarded, the first to Miss Julia Pocock for a study from the life. A prize of five guineas, presented by Mr. John B. Allcroft, and a second of two guineas, presented by Mr. L. R. Talpy, for the best essay on the uses to which the School of Art could be put, have also been awarded to Miss E. Toulmin Smith and Miss Isabel Berkeley. The Queen's Gold Medal was awarded specially in the department of applied design to Miss Sarah M'Gregor, for designs in lace and church decorations; the drawings by the student were submitted to the Queen's inspection, who graciously purchased a study of flowers as a mark of her Majesty's approbation. The examiners for the Queen's medal were Charles Landseer, R.A., Sir A. Hart, R.A., Henry O'Neil, R.A., and J. Holland. Alice Alfrida Manly, late pupil teacher in this school, who last year carried off the Queen's Medal, has been admitted a student of the Royal Academy. The report having been read, the prizes were distributed to the successful candidates; and, on presenting them, the chairman bestowed a few words of encouragement and laudation on each of the fair recipients. At the conclusion of the presentation Mr. Layard addressed the assemblage on various art topics.

Mr. M'Cullagh Torrens, M.P., in addressing the school, asked the students to avoid "the finical." He thought it was the besetting sin of our time to be too minute and too anxious to do something that was perfect in itself. There was also a tendency to make the objects of art too small—they should rather draw large than diminutive. He moved a vote of thanks to the council of the University for the loan of the lecture-hall, and for the interest they took in promoting their studies. Mr. S. Poole seconded the proposition, which was carried; and a vote of thanks to the chairman terminated the proceedings.

MEDIÆVAL IVORY CARVINGS.

WE furnish our readers this week with a lithographic drawing of mediæval ivory carvings, taken principally from the collection at the South Kensington Museum, where a special department is devoted to the exhibition of such and similar works of art.

Nos. 1 and 3 are abnormal animals. They make up the spandrels of circular mirror cases, and are of fifteenth century workmanship.

Nos. 4, 5, 6, and 7 are carved, engraved, and cement-filled plaques on the cover of a bone box. They represent the various poses, &c., of the common Morris or pseudo-Moorish dancers of the fifteenth century, and are taken from a casket of French execution.

Nos. 8 and 10 are twelfth century Byzantine borders, and are exceedingly playful and characteristic in their interlacings.

No. 9 is a cross of very simple and elegant proportions, carved in low relief on a Romanesque panel.

No. 2 is by a draughtsman of the thirteenth century, carved out of walrus tusk and labelled, "The sign of the Zodiac for the month of January;" but we would suggest, however, that more probably it is a representation of the preparation for "a sacrifice." This example, now in the British Museum, is very boldly cut, the figures being almost entirely detached from the ground.

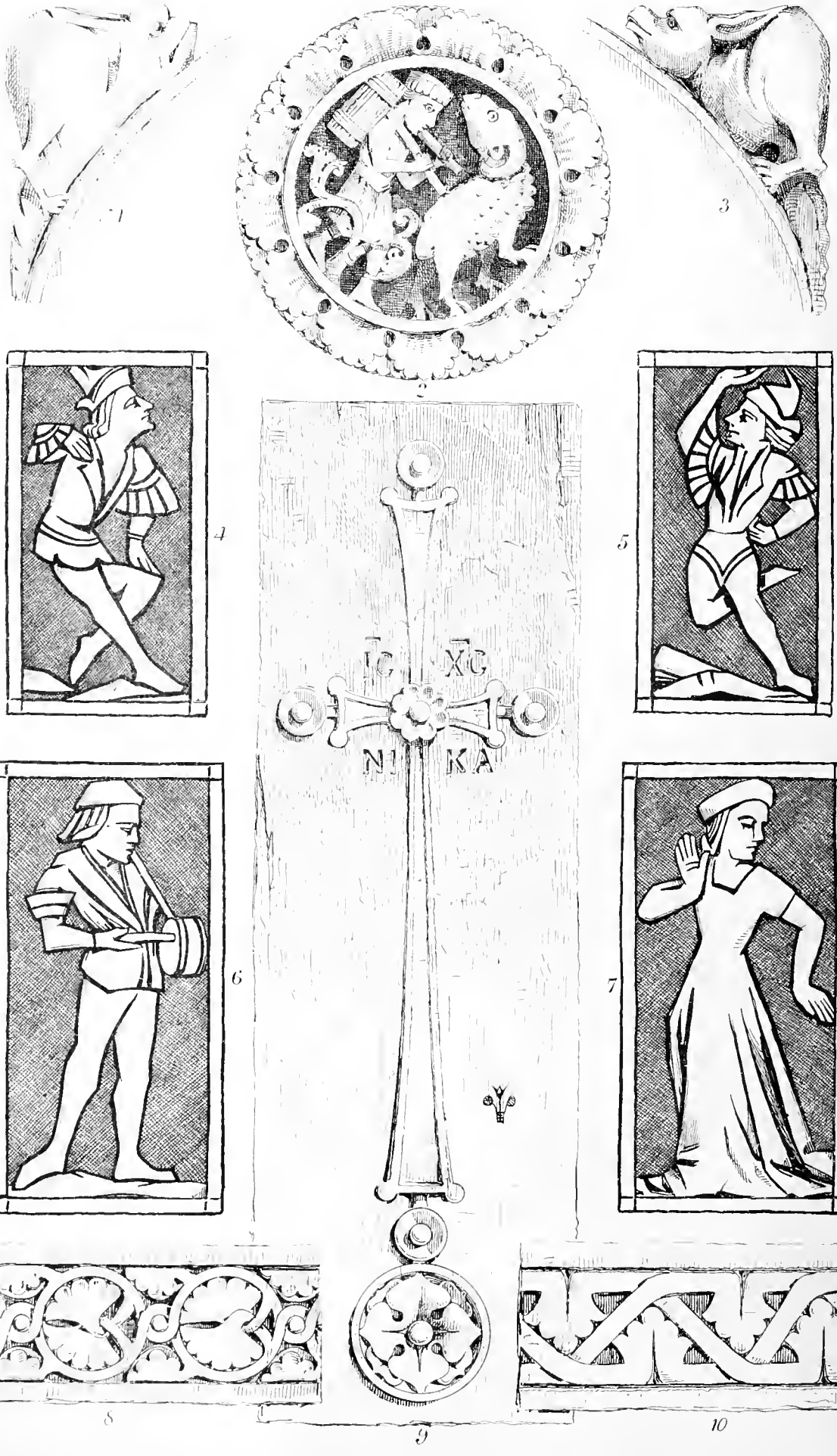
From the Egyptians downwards we find the use of ivory universal in every age of art. Several very fine specimens of Egyptian, Assyrian, and old Indian ivory carving are to be seen in the Louvre and our own Museums. In Scripture, too, we find mention made of ivory thrones, beds, and palaces, and if we can credit the account of Strabo and others regarding the colossal statue of the Olympian Jupiter at Elis, made of ivory and gold by Phidias—the Chryselephantine of the Greeks—ivory was then made much more use of than in modern times. The solid and compact nature of the material allows the artist to linger over and revel in his work, as exemplified in the minute delicacy of the Chinese carvings. To the mediæval European artist it must ever have been a costly material.

Ivory has this decided advantage, that where many fine art treasures of the precious metals have succumbed to the vicissitudes of the times, and found their way into the melting pot, it has been preserved owing to its value as a work of art and its inherent worthlessness except from an art point of view. In a temperate climate it may be considered as practically indestructible. The Assyrian ivories, when brought to the British Museum, were found to be much desiccated by time and dry atmosphere, but after they had been saturated with boiled ivory shavings they became as hard as the ordinary material. O. W. D.

SOCIETY OF ARTS.

THE 115th session of the Society of Arts commenced on Monday evening, when Lord Henry G. Lennox, M.P., delivered the opening address. After some introductory remarks Lord Lennox said—The first thing he would notice would have relation to the Art Copyright Bill, which would be again brought before Parliament during the ensuing session. With respect to technical education, he considered that the study of the pure sciences must be the true foundation of all valuable technical instruction. After referring to the school of naval architecture at South Kensington, which was, he said, sending into the profession a valuable body of young men, his lordship stated that he hoped the long-sought, for problem had been solved of the discovery of a chemical composition to prevent the fouling of ships. He regretted that Mr. Whitworth, whose munificent foundation of the only technical scholarships could not be too highly lauded, was not present to receive the gold medal, which the society had awarded him, and he went on to advocate the maintenance of art museums in great manufacturing centres. It was most important to set good models before the artisans. In 1750, when the Society of Arts gave premiums for success in art, they had no museum and no gallery by which to educate the artists. His ancestor, the third Duke of Richmond, then supplied them with a gallery of statues and objects of art. His lordship then alluded to the deplorable want of taste in the London streets and statues, and recommended that a committee of taste should be appointed to examine and report upon the Thames Embankment, with a view to its prevention from being employed in a manner contrary to good taste. He concluded by assuring his hearers that he would use his best exertions to promote their welfare. Mr. W. A. Gibbs was then presented with the gold medal of the society and 50 guineas, for his invention for harvesting corn in wet weather. Mr. Robert C. Kington was presented with a certificate for having obtained the greatest number of first-class certificates at the society's examinations. The Albert Gold Medal, awarded to Mr. Whitworth for his munificent donations for the benefit of technical education, was to be forwarded to Mr. Whitworth by Mr. Foster, the secretary. Upon the motion of Mr. Shaw, seconded by Mr. Seymour Tenlon, the thanks of the society were given to the noble chairman, and the business terminated.

A correspondent sends us the following letter:—Sir,—It appears to me that the study of the profession of architecture would be greatly facilitated to young men were they furnished with a list, by those in position, of the works most suitable as standard text books and references. Amid the vast sea of publications it is difficult, nay impossible, for the student to make the selection for himself, but were he guided by adequate authority as to which works are really useful he would be saved much time and unprofitable labour. It is not the *scarcity* of good books of which he has to complain, but a want of an authorised statement of their comparative usefulness. Let the Institute make a small and careful selection from existing works and publish it under their approval, and by doing so I am sure they would earn the lasting gratitude of the younger members of the profession.—X.

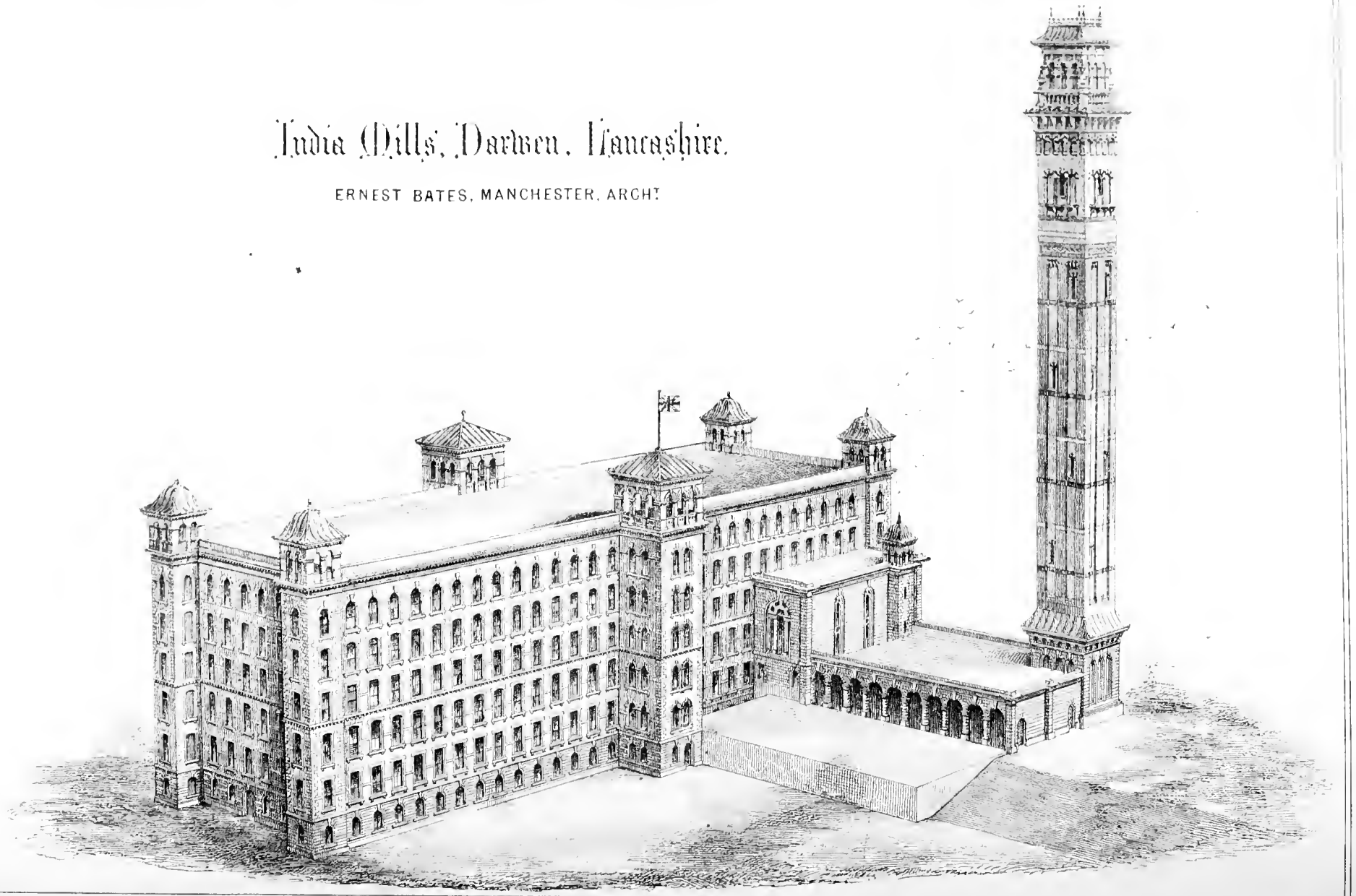


Printed by W. Griggs & Sons

MEDIÆVAL IVORY CARVINGS.

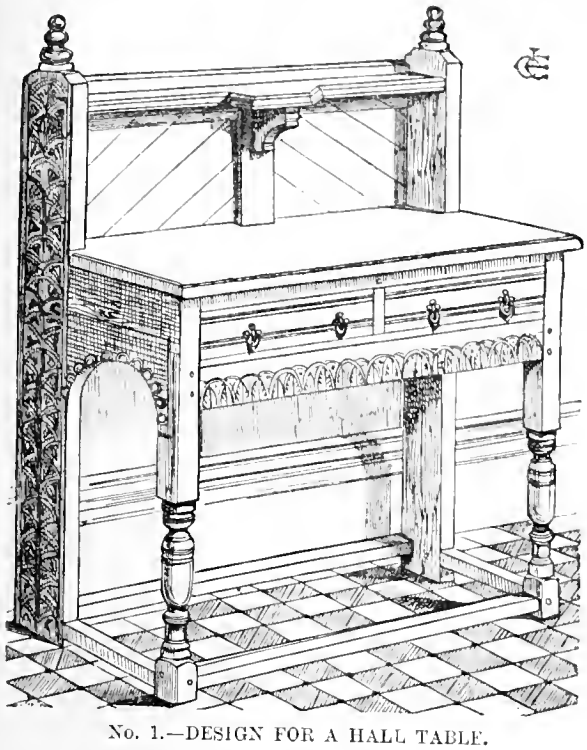
India Mills, Darwen, Lancashire.

ERNEST BATES, MANCHESTER, ARCHT

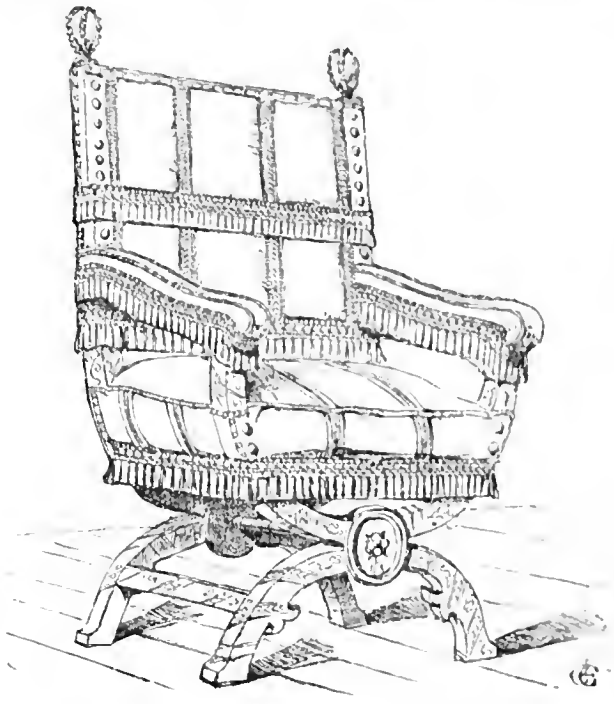


H. Abbott, Lith.

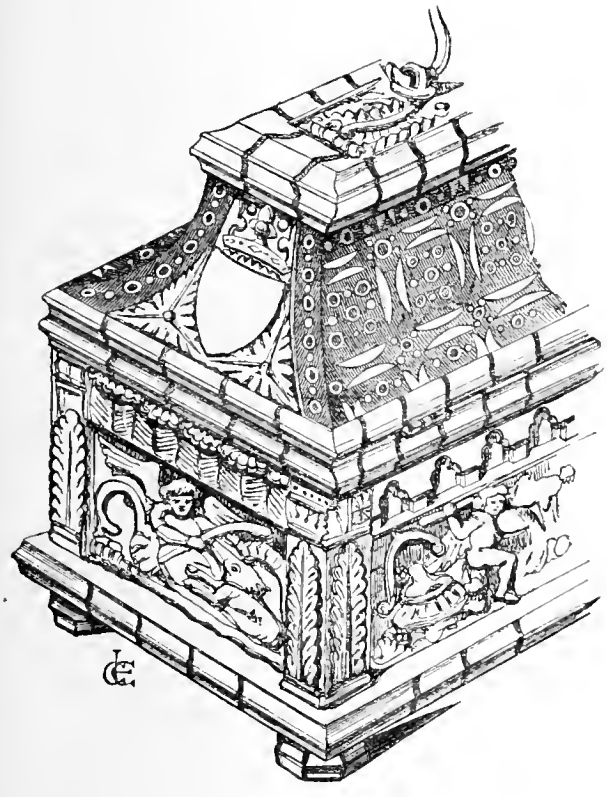
Printed by Whiteman & Sons



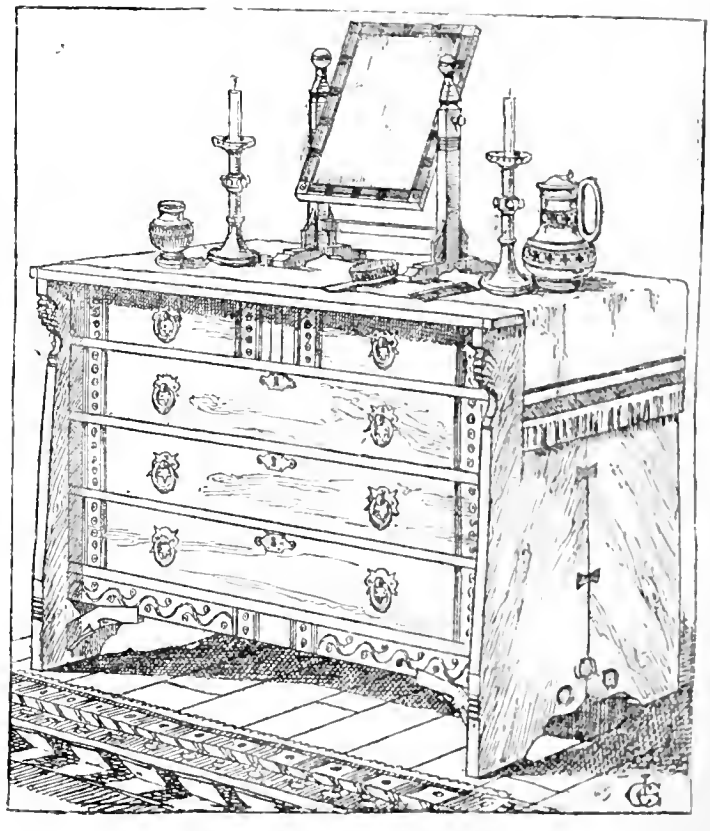
No. 1.—DESIGN FOR A HALL TABLE.



No. 2.—OLD ARM CHAIR.



No. 3.—EARLY ITALIAN CASKET.



No. 4.—DESIGN FOR A CHEST OF DRAWERS.

HINTS ON HOUSEHOLD TASTE.*

IN the preface the object of this work is stated to be "in a word, to suggest some fixed principles of taste for the popular guidance of those who are not accustomed to hear such principles defined," and it has reference to articles of furniture, house decoration, and other things of ordinary use which surround us in our homes. As most of our readers will acknowledge that a healthy art in any age or country will affect the design of articles of manufacture, and not limit itself to pictorial inventions or any other special department of taste, there can be no question as to the utility of such a handbook of household taste as this purports to be. Several antiquarian treatises of the subject of furniture have appeared before, and that by Monsieur Viollet le Duc is known to and appreciated by most architects; few of these, however, are addressed to the class of persons whom Mr. Eastlake seeks to reach, and the examples described in such works are seldom adaptable to modern requirements.

It not being for architects or artists that this work is intended, any criticism founded upon its not presenting in its pages special novelties to them is disarmed. The same reason explains the absence of all reference to the efforts of other professional men who have for some time been striving in the same direction, no great success having yet crowned their efforts to correct the public taste. Speaking generally, the strictures passed by the author upon the character of modern cabinet work and upholstery, though severe, are just. False principles and false taste are rampant. Still, seeing the direction in which the author would endeavour to lead his readers, it is impossible to forget that the Mediæval Court at the International Exhibition of 1862 contained works of merit by Messrs. Morris, Marshall, and Co.,

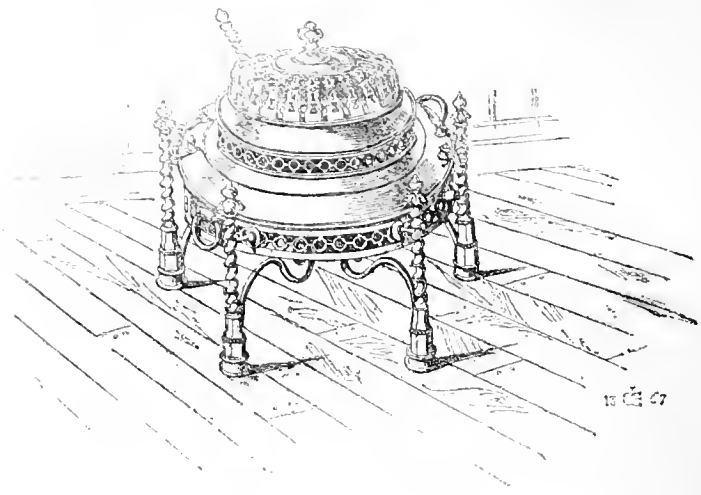
* "Hints on Household Taste," by C. L. EASTLAKE, Esq.

Burges, Seddon, and others, and various examples of the kind have from time to time been illustrated in the pages of this journal. In other styles also, several manufacturers have produced works which do not deserve to be classed with the tawdry rubbish described as so general. The grace of English furniture of no very ancient date is of marked merit, and some of our best artists and designers have left their mediæval love, and gone clean over to the camp of those who extol the relics of the days of Queen Anne. We ourselves, though heartily endorsing Mr. Eastlake's strenuous upholding of the common-sense principles which dictated all Gothic design, would commend to his serious study the delicacy and refinement of the furniture of the class we have referred to.

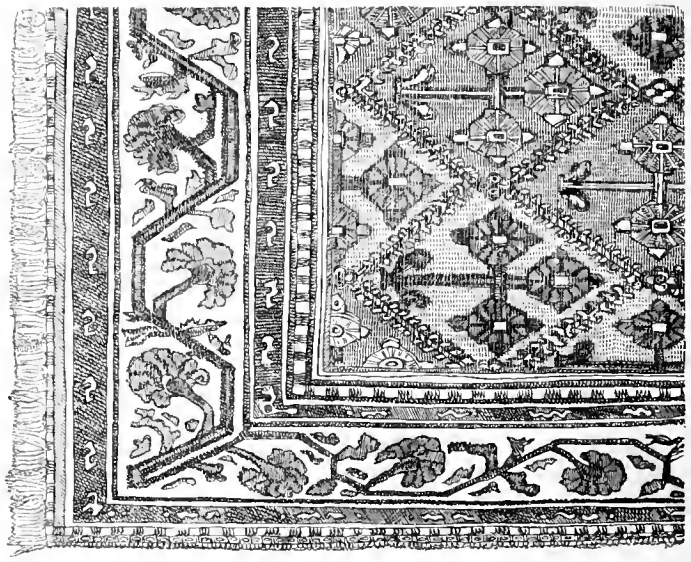
The volume is divided into twelve chapters, to which an introduction is prefixed. The first chapter is devoted to a description of the present character of street architecture, for the sake of comparison with which a clever illustration is given of a street in Nuremburg; we must own that the author has taken no unfair advantage by this selection, as Pugin is said to have done in his "Contrasts," for, with the exception of the church in the distance, we see nothing particularly picturesque in it, the houses being of very ordinary character. Surely Nuremburg or a hundred other cities would have afforded subjects more likely to press home this point.

The chief theme, however, of the work is the interior and not the exterior of houses, and Mr. Eastlake does not confine himself to criticisms on what exists, with lamentations after what has passed away; but side by side with capital sketches from old examples he sets some excellent and suggestive designs of his own to show what he would propose in their place. In the following passage he racily hits the blots of ordinary modern work:—

> And here, perhaps, I should astonish my readers if I were to state that there is no upholsterer in London at whose establishment good artistic furniture of modern date is kept on stock for sale, and yet such a statement would not be very far from the truth. For years past this branch of art-manufacture has been entrusted to those whose taste, if it may be called taste at all, could be no more referred to correct principles of design than the gimcrack decorations of a wedding cake can be tested by any standard of sculpturesque beauty. It may be urged, in answer to this parallel, that in the latter case it would be superfluous to apply such a test. Without even admitting this to be so (for in the best ages of art the commonest article of household use, down to the very doornails, had an appropriate form and beauty of its own), it is obvious that, although we may tolerate insipid prettiness in perishable confectionery, we ought not to do so in objects which become associated with our daily life, and which are so eminently characteristic of our national habits. There are few persons of education and refinement who do not feel interested in architecture, but I would ask of what use is it to decorate the exterior of our country houses if we are to permit ugliness within them; and ugliness we shall be sure to have if the choice of furniture is left to ordinary upholsterers. Indeed, their notions of the beautiful are either centred in mere novelty or derived from traditions of the Louis Quatorze period. That school of decorative art, bad and vicious in principle as it was, had a certain air of *luxe* and grandeur about it which was due to elaboration of detail and richness of material. Its worst characteristic was an extravagance of contour, and this is just the only characteristic which the tradition of upholstery has preserved. Our modern sofas and chairs aspire to elegance, not with gaily embossed silk or a delicate inlay of wood, but simply because there is not a straight line in their composition. Now a curve, especially of such a kind as cannot be drawn by artificial means, is a beautiful feature when rightly applied to decorative art, whether we find it as the appendage to an old Missal letter, or bounding the entasis of a Greek column. But a curve at the back of a sofa means nothing at all, and is manifestly inconvenient, for it must render it either too high in one place or too low in another to accommodate the shoulders of a sitter. The tendency of the present age of upholstery is to run into curves. Chairs are invariably curved in such a manner as to ensure the greatest amount of ugliness with the least possible comfort. The backs of sideboards are curved in the most senseless and extravagant manner; the legs of cabinets are curved, and become in consequence constructively weak; drawing-room tables are curved in every direction—perpendicularly and horizontally—and are therefore inconvenient to sit at, and always ricketty. In marble washstands the useful shelf, which should run the whole length of the rear, is frequently omitted to ensure a curve. This detestable system of ornamentation is called "shaping." It always involves additional expense in manufacture, and therefore, in avoiding "shaped" articles of furniture, the public will not only gain in an artistic point of view, but save their pockets.



No. 5.—MODERN SPANISH BRAZIER.



No. 6.—HEARTH-RUG FROM SCINDE.

The "Entrance Hall" is the title of the second chapter, and, to show what may be done with floors, illustrations are given of encaustic tile pavements, by Messrs. Maw. Of these, however, we think no very favourable selection has been made, for we notice in them the prevalence of an indifferent buff, while one ribbon border offends against a canon laid down in the text, "that there should be no attempt to indicate relief or raised ornament in the pattern." Nor can we say that we care for the example of mural decoration of Messrs. Heaton, Butler, and Bayne. The design for a hall table, by the author himself, shown in the illustration (No. 1), is far preferable, and by its simplicity and by the character of its structure and ornament serves to show the direction to which Mr. Eastlake would lead us in the way of reform.

Chapter III. treats of the dining-room, and contains some good remarks, but we fear that the author will fail in his endeavour to induce the public to dispense with their movable tables. The interesting old examples he gives were very suitable to the public halls for which they were designed, but would be most cumbrous for present household use A modern telescope table on four corner legs is, it is true, ugly and weak, but the expansive system is a great convenience and may be better treated. The old armchair from Knole, shown in the drawing (No. 2), is a pleasing example, equally suited to our own wants as to those of our grandsires.

In chapter IV. on "the floor and the wall," as an example of Oriental manufacture, and *apropos* of the advantage of a certain degree of freedom and irregularity of design as compared with the studied accuracy of English carpets, the sketch (No. 6) is given of a cheap hearth-rug, from Scinde.

Such carpets, laid upon parquetry floors, the author recommends as better and hardly more costly than the practice of covering up every corner of a room with Brussels carpet, which he inveighs against as a piece of modern folly involving waste of material and sacrifice of effect.

Chapter V. treats of the library, and the drawing-room forms the subject of the sixth chapter, and we think that the ancient examples of the furniture for the latter, given in the illustrations, far surpass those suggested for modern use; thus while we can hardly sufficiently express our admiration for the beautiful sofa from Knole, shown in plate 28, we confess we do not see the adaptability to its purpose of the drawing-room cheffonier designed by Mr. A. W. Blomfield. Sympathising with the author's desire to see good inlaid ornament substituted for the indiffe-

rent carving now in vogue, and appreciating his pretty sketch of an ancient example of the style of decoration recommended, we subjoin his remarks on the subject with the illustration they refer to.

Where an effect of richness is aimed at, two legitimate modes of decoration are available for wood, viz., carving and marquetry or inlaid work. For cabinets, coffers, sideboards, and other repositories of household goods, the wood carver's art has been successfully employed in the best ages of design; but it should be sparingly used for chairs, tables, couches, and in all situations where a knotted lump of wood is likely to prove inconvenient to the touch. It is a pity that marquetry should have fallen into such disuse, for it is a very effective and not necessarily expensive mode of ornament. It consists of inlaying the surface of one wood with small pieces of another, differing from it in vein or colour. These pieces may either be grouped in geometrical pattern or arranged so as to represent natural objects pictorially. The tarsia, or old Italian marquetry, was used for both purposes, and owing to the minute size of the inlaid pieces, was equally adapted for either. The woodcut (No. 3) is from an early Italian casket in the South Kensington Museum. The lower portion is of carved ivory, the lid being composed of ebony and ivory inlaid. It is probably of fourteenth century manufacture.

The seventh chapter is entitled wall furniture, and the eighth treats of the bedroom; the good design for a chest of drawers (No. 4) will give a sample of its contents.

The concluding chapters treat of crockery, table glass, dress and jewellery, plate and cutlery, all of which are well and fully illustrated with able sketches of interesting objects, from which we select the sketch of a modern Spanish brazier (No. 5) in the possession of Lord Mount Edgecumbe, at Cothele, with some remarks as to the prospects of art manufactures deserving of consideration:—

The future success of art manufacture in England must, of course, depend in a great measure on the taste of the public for which it is supplied; but I do not see how that taste is to recover from its present degradation until manufacturers begin to educate it by the production and display of goods which will bear the test of sound criticism. Museums and exhibitions of art treasures are useful in familiarising the eye with the appearance of objects which illustrate the taste of a former age. But it must be remembered that such objects are usually articles of luxury, which at any period would lie beyond the reach of ordinary means, and which in many instances were applied to some purpose that has long since fallen into disuse. In examining them, people are apt to forget that our forefathers were not all people of unlimited wealth, who could afford jewelled caskets, costly embroidery, richly carved cabinet work and plate, which would fetch ten times its weight in gold and silver.

In those early days there were, as now, households in which economy was an object. Pots and pans, wooden trenchers and three legged stools—articles, in short, far more humble in make and material than those which increased commercial prosperity has given to our present homes—were then required, produced, and sold at a moderate price. But it was not because they were cheap that they were necessarily ugly or ill fashioned. That contemptible kind of workmanship that is at once slovenly and tasteless because it may be showy and cheap, was not then in demand. The rich, indeed, spent more money, both on dress and objects of general luxury, than at the present day; but such furniture as be fitted the habits of ordinary citizens and country gentlefolks of that date was found in the homes of the middle classes more than two hundred years ago; and wherever it existed, we may be sure it was deftly and honestly made. Those examples of ancient handicraft which have reached our own time may well put to shame the efforts of modern smiths and cabinet makers, who work like machines, while their ancestors worked like artists and practical men.

We think the work is well-timed, and calculated to prove practically useful in spreading those true principles of ornamental art which we desire to see more widely understood and followed.

RAILWAY COMMUNICATION WITH BILLINGSGATE.

THE proposal to remove the fish market from Billingsgate to some more easily accessible and convenient site has met, of course, with disapproval at the hands of many interested in its proximity to the river. The removal of a market is not effected without great cost, and there is always a risk of the new establishment proving a failure. Its improvement or removal being still under the consideration of the Corporation of London, Messrs. Vigers, of 2, Frederick's-place, Old Jewry, have submitted a plan for extending the existing railways into the port of London and to Billingsgate, thus, among other advantages, making the existing market easily approachable by land, without any loss of access by water. The promoters say the railways are all practically at Blackfriars, and to extend them along the foreshore of the river to Billingsgate, and thence to Tower Hill, will afford opportunity for the enlargement of the market and the acquisition of additional advantages. They propose to construct a new road from Adelaide-place, London Bridge, along the new line of embankment to Billingsgate, and thus afford relief to Lower Thames street, at presently fearfully overcrowded. If this were done both the Metropolitan Low Level Sewer and the Metropolitan District Railway might be carried through the new embankment to Tower Hill—the former according to Messrs. Vigers at a saving of £100,000 as compared with the expenditure required for the present inland course it is proposed to adopt. Application is to be made to Parliament during the next session, and plans, sections, &c., will be deposited during the present month.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—J. H.—C. B. A.—T. G.—H. L.—H. T.—E. and Son.—W. S.—T. F.—A and P.—H. I. P.—J. H.—B. M. H. C.—I. C. I.—W. B. E.—E. M. and Son.—A. W.—I. P. S.—E. W.—E. J. B.—I. H.—A. R. and Co.—I. H. A.—R. D and Co.

AN OLD SUBSCRIBER.—Write to J. K. Colling, 150, Hampstead road, London. "Art Foliage" can be had only through him.

Correspondence.

MR. J. M. SMITH'S DRAWINGS.

To the Editor of the BUILDING NEWS.

SIR,—Of what have the subscribers to your esteemed journal been guilty that they should be subject to the pictorial eccentricities of J. Moyr Smith? At one time the animal, at another the vegetable kingdom, and sometimes both, are paraphrased and translated into new and anything but improved versions. And that a versatile mind may not be limited for a choice of subject, he leaves for a moment existing varieties and embodies the extinct "dodo," duly necklaced and clad in habiliments of the period, standing with astonished gasps at the audacity of modern art. In short, through the variety of Mr. Smith's inventions, your subscribers may be said (applying that gentleman's advice relative to one of his designs) to be "done in a variety of ways." Of these ways let me specify one or two; the cross, for instance, in illustration for August 28th, embellished with a series of animal heads most usually found both in number and perfection adorning the ends of umbrella sticks, but in this case leering at one another in a most congratulatory way at their good fortune in promotion from secular to sacred use.

Again, Mr. Smith's recent contribution, apologetically called "grotesques," the result evidently of Polynesian art studies, illustrating among other things seven different modes of eye-delineation, not, by the way, seven as symbolical of perfection in eye art, but as instances which "only touch on and by no means exhaust the number of treatments possible of the subject," and, it may be added, showing what ingenious arrangements of circles, dots, and notches are possible to an inventive mind. But, to speak seriously, the influence of these original and in some respects clever sketches on the unformed, impressible minds of young students of architecture is, in my opinion, not only unlikely to be in the least beneficial, but positively injurious. Mr Smith is an accomplished delineator of the human figure, but quite otherwise as a designer and composer of architectural forms; his outlines are crude and ungraceful, his details out of proportion, and his foliage conventionalised to mechanical mannerism.—I am, &c.,

G. S. A.

WATERPROOF WOODSHEDS.

SIR,—"W. S." Nottingham, in "Intercommunication" (1116), November 13, having given a description of "shingles" and their use in Norway and Sweden will you permit me to give a description of "shingles, &c.," in Canada? Shingles are either "split and shaved" or "sawn," and are manufactured of white pine, fir, cedar, spruce, &c. Shaved shingles are usually made in the bush, where suitable timber is to be found. There the "shingle weaver" sets up his "shanty" to protect him from the weather whilst carrying on his work. For shaved shingles straight-grained timber is sought and is usually found in fallen trees prostrated by the wind, which have lain several years and so are partially seasoned. The tree is cross-cut into lengths of 16in., and these blocks are split into a series of splints ¾in. thick, and varying in width as the diameter of the tree is reached. These splints are then placed and held in a "horse," upon which the weaver sits and shaves them with a "draw knife" down to their proper shape, which is as broad as the splint will make with parallel edges, the butt being ¾in. or 5-16in. thick, gradually tapering off to a sharp edge at the top. The longitudinal section of a shingle is a triangle 16in. in height and ¾in. or 5-16in. wide at the base. Sawn shingles are manufactured by a peculiar machine, which grasps the block of wood and presents it to the saw circular, which cuts the shingle off to its proper dimensions at once. A shingle is 4in. wide, and is put up for the market in bundles containing 250 and sometimes 500—that is, a bundle will not contain 250 separate pieces, but must contain so many pieces that their united widths when laid in work will equal 250 by 4in., or 83ft. 4in. One thousand shingles will cover a "square," allowing liberally for waste, which is generally large. Roofs are, as a rule, close boarded, and in starting work two thicknesses of shingles are laid at the eaves; at 4½in. or 5in. from the butts of this row a chalk line is snapped, and to it the butts of the next row (single this time) are laid with their edges abutting, and in like manner the work is continued to the ridge, which is always curved with a saddle board. The sides of buildings are sometimes shingled, and where sawn shingles are used they are sometimes planed and squared, and when carefully laid present a good appearance. A shingle is said "to be laid 4½in or 5in to the weather" when the distance apart of the butts of overlying rows is either 4½in. or 5in. Cut nails, somewhat larger than the lath nails in use here, are used, and are always so placed as to be covered by the next overlying row. Joints are broken as in slating. Shaved shingles are more durable than sawn, and command a higher price in the market.

A SHINGLE WEAVER.

DEAD MEAT MARKET.

SIR,—This important addition to the markets of London was opened on Tuesday by the Lord Mayor, and your reporter no doubt attended. We have observed the excellent notices of the building which have already appeared in your paper, but there has been no mention of the "Pyrimont Seyssel Asphalte," which forms the wide margins to all the shops and immediately beneath what are technically called the "butchers' hangings." So uniform and neat an appearance does this work in asphalte present that one cannot but remark that if the entire area had been floored with the same material it would have been, with a view to utility and cleanliness, a far better flooring than the wood pavement, the whole of which, with its countless joints, must absorb a great deal of offensive matter liable to become dangerously unpleasant during hot weather, and ultimately to necessitate the removal of the wood, whereas had asphalte been wholly adopted such a non-absorbent material could by a limited supply of water daily from the hydrants, have been made thoroughly wholesome.

Hoping your reporter's attention was directed to it when he visited the building on Tuesday,—I am, &c.,

J. FARRELL, Sec.

Seyssel Asphalte Co., 3, Parliament-street, S.W.
November 26.

GREEN SLATES.

SIR,—I was glad to see, in your article on Roof Coverings, attention drawn to the superior merits of green slates over any other colour. I cordially endorse all you say on the subject, and also what your correspondent, "Anti Tile," says as to the durability of some sorts. I think I know the

slate he refers to, and recognise a good hard Welsh slate under its classic title. There is no doubt if architects would only look into the matter a little more for themselves, they would find plenty of green slates, both cheap and beautiful, hard and durable. They are, however, too apt to select a green slate simply for its shade of colour, without reference to its texture or lasting qualities. I trust this question will be well ventilated, and that our fine public buildings will no longer be disfigured by the thin blue things that a mistaken economy places on them.—I am, &c.,

A QUARRY OWNER.

A CORRECTION.

SIR,—Having unintentionally attributed in a report I wrote on Class XVI. of the Paris Exhibition for our Government the credit of having executed a very satisfactory reproduction of a picture of Phideas by Mr. Poynter to Mr. Powell, of Whitefriars instead of to Messrs. Harland and Fisher, of Southampton street, Strand, I desire to make any reparation I can to them for this slip of my pen. I shall esteem it a personal favour if you will allow these few lines to appear in the next number of your journal.—I am, &c., M. DIGBY WYATT.

37, Tavistock-place, Russell-square, W.C.
November 21.

Intercommunication.

QUESTIONS.

[1137.]—POLISHING ALABASTER.—Will any reader kindly inform me as to the quickest, best, and cheapest way of polishing alabaster?—T. R. W.

[1138.]—THIEVES' VINEGAR.—What is thieves' vinegar? I have heard several speak of it as a good disinfectant, and should like to know of what it is composed?—CELEBATE.

[1139.]—LIME MEASURE.—I shall be obliged if some of your correspondents that are acquainted with the building trades will inform me how many bushels of lump lime are considered to be one cube yard; also the number of bushels of ground lime usually sold for a cube yard: and the cause of the difference, if any.—H. W.

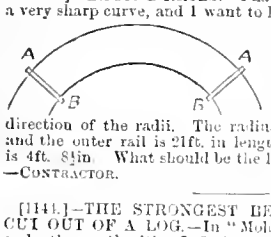
[1140.]—BUILDERS' CHARGES.—I should be much gratified could I gain some information as to what is right in the following: In cases where a large discount is allowed on materials (say 15 per cent. on plate glass, or 50 per cent. on gas piping), what ought a builder to charge, or who should gain the advantage of such discounts?—SURVEYOR.

1141.]—BACK NUMBERS.—I should feel obliged if any of your readers would kindly inform me, through the medium of "Intercommunication," where I can obtain the BUILDING NEWS for 1865, or whether they themselves have it to dispose of. I should prefer it in numbers, but if not, the volume will do.—A. Y. E.

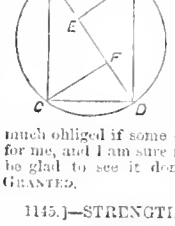
[Some of the numbers for 1865 are out of print; the remainder can be had from the publisher on application.—ED. B. N.]

[1142.]—VELOCIPEDE.—Will you or any of your numerous readers kindly inform me, through "Intercommunication," of the address of the builders of the velocipedes referred to in the BUILDING NEWS of Nov. 20, p. 799? and oblige—G. P. T.

1143.]—LAYING RAILS.—I have to lay some rails upon a very sharp curve, and I want to know how much I must cut off the inner rail, so as to make it of the proper length to bring the joints A and B (see figure) opposite one another, that is, in the direction of the radii. The radius of the curve is 200ft., and the outer rail is 21ft. in length. The width or gauge is 4ft. 8½in. What should be the length of the inner rail?—CONTRACTOR.



[1144.]—THE STRONGEST BEAM THAT CAN BE CUT OUT OF A LOG.—In "Molesworth's Pocket Book" and other authorities I find that the following rule is given to cut the strongest beam out of a log:—Divide the diameter A D into three equal parts, A E, E F, and F D, and from E and F draw the lines E B, F C at right angles to the diameter, then A B C D is the section of the strongest beam that can be cut of the circle shown in the figure. Now, assertion is no proof, and although I am unable to prove the thing myself, I should be much obliged if some of your correspondents would do it for me, and I am sure many of your readers besides would be glad to see it done.—ONE WHO TAKES NOTHING FOR GRANTED.



1145.]—STRENGTH OF JOINTS.—How should I calculate the strength of a pin, as shown in sketch, where a number of bars are joined together? This is the arrangement adopted in the chains of suspension bridges, but it does not seem clear to me how the proportions of the pins are arrived at.—DRAUGHTSMAN.

[1146.]—LOCAL BOARDS. Could any of your readers inform me whether there is any appeal against the decision of a Local Board, and if so, where to carry it? The Board of my district are carrying out some very stringent measures against some of the inhabitants, including myself, and we are thinking of taking action against them in the matter.—RATEPAYER.

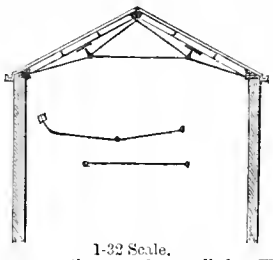
[1147.]—COPYING PLANS.—I have been recommended to get a pantagraph for reducing and copying a number of plans I have in hand, and I should be exceedingly obliged to any of the subscribers to "Intercommunication" if they would inform me what is the principle of the apparatus, and its probable price; also whether it is to be relied upon for producing accurate work. Some copying instruments I have seen are utterly useless so far as accuracy of reduction is concerned.—S. P. S.

[1148.]—CENTRE OF GRAVITY.—Can any reader inform me how to find the centre of gravity of a piece of iron (uniform) 16ft. long having 9ft. bent at right angles to 7ft.? and oblige—RAYMOND F.

[1149.]—FRICTION.—A ladder, 30ft. long, makes an angle of 30 deg. with the wall against which it stands. The coefficient of friction between the ladder and ground is .6, and between the ladder and wall .5. If the ladder weighs 4cwt. (84lb.) how high may a man weighing 11st ascend before it begins to slip? If any reader could solve the above I should feel obliged.—RAYMOND F.

[1150.]—CHARGE FOR STREET PAVING IN LONDON.—I shall be obliged if any of your circle of intercommunicants can inform me what is the usual charge made by the vestries of London parishes for paving the streets when they take possession thereof. I, an unfortunate provincial, have a house in London with a frontage of 16ft., causeway 9ft. wide, and half of carriage-way 15ft. wide. For paving the carriage way with Kent flints (including removing soil 15in. or 18in. deep) and taking up and relaying flags of causeway they demand £9 15s. per house. This seems to me an extortionate charge; and on public grounds, and as the reply to the question may be useful to some other readers, I venture to make this inquiry.—K. M.

[1151.]—ROOF CONSTRUCTION.—Will you or any of your correspondents be kind enough to give me your opinion of a roof of the kind I have sketched? There has been one of its kind put up in this town on a school, and it has come to grief, carrying the entire side of the building with it. Not being myself well up in such matters I should like some reliable authority on the subject. The roof was completed, slated, slate-pointed, and lathed and plastered to the small rafters, or spars as they are here called. What I want to know is, whether it is likely to have been the fault of the construction of the roof, and I should like to know the weight there is on the roof irrespective of lath and plaster—principal rafters 12in. by 4½in., purlins 8in. by 4in., common rafters 3in. by 2½in., roof tree 7in. by 3in., rods and pins 1in. round malleable iron, cast-iron shoes, struts and sockets for principal rafters and roof tree. The architect is a joiner.—R. SCHOOL.



1-32 Scale.

[1152.]—INDIAN INK.—Can any of your readers inform me where I can procure Indian ink that will not run when coloured over? I have tried various descriptions of ink on paper strained and unstrained, and have even laid the drawing aside for some weeks, but to no purpose, the lines always run more or less when colour was applied.—W. M. M.

[1153.]—DEALS AND BATTENS.—Will any of your correspondents kindly inform me the best manner of bringing a number of deals and battens of various sizes into St. Petersburg standard, or could they name any able and cheap work for that purpose. For example, what would the following expression mean:—731 pieces = 7 3-11 10-12? By kindly inserting the above you will confer a favour and receive the thanks of—ASPIRANT.

[1154.]—MAKING BRICKS WATERTIGHT.—Will some of your practical readers kindly give their opinion on the following points:—Is a coat of boiled oil on the outside of a house built with tolerably good bricks an effectual or partial preventative of rain driving through? I dislike the appearance of stucco, even if it were damp-proof, which I find is not always the case.—P. B.

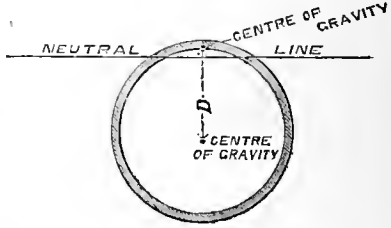
[1155.]—JOINTING STONEWARE.—What is the best material for jointing stoneware socket-pipes with when used for house drains?—P. B.

[1156.]—LEAD AND IRON PUMPS.—What kind of pump is best for raising water about 12ft. or so? Lead or iron are most recommended by their respective makers, but which or what is the most serviceable and easiest repaired, and best adapted for house use?—PROVEN BY PRACTICE.

REPLIES.

[1080.]—RETAINING WALLS.—I am very much obliged to "J. L." for his solution of the problem of finding the pressure of a surcharged embankment against a retaining wall. I think, however, there are one or two slight errors—misprints perhaps—in the letters and signs of it. The equation $G\ I = \frac{^2W\ x \times (b + x)}{W + {}^2W\ x}$ should be, I think, $G\ I = \frac{^2W\ x \times (b + x}{w + {}^2W\ x}$. The entire weight of wall also should be $w + {}^2W\ x$, and its moment $= \left(\frac{^2W\ x \times (b + x)}{w + 2\ W\ x} + a\right)$ $(w + {}^2W\ x)$, and the reduced equation will be, $x = \sqrt{\frac{o - w\ a}{^2W} + \left(\frac{a + b}{2}\right)^2} - \frac{a + b}{2}$. I shall be glad to know if these corrections are right. Also, should the thickness, as found, for exact equilibrium, be multiplied by 2 or 9-4, to give that required for stability? Or should the moment of the earth = o he first multiplied by 2 or 9-4, and the moment of the weight of the wall be made equal to it, and then the thickness of the wall found from that equation? There will be a difference between the thickness found by the first method and the second, and it was to this I referred in my question in No. 710, of Aug. 14, 1868. I mention this, as in the *Builder* of Dec. 28, 1867, in a paper on "Stability of Arches," the thickness found for equilibrium of the pier is not doubled, but the force to be resisted is doubled; and this equation gives a thickness for the pier much less than twice that required for equilibrium.—X + Y.

[1093.]—IRON PIPES.—The formula given by "Beta" for calculating the strength of a cast-iron pipe can only be an approximation when applied in the manner advanced; and I cannot see in what principle he thus applies it. Neither does the neutral line divide the pipe into two halves, but as shown on figure, dividing it into two portions, equivalent to the tensile and compressive powers which the material (cast-iron) has to resist these forces.



Their relative values are 6 and 1. Thus the area in tension = 6-7, and that in compression 1-7 of the whole area. The formula $\frac{A \times D \times C}{L}$ may then be applied, taking 6-7 the whole area = A, and D = the distance between the centres of gravity (which are the centres of pressure) of the two areas. For a wrought-iron pipe the same formula will apply, with a different value for C, and the area divided in the proportion of 16 to 20, or $A = \frac{\text{area} \times 16}{20.}$ c = 80. The approximation of "Beta's" formula is close, inasmuch as the upper area bears so small a proportion to the lower, and would be correct were the whole area in tension, or, rather, neutral at the top and exerting a maximum force at the bottom.—W. P.

[1096.]—STIFFNESS OF BEAMS.—I wish to point out the serious error made last week by "Architect" in the formula for the depth. He gave it thus:

$$D = \frac{\sqrt[3]{L^2 \times W \times C}}{B}$$

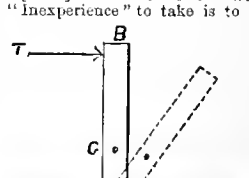
It should have been thus—

$$D = \sqrt[3]{\left(\frac{L^2 \times W \times C}{B}\right)}$$

PURLIN.

[1110.]—ANCIENT LIGHTS.—"H. C." may proceed to build his house as high as he likes provided he leaves the proper distance between the two walls. No one can claim the exclusive right of putting in a window that shall overlook uninterruptedly another person's property.—F. H.

[1112.]—STRENGTH OF WALLS.—The first step for "Inexperience" to take is to ascertain the value of the outward thrust, and he may then proceed as follows: It is a simple case of leverage. Let T = the outward thrust; R the resistance of the wall, which will of course act at G, the centre of gravity of the wall; and H its height. The forces tending to overthrow the wall by turning it about the point A are the thrust multiplied by the height of the wall; and those tending to maintain it are R multiplied by the distance of the centre of gravity from the point A, multiplied by the weight, W, of one cubic foot of the wall. Thus we have $T \times H = R \times A\ G$, and $R = \frac{T \times H}{A\ G \times W.}$



As a rule, the mean thickness of the wall may be taken equal to $\frac{H}{6}$, and the wall must be battered at the rate of one inch to the foot. I would strongly recommend "Inexperience" to put in a tie beam, and not run the chance of overturning the wall. Walls are very rarely built now to take thrusts, except those of arches.—HEYTON.

[1117.]—DISCOLORATION OF STONE.—There is only one way of removing the discoloration your correspondent mentions, and that is to have the stone re-tooled. No washings or solutions of any kind will be of the least use.—MASON.

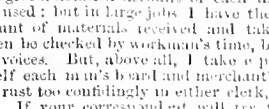
[1121.]—BATTER OF WALLS.—There is not the slightest necessity for continuing the batter of walls below the ground level. You may run them down plumb, as in the sketch given in the BUILDING NEWS of the 13th inst. The best way to get your curve is to plot off the top and bottom thicknesses of the wall, join them by a straight line, and then strike a curve that touches the inside of the line at top and the outside at bottom.—SURVEY.

[1128.]—CALCULATION OF PRIME COST.—In answer to your correspondent, I trust he will not be offended in the opinion I am about to express—viz., that he must have a very imperfect way of keeping his accounts if he cannot find, at the close of a contract, what profit he receives from the same. I am afraid both contractor and contracts will come to grief before long if he does not alter his ways. I beg to inform him of my way of doing business—viz., to have a separate heading for each contract

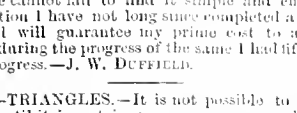
with debtor and creditor columns, entering in debtor column every week each item received from own yard, merchants, &c., including all wages, of course, all at prime cost, so on until close of contract, then cast up and take total. In the creditor column I enter all materials which have been taken away from one job to another at prime cost price, then at close of job the total credits are deducted from the debtor column, and the balance consequently is the prime cost. Of course the workmen who take the materials from a contract job give a detailed account of each day's work and material used; but in large jobs I have the foreman keep an account of materials received and taken away, which can then be checked by workman's time, board, and merchants' invoices. But, above all, I take especial care to check myself each man's board and merchant's invoice, and not to trust too confidingly in either clerk, foreman, or workmen. If your correspondent will try the above method he cannot fail to find it simple and effective. I may mention I have not long since completed a £600 contract, and will guarantee my prime cost to a shilling, although during the progress of the same I had fifty smaller jobs in progress.—J. W. DUFFIELD.

[1129.]—TRIANGLES.—It is not possible to solve this problem until it is put in a proper manner. How can a line be measured by degrees? What result does "R. F." expect? A boast is made of being somewhat of a mathematician, and yet two lines meeting at a point are called a triangle.—H. F. P.

[1129.]—"R. F.'s" problem may be solved, with the aid of a right angled triangle, in the following manner: Given A B = 30; ∠ B A C = 40°; and difference of sides A C and B C = 10°.



Let fall a perpendicular from B on A C, cutting A C in D



Then—As log. sin. B D A, 90° = 10
: log. A B 30 = 1.47712
:: log. sin. A B D, 50° = 9.88425
: log. A D, 23° = 1.36137

Let D C = x. Then A C = (A D + x) = 23 + x; and B C = (23 + x) — 10 = 13 + x. Then—As the whole base (23 + x): sum of the other two sides, 30 + (13 + x) :: difference of those sides, 30 — (13 + x): difference of segments of base (23 — x)

$$\therefore (23 + x)(23 - x) = \left\{30 + (13 + x)\right\} \times \left\{30 - (13 + x)\right\}$$

a simple equation, from which x = 7 10 13.
∴ A C = 23 + x = 23 + 7 10-13 = 30 10-13; and B C = 13 + x = 13 + 7 10 13 = 20 10-13.—J. G. SINGLE.

[1134.]—LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.—Charles Cane and Co., of Baltic Wharf, Wisbeach, write to say that they should be glad to supply "Young Beginner" with price list of deals, &c.

[1135.]—QUESTION IN STATICS.—
[C. D.'s answer to this question contains some algebraic signs which we have not got, and cannot procure. Some of C. D.'s signs are written so indistinctly that we cannot make them out.—ED. B. N.]

WATER SUPPLY AND SANITARY MATTERS.

THE Queen has been pleased to appoint the Right Hon. Thomas George, Lord Northbrook; the Right Hon. Charles, Earl of Romney; Francis Wemyss Charteris, Esq. (commonly called Lord Elcho); the Right Hon. Charles Bowyer Adderley; the Right Hon. Henry Austin Bruce; Sir Thomas Watson, Bart., M.D.; Sir Charles Lanyon, Knt.; Lieutenant-Colonel Charles Brisbane Ewart, R.E.; John Robinson M'Clean, Esq., C.E.; George Clive, Esq.; Francis Sharp Powell, Esq.; Acton Smee Ayrton, Esq.; Roger Sinclair Aytoun, Esq.; Benjamin Shaw, Esq.; John Lambert, Esq.; James Paget, Esq., F.R.C.S.; Henry Wyldbore Rumsey, Esq., M.D.; Henry Wentworth Acland, Esq., M.D.; Robert Christison, Esq., M.D.; William Stokes, Esq., M.D.; and Samuel Haughton, clerk, M.D.; to be her Majesty's commissioners to inquire into and report on the operation of the sanitary laws for towns, villages, and rural districts in Great Britain and Ireland, so far as these laws apply to sewerage, drainage, water supply, removal of refuse, prevention of overcrowding and other conditions conducive to the public health. Also to inquire into and report upon the operation of the laws for preventing the introduction and spreading of contagious and infectious diseases, and of epidemics injurious to the public health. Also to inquire into and report upon the local administration of the aforesaid sanitary laws, namely, the constitution and action of the respective governing or managing bodies and the formation of the districts in which these laws are carried into execution. Also to inquire into and report upon the operation of that part of the registration system which relates to certificates of causes of death, with power to suggest improvements in all or any of the matters aforesaid, and in particular to distinguish any laws that should be obligatory in their operation from those which should be permissive only, and any laws which should be generally applied from those which should be confined to populous places or particular localities.—*Gazette.*

STATUES, MEMORIALS, ETC.

AN equestrian statue of the present Emperor of the French has just been fixed over the new gateways that lead beneath the great gallery of the Louvre into the Place du Carrousel. The work is a close imitation of the well-known equestrian statue of Henry IV. over the central entrance of the Hotel de Ville. It is executed in half relief, in bronze, and is of great size, measuring about 14ft. each way, and weighing nearly a ton. It is being fixed to the stonework by means of 16 or more bronze bolts, screwed into sockets in the marble. The Emperor, in the costume of the Cæsars, is crowned with laurels, and holds in his left hand and resting upon his thigh the imperial sceptre. The work is said to be by the able sculptor Parye.

STAINED GLASS.

A STAINED glass memorial window has been placed recently in the north aisle of St. George's Church, Ramsgate. The window was prepared by Messrs. Warrington, of Hyde Park, and is executed in the architectural style of the fifteenth century. The general character of the drawing and canopy is appropriate. The latter consists of the passion-flower, the blossoms being richly blended with leaves. The subject is taken from the 1st chapter of the 1st book of Samuel, and illustrates the death of Jonathan.

LEGAL INTELLIGENCE.

RE LUNDY GRANITE COMPANY.—On the 19th inst., in the Chancery Court, Lord Romilly gave judgment in this case, in which two petitions—one by the National Bank of Ireland and the other by shareholders—had been presented, praying for an order to wind up the Lundy Granite Company. It was not disputed that an order to that effect must be made, but the second petition contested the claim (over £15,000) of the National Bank, and made grave charges against the National Bank, in relation to the Lundy Granite Company. It was not necessary, nor indeed desirable, to enter now into these charges in detail. It was sufficient for the court to say that the charges against the directors of the National Bank, or, at least, four of them, were that they had carried on a species of trade in launching and winding up joint stock companies for their own benefit; that, in fact, the National Bank was the Lundy Granite Company, that the claim of the National Bank was illusory, and such as the shareholders of the Lundy Granite Company were not legally liable to pay. The charges, which were supported by affidavits, were not satisfactorily answered. Indeed, the directors avowed that they declined to answer the charges fully, on the ground that this was not the time for entering into them, and that that should be done in the course of the winding up. He could not dismiss the petition of the National Bank without saying that their claim was invalid, but at present he could not determine that question. He could not dismiss the second petition without coming to the conclusion that the charges contained in it were frivolous and unsubstantial; but, after having read the whole of the evidence, he was of opinion that there was matter of grave importance to be tried, and that the conduct of the directors of the National Bank could not be properly disposed of under a winding up order obtained and carried on by them selves. He thought the best course was to make one winding-up order on both petitions; but that the carriage of it should be given to the second petitioners.

JENNING *v.* BULL.—A case of some importance in connection with the Metropolitan Buildings' Act came before Mr. D'Eyncourt last week on a summons taken out by Mr. Joseph Jennings, district surveyor for the south part of St. Marylebone, against Mr. Edwin Bull, an architect, of 16, Holles street, Cavendish-square, and owner of a house No. 9, Duke street, Portland-place. It appears the house in question has been rebuilt, and a claim for district surveyor's fees made in due course, his fee being for inspecting arches under public ways, 10s., which Mr. Bull objected to on the ground that the arches had not been touched. On this objection being made Mr. Jennings withdrew his claim, but substituted another of 7s 6d, for "alteration made to building after the roof had been covered in, situate in front of No. 9, Duke street." Such "building," Mr. Jenning explained, was the coal cellar, and the alteration was the taking down a portion of the area wall on which the area railings stand, and an alteration entitled him to half the fee charged on a new building under 100 superficial feet and one story high, viz., 7s 6d. Mr. Bull denied his liability, contending that what had been done was by way of necessary repair, and moreover that vaults and cellars under public ways could not be deemed buildings; if so why did not the Act style them so? whereas it continually referred to them as arches and floors under public ways, and there was a distinct fee payable to the district surveyor on these arches and floors under public ways being disturbed. The other two vaults might also be considered buildings, and why had not Mr. Jenning charged a fee on each of them? In support of these views Mr. Bull called Mr. Henry Baker, district surveyor for St. Pancras, and surveyor to the Duke of Portland, and he stated that he had inspected the premises, 9, Duke street, and found that what had been done was only by way of necessary repair, and that a cellar or vault under a public way was certainly not in his opinion a building under the Act, that the area wall in question did not come under the regulations of the Act as regards the material it was to be built of, nor was it liable to the fee Mr. Jenning had charged, and that during his experience of more than thirty years as district surveyor he had never made such a charge or seen such a charge made. Mr. D'Eyncourt deferred his decision for a week, and now said that a cellar was in his opinion a building, and that the taking down a portion of the area wall he considered was the external wall of such building, and as such was liable to the fee Mr. Jenning had charged; but he, Mr. D'Eyncourt, thought it rather a harsh proceeding, inasmuch as he had ascertained that it was not the practice of district surveyors to make such a charge; therefore he asked Mr. Jenning whether he would press for an order. Mr. Jenning said he merely wished the magistrate to decide under the Act. Mr. D'Eyncourt said he would allow the order to stand over for three days, as he would certainly grant a case for a superior court if Mr. Bull desired. Mr. Bull attended at the expiration of the three days to point out to the magistrate that there was no appeal, a fact that the magistrate's attention had been called to by a note from Mr. Jenning. Mr. D'Eyncourt said he should have been glad if there had been an appeal, as the Act was difficult of construction, and required arguing on both sides. Mr. Bull said he should not have appealed, as it would have taken up far too much of his time, but he regretted not being better prepared to argue the case when the hearing came on, but he Mr. Bull was at a loss to understand the point Mr. Jenning intended to raise, as it was admitted by him that a cellar under a public way was a building. Perhaps at a future time a [illegible] the legal Professor in Mr. D'Eyncourt, by counsel, with proper models of the premises, for without the latter it was difficult for non-members of the profession to understand cases of this kind.

Our Office Table.

SOME colossal schemes are in hand by the French government and financiers for improving Trouville, the new watering-place on the Norman coast, near Havre, which has lately become a place of English resort. There are already some fine buildings there, erected by a French architect, who distinguished himself in the London competition for the Palace of Government.

The earliest architectural periodical in England appears to have been the *Builder's Magazine, or Monthly Companion for Architects, Carpenters, Masons, Bricklayers, &c.* London: 1774. It was in quarto, and the whole series contained 185 plates. In five or six years we shall complete the centenary of the architectural press.

The death is announced at a premature age of Harmer E. Moore. He was for some time engineer of the Smyrna and Calabar railway. It is supposed illness was brought on by over-exertion in preparing the drawings for a townhall competition, in which he carried off a premium of fifty guineas. He was a very fair amateur artist.

A correspondent says:—"In its essence, then, Ritualism as now cultivated, both in its milder and its more audacious forms, is an æsthetic movement. It is a protest against the miserable meagreness and ugliness of the old-fashioned puritanical rigorism. Its connection with the Roman eucharistic dogmas, and Roman Mariolatry and saint worship in general, is little more than accidental. Undoubtedly, the æsthetic system of public worship finds in sacramentalism, and especially in the doctrine of the real presence, a splendid opportunity for its development. But that is all. The spirit of Ritualism—that is, a love for something more than a bare decorum in public services—is everywhere at work. It has covered the country with restorations of churches, cathedrals, and chapels, and with new churches and chapels almost innumerable. High Church, Low Church, Middle Church, Wesleyan, Independent, Baptist, Unitarian, ultra-Protestant, and ultra-Roman alike—every branch of the Christian Church has caught the soft infection.

A writer in the *Daily News* says:—"To those who have advocated the concentration of the Law Courts, it is unsatisfactory to find that when their labours seemed destined to bear fruit, when Parliament has given its assent, when the site has been purchased, and nothing left but the choice of the design, the prospect of this generation profiting by these labours grows daily more faint. A few persons of sanguine temperament thought that when the battle of the architects was ended the work would go on vigorously. Well, the architect was nominated several months ago, and not a step in advance has yet been made. The site is not even cleared for the reception of the foundation. There appears no likelihood of the uninhabited tenements which partially cover it being pulled down for years to come. One or two men are employed at intervals to demolish these houses and cart away the materials, and they will doubtless succeed in finishing their task in the course of ten or fifteen years. When we remember that private enterprise can design and erect a Crystal Palace in one year, we may fairly ask the Government to arrange for the erection of the Hall of Justice in the course of at least ten years.

The National Gallery has received the large family picture by Gainsborough, which was bequeathed by the late Mr. Alexander Baillie, and which, according to the testator's intention, remained in the hands of the late Mr. M. J. Higgins until his death.

A fire broke out on Monday morning, about seven o'clock, on the premises occupied principally by Messrs. Grieve and Co., the well-known scene painters, situate in Charles street, Drury-lane. The building was at least 100ft. deep, about 50ft. wide, and three floors high. A large number of elaborate scenes for the Christmas pantomimes were being prepared, all of which have been destroyed.

The following candidates have been admitted students of the institution of Civil Engineers: Charles Toler Burke, George Ernest Faithfull. Henry James Samson, and Herbert de Symons Skipper.

The monument to Ingres, the distinguished French artist, has been recently completed at Père-la-Chaise. It consists of a Greek cippus, designed by M. Baltard, architect, and a bust of the artist by M. Bonassieu.

The inhabitants of Holloway and Islington are much disappointed at the decision of the Metropolitan Board respecting Finsbury Park. They were originally promised 250 acres, then it was cut down to 131, now it only consists of 118 acres, yet the Metropolitan Board still intend to sell twenty acres—the number originally fixed upon when the area was to consist of 250 acres—for building purposes. The St. Pancras Vestry and the Holborn Board of Works favour the Metropolitan Board's proceedings from motives of economy. There seems to be now no means open to the disappointed inhabitants except an appeal to Parliament.

The usual fortnightly meeting of the Edinburgh Architectural Association was held yesterday week in the hall, 5, St. Andrew-square—Mr Alexander Ballantine, president, in the chair. Mr. W. G. Shiells read a paper entitled "Notes on Architectural Detail." He commenced by referring to the several merits of Grecian and Gothic architecture, and continued by drawing attention to the prominent features in architectural detail, pointing out what he considered worthy of study and what should be avoided. After remarks from several of the members, a vote of thanks was proposed by Mr. J. Ross to Mr. Shiells and cordially agreed to.

M. Legros, a French artist, who has resided in London for several years, and who has made himself a certain reputation for his pictures of incidents of monastic life (his lectern exhibited two years ago, and the refectory in last year's Royal Academy Exhibition, will be remembered), has presented the Museum of Dijon with a picture which formed part of the Paris salon of 1861. It represents a calvary in the Campagna, in front of which a group of women are kneeling in prayer. This group is all that remains of a picture that many of the artist's friends will recollect to have seen in his studio at the commencement of his career, then called "The Removal of the Bier." This picture has been entirely repainted. M. Legros is engaged upon a picture of St. Sebastian, of which report speaks well.

The Hôtel Carnavalet, Paris, formerly the residence of Madame de Sevigné, is being converted into a museum for the antiquities of Paris. An interesting operation is now being carried out, namely, the transplanting, stone by stone, a curious arch, constructed in the time of Henry II., and which formed part of the dependencies of the Prefecture of Police. This arch originally crossed the old Rue de Nazareth; it formed a communication between two public offices, the Cour des Comptes and the gallery of the Archives.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects.—"On Mosaic Decoration," by A. H. Layard, M.P., D.C.L.

TUESDAY.—Institution of Civil Engineers—"Description of the River Witham, and of its Estuary and of the Works upon it," by M. A. H. Wheeler, M Inst. C E., &.
Anthropological Society, 8.

WEDNESDAY.—Society of Arts.—"Further notes on the Productive Industries of Natal," by Dr. Mann, Superintendent of Education and special Commissioner for the Colony, 8.

THURSDAY.—Linnean Society, 8.

Trade News.

TENDERS.

CATERHAM.—For the erection of a dwelling house and shop on the Godstone road, Caterham, Surrey. Mr. Geo. Robson, architect:—

Ball	£679 10
Galyer	676 0
Francis (accepted)	650 0
Elliff	643 0

CHISLEHURST.—For the erection of a villa residence with boundary walls, &c., complete, at Chislehurst, Kent, for D. Chattell, Esq. Joseph S. Moye, architect:—

Grover (accepted)	£4016

LONDON.—For rebuilding No. 22, Villiers-street, Strand, for Messrs. Stevens and Sons. Mr. W. H. Saunders, architect. Quantities supplied by Messrs Rake and Ranwell:—

Carter and Son	£1367
Baguley	1211
Downs	1127
Macey	10 8
Clemence	1090
Read	854

RAMSGATE.—For the erection of a villa on lots 5, 6, and 7, of the Ellington estate, for Mr. Cooper. Mr. John R. Collett, architect:—

Wade	£1005 10 0
Forewalk	995 19 11
Osborne	988 0 0
Duckett	978 0 0
Elgar	915 0 0
Kelson (accepted)	875 10 0

SOUTHALL.—For the erection of cisterns and water pipes at St. Marylebone Schools, Southall. Mr. H. Saxon Snell, architect:—

Dennis and Scruby	£495 0
Benham and Sons	450 0
Jennings	418 0
Jeakes and Co.	398 7
Potter and Sons	375 0

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

PRIORY ESTATE, DOVER.—December 15.—For laying out about 13 acres of building land. Premiums of 50 and 25 guineas. Mr. S. Finnis, Biggin-street, Dover.

SOUTH METROPOLITAN SCHOOLS, SUTTON (Surrey).—February 2.—For designs for the erection of an infant establishment adjoining the present schools. Premiums of 40 guineas each for the three designs considered the best. J. Burgess, clerk to the managers, Vestry Hall, Walworth.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

LEICESTER WATERWORKS.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green-street, Leicester.

HAMPTON COURT AND WALTON BRIDGES.—December 16. Tender for tolls. Mitre, Hampton Court.

ST. JAMES'S CHURCH, GREAT YARMOUTH.—December 12.—For the erection of a portion of this church. J. P. Seddon, architect, 12, Park street, Westminster.

REIGATE.—For completing a residence at Reigate. J. F. Matthews, London road, Reigate.

ST. MARY ABBOTT, KENSINGTON.—For the construction of about 1,100ft. of brick sewer. Mr. J. Whitchurch, surveyor, 7, Lincoln's Inn Fields.

STREATHAM.—December 1.—For the construction of about 3,480ft. of brick sewers. A. A. Corsellis, Battersea rise, Wandsworth, S W

LINCOLNSHIRE.—December 5.—For the restoration of Gunby Church, near Burgh Station. J. Fowler, architect, Louth.

BRISTOL AND EXETER RAILWAY.—December 3.—For purchase of old stores, brass, &c. A. Moore, secretary, Railway offices, Bristol.

LEICESTER WATERWORKS.—December 8.—For the execution of the works comprised in Nos. 4 and 5 contracts. J. H. Williams, secretary.

BARFORD.—For the erection of hospitals and other buildings in connection with the union. R. B. Spencer, clerk to the Guardians.

PROPERTY SALES.

NOVEMBER 16.

AT THE MART.—By Mr. Whittingham.—Freehold building land, situate in Rendle-ham road, Clapham, in 45 lots—Lot 1 sold for £370; lots 2 to 4, £125 each; lots 5 and 6, £140 each; lot 7, £475; lots 8 to 13, £120 each; lots 14 to 21, £105 each; lots 22 to 25, £ 00 each; lot 26, £450; lots 27 to 29, £215 each; lots 30 and 31, £85 each; lots 32 to 34, £90 each; lots 35 to 38, £85 each; lots 39 to 45, £80 each.

Freehold two cottages, situate in Western lane, Nightingale lane, Clapham—£425

Freehold two cottages, situate in Western lane, Nightingale lane, Clapham—£425.

Freehold two cottages, situate in Western lane, Nightingale lane, Clapham—£455.

NOVEMBER 17.

At Garraway's.—By Messrs. Warlters and Lovejoy.—Leasehold premises, No. 23, Paternoster row, producing £562 per annum, term 59 years from 1867, at £160 per annum—£5,040.

NOVEMBER 18.

At the Mart.—By Mr. A. Savill.—Leasehold house and shop, No. 37, Great Tower street, and three tenements Nos. 24 to 26, Beer lane, producing £117 14s. per annum, term 19 years unexpired, at £46 per annum—£1,050.

NOVEMBER 19.

At the Mart.—By Mr. Geo. Newman.—Leasehold profit rental of £102 per annum (for 18 years) secured on Nos. 20, 22, and 24, Essex road, Islington—£610.

NOVEMBER 20.

At the Mart.—By Messrs. Rushworth, Abbott, and Company.—Freehold 7a. 1r. 5p. of building land, with residence thereon, known as Royston Hall, Kilburn—£7,400.

By Messrs. Norton, Trist, Watney, and Company.—Leasehold residence known as Springfield House, Lower Tulse hill, let on lease at £130 per annum, term 72 years unexpired, at £31 6s. per annum—£1,700.

NOVEMBER 23.

At the Mart.—By Mr. Whittingham.—Freehold building land, situate at Stamford hill, in 29 lots, lots 1 to 35 comprised previous sales:—Lots 36 to 38 sold for £150 each; lots 39 to 41, £145 each; lots 42 to 44, £130 each; lot 45, £175; lot 46, £310; lot 47, £100; lots 48 to 50, £ 0 each; lot 51, £80; lots 52 and 53, £85 each; lot 54; £100; lot 55, £85; lot 58, £100; lot 59, £95; lot 60, £100, lot 61, £90; lot 62, £90; lot 63, £180; lot 64, £140; lot 65 £90.

By Messrs. Bromley, Son, and Kelday.—Leasehold improved rental of £30 per annum on Nos. 1 and 2, St. George's mews, Regent's Park road, term 79 years from 1853—£310.

Leasehold residence, No. 13, Theberton street, Upper street, Islington, producing £61 per annum, term 82 years from 1832, at £6 16s. per annum—£670.

Leasehold house, No. 35, Northampton street, Clerkenwell, let at £34 per annum, term 73 years from 1805, at £1 per annum—£155.

Leasehold three houses, Nos. 7 to 9, New Charles street, City road, producing £63 10s. per annum, term 99 years from 1843, at £16 10s. per annum—£5 5.

NOVEMBER 24.

At the Mart. By Messrs. Debenham, Tewson, and Farmer.—Reversionary interest of a gentleman, aged 28, to one third of a freehold estate, known as the "Ferns," in the parish of Lydd, Kent, comprising 35 acres of marsh land, with cottage and buildings, subject to an annuity of £90 during the life of a lady, age 65 years—£200.

By Messrs. Toplis and Harding.—Leasehold residence, No. 30, Mornington road, Regent's Park, term 66½ years, at £22 per annum—£470.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Ambrey Hercules Angell, Chalvey, near Slough, builder, December 2—Edward Charles Birt, East India road, contractor, December 2, at 12—Charles Jabez Cash, Whitehorse street, Stepney, zincworker, December 3—Benjamin Chandler, Worth, Sussex, builder, December 2, at 1—John Smith, Appleford road, Westbourne Park, stonemason—James Edward Ward, Plaistow, builder, December 3, at 11—Edward Foley, Leyton, Essex, builder, December 9, at 1—William Mackenzie, Colchester street, Pimlico, builder, December 9, at 12—William Sparrow, Acton, carpenter, December 10, at 11—Joseph Spurrell, South Norwood, locksmith, December 9, at 2—William Townsend, St. Mary Cray, builder, December 7, at 11—Joseph Wheeler, Althorpe road, Wandsworth Common, builder, December 9, at 12.

TO SURRENDER IN THE COUNTRY.

John Buckley, Davenham, Cheshire, builder, December 3, at 11—Richard James Lawes, Caister, carpenter, December 1, at 12—Matthew Duckworth, Bowling, Yorkshire, stonemason, December 4, at 9.15—Robert Joseph Jones, Liverpool, builder, December 4, at 11—Nicholas Thomas, Merthyr Tydfil, contractor, December 8, at 11.30—Frederick Woor, Loddon, brickmaker, December 9, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 11, R. Gooch, Hertford road, Kingsland, plumber and glazier—December 11, J. H. Lance, Croydon, builder—December 11, J. M. Smith, Cornhill, architect—December 14, W. H. Kimmins, East End, Finchley, brick merchant—December 14, V. Cooper, Lewisham, builder—December 8, J. Finning, Pinhoe, Devonshire, builder—December 5, J. H. Bates, Wolverhampton, brick dealer—December 16, A. Barrett, Donhead St Andrew, stonemason—December 3, B. Scotting, Wilton road, Shepherd's Bush, builder—January 8, J. W. Somerville, Meyrick road, Clapham Junction, plumber—January 11, J. P Crowther, Marlborough square, Chelsea, stonemason—January 12, W. Crimp, Dale road, Kentish Town, carpenter—December 9, E. Flanagan, Ashtead, builder—December 9, E Frost, Forest hill, builder—December 22, W. Clamp, Leicester, builder—December 11, E. C. M. Walker and D. A. Jones, Liverpool, timber merchants—December 4, W. F. Ireland, Bolton, slater—December 15, T. Holmes, Tranmere, Cheshire, architect—December 7, A. Kane, Carlisle, joiner.

PARTNERSHIPS DISSOLVED.

Dowbiggin and Legge, Leeds, builders—Palmer and Co, Old street, varnish manufacturers—Younger and Co., Leeds, timber merchants.

DIVIDENDS.

December 9, H. Shepherd, Old street road, timber merchant—December 17, S. J. and J. Dudbridge, Stroud, builders.

SCOTCH SEQUESTRATION.

Andrew David Crow and James Horatio Thomson, Lochgilphead, builders, November 25, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load Drawback, 1s.

Teak	load	£10	10	12	10	Archangel, yellow	£10 10 £13
Quebec, red pine		3	10	4	15	St. Petersburg, yel.	10 0 12
,, yellow pine		3	0	4	8	Finland	6 5 8
St. John N.B. yellow		0	0	0	0	Memel	0 0 0
Quebec Oak, white		5	5	6	0	Gothenburg, yellow	8 0 9 10
,, birch		3	15	4	15	,, white	8 0 9 0
,, elm		4	0	4	17	Gefle, yellow	9 0 10 10
Dantzic oak		4	5	5	11	Soderhamn	9 0 10 10
,, fir		2	10	4	0	Christiania, per C., 12 ft. by 3 by 9 in.	
Memel fir		2	10	3	0	yellow	10 10 13 0
Riga		2	15	3	0	Deck Plank, Dantzic, per 40 ft. 3 in.	0 14 19
Swedish		2	2	2	8	PUMICE STONE per ton	6 0 8 0
Masts, Quebec red pine		4	0	6	10	OILS, &c.	
,, yellow pine		4	10	6	0	Seal, pale	per tun 35 10 0 0
Lathwood, Dantzic, fm		5	10	6	10	Sperm body	95 0 0 0
,, St. Petersburg		7	10	8	10	Cod	38 0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.						Whale, Sdh. Sea, pale	38 0 0 0
Quebec, white spruce		13	0	18	0	Olive, Gallipoli	68 0 73 0
St. John, white spruce		13	0	15	0	Cocoanut, Cochin, ton	58 0 55 0
Yellow pine, per reduced C.						Palm, fine	44 10 45 0
Canada, 1st quality.		16	0	18	10	Linseed	28 0 34 0
2nd do.		11	5	12	10	Rapeseed, Eng. pale	33 10 0 0
						Cottonseed	27 0 31 0

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 4, 1868.

FAIRFORD WINDOWS AND THE ROYAL ARCHÆOLOGICAL INSTITUTE.

THE beautiful stained glass windows at Fairford have so long, notwithstanding the out-of-the-way place where they are, excited the interest of all who care for such things, that no assertion of Mr. Holt is more unfounded than that they have been neglected by artists and the public in general. It is true that the claims of Albert Durer to the authorship of them had not been publicly and seriously advocated before Mr. Holt produced his marvellous and audacious list of assertions unsupported by one jot of evidence, grounded upon a judgment which was formed without even the trouble being taken of seeing the things commented upon. Never was a controversy carried on with such an exhibition of contempt for all the judgment of predecessors and contemporaries, and with so little to justify the assumption of such an unusual tone of self-assertion. Mr. Holt, as a writer in *Notes and Queries* has remarked, is unable to take up his pen without being obliged to laugh or smile, or give ironical thanks for supposed but mis-directed kindness. Mr. Holt has made up his own mind apparently without any data to go upon, except trifling fancied scraps of circumstantial evidence, and then he seems furious with the world because they want something more. We are not going to question for a moment the importance of the series of glass pictures at Fairford. We have always considered them among the most charming specimens both for colour and design that we have seen. All we object to is the attribution of them to Albert Durer, whose style none of them in the least resemble; and even if they did it would take a great deal more evidence than has yet been produced to prove that they were executed by that giant of an artist. The attempt to prove his concern in this matter upon such data as Mr. Holt brings forward is almost ridiculous. If he could point out the hand of the master, by comparison with acknowledged works, and, better still, if he could produce some collateral evidence of Albert Durer's connection with glass painting, he would have commanded respect and have merited the thanks of all who take interest in his biography. But that he considers far from necessary. When "J. C. J.," in the *Standard*, insisted upon some direct affirmative documentary evidence of Durer's having to do with glass painting, and especially that at Fairford, he was met by an attempt to turn his letter into ridicule. Mr. Holt presumed that the writer expected him to find and produce the original invoice to the goods:

"James Thane, Esq.,
Dr. to Albrecht Durer, of Nuremberg.
To 28 windows painted for your ch., &c."

Does Mr. Holt know that, as a matter of fact, very few names of architects, painters, or sculptors of the middle ages, and some as late as the fifteenth century, in Western Europe at least, can be identified except by evidence very nearly approaching to that which appears so impossible and absurd to him—very nearly all we know of mediæval architects, &c., is from the entries in the church accounts or chronicles? Neither Englishmen, Frenchmen, nor Germans were in the habit of parading their names. They did their lovely work for the love of it, so that in the finest illuminated books, for instance, we hardly ever see a name, date, or place. One cannot help admiring so unselfish and noble a trait in the character of these people, though historically it is a great pity that we have lost such interesting information. It would not have been an easy matter to prove the English origin of the charming Devoniensis Bible in the British Museum if the writer had not fortunately and contrary to custom inscribed the volume with his name. But, on the other hand, we have nothing but the skilled eye to guide us to pronounce upon the English origin of the glorious Tennyson Psalter and Queen Mary's Book 2 B. 7. For this reason Mr. Holt's argument, that we are bound to find a name for the author of these windows if we reject that of Albert Durer, is groundless. There are comparatively few windows or sculptures, or buildings either, before 1500 to which you can assign the names of the artists or architects. By the way, we may as well here express our surprise at Mr. Holt's difficulty about the first printed books wanting names, dates, and places, and his assertion that there must be some particular intention in the omission. Why, we should like to know, should it be expected that the first printed books should have these when we know that of the MSS., in strict imitation of which—(so strict, in fact, that at the first glance the unpractised eye would mistake the one for the other)—these printed books were made, not one in a thousand had anything of the kind? We will not enter into the question of the block books because no one with any knowledge of art can for a moment believe that they were all or any of them the work of Albert Durer, bearing as they do upon the face of them various dates, hands, and countries, and, secondly, because we know it is quite useless to try to persuade Mr. Holt. When Mr. Noel Humphreys alleged the existence of a block book in a binding of 1420 or '30, we were told at once that either the date or the binding was wrong, or that the book had been, for some fraudulent purpose, inserted in the old cover of some MS. So again when at the late meeting of the Royal Archæological Institute, he was told that there was a date perfectly plain, though partly obliterated—Anno Domini 1467—"he did not believe in Anno Domini at all, at anything like the date. The date had been put on." In neither of these cases did he make the assertion *because he knew it to be true.* They interfered with his theory, and so they couldn't be true. *He had never seen either, he allowed;* but what of that? His theory was right, and if facts were against it, so much the worse for the facts. But the most amusing case of all was the celebrated St. Christopher, at Althorp, with the date 1523. The particular copy, by the bye, in the Spencer collection, has always been allowed to have been *printed* with printing ink, by a printing press, though the block is supposed to be of the date inscribed. Well, this is the way Mr. Holt has treated this part of his subject. One would have thought that a gentleman about to contest, in the most positive and not over-courteous manner, the opinion of the general public would have taken the trouble to examine so well known a print as this; especially when the courtesy of Mr. Cavendish Boyle is so well known. But no such thing; without even having seen the original he pens this sentence: "I am an utter unbeliever in dates of literary and artistic curiosities prior to 1500. As the most perfect justification of my disbelief in early dates, I denounce the date upon Lord Spencer's St. Christopher of 1423, so implicitly believed to this moment to be the earliest known woodcut with a date, to be a forgery, and that the true date is 1493. I further say that this forgery was effected by altering the C of the X C into an X, by which simple process seventy years was forthwith added to the date; and I also declare that the St. Christopher in question was executed by Albrecht Durer, at Colmar, in 1493, on the occasion of his visit to the brother of Martin Schon." Now here we see he attributes this cut to Albert Durer, not because it is in the least like anything that he is known to have done—it is no more like his work than it is like Bewick's—but simply because of the date which he or his authority supposed had been discovered. Of any other reason than the supposed date and Albert Durer at that date having been at the place named for the assignment of the woodcut to him, Mr. Holt says not a word. But then unfortunately the date, after all, *is no forgery.* The writer of the above positive statement is obliged to acknowledge that the print has not been tampered with. He then, upon the discovery, coolly, as if nothing had happened, starts another theory that the date has to do with the legend only and not with the cut. If he can only give a good reason for this—we will not say opinion—this *ipse dixit*, we shall be glad to give it the attention it deserves. In the meantime, considering that in the long letters in *Notes and Queries*, in which all sorts of wonderful things are fearlessly declared to be proved, not one difficulty is really met nor a single position established, it will be waste of our time and that of our readers to discuss that part of the question further. At the opening meeting of the Archæological Institute, at which Canon Rock presided, Mr. Fuller Russell combated the position Mr. Holt had taken in respect to the Fairford windows, and proved the untenableness of the jots of circumstantial evidence by which he had attempted to make out his case. These were that Albert Durer was the inventor of the particular cruciform *fleur de lis* nimbus which occurs in the *Nuremberg Chronicle* and in books from the Koberger Press between 1490 and 1500, A. Koberger being godfather of Albert Durer. Secondly, that he was the first who portrayed the angel and demon receiving the souls of the two thieves in the Crucifixion. Thirdly, that the lily and sword proceeding from the mouth of our Blessed Lord sitting in judgment were his invention. Fourthly, that as far as Germany was concerned, Albert Durer was the original and first delineator of the meeting of Joachim and Anna, the birth of the Virgin, her presentation in the Temple, her marriage to St. Joseph. First of all he affirmed that they had never been painted before 1500, but finding that this would not do, he, as usual, shifted his ground and inserted the words "in Germany." In the *Standard* of September 24, soon after the promulgation of these claims, a writer pointed out very clearly that if Mr. Holt could prove them all to be true—which, however, was virtually quite impossible—he would still be scarcely a step nearer to anything like proof that Albert Durer painted the Fairford glass, and gave plain examples where far more convincing, similar proof might be given on paper in favour of works which, from other reasons, the judge would know not to be by the artist. But, as a matter of fact, Mr. Fuller Russell, from his own personal experience of foreign galleries, and from the books in his own possession, was able to crumple up every instance. Mr. Westlake had already shown that the subject of the demon and angel was common in Italian art, and that Durer could scarcely have been unaware of it. A volume was exhibited of 1508, by John Knoblouch, in which a Crucifixion occurs, with the two angels. This cut is by Van Gamperlin, a contemporary of Durer, who resided at Strasbourg, who might as well be called the inventor, but the fact is that it is much older. Dr. Roch said that he had an early German painting where the soul of the penitent thief is carried up to heaven by two angels in azure dalmatics, while the soul of the other is being taken off by the devil himself.

Next, as to the lily and the sword, Mr. Russell would have instanced first of all the *Nuremberg Chronicle*, but as Mr. Holt, contrary to all probability as to resemblance to his known works, contrary to possibility according to Mr. J. G. Joyce, F.S.A., if we consider the date, attributed these cuts to Albert Durer, and that notwithstanding the statement in the Colophon, "Michaele Wolgemut at Wilhelmo Pleydenwurf quorum solerti acuratissimaque animadversione tum civitatum tum illustrium virorum, figuræ insertæ sunt." But, says Mr. Holt, figuræ here means portraits, though he would find it very difficult to prove it. Why! figuræ or typi is

the regular printer's word for all sorts of illustrations long and long after Durer's time. Thus "Il Pastor Fido," illustrated by L. Kilian, 1602, has on the title "di bellissime figurae ornato;" and in "Impresa Illustri di diversi," &c., by Camillo Camilli Venetiis, 1586, we have "con le figure intagliata. Biblia Sacra—cum figuris et descriptionibus," &c.: Lugduni, 1567. "De necnon figuris et chorographicis descriptionibus illustrata": Lugduni, 1569. And, as late as 1685, "Philosophia Imaginum figuris elegantioribus ac antea ornata Amstelodami."

If, however, as Mr. Holt would have it, Albert Durer's name was omitted from the Colophon, and the work of the other two carefully limited to the cities and portraits (?) in order that he might at some future time assert his authorship of the larger cuts, how is it that he never did so? He was very tenacious of his rights, as is shown by his complaint against Marc Antonio. But, as the designer of these cuts is disputed, Mr. Russell showed that the detail mentioned was in use long before Albert Durer's time from other sources. First, they occur in a tempera painting at Gloucester, described by Mr. Scharf as a most important specimen of English work of the fifteenth century. Secondly, in a Horæ after the use of London, belonging to Mr. Russell, in which our Lord as Judge is attended by two angels—one (Misericordia) with a lily, the other (Justitia) with a sword. Thirdly, in two important pictures quite within Durer's reach, viz., the triptych by Rogier Van der Weyden the elder, at Beaune, in Burgundy, and the altar-piece at Dantzic, by Memling. This Mr. Holt doubts, though it is dated. Anyhow, whether it be rightly ascribed or no, the supposition of its dating fifty years later is preposterous. The style, and especially the architecture, such as the splendid Pointed Gate of Paradise and the burnished gold armour of St. Michael, forbid any such idea. Mr. Russell expressed his own certainty, from a long study of his works and from comparing it with a beautiful specimen of the artist in his possession, that it was really the work of Memling. The Van der Weyden's masterpiece is also doubted by Mr. Holt, apparently for no other reason than that art critics are not all agreed as to the name. He is known, however, to have painted for Chancellor Rollin, who in 1443 founded the hospital of Beaune; but whether he painted it or no, "as well," says Mr. Fuller Russell, "might Van Eyck's picture at S. Bavon be attributed to Mabuse as this to any painter of the sixteenth century." Next let us take the representations of St. Joachim meeting St. Anna, the Birth of the Virgin, &c. In the "Missale Pariense" (John Prato, 1489) we have both the Birth and Marriage, and vignettes of the meeting of Joachim and Anna; the Nativity, Presentation, and Espousals. The Birth and Marriage occur also in a painting by Van der Weyden in the Berlin Museum, described in the *Ecclesiologist*, 1850. The Nativity is painted in a picture by the Cologne artist, usually called the master of the Lyversberg passion (1463 to 1480), in the chapel of St. Maurice, at Nuremberg, and the meeting of SS. Joachim and Anna in a picture by the same man at Munich.

Mr. Holt also said that the lettering of the scrolls was in the style invented by A. Durer, and always since called by his name; but a comparison of tracings from the windows with the real thing proved that no such thing was the case. And now we come to what Mr. Holt calls his private and particular property, and which he says gave a clinching blow to his theory, viz., the *fleur de lis* nimbus. Now it is not a little curious that, as a rule, Albert Durer in his acknowledged works hardly ever used a nimbus at all; if he represented glory it was usually in the form of rays, either cruciform, as in the Seven Candlesticks of the "Revelations," or round the head and body, as in the lovely Madonna and Child upon a crescent, a trial proof of which is before us. It is not correct to say, as some have done, that he never used the nimbus, for in a woodcut of a Virgin and Child seated, which is also before us, she, with a crown on her head, has a circular nimbus with a scalloped edge, and the Saviour a cruciform nimbus, the limbs being formed not of *fleur de lis*, but of some light branching twigs of foliage. As to this nimbus being particular to Albert Durer, if he ever used it, he only did so as one of the commonest forms of nimbus in vogue. We have before us at the present four instances at least, two in pages from block books whose rudeness would have disgraced Albert Durer even as a child—one in a woodcut representing our Lord in the scarlet robe, attributed to Lucas Van Leyden, and certainly of his time; and another in the "Missale Augustense," by Radholt, 1510—who, by the way, was formerly of Venice. But Mr. Russell's collection makes very short work of this clincher. He showed, by examples, that the aforesaid nimbus was neither confined to the books alleged nor to the time specified. Among the instances shown, were a book by Antoine Verard, 1480; a MS. of about 1450; "Missale Parisiense," mentioned above; "Sermo pro Episcopo puerorum, circa 1496," W. de Worde; "Mons Perfectionis," by the same printer, 1501; Van Gambelin's "Crucifixion," Strasbourg, 1508; "Missale Trajectense," 1514; Martin Luther's sermon, 1523. If out of two not very large libraries so many examples, from so many different places, and of such various dates, could be readily found of this particular detail, we see how foolish must be any attempt to prove the authorship of any work of art upon such fanciful data.

The question, then, of the painter of these windows still depends, as the writer in the *Standard* said it must do, upon the internal evidence of the paintings themselves and documentary evidence, if such is forthcoming. Actual reference to these particular windows in any account is now unlikely to be found, though those whose business or pleasure it is to hunt up old MSS. know that more unlikely things have occurred than the discovery of such a very interesting entry as that would be. Still, the great quantity of papers relating to this great master, or the public records, &c., and church accounts of Nuremberg and Germany, if properly searched, ought at least to furnish some evidence of Albert Durer being engaged in this trade, if he was employed in it to the extent supposed by Mr. Holt. To this question at last Mr. Holt seems to acknowledge that some answer should be given. At the meeting of the Royal Archæological Institute he seemed to fancy that he had quite proved this point—first, because there had been unbroken tradition from the time the windows at Fairford were executed; but, unfortunately, no such tradition can be proved for more than a hundred and fifty years or so. Secondly, that certain modern treatises and dictionaries said so—an argument about as strong as if we were to say "that he didn't." Thirdly, because, if he did not paint glass, how did he employ himself from 1490 or so to 1506, in which year he painted his first picture, though he previously signs himself as "Mahler"? We are not at all prepared to admit that the picture of 1506 was his first, and even if we did we presume that he could not have painted such a picture in so perfect a manner without considerable previous training both in the study of the human figure, in which he so excelled, and in the use of oil colours. Besides this, it is quite certain that he must have had immense practice at this time in drawing to enable him to bring out the marvellous woodcuts and engravings which were issued towards the end of that time. In Marc Antonio's "Life of the Virgin," the date 1506 is given, which we have no doubt is the date Albert Durer wished to be appended, and which denotes the time of the completion of the *designs*, not of the engravings from which they were copied, the earliest date on which is 1509. Mr. Joyce pointed out, in the *Times* of September 23, that much of this time might easily be accounted for. But we can go much further. Has it escaped the notice of Mr. Holt, who was so very hard upon Mr. Waller for taking his crucial tests, by which he compared the drawing of the Fairford glass with Albert Durer's known work from the "Small Passion"—(he supposed that Mr. Waller's acquaintance with the works of the master was confined to that "common work")—has it escaped Mr. Holt's memory, we say, that that most delightful and extraordinary work, the "Adam and Eve," from which Marc Antonio and Raphael seem to have taken the idea of the design for the same subject, which is so celebrated, was published in 1504? The Leeds Exhibition furnishes a curious and instructive instance of the popularity of both these prints. In Gallery J, No. 1,124, was one of the most beautiful majolica plaques which we have ever seen. It is a copy in a fine blue of Marc Antonio's "Adam and Eve," but, as our readers know, the Marc Antonio had no drapery nor fig leaves; the artist, whoever he was (he signs, by the bye, with Marc Antonio's monogram), supplements the designs by the branches of the trees from Albert Durer's engraving. How much practical preparation would Mr. Holt give for the production of such a work? But we do not stop here; there are at least thirty-nine engravings without date, some of which certainly are shown by the style to be earlier works than the "Adam and Eve." Notably so is the portrait of himself as the "Prodigal Son," which was done apparently about the time the Fairford glass was painted. The animals in it are so beautiful as to be worthy of framing alongside of Morland or Teniers. But of this more anon. In 1503 we have two very fine engravings, "The Madonna seated suckling the Infant" being very lovely. In 1504, besides the "Adam and Eve," we have an engraving of the "Nativity," and in 1505 we have three more; so that, as a matter of fact, there was plenty of work to employ Albert Durer during the time in question, though it may not be easy to prove for certain what it was. We now come to the evidence of the paintings themselves. Do they bear the handwriting of the master upon them? Mr. Holt says that he sees Albert Durer in every inch, and in this opinion, to some extent, he is supported by a well-known and talented writer—more celebrated for his happiness of language and expression than for the value or justness of his art criticisms. But we must remember that Mr. Holt also sees Albert Durer's pencil in the "Speculum Humanæ Salvationis," in the *Nuremberg Chronicle*, and the block books—an opinion that will, in the judgment of most persons, destroy the value of his conclusion, and justify in a stronger sense than possibly was intended, his observation at the Institute that "he did not pretend to be an artist." Doctors still differ about the designers and country of the windows, but one thing is pretty certain, *i.e.*, that Albert Durer had nothing to do with them. There are two points which make this as certain as the case admits. No man for his date drew so correctly as Albert Durer. It was simply impossible for him to draw hands and feet badly. But notwithstanding the grandeur of and splendour of colouring, the human figure is singularly ill-drawn in the Fairford glass, the extremities and joints being particularly faulty. It is of no avail, as Mr. Holt did with singular infelicity, to say that these were works of his 'prentice hand. The designer and draughtsman of the woodcuts of the Apocalypse could not have done such bad drawing as is to be found at Fairford. Fancy the artist who had published the "Adam and Eve" in 1504 being unable to draw joints and feet a few years earlier!—the drawing of "Adam and Eve," be it remembered, being on stubborn copper. Never was a more unfortunate comparison made, as Professor Westmacott pointed out, than when Mr. Holt said we might as well compare Stanfield's

scene painting with his finished oils of his later life. The work of the artist is just as apparent in the one as the other, and it is just this point that we miss in the Fairford glass that proves it to have been done by a different man. But Mr. Waller adduced another reason against Mr. Holt's theory, viz., that the animals were lifeless and ill-drawn. This was a point in which Albert Durer particularly excelled, as in the delineation of pigs in the engraving quoted above, which is as early as the Fairford glass. This drawing is evidently by the hand of a master who closely observed not only the form but the ways and habits of animals; there is even the little pig jumping up to get his feet into the trough, and the crowding of the bigger ones to keep out their neighbours, one monster only just being able to get his nose through. The cocks and hens and other belongings to a farmyard are equally well and truthfully delineated. Mr. Waller instanced the ass in "The Triumphant Entry into Jerusalem," but we have earlier and finer drawings in "The Horses," of 1505, and the beautifully-drawn animals in the "Adam and Eve"—puss and the mouse, the parrot, the stag—so fine that Marc Antonio copied it almost line for line. Professor Westmacott and Dr. Roch, who said that the late Mr. Pugin was of the same opinion, strongly expressed their conviction that the Fairford windows were none of Albert Durer's. As this notice has already exceeded the length we intended, we will only touch upon another point which strongly militates against the German originality of many of these windows. The architectural details are of a Perpendicular character very common in England in English glass and wall painting—but never, as far as we know, used by Albert Durer in any single work known to be by him.

We do not pretend to have discovered the artist of these windows any more than those of a large majority of the windows in Europe. There is so little data to go upon that without documentary evidence we believe the thing to be virtually impossible, painting on glass being so entirely different in every respect from ordinary painting and drawing.

HOSPITALS AND THEIR CONSTRUCTION.

THE first grand point which the architect should bear in mind is, that "the object sought in the construction of a hospital is the recovery of the largest number of sick persons to health in the shortest possible time," and to this end everything else is only subsidiary. The ground selected for a hospital should be porous and dry, and should not receive the drainage of any higher ground. Clay soils, and retentive soils generally, should be as far as practicable avoided. It is an error to build a hospital on a steep slope. No doubt by forming a plateau for the building the water from the higher ground may be more or less perfectly cut off from the foundations of the hospital, but the higher ground, especially if it be steep, will stagnate the air just as a wall or a rampart stagnates it. In certain positions it is advantageous to secure shelter from unhealthy winds, but that shelter, be it a range of hills, or walls, or houses, or trees, should always be at a sufficient distance to prevent stagnation of air and damp. If the last point be not attended to, the shelter from an evil recurring only at intervals may be purchased by loss of healthiness at all other times. In short, by keeping steadily in view what the function of a hospital really is, many of those unhealthy conditions which are so frequent in some existing buildings may be avoided in future. In testing the healthiness of the site prior to making a set of plans, an inquiry into the rate of sickness and mortality in the district will afford valuable indications as to the fitness or otherwise of the ground for the hospital. But the architect should not be guided by the mortality alone, for it by no means follows that a district with a low rate of mortality is suitable for a hospital. The nature of the diseases and the facility or otherwise with which convalescence and recovery occur must also be taken into account. The architect must recollect that to the working population time is life, not only to the breadwinner, who is most probably the patient in nine cases out of ten, but to his entire family. Therefore on the architect as well as the doctor rests the responsibility of speedily restoring the poor to health.

The local climate should be healthy to a degree before an architect can with safety recommend the erection of a hospital on any site. There should be nothing to prevent the free circulation of air over the district. There should be no nuisances, damp ravines, muddy creeks, or ditches undrained, or marshy ground close to the spot, or in such a position that the prevailing winds would blow over them to the hospital. The natural drainage outlets should be sufficient and available, as from want of attention to this matter the whole fluid refuse of large hospitals has been allowed to percolate the subsoil within the hospital inclosures for many years.

Having selected the site, the next point is to determine on what principles the building is to be constructed. This is an all-important point, respecting which there have hitherto been no fixed principles recognised. Hence there are very few hospitals planned in such a manner as to be sufficiently supplied with space, light, or air, and further, there is hardly a single building in regard to which it can be stated that it combines the requirements of healthy construction with sufficient facilities for administration or the study of the young medical man. On what basis, then, should the plan of a hospital rest? From what point of view should it be considered? We state unhesitatingly from the ward construction. The first care of the designer of a hospital, be it large or small, is to obtain good healthy wards, and having obtained them on the plan everything else must be made to suit the money and the ground. The means of access, discipline, and administration must bend to the ward, but the ward must never be made to yield to them. In the great majority of cases the main question in hospital construction appears to have been how to get most conveniently in and out of wards and buildings, or how to provide the best offices and residences for the physician, matron, &c.—very proper questions in their place. But the real question is, how the sick are to get well in the shortest possible time, and this is mainly determined by the ward construction. The ward is hence the foundation of a hospital plan, and the ward construction and proportions must be based on the number of cubic feet to be allowed per bed. The new medical regulations have fixed this datum at 1,200 cubic feet, so that the architect, taking that space as the minimum, can govern himself according to the money at his disposal, and increase the cubical space in the ward as much above 1,200 cubic feet as he can afford. It is of vital importance that the space should be properly disposed of, whether the ward should be high, or long, or broad. The usual idea of appropriating space is to have high ceilings, which at a fixed amount of cubic space infers short wards, or narrow wards, or wards both short and narrow. Hence, if the wards be made higher than necessary the sick will be crowded too close together. A large cubic space badly used may involve overcrowding of sick on the ward floor. We would propose to make the breadth of the ward the foundation of ward construction, because a certain breadth of ward is essential for the ordinary working of the hospital. There must be space along the centre for the tables or other conveniences, and also for improved firegrates, which under certain circumstances may be introduced with advantage in the centre of long wards; while at the same time the breadth of the ward should not exceed a certain number of feet, otherwise ventilation by opposite windows, which should always be resorted to when the weather and season admit of it, cannot be efficiently maintained. Keeping these principles in view, if we take the opposite beds at 6ft. 6in. in length 13ft., we may allow 14ft. from foot to foot of the opposite beds, and the ward will thus be 24ft. broad. One of the dimensions of the 1,200 cubic feet allowed to each bed will be 24·2 = 24ft. If we allow 7ft. 3in. for each bed in the length way of the ward, we shall 12 × 7ft. 3in. = 87 square feet as the superficial area for each bed, and 14ft. for the height of the ward. The unit of cubic space per bed will thus be 12 × 7ft. 3in. × 14 = 1,218 cubic feet. It would nevertheless be advantageous to add a foot or two in width to the ward, in order to give more space for tables, &c. Each hospital bed should not be less than 3ft. in width, so that 3ft. being the standard the foregoing dimensions would give a distance of 4ft. 3in. from side to side of adjoining beds, if the beds were equally distributed along the wall. The length of the ward can easily be obtained by multiplying half the number of beds required by 7ft. 3in. Thus suppose a ward is required for twenty beds, then 20·2 × 7ft. 3in. = 72ft. 6in., the length the ward should be constructed. The beds should be arranged on opposite sides of the ward, heads to walls. The number of beds to be placed in a ward should be divisible by 4, in order to prevent loss of corner space. The greatest economy of space would be effected by adopting wards for 4, 8, 12, 14, 20, 24, 28, or 32 beds, beyond which last number we strongly advise no architect to design a hospital ward.

The next question is that of windows, and their number should be equal to half the number of beds. Thus a ward with twenty beds ought to have ten windows, five on each side. The distance between the end wall of the ward and the first window from each corner should be 4ft. 6in. The wall space between every two windows should be 9ft. wide, and the splay of the window into the room should be 5ft. 6in. wide. One bed should stand in each corner, about 18in. from the end wall, and each 9ft. of wall space should have two beds placed in it 3ft. apart. The windows should extend from within 2ft. 6in. or 3ft. from the floor to within 1ft. of the ceiling. In a ward 14ft. high the windows would be from 10ft. to 10ft. 6in. in height.

Every ward in a well-designed hospital requires for itself, or it should have, easy access to the following offices:—a nurse's room, a ward scullery, a water-closet for every ten beds, a urinal, and last—though not least—a bath room. The fitments of these rooms should be well considered by the architect, and a short *resumé* here may probably assist some of our professional friends some day when they are at work on a set of plans for a hospital. The nurse's room should be so placed that a window in the partition will enable the attendant to overlook all the beds in the ward from her chair. A scullery containing a small grate, with an oven and boiler, a table, racks for cups, a well-constructed sink of white glazed earthenware, the drain-pipe of which should be trapped and ventilated if connected directly with the sewer, or it should terminate in the open air at a short distance above a trapped sewer grating or rain water pipe. Over the sink should be two water taps, one for hot and one for cold water. The proper use of this scullery is to have small vessels washed, instead of their being sent to the kitchen, where they may be kept for some time, and the patients be thus deprived of their use. Hot water will be always at hand so as to fill feet bottles, or for fomentations, &c.

Water-closets, one for every ten beds and under, and one for any number of beds exceeding ten, or any multiple of ten, should be provided for. In the large class of hospital the closets should be placed at the end of

the ward furthest from the centre of the building, and in such a position that the external air can play freely around them. They should in all cases be cut off from the wards by a well-ventilated lobby. A fixed bath adjacent to each ward is absolutely necessary. The bath, of course, would be supplied with hot and cold water, but a tube should be attached to the tap, which would supply a slipper bath if required. In the floor of the bath-room a small trapped pipe will be of great service in removing the water which must often be thrown out of the bath. This last is a small point, but it is well worthy of being remembered by men who design such places. How seldom one sees it either in a hospital or even a public bath-room. Earthenware baths glazed inside are much better for hospitals than even the more expensive enamelled iron now so much used. They are more easily cleaned and keep the temperature more equal than those of metal. For ablution rooms fixed basins with plugs and washers are best.

COMPARATIVE STRENGTH OF WROUGHT-IRON TUBES.

AT a time when a large share of public attention is being directed towards every feasible method of overcoming the watery barrier separating Albion's chalky cliffs from the Gallic shores, it may not be *mal à propos* to briefly consider what would be the most suitable form that a bridge should possess, supposing for the moment that particular medium to be adopted. In consequence of the peculiar circumstances attending the case, the tubular form, from its great rigidity, perfect compactness of parts, and from the success which has attended its erection in a similar situation over the Straits of Menai, appears to offer many advantages over other types of bridge construction. Generally speaking we should be disposed to give the preference to the open web or lattice principle, from its superior lightness and elegance of appearance; but the present is just one of those special instances which occasionally arise, and justify a departure from that which would otherwise be the course to adopt. It must not be forgotten that one of the chief objections to the tubular type—namely, its great weight and mass of metal, in this case falls to the ground; in fact, it becomes an argument in its favour. As the spans must exceed any that have yet been erected, and cannot well be less than 1,000ft., a very large amount of metal becomes absolutely necessary in the construction of the bridge, and a great insistant weight, so long as it is also serviceable in carrying the live load, is a positive advantage. Taking into account that the maximum force or impact of the wind may in hurricanes attain to so much as 70lb. per square foot, it is evident that the *vis inertiæ* of a structure placed at an elevation of at least 120ft. above high water mark can scarcely be in excess of what may be required of it. In this respect the tubular girder, with its solid sides and booms, is infinitely superior to its open web rival. There is, in fact, no question that the former is the stiffest description of bridge that can possibly be constructed. We do not mean to assert that a lattice girder would not answer in the same situation, but we maintain that it is not the form best adapted to meet the peculiar exigencies of the case.

Assuming for the moment that the tubular principle is that selected, the next step is to investigate the precise shape in which it is best calculated to resist the various strains brought upon it. All tubular girders may be reduced to three classes—the circular, the elliptical, and the rectangular. A square tube would, of course, be only a particular example of the rectangular, in which all the sides become equal to one another. It is worthy of remark that the square or rectangular sections were those which first suggested themselves to the mind of Stephenson when he was engaged in devising the present means of crossing the Straits of Menai. On the other hand, it was argued, and with much justness, that the circular and elliptical tubes were well adapted to preserve their shape, to effectually resist the separate strains of compression and tension induced upon their upper and lower flanges, and, moreover, offered but little opposition to the force of the wind. This latter power was completely the *bête noire* of many interested in the successful execution of the great project, and terrible results were prognosticated by its enemies of what it would accomplish when the tubes were in course of being fixed. Fortunately, all these predictions proved utterly groundless, and the actual effect of the most violent storm has been determined by accurate measurement to produce little or no lateral motion or deflection upon the Britannia Bridge. The experiments carried out by Stephenson with regard to the strength of circular and elliptical tubes cannot be said to have been at all satisfactory or conclusive. The plates composing them were exceedingly thin, in some cases not exceeding the twenty-fifth part of an inch, and the mode of riveting adopted was of a very unscientific character, the joints not even being protected by a cover or wrapper. As might have been readily imagined, in consequence of the tubes possessing not the slightest lateral rigidity they were soon drawn out of shape, the circular form merging into an oval or elliptical, and the latter suffering a further elongation in the direction of the major axis. The proper course would have been to have carried out some experiments upon these tubes, with thicker plates, better riveting, and better designed joints, and then have compared the results with those of the other form. But as the rectangular shape appeared to offer, on the whole, superior practical advantages, the circular and elliptically shaped examples were abandoned, and attention directed towards perfecting the dimensions and proportions of the former kind. The alteration which took place in the form or section of the tubes might have easily been either altogether prevented or at least greatly retarded by the introduction of suitable diaphragms and internal bracing, and it was rather an unpardonable oversight in those who had the conduction of the experiments to have omitted means so simple and manifest of increasing the strength. Thick plates constitute the best protection against buckling or other change of form. The best proof of the unscientific and inefficient manner in which the circular tubes were constructed is that, although the iron was of a quality fully capable of sustaining a tensile strain of twenty tons, yet the bottom fractured when the strain was not more on the average than thirteen tons. After abandoning all further investigations with respect to the circular and elliptical forms those upon the rectangular were prosecuted with great energy, and the results gave a considerable accession of strength over those of their predecessors. So far as precedent is concerned the rectangular tube certainly appears to have the advantage over its rivals, but it is to be hoped that were this form of bridge seriously contemplated for crossing the Channel it would not be ultimately adopted until the others had been subjected to a series of comparative tests, for the purpose of determining whether they are really inferior in strength and rigidity. Among the practical advantages possessed by the square or rectangular section is that of requiring the smallest superficial internal contents. It is easily perceived that in the latter the roadway can rest close down upon the bottom of the tube, whereas in the circular and elliptical it must form a chord of the circle, and, consequently, the extreme height of the tube must be greater than in the rectangular section. A glance at the diagram will illustrate our meaning, the letters in each figure having the same signification. Thus, in a tube carrying a single line of rails the rectangular fig. A B C D will represent the least superficial contents or sectional area required, in order to afford room to clear the rails underneath, the funnels overhead, and the carriages at the side. The line L M represents the level of the top of the engine funnels, and N O that of the top of the rails. The fig. E F H K is the space contained between the centre lines of the cross sections of the engines. In adopting the rectangularly-shaped tube we perceive that we can reduce the form to the minimum sectional area demanded, while there is a manifest loss of area in the circular shape both at the sides and bottom. The elliptically-shaped tubes, shown approximately in fig. 1 by the dotted lines A C, B D, save some space at the sides, but are not so economical as the rectangular. Upon the whole, therefore, unless fresh experiments evince that the cylindrical form possesses some advantages not yet discovered, the preference, judging from precedent and practical knowledge and results, must be given to the rectangular form.

FIG. 1.

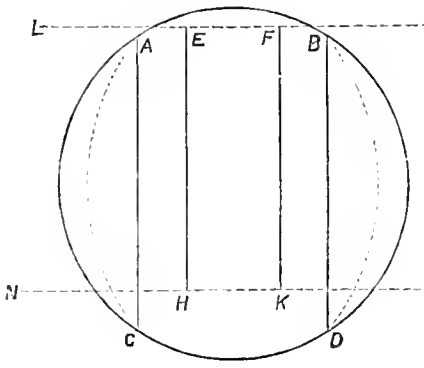
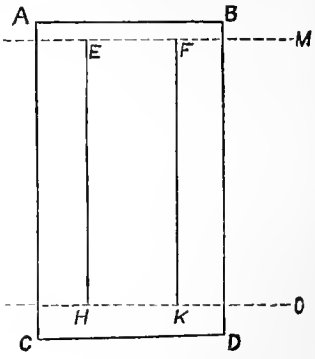


FIG. 2.



ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday evening last Mr. Charles Barry presided over a large attendance of Fellows and Associates. Mr. James G. Smither, of Colombo, Ceylon, was duly elected as a Fellow, and Messrs. William J. Marsden and Reginald E. Worsley were elected Associates. Mr. Seddon read a letter from Mr. Smirke, who sent an interesting Norman capital, found in the Temple in some recent works there, having all the freshness of new masonry, and having been apparently only used as rubble. It was probably twelfth century work. Mr. Seddon also announced that a report on a design for the new Norfolk Lunatic Asylum had been received from Mr. R. M. Phipson, the architect. This was a good precedent for architects to send similar reports to the Institute for the general information of the profession. The chairman then called upon Mr. A. H. Layard, M.P., to read the paper for the evening.

ON MOSAIC DECORATION.

Mr. LAYARD, after stating that his paper was supplementary to that read before the Institute by Mr. Digby Wyatt, in March, 1862, referred to

the attention he had paid to fresco painting, and to the disappointment he felt at the failure of that art in this country from climatic influences, as seen at Westminster and All Saints', Margaret-street. He next referred to the prejudice existing against the use of decoration in ecclesiastical and secular buildings, out particularly the former, although a great deal had been got over. Disappointed with the failure of fresco-painting in this country he had turned his attention to mosaic as a means of supplying the place of fresco. The art of putting together small cubes or tesseræ of different substances, so as to form patterns and figures either in monochrome or in various colours, was very ancient, being known to the Egyptians, Assyrians, and Babylonians. Mosaic was applied to the decoration of walls and pavements, and was extensively used, especially for the latter purpose, by the Greeks and Romans. Owing to the durability of the materials generally employed, such as hard marbles and porphyries, enamels or glass, and terra cotta, mosaic has defied the ravages of time probably more effectively than any other architectural decoration. Pictorial mosaic on a really large scale was first used for the decoration of public buildings during the later days of the Roman empire and during the supremacy of Byzantium. Mosaic took its chief development after the spread of Christianity, and in the decoration of Christian edifices, and may, therefore, be called an essentially Christian art. The most magnificent examples of ancient times were to be found in the churches of Christian Rome, Constantinople, and Ravenna. The chief features of Christian mosaic are the vast extent of wall surface to which it was applied; its most frequent use on domes, apses, and curved surfaces; and the representation of figures and ornaments on a gold ground, although a gold ground was not always used. The extreme richness of this mode of decoration, and its grand and solemn character when used in large masses, made it especially applicable to religious purposes. Though generally used in the embellishment of churches there are several recorded instances of royal palaces having been profusely adorned with it. A vast mass of ancient mosaic work has perished; no small amount in the East is still covered with whitewash and plaster. There seems to have been scarcely a church or baptistery of any importance built within the precincts of the Byzantine empire that had not more or less mosaic decoration. The fashion spread across the Alps, and Charlemagne decorated his basilicas and palaces with mosaic. The general use of mosaic led to improvements in the materials employed. Marbles and porphyry could no longer be exclusively used, and earthenware did not promise the required durability. Enamels or vitreous substances were mixed with them, and the art of enclosing gold leaf between layers of glass—a very difficult one, requiring great nicety of manipulation—was discovered. Among the most remarkable of the early mosaics now preserved are those of St. Sophia, a church at Salonica, the Baptistery of Constantine at Rome, the Baptistery at Ravenna, and of St. Maria Maggiore at Rome. Unfortunately few of the early mosaics at Rome and Ravenna are free from considerable restoration, and their original character is in many instances much destroyed. Frequently these restorations are made with mere coloured plaster. Among the edifices which furnish the best examples of mosaic decoration and are most deserving of study with a view to the use of mosaic in this country, may be mentioned St. Mark's at Venice, the Capella Reale at Palermo, and the basilicas of Ravenna. These are to be taken not in order of date, but according to their importance as illustrating mosaic decoration. St. Sophia's is excluded, because the mosaics on its walls are for the most part concealed by plaster, and have been so covered since the Turkish conquest. St. Mark's, taken as a whole, is the most perfect example of internal decoration in the world. Details may be more beautiful in other edifices, but nowhere else will be found an example of one noble and grand conception so thoroughly and completely carried out. It furnishes, too, the fullest and most valuable chapter in the history of mosaic, for it comprises specimens of mosaics extending over a period of from between the eleventh and twelfth centuries to the end of the seventeenth, and consequently embraces a variety of styles and shows different modes of employing mosaic. Every square foot of the church is covered with mosaic work, except where the richest marbles panel the lower parts of the wall. There is no uncovered or naked space. The eye is completely satisfied. Nothing looks unfinished. A visit to this edifice would impress one with the feeling that if we are to have decoration in our sacred edifices on a large scale, so as to add to their religious character, mosaic is the most appropriate of all decoration. The lustrous surface of the enamels, the large masses of gold ground, the richness of the colour, produce an infinite variety of the most beautiful effects, ever changing as the sun changes its place. St. Mark's, is never the same. Enter at any hour of the day, in summer or in winter, and whether the sky be clear or overcast some new and unexpected effect will surprise and delight. The singular harmony, notwithstanding the abundant richness of the gold grounds which prevail throughout the decoration of St. Mark's' is owing to its completeness. Any whitewash or plaster, or blank undecorated space such as one sees in our churches, would have been an eyesore, and would have marred the marvellous beauty of the whole. When thus complete, decoration, whatever may be the wealth of gold and colour lavished upon it, is never vulgar or tawdry, but, on the contrary, when a just balance is preserved in them, it is sober and harmonious, and can be made eminently subservient to religious purposes. It is only when decoration is introduced as if it were something not forming an essential part of the building itself, but only put there for show, and as if too precious except to be doled out with a niggard hand, that it becomes vulgar and tawdry, and appears inconsistent with the objects of a sacred edifice. St. Mark's taught us that it was especially necessary to avoid white spaces, and especially plaster, when materials so rich as mosaics are employed. In St. Mark's could be studied the best mode of employing mosaics and the style best suited to our churches. In this very museum of mosaic decorations are to be seen specimens of all styles and descriptions of work. The most ancient are simple figures on a gold ground, probably the work of Greek artists, or if not, certainly copied from them, and most properly called Byzantine. Perhaps the most perfect specimen of mosaic decoration after St. Mark's is the Capella Reale, or as it is frequently called, the Capella Palatina in Palermo, built in 1132, and the mosaics of which were finished about 1143. They are all of the same period. The decoration of this building is complete. In the basilica of Monreale, magnificent as it undoubtedly is, and superabundantly rich as it is in mosaics, the effects are less solemn and religious than those of St. Mark's; still it is a glorious building, and furnishes to the architect an invaluable collection of beautiful ornaments of a particular period and style, the church having been entirely built and decorated towards the end of the twelfth century. It affords, too, an important example of the use of mosaics for pictorial purposes on side walls. The colossal form of the Saviour on a gold ground in the semi-dome over the central apse, has a grand and imposing effect, and is a fine example of the manner in which this architectural feature in a church can be appropriately decorated with a single figure. Unfortunately, the ancient basilicas of Ravenna have either been allowed to fall into decay or have been so much changed by modern restorations and alterations that we can no longer judge of the effect which the mosaics they contain must have produced when the whole ornamentation of the interior was in complete harmony with them. What is usually called the "Jesuit" architecture of Italy—that vulgar Renaissance which is so offensive to good taste and so utterly opposed to all solemnity and true religious feeling—introduced the fashion of breaking up the interiors of ancient churches by the introduction of side chapels, and of vast altars composed of columns, cornices, and pediments of marble of every hue, piled up without any reference whatever to the surrounding architecture, or without any pity for the frescoes and ornament which can have adorned the walls. The original simplicity and symmetry of almost every sacred building of any antiquity in Italy was thus destroyed. Most fortunately St. Mark's, for various reasons, has been spared, and remains both in ornamentation and form nearly as it was intended to be by its builders. In the basilicas of Ravenna we can only judge of each mosaic as an individual example with reference to the actual work and the capabilities of the material. We can form no adequate conception of the general effect which it was calculated to produce as a portion of the general decoration. The richness and harmony of colour are neutralised by the vast spaces of plaster and naked walls by which, in most instances, these mosaics are surrounded. But in themselves they are deserving of the most careful study, as belonging to the best period of early Christian mosaic art. They are specially valued for the interest attaching to some of the finest examples of the treatment of pictorial mosaic and of the technical qualities of the material. As an example of external decoration in mosaic may be mentioned the Cathedral of Orvieto. To judge of the full effects of the mosaic pictures which adorn its richly decorated façade it must be seen from a distance. Standing majestically on a platform supported by precipitous cliffs rising out of a wide valley, it is admirably suited to the display of a richly-ornamented façade. The mosaics, which are modern, are not of the best style, and are too pictorial for the architecture unless seen from afar. Still the effect is very gorgeous, especially on a bright day. Mr. Layard would hesitate, however, to recommend similar decoration for imitation in this country.

If mosaic can be used effectively and advantageously in sacred edifices, there is no reason why it should not, with equal propriety, be employed in secular buildings. All that is required for this purpose is a knowledge of the principles which regulate its proper application, and of the capabilities of the material. In many respects mosaic is preferable to fresco for decoration, especially in our climate, even without reference to the atmospheric influences upon wall painting. It is more durable, more lustrous, more effective when employed at a considerable distance from the eye, far richer, more brilliant (especially when gold grounds are extensively used in the subdued light of our climate, and, lastly, in case of injury or deterioration from dirt or other causes, it can be restored and cleaned without any detriment or loss of character to the original work. Fresco painting and mosaic have, however, distinct and separate attributes and capabilities, and when both can be employed under equally favourable conditions, as in Italy, they need not interfere with one another. The minute and elaborate mosaic work, chiefly practised at Rome, is intended rather for the reproduction of easel pictures and altar pieces than for architectural decoration. This is to be avoided by the architect. Legitimate mosaic decoration, like all true architectural decoration, should, in the very first place, be made subservient to the architecture, or rather it should be made essentially a part and parcel of it. The truly great architect will devise and superintend the decoration of his own building, even, if possible, to the minutest details, for nothing adds more to the effect of an architectural monument and to its grandeur and nobility of character than the feeling that one clear, well-defined, and lofty conception pervades the whole of it. When the identity of conception is apparent in a building, however inferior it may be in certain details to another edifice in which homogeneity is wanting, it will always be far superior to it in the general effect which it will produce. In order to make mosaic decoration harmonise well with architectural lines and forms, all the best designers of mosaic have sought to give their cartoons a certain conventional and architectural character, and have avoided any attempt to make the mosaics look like pictures in oil. As from the nature of mosaic (tesseræ placed together with more or less precision), it is best seen at a distance, it should be used, especially when pictorial, at a certain height from the spectator. There are no mosaics in St. Mark's less than about 10ft. from the pavement, and the greater number are at a considerable elevation. Consequently, distinctness of outline, not only in the figures themselves, but in their extremities and parts is required. Each figure should stand out boldly, and not interfere with other figures when grouped. For this reason the best mosaicists of the best periods of the art generally preferred the processional treatment of their figures. Any attempt to produce different planes of distance (which require, to be properly defined, all the subtle tints of the painter's palette), should be avoided. The outlines should be distinct, well-defined, and marked somewhat heavily, their darkness and thickness being regulated according to the elevation of the mosaic. This rule applies to both pictorial and purely decorative work. Reference should be specially had to the style of architecture of the building, always, however, remembering that although the general arrangement of lines and treatment of the subject may be varied to suit it, yet that whether mosaic be introduced into a Classic, Gothic, or Renaissance edifice, the general laws which regulate its use are the same. In order to increase its effect,

almost all good pictorial mosaic is surrounded by a band of appropriate ornament in the same material, the width of which depends upon the elevation and position of the mosaic picture. The design for mosaic, whether pictorial or simply decorative, is essentially the business of the architect, and unless he makes it himself, or causes it to be executed under his immediate direction, he will never produce a really great architectural monument, if mosaic decoration is to be a prominent feature in it. Architecture is the noblest of all arts, for when rightly understood, sculpture and painting become her handmaidens. When they were so, the most beautiful and perfect edifices were produced, whether in Greece or Rome, in Italy, or in more northern climes. The architect who takes this lofty view of his profession, and educates himself to carry it out, will erect the greatest monuments and earn the highest fame. Although the chief merit of the mosaic must depend upon the designer of the cartoon, much is left to the skill and judgment of the mosaicist who executes it. Much effect may be produced by a judicious selection of tesseræ of different sizes for different parts, by the mixture of tints in large masses of one colour (such as a gold ground), so as to avoid monotony of tone, and by the dexterity with which the arrangement of the tesseræ is made to follow leading lines and undulations of flesh or drapery. The intervals between the tesseræ must be regulated according to the distance from which the mosaic is to be seen, and can also be made to contribute to the general effect. These things, and the proper selection and matching of the tints, form the duty of the mosaicist.

It is to be regretted that mosaic had not been introduced into England when the decoration of the Houses of Parliament was commenced. It is to be hoped that it is not too late to introduce it into the building, which is eminently calculated for this mode of decoration. It is to be deplored that the noble idea of making the walls of the House of Commons record the history of the country has not been fully carried out, principally owing to the failure of the materials employed. It will be a national loss if the fine wall pictures of Mr. Maclise should perish, whether regarded as monuments of the genius of the painter or as most careful representations of great events. Had they been executed in mosaic the skilful touch of the master would doubtless have been missed, but designs would have been preserved worthy of him, and he would have been enabled to employ the years that have been taken up in the actual manual labour required in such vast works in preparing other cartoons for the completion of the decoration of the hall, in two panels alone of which the battles of Trafalgar and Waterloo are now represented. The works of some of the principal painters of our time, executed at no small cost to the nation, will perish in all probability within a few years, and our only chance of preserving any memorial of them is by reproducing at least a portion of them in mosaic. We have rising up around us museums, picture galleries, public offices, courts of law, townhalls, railway stations, and other edifices. Each of such buildings might be made to contribute towards the elevation of the public taste by appropriate pictorial decoration in mosaic. But the architect hesitates to fill up the blank spaces in such buildings with frescoes, because he cannot satisfy himself that they will resist the effects of our climate. Judging from the manner in which, in Italy and the East, mosaic (both when used externally and internally) has defied the ravages of time and weather, we may infer that mosaic of good quality is precisely the material which will suit our climate and atmosphere. In our museums and picture galleries (with the exception of the South Kensington Museum, where a most praiseworthy and, on the whole, successful attempt has been made to introduce ornamentation on a large and complete scale), we have hitherto been sadly deficient in rich and appropriate decoration. And yet the value of a work of art, and the impression it is calculated to convey, are very much enhanced in the public mind by the beauty or magnificence of the building which contains it—like a jewel which gains by a rich and appropriate setting. Our National Gallery, for instance, is a disgrace to a great and civilised people. Its dirty floor of common boards, its coarsely papered walls, its undecorated ceilings, its mean internal approach have unquestionably a tendency to depreciate in public estimation the value of the treasures which it contains. Our pictures crowded on the walls of such apartments look as if they were hung for approaching sale by auction. Thousands who visit the National Gallery, and for whose instruction and elevation its contents are partly intended, leave it without any adequate notion of the worth and beauty of what they have seen, merely because they cannot believe that things of real value can be so poorly cared for. There is something elevating and refining in rich and beautiful ornament when introduced into a public building, and the working classes feel the influence of it.

In exterior decoration, gold mosaic can be used as a ground to bas-reliefs, whether figures or ornament, in white marble and other materials. The Byzantines and Venetians were well aware of its worth for this purpose, and of the singular beauty and delicacy of its effect. There are some charming examples in the *facade* of St. Mark's. The statues on the exterior of the church of Or St. Michele at Florence were for the most part lined with gold mosaic. An important consideration in the use of mosaics in England, and especially in London, is the facility with which dirt and discoloration produced by smoke and soot can be removed from its surface, either by simple washing or by the employment of an acid, without the least detriment to its brilliancy. Some mosaics at Ravenna, dating from the fifth century, have been cleaned and are as bright in colour as when first executed.

In England we have never had a school of mosaicists. The fine ancient mosaics that we possess, such as those in Westminster Abbey, were executed by Italians. Mr. Cole attempted four or five years ago to found a school of workers in mosaic, who were to employ tesseræ of terra-cotta, or ceramic tesseræ, instead of enamel. Some creditable specimens were produced by Messrs. Minton, and Messrs. Simpson and Co., but the attempt was not altogether successful. For certain purposes these ceramic tesseræ are sufficiently effective, but they lack the richness, brilliancy, and luminous quality of enamel: reds and purples cannot be produced, and the effect of the gold cannot equal that of the Byzantine mosaics. Their durability is also questionable. In repairing the mosaics of St. Mark's it has been found that whilst the ancient tesseræ in enamel are perfectly preserved, those in terra-cotta and other materials have either perished or greatly suffered. Mosaics in enamel have been executed by several eminent firms in this country. Among these are some full-length figures at the South Kensington Museum by Messrs. Rust and Co. Some of the enamels used were made by Messrs. Powell, of Whitefriars, but the greater part came from St. Petersburg, where is a well-known manufactory of mosaic. In Italy the traditions of the workers in mosaic have been handed down through centuries, but, as the numerous restorations of mosaic work testify, the art has degenerated. A few years ago Lorenzo Radi, a glass-blower of Murano, effected great improvements in the manufacture of enamel mosaics. Dr. Salviati, a lawyer of Venice, was attracted by Radi's work, entered into an agreement with him, and opened an establishment at Venice for mosaic work, obtaining artists from Rome to instruct Venetian youths in the art. In former times mosaic work having to be executed on the walls required considerable time and labour, and was consequently very expensive. The mosaicist had to copy the cartoon on the wall itself, fixing the tesseræ one by one in the cement prepared to receive them. Dr. Salviati avoided this by teaching his workmen to execute the cartoon on the reverse side, the face of the mosaic being downwards. The tesseræ are fastened with common paste to sheets of coarse brown paper, on which the cartoon is traced. When the work is finished it has only to be fixed with cement upon the wall destined to receive it, and the brown paper is removed from its face. The process requires considerable skill, especially when figures have to be executed, but is perfectly successful. It cannot, however, be used when great delicacy and extreme nicety of work in the production of tints are required. Dr. Salviati's attempts at the revival of mosaic work have met with most success in England. His first important commissions were the decoration of Wolsey's Chapel at Windsor, and the Albert Memorial at Hyde Park. These furnish excellent examples of what mosaic work for internal and external decoration should be. Mr. Layard hoped that Mr. Penrose, the architect of St. Paul's, had not relinquished the idea of carrying out Wren's original design of decorating the interior with mosaics. Abroad, the principal commission obtained by Dr. Salviati was that for the complete restoration of the mosaics at St. Mark's at Venice, for which a contract had been entered into extending over fifteen years. In order to sustain an industry of so much importance, a few English gentlemen have come forward with capital, and Dr. Salviati's establishment has become an English company under his artistic direction. Mosaic, both pictorial and simply decorative, not only can be but ought to be employed in this country. Care should be taken in the selection of the cement. That used by Dr Salviati has been tested by Mr. Gilbert Scott and other eminent architects, and approved of by them.

The cost of mosaic depends principally upon the quality of the work, the distance from the eye at which it is to be placed, the predominance of figures, ornament, or simple ground, and the prevalence of certain tints. Reds and purples are the most expensive tints. The gold mosaic, and especially the silver (which is even more difficult to obtain than the gold), is more costly than common tints. As an indication of the requirements of a mosaic establishment, Mr. Layard stated that in order to execute the cartoons which had been entrusted to Dr. Salviati, nearly 1,500 tints had been brought together. Any quality or tint of gold may be obtained by darkening or lightening the colour of the glass upon which the gold leaf is laid, or by using a film of coloured instead of transparent glass over it. The brightness of the gold may also be deadened by roughening the outer surface of the outside film. Taking the various qualities of mosaic which may be fitly used for decorative purposes, the prices would vary from about 30s. the square foot for the coarsest work to £4 (or, at the utmost, £5) for the finest. This includes the fixing, but not the price of the cartoon. After showing that these prices, when compared with the cost of frescoes, are very moderate, Mr Layard concluded by commending the subject of mosaic decoration to the attention of English architects.

A long discussion ensued, in which Messrs. Digby Wyatt, G. E. Street, Aitchison, T. Hayter Lewis, J. P. Seddon, Fergusson, and G. G. Scott (who occupied the chair during the discussion) took part. A vote of thanks having been accorded to Mr. Layard for his paper, that gentleman briefly replied to the various points raised, and the proceedings terminated.

THE BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-first anniversary festival of the above Institution was celebrated on Thursday week, at the Freemasons' Tavern, Great Queen-street, Lincoln's inn-fields; Mr. George F. Trollope (president) in the chair. There were 250 friends and subscribers present. After the usual loyal toasts had been duly honoured, the chairman proposed the "Builders' Benevolent Institution," and set forth the objects of the Institution—viz., for giving relief and granting pensions to decayed members of every branch of the building trade and their widows; also for affording temporary relief to workmen in case of accidents. He pronounced the Institution as being in a very satisfactory state; but the directors had this year deemed it prudent to forego the usual election of pensioners in the autumn. Mr. W. R. Rogers, in support of the toast, having shown the peculiar characteristic in the trade, how, from a wealthy position, builders might—not by any fault of their own, but by vicissitude—be cast down, asked the friends and subscribers to continue and further their assistance, as there were many of their poor brethren anxiously waiting to become recipients of the charity. In August last, the number of pensioners on the funds was 48. The remaining toasts were:—"The Chairman and President," proposed by Mr. George Plucknett; "The Patrons, Vice-president, and Trustees," coupled with the names of Mr. Thomas Cozens, the founder of the Institution, and Mr. John Thorn, proposed by Mr. Crockett; "The Treasurer" (who, in reply, stated that the donations and subscriptions that evening amounted to nearly £500, that the funded stock now stood at £15,000, and that he hoped that in a few years the amount of the annual pension would be increased from £24 to £30); "The Architects and Surveyors," responded to by Mr. Franklin; and "The Directors and Stewards," to which Mr. Wilfrid Nicholson replied. Mr. J. Bird, the secretary, stated that there were 16,000 persons connected with the building trade, and doubtless the Institution only needed to be better known to receive still greater support.

ARCHITECTURAL ALLIANCE.

REPORT OF THE DELEGATES FROM THE ARCHITECTURAL ASSOCIATION ON ARCHITECTURAL EDUCATION.

To the Members of the Architectural Association.

GENTLEMEN,—At the last meeting of the Architectural Alliance, the subject of architectural education was suggested as a fitting theme for inquiry and discussion among the various societies forming part of the Alliance: and your delegates have drawn up the following report to be submitted at the next meeting of the Alliance, in May, which they now bring forward for your consideration. In order to facilitate the inquiry the subject has been divided under four heads:—

1st.—Architectural education as now existing in England and abroad.

2nd.—The best system of architectural education to be established in England.

3rd.—The opportunities which actually exist for extending the sphere of architectural education.

4th.—How far these can be modified and added to so as to arrive as nearly as possible at the ideal scheme set forth under Head II., and what provisional system should be recommended till the suggestions under Head II. be fully carried out.

HEAD I.—EXISTING ENGLISH AND FOREIGN EDUCATION.

In England, as a rule, the would-be student comes straight from school, where his attention has been confined, more or less exclusively, to the ordinary acquirements of a classic education, with little or no knowledge of drawing, and with such a smattering of physics and mathematics as is almost entirely useless. He is articled to some architect for a period of from three to five years, who gives him the run of his office, which means, that he is to pick up as much information as he can by working on the regular office drawings; and by dint of so doing, of copying letters, specifications, and tracing drawings, acquire by the longest possible process the practice of an architect's profession. If intelligent, he is able before the end of the second year to work out drawings from the sketches of his principal, and thus acquire secondhand the facilities of copying old work if in a very good office, or of mutilating it if in a bad one—designing is out of the question. In pointing out this course, it must be understood that it is not in all offices that the student has to shift for himself; but even when it is not so, the principal finds sometimes the greatest difficulty in suggesting how and where the best information is to be obtained; and we all remember when Mr. Scott brought forward his scheme of art education he himself said, "That he was entirely unable to point out to his pupils, or even to his own sons, any means of obtaining true artistic training but the most accidental and irregular."

In Paris, the student on leaving school enters one of the Government drawing schools ("Ecole de Dessin"), where he is taught freehand drawing from models geometrical and architectural drawing. At the same time he follows courses of instruction in mathematics and descriptive geometry. Towards the end of the first year (after leaving school) he enters a studio. A studio is a large room fitted with drawing-desks, where a number of students assemble together to draw and work out their own designs, under the supervision of an architect professor, whom they choose, and who, in consideration of the 20f. a month they each pay during the time they work in the studio, pays for the room, and gives them advice, coming three or four times a week, stopping about two hours and going round to each student in succession. In the studio, the student's attention is first turned to architectural drawing, the delineation of the Orders to a large scale, the projection of shadows, and the laying on of flat tints in Indian ink and colour. As a relief to this kind of study he commences designing, working out plans, sections, and elevations, and making free use of books; in fact, almost copying at first, and having throughout the advice of the professor and of his fellow students. In two years, or less, from the time of leaving school, he presents himself for admission into the "Ecole des Beaux Arts," and passes an examination in mathematics (as far as simple equations), logarithms, descriptive geometry (elementary and the intersection of cones, cylinders, &c.), drawing from the round, and architectural design. If admitted during the first year he follows a course of lectures in mathematics, physics, construction, perspective, &c., working out at the same time in the studio special designs in wood, iron, and stone, writing specifications, and giving all the details of ordinary floors, roofs, &c. In all these subjects, as well as in those above mentioned, on which lectures are given, he has to pass examinations. In the second year he begins architectural design proper, his attention being turned more specially to composition and proportion. Three or four years is the time usually spent in the school. If the student intends to take a high position in his profession he works longer, and the Grand Prix de Rome or even admission as one of the ten competitors for it each year, is the great object he strives to attain to; all this while working in the studios, except when competing for the Grand Prix, the designs for which are entirely done in rooms in the school. It will be seen, therefore, that the student devotes a much longer time to learning his profession than we here in England think necessary; and there are many to whom their parents could not afford support for so long. (We should, however, remark that no premium is ever paid, that the expenses of a studio are small, and that the school instruction is gratuitous.) There are many students, therefore, who not having means at their disposal, work at intervals in the office of some professional architect on his office drawings, receiving so much per hour (from 1f. to 3f.), and thus contrive by working for a little over half the year and in the evening to send in designs regularly to the "Ecole des Beaux Arts," until they have arrived at such distinction as to give them a position equal to their merits.

In consequence of some abuse which had crept into the Ecole des Beaux Arts and its direction, a new school called the "Ecole Centrale d'Architecture" was established four years ago, under the auspices of M. Trelat, an engineer. The results of their work may have been seen lately in the Kensington Museum. They were very poor both in drawing and in composition. In its practical element, however, this school is worthy of our consideration, and we may also be able to suggest where its artistic element was found wanting. The prescribed course of studies lasts over three years, three months in each year being allowed for vacation, during a portion of which time the student is expected to draw and measure ancient buildings. The subjects taught are:—First year—geometry (elementary and descriptive); the "coupe des pierres" (theory of stone cutting); trussing of girder beams, &c., strength of materials; ventilation, acoustics, and mechanics; chemistry, history, geology; sanitary science and natural history. Second and third years—perspective and projection of shadows; applied mechanics; machinery used in building, theory of architecture; comparison of style; construction; specification, estimating, &c.; political economy and architectural jurisprudence; and, during the whole of the three years, drawing and design in the three studios attached, under the direction of professors, with frequent examinations in the subjects of the lectures above cited.

In Prussia the student comes from the university or school with a fair knowledge of drawing, and of physics and mathematics. He first enters the office of an architect for one year, where he picks up what he can, as in England. He does not pay anything, his knowledge of drawing and descriptive geometry placing him in a position to be able to render assistance of value in return for the privilege of being there. He has then to pass a slight examination, and studies in the academy for two years. His attention there is turned to all the theoretical and practical points of the profession. He copies drawings made by well known architects—if at Berlin chiefly Schinkel's—and divides the time devoted to drawing and design between making these copies and the composition of original designs (which, as a matter of course, are more or less adaptations of what he has learnt in copying); he attends lectures on physics, mathematics, construction, supply of water, ventilation, and the principles and practice of estimating and writing specifications. At the end of the second year he passes an examination, and takes the title of bauführer or inspector of works. If he desires to take a still higher position, he gets appointed to some government building as an inspector or clerk, receiving a nominal salary for three years, and then enters the school a second time to study for two years more the higher parts of his profession, at the end of that time passing an examination (and an exceedingly stiff one) which gives him the title of Baumeister (master of buildings) or architect, and [illegible] either become a governmental architect or practise on his own account.

In Vienna the student follows a course of studies in the academy, where there are Gothic and Classic professors [illegible] class. In many cases both these [illegible] are followed, one after the other; lectures are given also, and examinations held in the various theoretical and practical subjects of our profession. A new system of study has been lately introduced here which is worth noticing. The senior students of the school make excursions with a professor, some twenty of them at a time, two or three times a year, for a period of a fortnight or three weeks. They take one or two important buildings in the district, and measure them, taking it in turns to sketch [illegible] or details. About £5 is allowed to each student by Government and his drawings become the property of the academy. On returning to the school at Vienna these drawings are worked out to a large scale by the students and afterwards traced in lithographic ink by the younger students, and published, each student having a copy. Alternately with the making of these drawings they work out designs of their own, in which [illegible] designs are inspired with the [illegible] they have imbibed in measuring and drawing details of the ancient edifices of the country.

In Stuttgard the instruction is somewhat similar to that at Vienna.

In Germany generally architects and engineers study together in the same schools; in France, architects, painters, and sculptors.

Having in a slight sketch run through the various existing systems of architectural education we must now first, before laying down suggestions for a new scheme, run through them to see the advantages and disadvantages contained in each. The first great failing in England is that the student coming straight from school *is not taught [illegible] that use of the pencil [illegible] which is universally [illegible].* He has little or no knowledge of freehand or geometrical drawing, of physics, mechanics, or of any of the elements of architectural style, and, consequently, he wanders about in too often styleless designs of the architect in whose office he may be placed, and thus acquires by the longest possible process a certain knowledge of a mixture of style and no style, second-hand; his imagination also is not brought into play till his *articles are run out*, and then want of time and absolute lack of training at once curtail his ideas and cramp his imagination. He has picked up a practical idea here and there in the office and numerous details, but he finds himself perfectly unable to group a building of any size. In many cases he has never had an opportunity of visiting or studying any one of the buildings the drawings of which he has been continually at work on, and, therefore, supposing he has been thinking for himself, has never seen the results of his thoughts and inquiries. He has in fact taken from three to five years to learn imperfectly what might have been learnt well in one or two if his mind had been properly trained to receive it and a proper and intelligent course of study pointed out. It is perhaps true that an intelligent student in a good office may learn a great deal by working out practically in the workshop of architecture (as it were) various designs; but also good offices and intelligent students to that degree required are very few and far between, and we are bound here to legislate for the average class.

If we now turn to France, we find that foundation of knowledge [illegible] wanting in England; before the student enters any office his hand is trained to draw freehand and architecturally in the primary drawing schools, and his mind trained by the peculiar instruction there afforded in mathematics and descriptive geometry. He enters the studio and the elements of style are learnt and architectural drawing carried to a higher pitch; in the Ecole des Beaux Arts, wood, iron, and stone construction, with specifications, are worked out, interspersed with original designs. The student works not so much in rivalry with his fellows as *in studio against studio.* Now this rivalry of studio against studio is the greatest feature in French education, and although descriptions of the latter have often been given here in England, this important feature has never been even alluded to. The isolated effort of one individual in rivalry with another may—nay, must—continually fail, because style is not, and never can be, entirely worked out by one man. An original

genius suggests a theory, a second carries it a little further, by numerous others it is taken up, till at last this new idea becomes an established fact. A number of men working in one studio form a school; in order to maintain the prestige of such a school when pitted in friendly rivalry against others, each student in it exerts himself to his utmost, the elder ones give advice and help the younger ones in working out their drawings. The energies of both are brought into play, each learns immensely in a short time, and this unison of feeling, this mutual co-operation, these valuable friendships formed, last through life: here we have the great secret of the success (so far as it goes) of the French school. Where, then, does it fail? It fails in the very important fact that a studio is not a workshop—the designs made are never carried out; all is too theoretical, the construction designs are made in the first year, before the student knows much of architecture. They are copied from others, and got over as soon as possible as a bore, so that, although the student has received the best foundation for a thorough theoretical knowledge of construction, the practical points are soon forgotten. He can project and lay down on paper vaults, bridges, and roofs of any kind, but the economical uses of stone and wood he fails to appreciate; the use of brick or of iron is unknown to him. The student who obtains the Grand Prix de Rome at twenty-five and returns to Paris at twenty-eight years of age, and who is at once named architect of some great public building, has forgotten how a truss is framed, and is absolutely ignorant of the scantlings of timber for any use whatever, still more so the writing of specifications and other practical details, or even the routine of an office. This accounts for the poverty of modern French architecture. It is never constructional, but fritters itself away in meaningless, though sometimes extremely beautiful, detail.

In Berlin this want of practical training is avoided by the student being obliged to study for one year previous to entering the school in a regular office, for the practical training afforded there, and (if he takes any position) for the three years spent as inspector of Government buildings in the school, the student's attention is directed to all the details of design. Besides the composition of buildings he has to work out and copy designs for ceilings, staircases, cornices, &c., to a large scale, from time to time to turn his attention to surveying, supply of water, ventilation, the writing of specifications—in fact, all that is necessary to commence practice with.

Placed, however, by the side of French education it fails in this, that the students all work *in one school, under one set of professors, and the rivalry is between one another* instead of *between studios*. Add to this, that for ever and ever, eternally, they copy the designs of Schinkel, his ceilings, staircases, cornices, &c., which, being all in the coldest and poorest style of Greek architecture, cramp their minds, and they rarely, if ever, seem to emancipate themselves. Now and then a genius like Stüler advances a pace or two further, but throughout Prussia a hard and cold style prevails, which may be partly the consequence of the character of the people, but which must be to a great extent due to the restriction of their studies when young to the works of one of the greatest men Prussia has produced, but whose style is now gone by.

In Vienna the system of study from ancient buildings has only just been commenced, and its result is not yet visible. There is one unfortunate circumstance connected with it, which is that in and near Vienna there is no architecture which is good in epoch, and, as all the ancient churches and buildings belong to the most debased period of Gothic architecture, it will only be the purifying influence which the study of Greek architecture in the school will afford that will prevent the students from copying and designing in a debased style. It cannot, however, be denied that in Vienna are to be found some of the finest modern buildings in Europe. Whether we look at the numerous palaces of the archdukes, at the Exchange, the Arsenal, or new Votive Kirche, we observe an originality of design, based on good models, for which we must look further than the school. We think that much of this is to be referred to the fact that as (in common with all Germans) the Austrians are very fond of travelling, and as the whole of Italy, and till within the last few years the towns of Austrian Italy were especially easy of access to them, that much good has been derived from their studies there, and all those architects who have taken a good position in Vienna have travelled from six months to two years before settling into practice; the more practical training than in France which the student has received in the school giving him a better opportunity of deriving benefit from his travels.

The Ecole Centrale in Paris has not been established long enough to see its results. There is, perhaps, an excess of theoretical subjects, and all is set before the student in too theoretical a manner. Instead of confining the attention of the students more especially to those points with which he would have to grapple in the first ten years of his practice, they enter into abstruse subjects, such as sanitary science, health of towns, political economy, natural history, &c. The chief of the school also, M. Trélat, is an engineer, and, believing that all the finest problems of ancient art have been the result of scientific research alone, his lectures on art and design tend to the development of this belief, and bring about no result. It is also much to be doubted whether design can be taught by theory in a series of lectures at all; and whether, as the conditions of each problem are different, any laws can be laid down for their development beyond those which are afforded by precedent, and precedent or bygone architecture is not admitted into the teaching of this school—a fallacy which the designs at South Kensington show very plainly.*

FONT AT DRYBURGH ABBEY.

THE Abbey of Dryburgh, though less known and less praised than its neighbour of Melrose, is more than equal to it in beauty of situation and severe grace of detail; it lacks, indeed, the elaborate carving and varied tracery of Melrose, but (to the student of architecture) this is counterbalanced by the thoughtfulness of its design, which gives the greatest effect by the use of the most simple means, and also by the symmetry and suggestiveness of its mouldings and details. Like many of the principal Scottish antiquities, it is pretty fully illustrated in Billing's magnificent work on the "Baronial and Ecclesiastical Antiquities of Scotland." From the "Chronicle of "Melrose," we learn that it was founded about the year 1150, during the reign of David I., by Hugh de Morville, Lord of Lauderdale, a favourite of the King, who created him Constable of Scotland. Its site was supposed to have been originally a place for Druidical worship. Edward II., in his retreat from Bannockburn, encamped in the grounds at Dryburgh, and tradition says that the monks jeered at the soldiers of the fugitive army, who, in revenge, set fire to the monastery and burnt it to the ground. 'Robert I. contributed liberally towards its repair, but it has been doubted whether it was ever fully restored to its original magnificence." The last sentence I quote from the guide book, and I think the early character and rich ornamentation of the fragment of the font, which I set down as part of the original work, goes a good way to prove that the present ruin, good as it is, was at its best only a faint reflex of the original building, being, it would seem, the recast of a different and later period, and designed with much more regard to economy than the original monastery. In 1544 the Abbey again suffered from a hostile incursion of English, who, it is said, destroyed it, but I fancy the destruction could only have been partial. It is worth while, however, noting these facts, for usually there is a vague idea that the odium of wrecking Scotland's finest antiquities ought to be laid on the shoulders of Carlyle's hero, John Knox, and the Reformation party.

The fragment on which the present sketch is founded has more delicacy in its design and execution, and approaches more nearly to the ideal of Norman ornament, than anything else I have yet seen. My sketch was taken some years ago hurriedly, and in the twilight, and it is very likely the present illustration does not do justice to the original.

Of the other three sketches on the same page the central one was done in the Hospititum of St. Mary's Abbey, York. The other two are from sketches made at Canterbury Cathedral.

J. M. S.

M. Berryer, the celebrated French advocate, says *La France*, will be interred at Angerville, in a vault constructed after his own designs.

* To be continued.

WORKING MEN'S FREE INSTITUTE, MONMOUTH.

THIS building was opened on Thursday, the 15th of October. It has been built by a charitable lady, Mrs. Matilda Jones, of Ancre-hill, near the town, who has also endowed it for the free use of the working men of Monmouth under the care of trustees *in perpetuo*. The plan is a parallelogram 52ft. 6in. by 32ft. 6in., with a transeptal wing 28ft. by 15ft. on the south side. It has two stories. The ground floor is 12ft. high, comprising a spacious entrance vestibule, and hall, with mosaic floor, from which an inner vestibule is entered through an ornamental glazed wood screen with self-acting folding doors.

From this inner vestibule the following rooms are entered:—The reading and news room, 32ft. by 16ft., which is lighted in front by a coupled window, and in the side by two windows of a similar character; the library, 20ft by 13ft. 6in; committee room, 14ft by 12ft., which can also be entered from the reading room.

From the outer vestibule stone stairs, 6ft. wide, with ornamental balustrade of hammered wrought-iron, lead to the lecture hall, 48ft. by 28ft. and 20ft high. Midway on the south side, and above the doorway, is a pointed arcade of two openings to a gallery over the landing and staircase, which is approached by a circular stairs from a cloak-room forming a mezzanine story on the first landing of stairs. Beneath the mezzanine, and approached by a few steps from the outer vestibule, are a lavatory room, urinals, and watercloset, and on the basement are a boiler room for tea purposes, cellars for coal stores, &c.

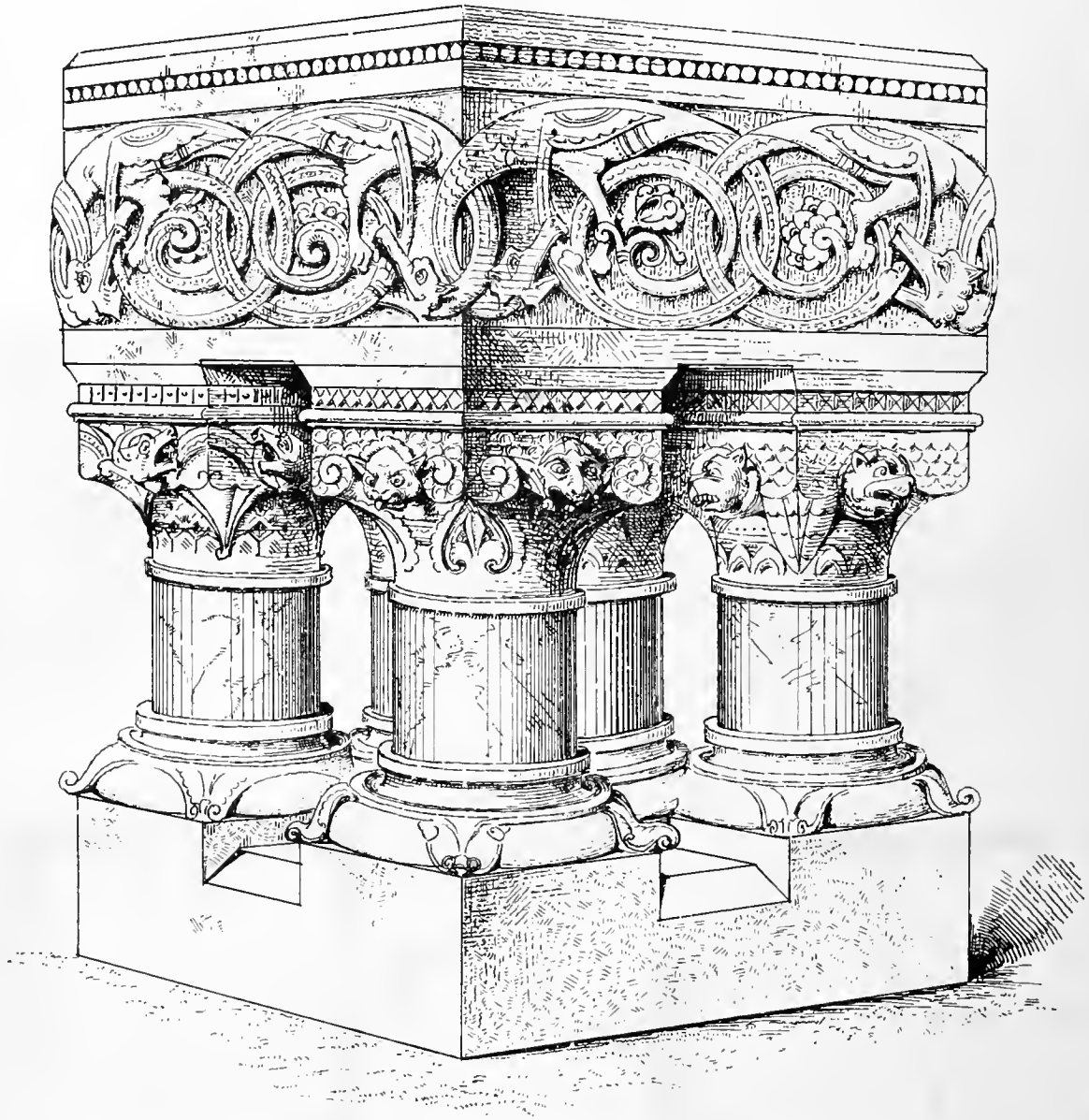
The general style of the edifice is of Italian Gothic character. The exterior is constructed with polled red sandstone walls and Bath stone dressings and strings, interspersed with blue forest stone bands; the shafts of the columns of entrance doorway and windows also being of blue forest stone polished.

The noticeable features are the lofty gabled front, 54ft. high, surmounted by a banneret of hammered iron, coloured and gilt with crystal points. In the centre of the gable is the large pointed window of the lecture hall. This window is subarcuated as a triplet on circular columns with foliated capitals, the spandrel being filled in with the arms of the founder, surrounded by diaper and foliations of a conventional character. The entrance doorway, flanked with moulded jambs and circular columns with foliated capitals and moulded bases, is finished above with a bold octagonal balcony carried on massive moulded brackets and corbels with pierced spandrels. The architect was Mr. B. Lawrence, of Newport. The contractors were Mr. C. Lawrence, jun., Mr. George Webb, and Mr. H. Elias. The cast-iron work was supplied by Messrs. Macfarlane, of Glasgow, and the hammered iron work by Cormell, of Cheltenham. The carving is by Mr. J. Willis.

THE NORTHERN ARCHITECTURAL ASSOCIATION.

THE quarterly meeting of the Northern Architectural Association was held on Thursday, the 26th inst., in the keep of the Castle, Newcastle, under the presidency of Mr. J. Watson. It was announced that a sum of £10 had been received from the Architectural Benevolent Society, on behalf of the widow of a deceased member, being the third sum sent for similar purposes. Mr. Henry Leighton was elected a member of the association, the vote by ballot being unanimously in his favour. The minutes of the seventh annual meeting of the Architectural Alliance, at which Mr. Johnson had attended as a delegate, were then taken as read; but as a letter had been received concerning a resolution to the effect "that information should be obtained from the allied societies as to the facilities for architectural education now existing," it was agreed to have a special meeting for the due consideration of the subject. It was suggested, however, as a means for securing greater efficiency in the profession, that architects should refuse to take pupils into their offices who had not previously been twelvemonths in the School of Art. The president elected for the ensuing year was Mr. J. Watson; the vice-president, Mr. R. J. Johnson; the treasurer, Mr. Charlton; the secretary, Mr. Thos Oliver; the hon. solicitor, Mr. G. W. Hodge; while the new committee men were Messrs. Hogg, Fowler, Thompson, Johnstone, and Parnell. Mr. Watson having returned thanks for the honour conferred upon him, the meeting separated.

An Attempt to Restore the Ancient Font at Drybvrgh Abbey



J. Moyr Smith Archt.

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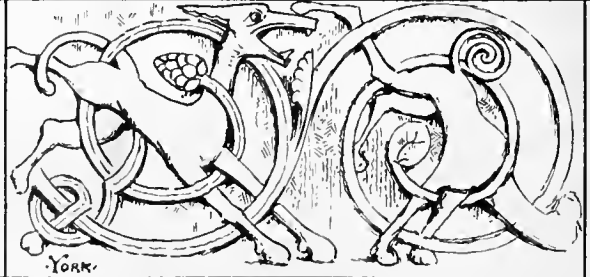
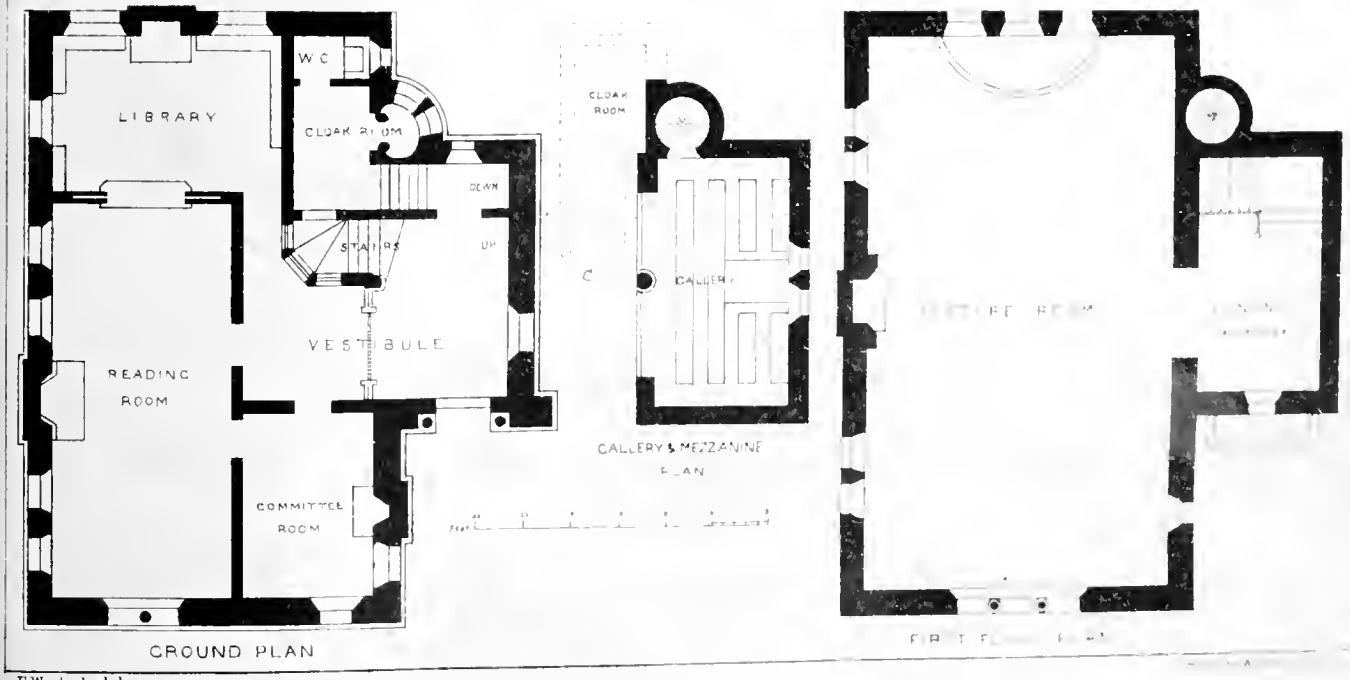


·York.

·Canterbvry.

J. Moyr Smith lith

Printed by Whiteman & Bess



E. Wimbridge lith.

Working Mens Institute Monmouth.

Mr BENJN LAWRENCE. ARCHT.

ARCHITECTURAL THOUGHT AND TASTE.

AS in the world of politics and religion so in art, there are two great parties or currents of thought ever in apparent conflict, though essentially agreeing in the main. It will be found the disagreement consists chiefly in the method of applying and not so much in the great principles themselves. Looking at the practical results of this disagreement, it is a common though mistaken notion that our extended education and our modern facilities and appliances are really detrimental to our social well-being and to our progress in art. Some people point with a mistaken pride to what they term "the good old days," when party and political strife did not run so high, when the national and established religion held supreme and undisputed sway—in a word, to a time when things ran smoother and better with them as a homely and social race. There were fewer feuds between men and manners; the jarrings and discords of a noisy and over-busy age had not broken the quiet of an old *régime*; and there was little or no competition to exert and strain our bodies and brains. A deeper inquiry and consideration will show, however, that such an idea is both inconsistent with progress and obstructive. Thus one party of politicians, religionists, or artists is continually keeping back or hindering the march of improvement, while another party is as zealous in forestalling it. In spite of the most obstructive policy no less than in spite of the most restless advancement mankind will more onwards. An agreement in principles and in the means of applying them is an impossibility in these days, when there is a variety of minds. Conflict must ensue, and the fiercer the conflict the quicker the results which sooner or later become accepted. Existing examples of art—and I wish to confine my readers' attention to the progress of architecture—show that all the contrary grooves of taste and thought are in spite of themselves moving in one direction or in such a modified direction as the force of the most powerful impulse would give. In the case of architectural thought, the movement is in much less distinct and decisive manner than in political and physical science, because, unlike them, the law of cause and effect is not so manifest. People, especially the ordinary educated, are not likely to connect or associate loopholes, machicolations, or a feudal style of building with the feudal or military system of society; nor are they likely to attach any particular significance to light and composite structures in which fenestration and economy of material are notable features.

Comte, in his "Philosophy of the Sciences," shows us a grand law of evolution agreeably to which all changes of humanity, historical and intellectual, have followed, and he logically constructs therefrom a reorganisation of the elements of society by which the intellectual and scientific precede the moral and political. We are now undergoing that process of critical elaboration necessary to the grand recomposition of science, art, and politics, and the final co-ordination or reconciliation of truths. In preceding ages, art, as thought, always showed a predominant spirit. It was generally religious—the theological and metaphysical element preponderated. Now the secular and religious movements are striving for mastery or reconciliation; hence it is we see the antagonism existing between styles, we have our houses and townhalls partaking of the same character as our churches. So long as the current of thought ran in particular grooves the slightest interruption was fatal to art, or so impeded its progress that it often became stagnant. Thus it was with the great periods of Greek and Roman art and its offshoots, especially the period of mediæval excellence. The current of thought and art had not been interrupted, for religion and art were intimately associated and continued to be so till the dawn of the fifteenth century. At that time a separation commenced; the religious and secular movements became distinct; religion and art, hitherto allied, henceforward became new and disconnected powers. Dependent on itself, art had now to find a new basis—some more scientific method, and until it could find this it had to borrow or confine. The art renaissance of all countries indicates this moral divergence and change.

In this nineteenth century we find art studied for its own sake; borrowing and appropriating, possessing little of its former spirit and unity, it will nevertheless ultimately take its place as a science co-ordinated in the grand scheme of human ideas, yet to be organised out of the apparent chaos and conflict of our civilisation. It is this grand correlation of ideas in prospect that lends a spirit and aim to our study of architecture as to every other branch of thought and speculative inquiry, and if we will but try to eliminate the sentimental and antiquated from the logical and modern, and infuse the spirit of modern thought more into our designs, despite the ultra-copyists of every school, the quicker will be the realisation of an art at once homogeneous, national, and progressive. In another paper I hope to point out more practically the false sentiments and crudities that have crept into our architecture.

G. HUSKISSON GUILLAUME.

THE WORKING CLASSES AND THE PATENT LAWS.

ON Monday evening a meeting of the Inventors' Institute, under the presidency of Lord Richard Grosvenor, M.P. (president), was held at the offices of the institute, St. Martin's-place, Trafalgar-square, when the patent laws, as affecting the interests of the working classes, were discussed. Members of the invention right committee, consisting of delegates from numerous industrial associations, attended to explain proposed reforms in the patent laws, and to confer with the meeting thereon. The noble chairman, referring to the patent laws, said there existed among all classes, and especially among working men, a strong feeling that the patent laws needed simplification and modification. In the new parliament there could be no doubt that the legislature would interest itself much more deeply in social questions than heretofore. Education would no doubt form a subject of much discussion in the new parliament, and education was so closely allied to the objects of the institute that such discussion must affect the present patent laws. Mr. Hume Williams addressed the meeting, and having paid a high tribute to the memory of their late president, Sir David Brewster, spoke of the expediency and justice of the patent laws, and said that even in these days of free trade there was little ground for apprehending that capital and intellect would be placed in antagonism by any attempt to abolish the protection which satisfied the just requirements of each. In this age of progress it became a matter of the utmost importance that the inventive genius of the country should be fostered and protected. To new inventions in machinery they should look for additional progress; but still not neglect the old ones. Agreed upon the broad principle of protection to invention, it appeared to the council of the institute that the education of artisans in mechanical knowledge and their guidance in scientific study were matters not unworthy their attention, and accordingly steps had been taken to advance those objects. He concluded by stating that it was intended to inaugurate a benevolent fund for men of science, to which they could appeal in time of need, not as a matter of charity, but of right. Mr. Savage said he had been all his life in contact with intelligent working men, and from his knowledge of the manner in which the patent laws worked, he could say that their action was tantamount to putting 50 per cent. of the intellectual power of the country into the grave. Some of the best inventions had never been patented because of the expense. The steel pen had never been patented, on that account. Since 1861, very few new inventions had been exhibited lest they might be copied. It was said that the inventor of the sewing machine had derived no benefit from his invention in this country because he was too poor to take out a patent. Captain Selwyn, R.N., thought that a working man's patent should be solid and reliable, because the present patent law was nothing but a permission to go to law. They must first of all have cheap protective law; next, such an investigation as would assure the poor man he was not paying for a sham; and thirdly, such publicity and encouragement as could only be given by an institute. Hitherto invention had been pulling one way and manufacturers another, but a better time for both parties was arriving. Mr. Patterson asked why a man should pay a tax for having his brain property protected. Why should a working man be called on to pay anything beyond a registration fee? It was not right to complain that working men did not move when they were actually taxed for doing so. Mr. Siemens thought that where there was an allegation of an infringement of a patent commissioners should be appointed, who, without stopping a manufacturer's business, could ascertain the truth of the allegation. Mr. Webster believed that an invention should be as much protected as property in matter. The state of the present patent laws was a disgrace to a civilised country. After further discussion a vote of thanks to the chairman closed the sitting.

CLOCKS, AND THE STRUCTURAL ARRANGEMENTS MADE FOR THEIR DISPLAY AND PRESERVATION.*

THEORETICALLY, no doubt, the weights of the clock, and consequently their casing, should run plumb down from the barrels to which their descent supplies motion, but this would sacrifice too much room beneath, and generally be so inconvenient that by common consent of architects and clockmakers it should be considered as the usual thing to collect the weights and take them down in the nearest convenient angle of the structure in which the clock was to be placed. If this was not attended to in the first instance by the clockmaker, he was nearly certain to be called upon to make alterations which might lead to increased expense and possibly to discord. Where the architecture of a lofty clock tower at all lent itself to such a feature, much trouble and ultimate expense would be saved, and the appearance of the clock dial much better maintained than was likely to be the case where such a feature was omitted, if the architect should provide a balcony or projecting gallery at such a distance below the dial as to admit of its being easily reached by short ladders, the balcony or gallery being of course accessible by a door from the interior of the tower. Such a balcony might of course be made useful as masking reflectors and gas jets throwing light upon the sound clock faces where dials were required to be illuminated which it was not convenient to make transparent. They would also be serviceable as facilitating the lowering down of any portion of the clock machinery which might require to be taken out for repair or replacement. Their main use would, however, of course be to furnish ready opportunities for cleansing the hands and dial faces, for freeing the main arbor bearing the hands from dust and dirt, and for regilding the hands or figures. To perform any of these operations at the top of a lofty tower unprovided with such means of external access would involve an outlay for scaffolding and a risk of men's lives of the most serious kind. With respect to transparent dials illuminated by gaslights burning between the clock dial and the works, the architect should take care that two provisions were made by the clockmaker—one that a screen (4½in. hollow brickwork in cement, covered on the dial side with white tiles, was the best) should be fixed at such a distance in the rear of the clock face as should allow of a man getting into the chamber for the purpose of shutting off and adjusting the gas burners, &c., the object of the screen being to shut off the products of combustion from the going parts of the clock; and the other that any counterweights to the clock hands which might be requisite to neutralise their leverage should be fixed on the outside and not inside of the dials. If this was neglected Mr. Denison stated that very puzzling shadows would be thrown on the clock face. For the purpose of ventilating this chamber and the clock separately, the architect should provide four apertures through his walls, two at the level of the clock floor and two at the ceiling level of the clock chamber. If he should provide more air passage than was absolutely necessary it was easy to shut off any portion of it, but if he should provide little or none it would be difficult and costly to obtain a sufficiency after the building

* Concluded from page 305.

might have been completed. Moreover, if the mode of provision was left to a clockmaker and a clock committee after the architect's connection with the structure might have ceased, the chances were ten to one that the apertures were made in just the way and place in which the architect would prefer that they should not be made. Such being some of the conclusions to which Mr. Wyatt's studies of the subject had led him, he thought it well to supplement them by giving a copy of the following interesting letter which had been written to him by Messrs. Moore, of Clerkenwell, whom he had consulted upon the matter :—

SIR,—Upon looking over the paper you gave me in reference to particulars you required concerning clocks, &c., of various sizes I find I should be at a loss to supply the information you wish, as it would take up much time to give anything like an accurate statement. But I would submit that the size of the dial or dials determined upon when making the drawings of any particular building would be sufficient to guide any architect as to the space required for the works of the clock, and should say no space less than 3ft square by 4ft. high (for the smallest clock) would be available for a man to wind the clock, &c. But in many cases it would be more convenient to place the clock movement below, and lead up to the dials with rodding and angular wheels, and as it is very unusual to have a turret clock without striking the hours the space should be allowed the same. It is desirable to have the clock as near the dials as possible, and if convenient the bell or bells should be placed above the clock, with a lead flat to prevent the weather getting into the clock chamber. The bells should be, where practicable, as open as possible; any wood or slate louvres tend materially to obstruct the sound; if louvres are used at all they should be glass. The bells in church towers are hung lower than the weather boarding, and as the clock strikes the bell when at rest the sound is much obstructed. Of course when the bells are ringing the mouth is upwards and level with the openings, and the full sound escapes. When illuminated dials are to be used openings the full size of the dials must be made, and if convenient splayed off to the inside. With proper management a 6ft. dial could be well illuminated with two ordinary burners. A good proportion for size of dials (to be thoroughly useful) would be 1ft. for every 10ft. above 0ft. high. Below that height 4ft dials would do very well. Where 4ft. dials are used the clock floor should not be less than 6ft. below the centre of the dials (it might be more); but if one, two, or three dials are used the floor might be 4ft. 6in., or 5ft. below the centre. In large clocks a 14ft pendulum should be provided for if practicable, and in all cases the pendulum should be as long as circumstances would allow of. In some church towers clocks are fitted up in the bell chambers and thus much exposed. They should always be placed in a chamber below, and, if necessary, lead up to the dials, as before described. Arrangements should be made to get the greatest fall possible for the weights, as upon this the performance of the clock much depends. It is not absolutely necessary that the weights should drop immediately under the clock (although if convenient it is best), since they can be carried off by pulleys to any convenient place where the fall could be obtained. At all times when it is decided to have a clock it would be well to consult with the maker selected to supply it, in order that everything may be properly arranged before commencing the building. We take this opportunity of naming that it has often come under our notice in clock turrets that no provision has been made for the escape of the sound of the bell, and this has caused much inconvenience and annoyance to all concerned. In some instances a bell cote has been added outside, which has had the desired effect of getting the full sound out of the bell. We have lately put up a set of chimes with fifteen bells on the top of the tower of Sudeley Castle, Gloucestershire, and the tunes played upon these bells are distinctly heard for two miles, although the fifteen bells together only weigh 5 cwt., while at the village church there is a very large peal of bells, playing tunes, and the same are not heard half a mile off. This difference in sound is almost wholly attributable to their position, the bells of our clock being exposed to the open air. We have merely a glass roof to cover the works. The bells are in no way affected by exposure to the weather. . . . I remain, &c., for self and partner, JOSIAH MOORE.

M. Digby Wyatt, Esq., F.S.A., &c.

P.S.—Clocks are sometimes constructed in horizontal frames, but in many cases this is objectionable in consequence of their taking up much greater space. They are more convenient in upright frames.—J.M.

The following particulars were those which should be furnished to a clockmaker, as without them, at least, he could not furnish any estimate of cost—viz, size of dials and how many, weight of bell the clock was to strike upon. If the weight of the bell was not known, by measuring it across the lip or mouth, and comparing it with the following, the weight would be ascertained :—

Diameter of Bell. ft. in.	Weight. cwt. qr. lb.	Diameter of Bell. ft. in.	Weight. cwt. qr. lb.
1 0	0 1 12	2 4	5 0 0
1 1	0 1 12	2 5	5 2 0
1 2	0 2 6	2 6	6 0 0
1 3	0 2 16	2 7	6 2 0
1 4	0 3 0	2 8	7 0 0
1 5	1 0 0	2 9	7 2 0
1 6	1 1 0	2 10	8 0 0
1 7	1 2 0	2 11	8 2 0
1 8	1 3 0	3 0	9 0 0
1 9	2 0 0	3 2	10 0 0
1 10	2 1 0	3 4	11 0 0
1 11	2 2 0	3 6	12 0 0
2 0	3 0 0	3 7	13 to 14 0 0
2 1	3 2 0	3 9	14 to 16 0 0
2 2	4 0 0	3 10	17 to 18 0 0
2 3	4 2 0	4 0	20 0 0

The author had not entered into any detail upon the subject of clock bells in this paper, because the matter was so fully gone into in the "Transactions" of the Royal Institute of British Architects; but there remained two points of importance which he should notice before concluding—viz., the construction of a rule, firstly, for the size of the clock chamber; and, secondly, for the position of the level of the clock floors or beams below the centre of the hands. With respect to the first, he thought, from observations he had made, that the diameter of the dial *plus* 2ft. might be adopted as the suitable gauge of any clock chamber, both for width, height, and length, including space for winding; and with respect to the second, that if the floor of the clock chamber was placed the same number of feet below the centre of the dial the rodding for working the hands would be sufficient without waste. The same sliding scale would be sufficient for the arc of vibration of the pendulum, whatever its length might be. Upon these points, as he had only endeavoured to construct an empirical rule for his own observation, he should be glad to be corrected. Nor was this the only point upon which he might have to ask for indulgent criticism and correction. To a considerable extent in this paper he had been groping his way without much light from others, and he might naturally have knocked his head against many blunders. His object would have been answered if he might hereafter spare the heads of his hearers from some of the many bumps he might have himself incurred.

A short discussion ensued, in the course of which Mr. Redgrave proposed and Mr. Phené Spiers seconded a vote of thanks to Mr. Wyatt for his valuable paper. Mr. Wyatt briefly responded, and the proceedings terminated.

THE INSTITUTION OF CIVIL ENGINEERS.

THE first meeting of the session 1868-9 was held on Tuesday, November 17, Charles Hutton Gregory, Esq., President, in the chair, in the new building, erected during the recess, and upon the completion of which according to the promise made by the council the president congratulated the members; taking occasion to remark that the council had placed upon their private minutes a unanimous vote of thanks to the architect, Mr. T. H. Wyatt. The president observed that the contractors, Messrs. Holland and Hannen, were also entitled to commendation for the manner in which they had carried out the works within the time specified in the contract—a result to which the personal care of the secretaries had largely contributed.

The paper read was "On Lighthouse Apparatus and Lanterns," by Mr. David M. Henderson, Assoc. Inst. C.E. It was stated that this communication might be regarded as a sequel to the paper "On the Optical Apparatus of Lighthouses," by Mr. James T. Chance M.A., Assoc. Inst. C.E., read during the session 1866-7.

The glass used in lighthouse apparatus was nearly all made at Saint-Gobain or Birmingham, and was of the kind known by the name of crown glass. Different mixtures had been employed for the purpose; but M. Reynaud, the director of the French lighthouse service, now gave the composition as—

Silica	72·1
Soda	12·2
Lime	15·7
Alumina and Oxide of iron	traces.
	100.0

At Birmingham various mixtures had been tried, of which several examples were given, the following being about an average :—

	cwt.	qrs.	lbs.
French sand	5	0	0
Carbonate of soda	1	3	7
Lime	0	2	7
Nitrate of soda	0	1	0
Arsenic...	0	0	3

English glass was supposed to be of the refractive index of 1·51. That produced at Saint-Gobain had formerly an index of refraction as low as 1·50, but now it was 1·54, and frequent experiments were made to ascertain that the standard was maintained.

The furnace for melting glass was generally rectangular in plan, and was constructed of the most refractory materials; and the sides were arranged so as to allow of the easy withdrawal of the pots. Six, and sometimes eight, pots were placed in the furnace, arranged in pairs with a firegrate at each end. The flame filled the whole interior of the furnace, and, after circulating round the pots, which were covered to prevent the colour of the glass being injured by dust or impurities from the coal, found its exit by flues. Great care was necessary in the preparation of the pots, which were made of about one-half new fire-clay, and one-half old potsherds finely ground. The length of time a pot would last depended upon (1) the quality of its manufacture; (2) its being slowly and thoroughly dried—a process occupying about six months; and (3) the care bestowed upon it in the furnace, and whilst withdrawn for casting. The average number of castings from each pot was about twenty; and the time the pot was out of the furnace at each casting was about three minutes. It was mentioned that Mr. Siemens' regenerative furnaces were now in use for the manufacture of lighthouse glass with perfect success. When the metal was ready for casting, each pot was lifted from its seat, withdrawn from the furnace, and carried to the foot of a crane, the lifting chain of which had attached to its end a clip to embrace the pot. A mouth-piece of wrought iron was fitted to the pot before casting, to facilitate the pouring, and the workmen tipped over the pot by means of long handles.

The casting table was circular, and was mounted on a frame, so that by means of a handle it could be turned round, and each part of its outer circumference brought consecutively under the pot of molten metal. The moulds into which the glass was to be cast were arranged around the outside of this table, and were caused to revolve slowly under the continuous stream of liquid glass flowing from the melting pot, so that each mould was filled in succession, thereby enabling the immediate return of the empty pot to the furnace. The moulds were of cast iron, of a uniform thickness of ¾in., and were supported on feet cast on, the size being such as to allow ¼in. thickness of glass all round for the grinding process. The small lens-rings and prisms were cast in one piece but the larger ones were cast in segments. The large belts, or central lenses for fixed lights, were generally cast flat, and were afterwards bent on a saddle to the required curve in a kiln.

Sand, emery, rouge, and water were the four necessaries for glass grinding and polishing. The sand had to be applied, with abundance of water, until it lost its cutting qualities. The emery, after being ground to a fine powder, was agitated in water, and the mixture was passed through a series of vats or tubs, so that the emery was divided into as many qualities as there were tubs, the coarsest being deposited in the first tub, the finest in that furthest from the supply. The rouge, which was an oxide of iron, was prepared from the sulphate, and was separated into qualities by means of water tubs, as in the case of the emery. The glass of optical apparatus was ground on horizontal circular tables, securely fastened to the tops of wrought iron vertical spindles, which received motion from the main shafting in various ways. The surfaces of these tables were divided out, like the face plate of a lathe, to receive the different sizes of "carriers," or supports of cast iron, which were bolted to them, and were arranged to hold the lenses or prisms to be ground. Plaster of Paris was then laid on the "carriers" in bands, the bands being reduced to the exact size by turning the table round under a gauge secured to the framing of the machine. The glass was laid on these strips, and was secured in place by means of pitch, care being taken in the larger sizes which were ground in segments, to place a thickness of pitch between each joint, so that glass did not touch glass. A detailed account was given of the method of grinding a belt or central lens of a fixed light, and also of grinding a bull's-eye or central piece of an annular lens.

The various sizes of catadioptric lights were next given in detail; and it was stated that, in order to produce a distinction between different lights, some were fixed and others revolving, while there were many combinations of the two classes. Again, there were modifications to render fixed lights intermittent, and colours had also been employed to both fixed and revolving lights.

In reference to the method of mounting the lenses and prisms, it was remarked that sea-lights, on account of their size and weight, were necessarily divided into several portions. The section of the apparatus, consisting of lower prisms, lenses, and upper prisms, gave a convenient division into three tiers, each of which was sub-divided into panels of a convenient size. In a first-order

fixed light, the circumference was divided into eight panels of 45 deg. each, which were made of gun-metal racks, or side-pieces, formed to receive the lenses or prisms, these side pieces being connected together by gun-metal segments of rings at the top and bottom The author then proceeded to describe minutely (1) one segment of a first-order light, in which all the joints of the panels were vertically over each other; (2) an arrangement with inclined lens-panels, the upper prism-panels being so placed that their joints did not come vertically over those of the lower prism-panels; (3) a first-order apparatus, where the upper and lower prisms were fixed; (4) an eight-sided revolving light, collecting the whole light into eight beams of parallel rays; and (5) a first-order apparatus, commonly called a "Fixed Light varied by short Eclipses," a title which did not convey the actual effect, as the fixed light was followed by an eclipse, then a flash, and next an eclipse, the same phases being continually repeated.

The construction of the panels was referred to in detail; and it was observed that, when the fitting was finished, the panels were taken to the erecting shed, where they were erected on their pedestals, or on, what was more convenient, a revolving table, specially constructed so that each panel, or part of a panel, could be brought in succession opposite the erecting post. The prisms were passed into their places, one end covering plate of the panel to be set being removed, and wooden wedges were used to support the glass and enable it to be accurately adjusted in its position by means of internal observation, as explained by Mr. Chance in his paper. When the prisms were adjusted, plaster of Paris was applied at all the corners to retain the prisms in their correct position, and when fairly set, the wedges were removed and the remaining spaces filled in with best red lead putty.

The arrangement of panels generally adopted was that of placing one panel over the other, so that the joints should be vertically over each other. It had in its favour simplicity, a minimum loss of light, a minimum cost, and strong, convenient-shaped panels. These advantages had been considered of such importance that in France this method was still adhered to, and all the lanterns were constructed with vertical standards placed in front of the obscuration caused by the sides of the panels. This plan, however, rendered as many points, or rather small arcs, on the sea as there were standards in the lantern, to be illuminated with a considerably weaker light. The late Mr. Alan Stevenson was the first to introduce inclined lens-panels, with a view to equalise the distribution of light on the sea, but he was, no doubt, well aware that the total loss of light would be increased. Inclined standards had been adopted in several instances, but without any alteration in the optical apparatus. The horizontal divergence, resulting from the size of the burner in a particular case alluded to, might be taken at 6 deg, and the standard was inclined over an angle of 7½ deg in plan, so that when an observer was placed in front of the standard, it nearly stopped off the light from him throughout its entire height, commencing on one edge of the flame and finishing on the other, thus obstructing much light which had successfully passed through the apparatus. The lantern of Mr. Jas. N. Douglass, M. Inst. C.E., the engineer to the Trinity House, was designed to render impossible a correspondence, or optical coincidence, between the framing of the apparatus and that of the lantern. In the author's opinion, this lantern was expensive, from the amount of workmanship of a costly class, and from the glass cut to waste.

An arrangement had been designed by the author, with a view to obviate the objections to previous methods. The first consideration was the optical apparatus, and it was apparent that a minimum amount of light was stopped by vertical panels, and that it was possible to divide the previous large obscurations into a greater number of smaller ones, thus equalising the light without increasing the total obscuration. By excentreing or placing the various tiers of panels so that their joints did not come vertically over each other, each previous obscuration was divided into three. The amount of excentreing necessary depended upon the size of the flame, so as to enable one obscuration to be completely passed before entering upon another. In a first order, for example, the panels were 45 deg. each; and, as there was an intermediate rack in the prism-panels, there was a space of 22½ deg. between each obscuration. Each large obscuration could be divided into three small ones, which, if placed at intervals of 7½ deg., would never allow more than one obscuration to be visible at a time. The next consideration was the lantern, which when arranged with excentred panels, was rendered less rigid, owing to its weight not being transmitted continuously downwards, as was the case with vertical continuous standards. This want of rigidity would be objectionable in a light illuminating the whole horizon, but in those illuminating from 180 deg. to 270 deg. (which were by far the most common) the dark arc could be filled in with solid iron plates, by which any amount of rigidity could be obtained. By the substitution of triangular frames in the central tier, it was still possible to retain the upper and lower panels excentred, and to render the framing perfectly rigid, in fact more so than with the vertical continuous bars of the old lanterns.

A detailed description was then given (1) of a first-order lantern with inclined standards, (2) of the lantern to which the French engineers adhered for all apparatus burning oil, and (3) of the lantern arranged by the author to ensure the most uniform distribution of light.

The three principal varieties of lamps in use for sea lights were the mechanical, the high reservoir, and the pressure. The mechanical were the most general, being used in Scotland, France, and many foreign countries. The oil was forced over the burner by pumps, which were worked by clockwork placed underneath and driven by a weight. One of the best high reservoir lamps was that designed by Captain Nisbet, of the Trinity House, and which had been applied to several English lighthouses. Lamps of this class were not, however, applicable to revolving lights, or those illuminating all the horizon, on account of the obstruction of light that would be caused by the reservoir. The pressure lamp of M. Degrand, of Paris, was next noticed. In it the oil was forced over the burner by means of a weight pressing directly on the surface of the oil. It was found that the large space between the piston and the cylinder in this lamp rendered the leather packing liable to turn over when the oil got heated, and softened the leather; added to this, there was no provision for varying the weights on the piston. To meet these objections, M. Masselin designed a lamp with external weights which gave excellent results, and had the advantage, not possessed by the high reservoir lamps, of being equally well adapted for fixed and revolving lights, whether the whole horizon was illuminated or not. This lamp was minutely described; and in the next section of the paper an account was given of a first-order clockwork, consisting of two trains of wheels, one for driving the apparatus, and the other for driving a fly-wheel with adjustable vanes for regulating the speed.

In conclusion, the means adopted for lighting the entrance to Odessa harbour were described. At the extremity of one breakwater a tower was built, to contain a fourth-order optical apparatus fixed for 270 deg, with a metallic reflector for the remaining 90 deg. At the extremity of the other breakwater a beacon was erected, but it was required that a light should be shown without there being a lamp, or any metallic reflector, at that place. Accordingly a sixth-order holophote was placed in the tower, to collect all the light from its lamp into one beam of parallel rays, which was thrown across the entrance to the harbour to illuminate the beacon, producing thus what was called an apparent light. On account of the distance of the beacon from the holophote, 300ft., much light was lost, and the divergence of the beacon was small, but ample for what was required, as it was placed low, and a range of only about 1 mile was required.

The communication was accompanied by fifty-six large diagrams, and by six sheets of carefully executed drawings to a reduced scale.

ARCHITECTURAL ASSOCIATION.

At the meeting on Friday evening last, Mr. Lacy W. Ridge, A.R.I.B.A., vice-president, in the chair, the following gentlemen were elected members.—Messrs. T. A. Longstreet, James Kennedy, William H. Johnson, Montague Hepworth, Arthur Ashpitel, Arthur Warner, George Heighton, Ernest C. White, Herbert Payne, Thomas Batterby, Matthew Henry Hadland, William Frame, J. Arthur Reeve, J. H. Bryan, George Currier, T. A. Tregilla, J. H. Cundall, and C. S. Webber. A vote of thanks was then passed to the architects of Her Majesty's Theatre for the facilities afforded by them to enable the members of the Association to visit the works, after which Mr. J. Douglass Mathews announced that an early opportunity would be afforded the members of visiting the new Gaiety Theatre in the Strand. The remainder of the evening was occupied in reading and discussing the annual reports.

The report of the committee of the Association was first read by Mr. Quilter. It appears that the roll book now contains 466 names of members—for the most part those who are not far advanced in the profession. While every feature of the Association was in a satisfactory condition, the report expressed a hope that the present session would see an augmentation of the number of members taking part in the discussions, which was at present very small. The library, which is still the only architectural lending library, has received so many additions during the past session that it has doubled its number of volumes. The "Association Sketch Book" has completed its first volume. The various prizes offered during the past session have been competed for by more members than usual. More extensive accommodation was being provided at Conduit street for the increasing wants of the Association.

The balance sheet, read by Mr. J. Douglass Mathews, showed an expenditure of £239 17s. 7d. against an income of £331 15s., leaving £91 17s. 5d. in the treasurer's hands. The association was, moreover, not a halfpenny in debt.

The librarian's report showed that whereas the number of readers in session 1866-7 was only 269, the number last session was 423. Contributions have been made by Mr. Beresford-Hope and other donors. The librarian's accounts show a balance in hand of £35, which will be expended in new books.

The report of the Class of Design showed that the attendances and sketches were greatly in excess of those last session. The total number of attendances was 323, and of sketches 170.

The second annual report of the Class of Construction showed a great increase of members, attributable to the practical method of imparting instruction. The class now musters more than thirty members, and the average attendance is eighteen.

Mr. C. H. F. Lewes read the report of the Figure Drawing Class, which is still conducted at the West London School of Art. The number of members is thirty-three, of which number five are not members of the Association. The course of instruction is left almost entirely to the student, who is at liberty to study from plaster casts, anatomical models, or from the living subject. Some discussion ensued on this report, Messrs. T. Roger Smith, Tarver, R. P. Spiers, G. R. Redgrave and others, offering various suggestions as to the future of the class. It was suggested that as the Association was now in a flourishing condition the class should be divided and one division held at stated intervals in the new rooms of the Association in Conduit street. It was also suggested that one division of the class should be for mere elementary instruction, so that the junior members of the Association would be able to join it. Another suggestion made was that paid tutors should be employed, and it was further suggested that the Association should expend a limited sum in the purchase of casts to be placed in the new rooms for purposes of study. In reply to all these suggestions, Mr. Douglass Mathews and the chairman said that when the new rooms were finished the class would doubtless be accommodated, as would also a class for freehand drawing. Nothing had been hitherto paid for tuition, but it was extremely probable that the custom would be departed from in more than one instance before very long.

The report of the Water Colour Class was read by Mr. Florence. This class was established in the spring of 1866, Mr. Aaron Penley being appointed tutor. The number of members was eighteen.

The second annual report of the Sketch Book Club showed that the number of subscribers was 117. Since the commencement of the second volume a vast improvement has taken place in the sketches and lithography. The committee for this year have offered a prize for a new title-page. Non-members are now eligible to become subscribers on payment of an extra half-guinea.

Mr. T. Roger Smith then read the report of the delegates from the Association to the annual meeting of the Architectural Alliance, at which a

deputation from the General Builders' Association had also attended. The officers of the Alliance were appointed a sub-committee to make arrangements for the representation of that body at any conference that might be held on points affecting building contracts. The report of the Alliance, which was distributed in the room, has already been referred to in the BUILDING NEWS.

Mr. R. Phené Spiers then read the report of the delegates from the Association to the Alliance on the subject of architectural education, the first portion of which will be found on another page.

Some discussion ensued, in which Messrs. T. Roger Smith, Blashill, J. Douglass Mathews, and the chairman took part, and the consideration of the report was adjourned.

ASSOCIATED ARTS' INSTITUTE.

AT the meeting of this Institute on Saturday evening last, Mr. R. Phené Spiers, vice president, in the chair, Mr. Charles Henman, jun., architect, was duly elected a member. A discussion then took place on the question, "Does the literature of a nation to any great extent influence its art?"

Mr. A. H. WALL opened in the affirmative, instancing Greece, which as it progressed in literature progressed in art. Art and literature progressed side by side and in the same ratio to each other. In support of the theory that art influences and is influenced by literature the speaker adduced an argument from the fact that literary men and artists understand each other better than most classes. Literature had a power of educating the masses with respect to works of art, and if only so regarded it would be felt to exercise great influence in the art progress of a nation.

Mr. LEMON H. MICHAEL, taking the negative side, maintained that art had much more influenced literature than literature art. Art was the motive power. To a certain extent literature did influence art, but it was the literature of bygone ages that did so. In the time of the Greeks literature did not reach the masses. It was the artistic and not the literary faculty that was dominant in Greece. There literature was more a reflex of art than art was of literature. In the time of our own Elizabeth English literature was perhaps at its highest, but the arts, especially architecture, were at a very low ebb. Again, in the time of Queen Anne, when we had one of the finest schools of writers ever produced, the remains of a few painters would include all the fine art of the period. Ornamental art had chiefly been produced by nations who had had no great literature at all. It was only in comparatively late times that literature had come within the reach of the masses. In mediæval times, when literature was confined to a small number, the artistic feeling was at its highest.

Mr. CRAVEN said that painting, like literature, might be divided into poetry and prose, and these two divisions could be sub-divided. The Classical revival was simultaneous both in literature and art.

Mr. G. R. REDGRAVE was of opinion that the literature which directed attention to art was a literature which was constantly landing works which were not worthy, and trying to bring forward cliques and coteries of men. The Italian artists had no literature to bring them forth. If the education of the public mind were the good that literature was doing artists, literature was not influencing art, although it might be educating the public into true views of art.

Mr. DAY was of opinion that the literature of a nation did very materially influence its art, and in two ways, by art literature proper and literature generally. All art criticism was not puffing. To maintain that Ruskin's works had not had an influence on the art of the present day was to ignore a very great fact.

Mr. RANKING observed that eastern nations which had excelled in art had also excelled in literature. Such were the Chinese and Persians.

Mr. ALDRIDGE said that the influence of literature upon art was a very bad one. The visible influence of literature in a picture at once destroyed the effect of pure art.

The CHAIRMAN said that the revival of Renaissance art in England was dependent almost entirely on literature. Speaking as an architect of Horace Walpole's revival of Gothic, he thought it was likely that buildings influenced Walpole more than literature. All the explanations in the world would never tell one what style of architecture or form of architecture was. It was impossible to describe a good building. If a good description of a building could be given, that building was not worth anything. The subtleties of good architecture were so intricate that they could not be described in words. Pugin's writings had had a great influence, but *he* was, however, influenced by buildings and not by literature. Ruskin almost always chose the very worst periods of Gothic architecture to hold up to admiration. There were few persons of the present day who would say that Ruskin's views upon architecture were at all to be followed or agreed with.

Mr. WALL briefly replied on the whole debate, affirming that literature and art were so intimately intertwined that it was impossible to say where one began and the other ended. Before the time of the printing press the traditional and monumental literature handed down from generation to generation exercised great influence. The prosperity of literature and the decadence of art in Elizabeth's time were attributable to the fact that the one was encouraged and the other not.

The voting then took place on the sketches exhibited (subjects: "The Tempest, Act. 1," and "A meeting"). One by Miss Thornycroft on the latter subject was selected as being most worthy of being photographed. The proceedings then terminated.

PROPOSED NEW RAILWAYS IN THE METROPOLIS.

IN addition to the proposal to connect the fish market at Billingsgate with the great trunk lines, as described in last week's BUILDING NEWS, another and a revived scheme is for a railway (for a greater part of the distance underground) from the Marble Arch to the City. The City terminus will be near the Peel statue, at the western end of Cheapside. In its course the line will pass through or under the following roads and streets:—Uxbridge-road, Bayswater-road, Oxford-street, Duke-street, Regent-street, New Oxford-street, Holborn, Holborn Viaduct, Farringdon-road, Skinner-street, and Newgate street. This line, if constructed, would be a great relief to the great highway between the City and West-end.

The promoters of the Port of London and Billingsgate Railway also propose a short line from Smithfield to Blackfriars, on a lower level than the branch to the Chatham and Dover line, to connect the Metropolitan Railway at Farringdon-street with the district line on the Embankment, thus bisecting the inner circle of metropolitan railways.

The bill for constructing a railway from Islington-green to the City, which was thrown out last year, is to be again brought forward in the coming session. The line proposed will form a continuous bridge or viaduct, and will be constructed to a gauge of 3ft. The safety and economy of a gauge less than ordinarily adopted have been already proved by the experience of years both at home and abroad. The Festiniog Railway (gauge only 2ft.) has during the year carried 120,000 passengers and 125,000 tons of goods, and there has not been a single accident during the four years since locomotive power has been placed on the line. It has been most favourably reported on by Captain Tyler, R.E., the Government Inspector. It is proposed to have an intermediate station in the City-road, near the "Eagle." The line of route marked out is parallel to Packington-street, Shepherdess-walk, and Bunhill-row, that is to say, parallel to the new direct route to the City which was partially opened a few weeks ago. It is estimated that 40,000 persons take this route daily, and as the third class fare proposed for the journey will be one penny, a large traffic may reasonably be anticipated. The estimated cost is £800,000, and the time required for the construction of the line is twelve months.

ARCHÆOLOGY.

DURING the last few weeks several specimens of Roman pottery have been found in dredging on the Whitstable oyster grounds. They are similar to the numerous other specimens which have at various times been discovered there, and which consist of small bowls and cups, circular dishes, and flat stands surrounded by a rim like a modern cheese dish. They are all made of the red glazed ware known as "Samian." All the specimens are plain, and were evidently made by being turned on a potter's wheel. This is somewhat remarkable, as, while much of the best Samian ware was so made, there was a mode of manufacture in which a mould was used, and the articles were thus adorned with figures in relief. The period to which this kind of pottery belongs is from the first century B.C. to about the third century A.D. It was undoubtedly imported, and must not be confounded with the Romano-British pottery, which began to be made about the third century, and of which there was an important manufacture at Upchurch, near Sheerness.

Building Intelligence.

CHURCHES AND CHAPELS.

On the 13th ult., the parish church of St. Mary, Etton, Yorkshire, was reopened after restoration. The church is of very early date, the tower and north side of the nave being supposed to have been built about 1100—1150. The chancel was rebuilt about 25 years ago in a debased style, partly Norman in character. The tower has now been thrown open to the church, open pews have replaced the old square boxes, and a new roof placed on the tower and nave. The whole of the work has been designed and executed by Messrs. Simpson and Malone, of Hull.

The new Presbyterian Church of St. Paul Montreal, in the dominion of Canada, was dedicated on the 27th of Sept. last. It is in the Early English style, and is built of blue Montreal limestone, with facings of light Ohio sandstone. The plan consists of nave, transepts, and apsidal recess for organ and choir. The length is 140ft., breadth at transepts 95ft., and at nave 60ft. It seats 1,000 persons, at a cost of about £12,500. Mr. Frederick Lawford, a pupil of the late Sir Charles Barry, was the architect.

A new English Presbyterian Church has been opened at Birkenhead. The style is Late Geometric Gothic. The principal elevation is entirely of the stone of the neighbourhood, with a little red stone in bands and arches introduced to give effect. The contract has been carried out by Messrs. R. Anderson and Sons, contractors, Slater street, under the superintendence of Mr. James N. Crofts, architect, of Liverpool. Mr. Turnbull was the clerk of works. The site is the gift of John Laird, Esq., M.P., and the cost of the building about £2,500.

On Tuesday, November 24, the foundation stone of a new Methodist Chapel and schools was laid at Cullercoats. The style is Gothic, and the building will seat 400 persons, at a cost of about £1,300. Stone is to be used throughout. Mr. T. Oliver, F.R.I.B.A., is the architect, and Mr. Thomas Turnbull, of Bertley, the sole contractor.

The foundation stone of a new English Protestant Church was laid at Point de Galle, Ceylon, on the 30th of October, by the Lord Bishop of Colombo. Mr. James G. Smither is the architect.

A pastoral letter from Dr. Manning read on Sunday last in the Roman churches in the metropolis, states that a site in Carlisle-place, Westminster, has been secured for the new cathedral, and a large amount of the purchase money paid over. The buildings to be erected adjacent to the cathedral, and which comprise a residence for the bishop of the diocese, will be executed by Mr. Gilbert Blount, and the designs for the cathedral are entrusted to Mr. Clutton. To the ability of each of these architects the letter bore marked testimony.

On Monday, the Lord Bishop of Ripon consecrated a new church dedicated to St. Thomas, at Batley. The structure consists of nave, side aisles, chancel, tower and spire, is an example of the Geometric Decorated Gothic, and has been erected from the designs of Mr. Sheard, architect, of Batley. The nave is 52ft. high, 75ft. long, and 23ft. wide, and the chancel 33ft. long by 20ft. in width, the former being divided into five bays. The tower is 20ft. square, at the south-west corner of the nave, and 150ft. high to the top of the vane. On the north side of the chancel is the organ chamber and vestry. The material used in the construction of the building is delph stone from the local quarries for the walls, and Finsdale stone for the dressings. The total cost has been about £6,000.

The first stone of the new church, Titley, Herefordshire, was laid on the 30th ult. It will replace an edifice erected a hundred years ago, and consist of nave, north aisle, south porch, chancel, organ chamber, and vestry. The present tower is to be retained. Provision is being made for 220 persons. The fittings will be of oak. Penrhos stone is being used for the walling, blue pennant for the arcade shafts, and Bath for the dressings. The walls will not be plastered internally. The style of the church is Early Decorated. The estimated cost of the work, which is being carried out by Messrs. Lewis and Day, of Hereford, is £1,600. Mr. E. Haycock, jun., of Shrewsbury, is the architect.

On Saturday, the new church of St. John the Evangelist, Lepton, Yorkshire, was consecrated by the Bishop of Ripon. The style is Early Decorated, and the plan consists of nave, chancel, and south aisle. The building seats 500, at a cost of £3,800. Messrs. Healey, of Bradford, were the architects.

BUILDINGS.

The New Metropolitan Meat and Poultry Market was inaugurated on Tuesday week by the Lord Mayor and other members of the corporation. There are 162 shops in the market, each about 36ft. by 15ft.; each shop consists of front shop, enclosed by open iron railing, and back shop, which can be entirely closed after business hours; in the back shop is the counting-house, and over it a private room, with water-closet, &c. The entire cost of the market building will be somewhat within the architect's estimate of £200,000. That the building will prove most useful, as partly supplying a great need, there can be no doubt. Of its architectural character we have already said all we care to say.

On the 25th ult., a new townhall was opened at Mirfield, near Dewsbury. The style of the building is Italian, freely treated, and the material used is stone from the local quarries. A large lecture hall containing sitting accommodation for 1,000 persons is on the ground floor. The cost of the building was £4,000. Messrs. John Kirk and Sons, of Huddersfield and Dewsbury, were the architects.

A national school building, for about a hundred children, is in course of erection in Plympton, Devon, from a design by Mr. James Hine, architect, Plymouth. The site, on the south side of the ancient castle and immediately adjoining the village Green, was given by the Earl of Morley. The style of the building is Early Pointed; the materials of the walls local stone, freestone, and Lee Moor brick. Mr. Verren is the builder.

TO CORRESPONDENTS.

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—L. Z.—A. H. H.—I. C. H.—O. W. D.—I. P. S.—H. W. P.—I. C. K.—W. and B.—E. H. T.—T. C.—W. H. L., with photograph.—J. C. T.—J. H.—W. and N.—E. P.—D. B.—T. T.—I. F. R.—O. W. D.—J. C. J.

J. D. M.'s letter on Local Boards next week.

A. C. G.—Next week.

G. G. H., with photographs.—We will give one of the illustrations with plan, and should like to state price as well.

QUERY.—Your going to India must depend on your inclinations, health, ability, and means.

A LOOKER ON should have put his name to his letter.

Correspondence.

MR. J. M. SMITH'S DRAWINGS.

To the Editor of the BUILDING NEWS.

SIR,—I trust that not one of your readers will endorse the remarks made by your correspondent "G. S. A." in the BUILDING NEWS of last week. His preliminary remarks are simply fanciful generalities which in themselves refute themselves. The ingenious way in which he has worked out a joke at the expense of the umbrella sticks is worthy the ingenuity of an architect, and would be extremely amusing if it were more in accordance with the fact.

When "G. S. A." uses the expression "apologetically called 'grotesques,'" I suppose he means that Mr. Smith thought his creations so ugly that, as a kind of apology for publishing them, he informed your readers that they were intended for "grotesques."

Perhaps "G. S. A." is not aware that the beauty of a "grotesque" consists in what to the uninitiated is its ugliness, but to the initiated is the quaint conventionalisation of a thing, which being a natural creation is necessarily beautiful. In fact, the whole of "G. S. A.'s" remarks are entirely away from the question until we come to his last sentence, which is evidently reserved, as an actor going off the stage loves to reserve a flowing, rhythmical, and high-sounding phrase, with which he hopes to "bring down the house." "His outlines are crude and ungraceful, his details out of proportion, and his foliage conventionalised to mechanical mannerism." These are evidently points upon which opinions may differ possibly, and I hope some of the higher members of the profession, whose opinions are well known to be worthy of acceptance, who really can appreciate the power of the Gothic "eccentricities," will stand forward and tell to the "impressible minds of young students of architecture" whether *they* agree with "G. S. A.," or whether they say with me that the designs and the descriptions which accompany them "suggest" (to use Mr. Smith's own word) that essence of art feeling and that embodiment in material of a real and soul-felt religion which had almost died out for ever with the romance and chivalry of a past age, and is now being so happily revived and so universally recognised by the people of this country.

In conclusion, I trust that your readers may for some time yet have the privilege of seeing future sketches from the pencil of Mr. Smith in the BUILDING NEWS. The approval of his own innate sense of the beautiful will, no doubt, satisfy him; and the simple fact of the designs having been admitted at all in your pages seems to me to prove that you consider them worthy of the consideration of the profession.—I am, &c.,

A. R. T.

VENTILATING CORNICE.

SIR,—Mr Potts's patent ventilating cornice is not a new invention. It is a pity indeed to patent anything for ventilation. So many minds are continually bent upon the subject, so many methods are adopted, that no person can flatter himself that he has hit upon means so novel as to secure protection. If I mistake not the House of Peers was both supplied with fresh air and ventilated from the cornice level. The principle has answered where one condition is favourable, that is, where air is not supplied to the room in any other way. In the new committee room of the Stock Exchange the fresh air enters through the cornice only, for the sashes are unusually guarded against draught, and the doors have moulded and rule-joint rebates. The vitiated air leaves through the cornice only, but, as with the fresh air, no perforations are visible (for woe to the architect who hopes that they would not be pasted up), and there are no valves. The current is self-acting, but can be quickened without machinery. The plan has certainly succeeded in this case far better than could be expected from the varied temperaments and stoutness and thinness of men, and it has not been altered in the least from my first arrangement. Mr. Potts's cornice may answer the purpose; but he cannot claim the invention, nor can I.—I am, &c.,

J. J. COLE.

New Court, Throgmorton-street, E.C., Dec. 1.

SOCIETY OF ENGINEERS.

SIR,—I trust you will allow me, through the medium of your paper, to call the attention of the members of the Society of Engineers to the balloting list of proposed new members of council for the ensuing year. There are seventeen candidates and twelve only can be elected. The outgoing council have as usual nominated themselves with one or two exceptions, and will no doubt vote for each other, and get their friends to help them to get returned. I beg to suggest that, following up the Conservative tactics, members should plump for eight candidates, including the five new candidates not in the outgoing council's list. This will ensure the return of the new candidates, and infuse new blood in the council, which I need hardly say is much required.—I am, &c.,

A MEMBER OF MANY YEARS' STANDING.

Intercommunication.

QUESTIONS.

[1157.]—A QUESTION FOR SCHOOL BOYS.—Can any of your correspondents give me the solution of the following?—The copper sheathing of the hull of a vessel which had been seven years in the Pacific was found to contain 1-2,500 of its weight in silver. What fraction of a pound troy of silver would 1 cwt. of the sheathing contain?—F. A. E.

[1158.]—COMPOSITION LETTERS ON STONE.—Will any of your numerous readers be kind enough to inform me what kind of composition is used to fill up letters on stone, so that they look well and are durable.—IGNORAMUS.

[1159.]—ESTIMATES OF CORRESPONDING AMOUNTS.—As a constant reader of your paper, may I beg of you to inform me [illegible] your next issue how an architect [illegible] to settle matters when out of several tenders presented to him the two lowest [illegible] whether a [illegible] tenders [illegible]. If yes, by whom. I ask this question for the public in general.—A CONSTANT READER.

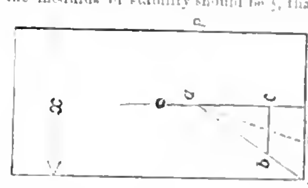
[If an architect reserves to himself the right of not necessarily accepting the lowest or any tender, he has liberty to select from the two contractors (whose tender is the same) the person whom he considers most competent to carry out the work. If he has no [illegible] this matter, call the two contractors together, and let the question be decided by lottery.—ED. B. N.]

[1160.]—GLAZED BRICKS.—Can any correspondent inform me where glazed bricks 11in. long can be procured and the price? I saw them advertised somewhere once for bonding together 2ft. 4½in. hollow wall.—I. E. H.

[1161.]—PRACTICE OF THE PROFESSION.—Can you, or any of your readers, inform me what is the practice of the profession in the following cases?—1. When a quantity surveyor has supplied quantities for a job, which, the tenders having been received, is found to cost too much, and is therefore abandoned, who pays him for his labour in that case? 2. Or, when the job goes on in part, or on a reduced scale, and the original quantities are set aside, the builders tendering in the second instance on their own quantities, or on what they can make out of the original ones, how is the said surveyor to be paid in that case? On the amount of lowest tender based on the original quantities, or on the amount of the actual work (building work, that is) carried out?—M. K.

REPLIES.

[1080.]—RETAINING WALLS.—The corrections given by "X + Y" to the several expressions on my solution of his problem on the stability of retaining walls are correct, the errors being misprints. In calculating the thickness of a safe wall, the moment of the earth should be doubled, or = 2O, and I will give him the reason why. Let the line a c represent the weight of the wall, and b c the pressure at P. Then the resultant a b, when the wall is in equilibrium, will cut the toe of the wall at d; but for a safe wall the modulus of stability should be ¾, that is, the resultant should cut a point p, equidistant from d and f, therefore weight of wall × distance p f must equal O. Thus the equation for a rectangular wall on equilibrium would be



$O = h\ w\ x \times \frac{x}{2}$, and for stability, $O = h\ w\ x \times \frac{x}{4}$, or its equivalent $2O = h\ w\ x \times \frac{x}{2}$. h = height of wall; w = weight per cubic foot; x = thickness.—J. L.

[1080.]—There are some mistakes in the printing of part of my letter of November 27.

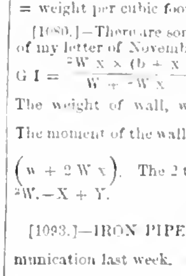
$G\ I = \frac{{}^2W\ x \times (b + x}{W + {}^2W\ x}$ should be $G\ I = \frac{2\ W\ x \times (b + x)}{W + 2\ W\ x}$

The weight of wall, $w + {}^2W\ x$, should be $w + 2\ W\ x$

The moment of the wall should be $\left(\frac{2\ W\ x \times (b + x)}{w + 2\ W\ x} + a\right)\left(w + 2\ W\ x\right)$. The 2 throughout in 2 W has been printed ²W.—X + Y.

[1093.]—IRON PIPES.—There is a misprint in my communication last week. $A = \frac{area \times 16}{20}$ $c = 80$, should be $A = \frac{area \times 16}{29}$ $C = 80$.—J. L. (signed W. P. in error.)

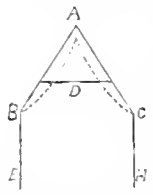
[1112.]—STRENGTH OF WALLS.—I have mislaid my number of the BUILDING NEWS containing the question put by "Inexperience," therefore cannot refer to it, but my attention is drawn to the information offered by "Heyton" in last week's issue. Before "Heyton" attempts to instruct "Inexperience" he should possess [illegible] of more accurate knowledge [illegible] subject in hand, and [illegible] perpetrate such absurdities [illegible] in his communication, which can only tend to bewilder [illegible] mislead. In the first place, [illegible] does not appear to know where the centre of gravity of the wall lies, neither has it a tendency to turn over on the point A, as he states, and his equation for the thrust and resistance is simply a "muddle."



If T represent the horizontal thrust at the top of the wall, T × H will express the value of the force tending to turn it over on the point b, and if W = the weight of the wall, W × a [illegible] will express its resistance, therefore the equation for thrust and resistance in equilibrium will be T × H = W × a b.—J. L.

[1122.]—ROOF CONSTRUCTION.—"A. F. [illegible]" and "H." are both of them in the dark as to the purpose for which a collar beam is used. They mistake it for a tie beam, and erroneously assert the strain to be a tension. The one other portion of roof framing with which a collar beam may be compared is the straining beam of a queen

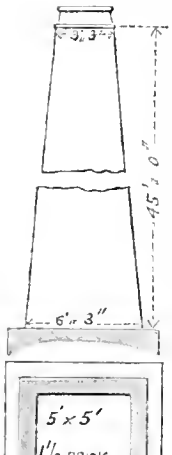
post truss; the longitudinal strain in each being that of compression. In the annexed diagram, A B and A C are the rafters, D the collar, B E and C H the walls. Suppose the collar to be taken away, then the tendency of the rafters will be to assume a curved form, the point A being depressed, as shown by the dotted lines. To prevent this sagging of the rafters, the collar beam D is introduced, and clearly the force it resists is one which compresses it. Tensile strain in a collar beam will occur when the walls have not sufficient stability to resist the outward thrust of the rafters; which would be an example of bad construction, and would prove the designer to have been incompetent or careless. The method suggested by "H." for keeping the thrust off the walls is not a good one, the connection of the strut with the principal is faulty, and, without bracing, the strut would soon cease to be of any utility. The king post might very well be dispensed with. The iron tie rod, which "H." rejects, would be much more effective; its variation from a mean length would never exceed, in this country, the 1-32nd of an inch.—PUBLIN.



[1122.]—Allow me to thank your correspondents for their replies to my questions, and in answer to "D. Y." I

have sent the attic plan. The ridges are shown by dotted lines.—BEGINNER.

[1118.]—SHAPE OF CHIMNEYS.—I should advise "Builder" to build his chimney square on plan, as that is a stronger form than the circular one. Moreover, while there have been abundant instances of circular chimneys falling down, the examples of square ones coming to grief in the same manner are very rare. The annexed is a plan and elevation of what I should recommend as good proportions. If the thickness at the ground level be a brick and a half, it may be diminished to one brick at the top. The foundations and footings must depend upon the nature of the ground. It is not generally adopted, but "Builder" will find that a cast-iron cap makes a very good finish to a chimney, much better than any ordinary coping. For small chimneys intended for temporary purposes, not exceeding 25ft. or 30ft. in height, the corners are sometimes protected by longitudinal angle irons, into the sides of which the abutting bricks fit. Several of these have been erected at the Royal Arsenal at Woolwich, for the furnaces where the coils forming the body of the Fraser gun are heated before being forged under the tilt hammer. When a chimney is very lofty, the accurate determination of the best curve for it is a very difficult mathematical investigation, as the effect of the wind must be allowed for.—P. B. STRUT.



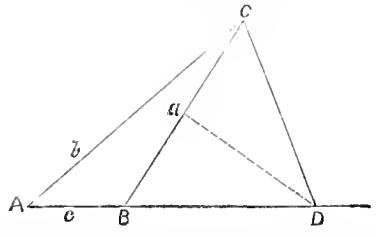
[1128.]—CALCULATION OF PRIME COST.—I have generally found that the expenditure on works could be conveniently calculated, as shown by the following example, in which I suppose the contract to be for £600, and I assume the expense of each item:—

	£	s.	d.
1. Paid for labour, as per foreman's weekly returns	120	0	0
2. ,, materials (not plant)	380	0	0
3. ,, carriage of same	10	0	0
4. Value of materials (not plant) supplied from stock	20	0	0
5. Carriage of same	1	0	0
6. Surveyor's fees, licences, and other like incidental expenses	10	0	0
7. Travelling expenses	3	0	0
8. Deterioration in value of plant	10	0	0
9. Carriage of same	3	0	0
10. Proportion of yard and office expenses, and time of general foreman, due to amount of contract	9	12	0
11. Loss of interest on sums drawn for payments	15	0	0
	£581	12	0
	£	s.	d.
12. Value of surplus materials (not plant) returned to stock, less cost of carriage; or sum realised by sale of same	15	0	0
13. Amount of contract	600	0	0
14. Interest gained on instalments	10	0	0
	£625	0	0

Shows a gain of.....£43 8s. 0d. H. C.

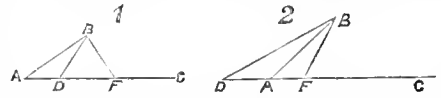
[1128.]—I think the reply sent by Mr. Duffield is somewhat overstrained. Not contented with telling your correspondent that he kept a separate heading or folio in his ledger for each contract or customer (strange book keeping if otherwise), he asserts that he can tell the prime cost of a £600 job to a shilling. When Mr. Duffield sends from his shop any joiner's work does he mean to say that every 1 in board taken from seasoned stock and cut into stiles and rails, that he knows whether that board came from deals at £21 per 100 or £22? Also, short ends cut up, he can identify their prime cost per 100. Also, when he sends out cut nails, does he know those he bought at 12s. 6d. from those at 11s. 6d.? Again, how does he manage so exactly the prime cost of the wear and tear of scaffolding? Say two jobs are in progress, one at £2,000, another at £4,000; the wear and tear of scaffolding may be greater at the smaller job from the nature of the works. I know an average per centage may be put on, but this is not the point. Mr. Duffield asserts that he can tell the prime cost to a shilling. As this is bringing accounts to a mathematical nicety, perhaps Mr. D. will enlighten—A GUILDER'S CLERK.

[1123.]—TRIANGLES.—Assuming that your correspondent "R. F." intends the sides of his triangle to be measured in feet or other lineal units, and not in degrees, as printed, I offer the following as a simple solution by construction, in the case where the base A D exceeds the side C D. On A D, as a base, set up A C at an angle of 40 deg.: make A C = 30, and on A D mark off A B = 10, the difference between the two sides whose lengths are sought, and join B C. Bisect B C in a, and draw a D perpendicular to B C, and meeting A D in D. Then will A D C be the triangle required, having the side A C = 30, the angle at A = 40 deg., and the difference of the sides A D, C D = 10. This construction at once suggests the trigonometrical solution, as follows:—1. To obtain the magnitudes of the angles A C B, A B C; putting a for the side B C, b for the side A C, and c for the base A B; also denoting the angles at A, B, and C by those letters, we have—As $(b+c)$ is to $(b-c)$ so is $\tan.\frac{B+C}{2}$ to $\tan.\frac{B-C}{2}$.

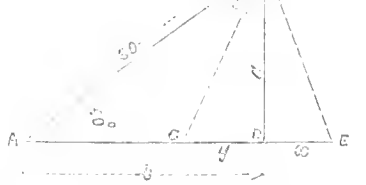


This gives the angle B = 123° 57', and that at C = 16° 3'. 2. To find the length of the side a—As sin. 16° 3' is to c, so is sin. 40° to a; whence a is found to be = 43.25. 3. We now proceed to find the length of the side B D or C D. By the construction they form the sides of an isosceles triangle, which has B C for its base; consequently the angles C B D and B C D are equal. But the angle C B D = 180° − 123° 57' = 56° 3'. Therefore the angle B C D = 56° 3', and the angle at D = 180° − (56° 3' + 56° 3') = 67° 54'. Then, as sin. B D C : B C : : sin. B C D : B D. Whence 20.81 is found to be the length of the side B D or C D. Consequently, the three sides of the required triangle A D C are respectively 30, 30.81, and 20.81; and the angles are 40°, 67° 54', and 72° 6'.—E. SWANBOROUGH.

[1129.]—Not seeing in the last number of the BUILDING NEWS any, as I considered, satisfactory answer to this question, I thought the following might be acceptable to "R. F." First—Supposing A C to be the longest side, from A C cut off A D = 10; join B D; at point B make the ∠ D B F = the ∠ B D C. Then B A F is the triangle required. Secondly—Let B F be the longest side. Produce F A to D, making A D = 10; join B D; and at point B make the ∠ D B F = ∠ B D F. Then B A F is the triangle required.—C. P. E.



[1129.]—With the conditions given in the problem supplied by "R. F." the remaining sides, which may be either A C and B C, or A E and B E, may be easily found



in the following manner:—The expressions for the several lines in the figure will be as under—

B D = 30 × nat. sin. ∠ 40° = 19.28 =	a.
A D = 30 × nat. sin. ∠ 50° = 22.98 =	b.
C D =	y.
D E =	x.
A C =	b − y.
B C = (c = diff. in the two sides)	b − y + c.
A E =	b + x.
B E =	b + x − c.

Having these expressions, it is only necessary to know the values of x and y to solve any one of them: and

$$x = \sqrt{(b+x-c)^2 - a^2} = \frac{a^2-(b-c)^2}{2(b-c)} = 7.83$$

$$y = \sqrt{(b-y+c)^2 - a^2} = \frac{(b+c)^2-a^2}{2(b+c)} = 10.85$$

Thus: A C = b − y = 22.98 − 10.85 = 12.13.
B C = b − y + c = 22.98 − 10.85 + 10 = 22.13
A E = b + x = 22.98 + 7.83 = 30.81
B E = b + x − c = 22.98 + 7.83 − 10 = 20.81.
—J. L.

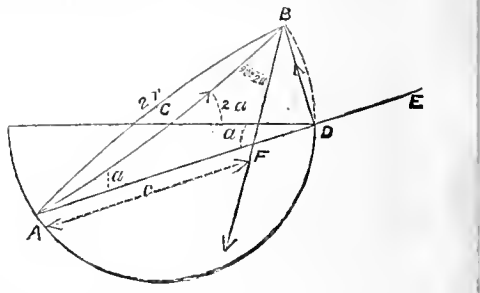
[1129.]—In reply to "F. R.," who styles himself a mathematician, I beg to say that his question is by far the most ridiculous I have ever seen. "R. F." should be careful in writing about the great sciences of mathematics, for if he only knew the unlimited value of things of so great moment, which even teaches to demonstration the art of investigating the motions and magnitudes of the starry firmament, he would not put questions to which no meaning can be attached; for, in the first place, to reason logically, a geometrical question is a problem, and a problem is something proposed to be done—that is, certain things or quantities are given to find out others, and this is called a solution. Now, your correspondent gives certain things for solution without saying what he really wants solved. In the second place he talks of triangles, and in his diagram draws only an angle. Now, a triangle is a superficies, but two straight lines agreeable with Euclid cannot enclose a space. In the last place, the measurement of lines are always taken by some unit, and it is the angles of a figure only which are taken by degrees. Let "F. F." think himself no more a geometrician, for be it well known, from the following lines, that the subject is based on really profound facts and not on farces:—

"He who thro' vast immensity can pierce,
See worlds on worlds compose one universe,
Observe how system into system runs,
What other planets circle other suns,
What varied Being peoples every star,
May tell us why our Maker made us as we are"

ROBIN CARPENTER.

[Answers to this question have also been received from "Martin B." and "Calculator."—ED. B. N.]

[1135.]—QUESTION IN STATICS.—Let A D E be the position of the rod; draw a diameter A B; join B D; then will B D be perpendicular to A D; and the reactions of the surface of the bowl and the point D will be in the directions A B and B D; a vertical line drawn from B will pass through the centre of gravity of the rod, which will be at its middle point. Let R = reaction in direction A B; R' in direction B D; A F = C. Now the angle C A D = a = angle C D A ∴ angle B C D = 2a, and the angle C B F = 90° 2a. Resolving horizontally, and taking moments round F, the following equations are obtained: (1) R cos. 2a = R' sin. a; (2) R' × F D = R A F sin. a, but F D = A D − A F = 2r cos. a − c ∴ R' (2 r cos. a − c) = R × c sin. a. Multiplying both these equations together, and reducing, we get 4 r cos. ^{2}a − c cos. θ − 2 r = o, which gives a quadratic for angle a. In this question r = 2 c = 2½. Substituting these values, and solving, we get



$$\text{Cos. } a = \frac{5}{32} = \sqrt{\frac{537}{1024}} = .8804143,$$

which is the natural cosine of the angle, ∴ a = 28° 18' 29"; now F D = 2 r cos a − c = 4 × .8804143 − 2.5 = 1.0207'. This result can be verified by plotting it to scale.—C. D.

LEGAL INTELLIGENCE.

BAD SLATES.—On Saturday an adjourned sitting of the Stockton County Court was held, and the case of Crossley *v.* the Liverton Ironstone Mining Company was disposed of. The plaintiff, who is a dealer in building materials at Stainton, sought to recover £17 13s. 8d. for slates alleged to have been supplied to the defendants. On April 13 last the defendants ordered 1,500 square feet of slating and 46ft. of ridge roll. On April 27 the manager of the Ironstone Company wrote to the plaintiff, stating that the slates were so inferior in quality that they could not use them, and offered to return them. Afterwards the manager said he would keep the slates on consideration that the price was reduced. The plaintiff saw the importer of the slates, and he consented to a reduction in price rather than receive them back. On July 9 plaintiff received a cheque from the defendants for £1 8s. in payment of the ridge roll only. Plaintiff then wrote to the manager reminding him that he had agreed to keep the slates at a reduced price. In reply to this the manager wrote offering to pay the carriage if the plaintiff would take back the slates. Plaintiff refused to do this, but in September the slates were returned. His Honour gave a verdict for £1 8s. without costs, the price of the ridge roll only.

THE WANDSWORTH BOARD OF WORKS (APPELLANTS) *v.* HALL (RESPONDENT).—The respondent in this case had been summoned by the Board of Works, on the ground that he had built in front of Thurlow Cottage, Wandsworth-road, beyond the general line of building frontage. It happened that at the time the respondent built, the architect of the board had not actually laid down any building line at the spot in question; and the magistrate held that under these circumstances he had no power to interfere and order the demolition of the plaintiff's building, and he dismissed the complaint. The question for the Court of Common Pleas, where the appeal was, was whether the magistrate had power to make the order for demolition. The court held that if a man built beyond the proper building line, and the line was afterwards fixed by the architect of the board, the magistrate had power, notwithstanding the line was not laid down until after the building was erected, to order the demolition of the building. Judgment for the appellants.

THE METROPOLITAN BUILDING ACT.—Mr. Ashley, builder, No. 20, Grafton-street, was summoned by Mr. Baker, district surveyor of St. Pancras, on Monday, before the Marylebone Police Court, for constructing a wall with broken bricks not put together with proper mortar or cement. Mr. Venn appeared for the defendant. After the evidence had been heard it was agreed to refer the case to some competent person, and Mr. Caiger, the police surveyor, was named by the magistrate and accepted by both parties. Mr. Caiger having made the necessary inspection, said he had found that the wall had not been built according to the requirements of the act, and he considered that it ought to be pulled down. An order having been made for the wall to be pulled down costs were applied for. Mr. Tyrwhitt acceded to the application, and in addition to a nominal fine of 1s., ordered the defendant to pay £4 8s. costs.

Our Office Table.

Within the last few days several of the grand marble tableau, executed in inlay work by Baron Triqueti, and intended for the decoration of the Albert Memorial Chapel, have arrived at Windsor Castle. Two of them have been placed in their proper positions on the south wall of the interior of the chapel. The first to be noticed is that contributed by her Royal Highness Princess Louise of Hesse. The subject is "Pharaoh creating Joseph Viceroy of Egypt." The next tableau, upon the south wall, is "The offering of the first-born of the Queen and the late Prince Consort." It is presented by her Royal Highness the Crown Princess of Prussia. The subject selected for Princess Victoria's tableau is "Jacob blessing the Sons of Joseph." Only a portion of the Princess of Wales's offering has yet reached the Castle.

A report has been published on the tin and tinued vessels used in the military hospitals in France. The metal used for tinning, it was found, contained from 25 to 50 per cent. of lead. In vessels reputedly made of pure tin, the commissioner found, in some cases, as much as 15 per cent. of lead. Such proportions are dangerous, he says, to the public health, and the Government is recommended to fix a standard allowing only 5 or 6 per cent. of lead to be used with tin in utensils intended for culinary purposes or for drinking vessels. The author has probably overstated the dangers from the use of utensils composed as he has found; but it would be well if cheap manufacturers in this country would bear in mind that it is not altogether safe to use a large proportion of lead.

A report from Dingle states that an extensive and valuable bed of slate, extending over several hundred acres, has been discovered close to the seashore at Dunarlin, in the extreme west of Kerry, and on the estate of Lord Ventry. Competent authorities announce the material to be of the best quality.

The eleventh annual meeting of shareholders in the Architectural Union Company was held on Wednesday at the offices, 9, Conduit-street, Regent-street; Mr. Charles Mayhew in the chair. Mr. Farthing, the secretary, read the report, which stated there was again an increase in the receipts from the rentals of the several rooms and galleries during the past year, and the financial position of the company was in the most satisfactory state. The total receipts for the year had been £1,803 4s., and the expenditure £1,197 10s. 7d., leaving a balance of £605 13s. 5d. The directors recommended a dividend of 10s. per share, being at the rate of 5 per cent. per annum, which will amount to £518. The number of shares now on the register was 1,037, upon which £10,370 had been paid. The chairman, in moving the adoption of the report, which was agreed to, congratulated the shareholders upon the steadily increasing improvement in the affairs of the company. Messrs. Ashfield, Lamb, Wood, and Wylson, the retiring directors, were re-elected; and Messrs. Lockyer and Cockerell were re-elected as auditors.

The medical officer to the Shoreditch vestry (or "Shoreditch Representative Council," as a local print magniloquently terms it) has reported on the dirty and dilapidated condition of a number of houses in Charlotte-court, Charlotte-street, Curtain-road, in accordance with the provisions of the Artisans' Dwellings Improvement Act. The houses are described as unfit for human habitation. The consideration as to the enforcement of the Act by the vestry is postponed till January.

A suggestion is made by one of the correspondents of the *Pall Mall Gazette*, for preventing accidents to railway travellers on the arrival or departure of trains, and rendering it unnecessary to lock the carriage doors. It is as follows, and seems, at any rate, worth a trial:—To the edge of the platform fix a barrier or railing, to rise and fall on the principle of a parallel ruler. At the sound of a gong the barrier could be raised for the whole length of the train, thereby preventing any reopening of the carriage doors at departure. The train could enter the arrival platform between barriers up on both sides, and passengers might be allowed to let themselves out on the side from which the barrier had been depressed at the stroke of the gong.

A large square of buildings was erected about twenty years ago in Albert-street, Spitalfields, under the patronage of the Earl of Shaftesbury, and was set apart for the accommodation of single men. Although one of the most commodious buildings of the kind, possessing a large reading room and lecture room, with accommodation for 210 lodgers, it has not latterly paid sufficient to clear the current expenses. It is, after being closed for a short time, in the course of refitting as a lodging house for families, and when completed it is expected to return 7 per cent. on the capital invested in the erection of the building.

The part of the approach to the New Meat Market east of Farringdon-road was opened for carriages on Tuesday morning. One of the water companies took the opportunity of opening the roadway of the section west of Farringdon-street (leaving room for one line of vehicles to pass) *on the same morning*, having neglected availing themselves of the six weeks' time they had had to effect their purposes.

Mr. George Martin, of Stockton-on-Tees, sends us the following on preparing paper for drawings:—Perhaps it may not be thought superfluous to point out to beginners that in stretching paper for show, or indeed any drawings, care should be taken to see that no part of the paper be secured to the clamps at the end of the drawing board, as these, being placed with the grain in a different direction, the expansion or contraction, or pinning, is not in harmony with the rest of the board, and the paper would be affected by the difference. Water colour painters recommend that the half inch to be glued should be doubled over upwards while wet, so as to be better got at in applying the glue. It is also recommended that after fixing the first side, the opposite one should be done, as twisting of the paper would be less likely to occur. These are, apparently, trivial matters, but attention to such may sometimes save a great deal of trouble.

The treasures of the Royal Irish Academy have just been enriched by a donation from the Earl of Charlemont. It is a collection of seventy-four terra cotta busts of the Roman emperors and their families, modelled from the original antiques in the capitoline museum at Rome, and which long adorned the library at Charlemont House. They are upwards of a century old, having been executed at Rome in the year 1754 for Mr. Edward Murphy, a gentleman of great literary and artistic ability, by an eminent Roman statuary, named Vierpyle.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Engineers.—Paper on the "Accumulator Cotton Press," by Mr. E. Matheson, and on the "Application of Steam to the Cultivation of the Soil," by Mr. B. Latham. Entomological Society, 7.

TUESDAY.—Institution of Civil Engineers.—Discussion upon Mr. Wheeler's paper on "The River Witham and its Estuary."

WEDNESDAY.—Society of Arts.—"On the Theory of Boiling in connection with some Processes in the useful Arts," by C. Tomlinson, Esq., F.R.S., F.C.S.

Geological Society, 8.

FRIDAY.—Architectural Association.—"The Architecture of Russia," by E. I'Anson, Esq., F.R.I.B.A.

SATURDAY.—Associated Arts Institute.—Paper "On the Treatment of Subject in Pictorial Art," by R. Redgrave, Esq., R.A.

Trade News.

TENDERS.

LONDON.—For new sewers in the Western Districts, and filling up open ditches in Wood lane, and Lawn-place, Shepherd's bush:—

Redding	£12,220 0 0
Risley	10,587 0 0
Pearson	10,500 0 0
Thoms	10,400 0 0
Morton	10,231 8 9
Jackson	10,000 0 0
Osenton and Carter	9365 0 0
Young	9003 0 0
Fossil	89[illegible]5 0 0
Docwra	88[illegible] 0 0
Crockett	8750 0 0
Neave and Fry	8700 0 0
Nicholson	8450 0 0
Thirst	8344 0 0
Toualey	8060 0 0
Blomfield	7879 0 0
J. and S. Williams	6550 0 0

HOLYHEAD.—For erecting new workhouse, buildings, and other at Valley for the Holyhead Union. R. G. Thomas, Menai Bridge, architect:—

W[illegible]	£[illegible] (?)
[illegible], Liverpool	3[illegible]0
W. Williams, Bangor	2[illegible]
[illegible]	[illegible]45
[illegible]	[illegible]
T. M. [illegible]	[illegible]8
Richard Jones, Holyhead (accepted)	2100 (?)

LONDON.—For erecting Model Buildings in [illegible] Market. H. S. Legg, architect. Quantities supplied:—

	Amount of Contract.	Credit for old materials.	Net amount.
Harrison and Edwards	£19,[illegible]	£[illegible]	£19,035
Williamson	17,[illegible]	1[illegible]	17,340
Hockley	16,[illegible]	200	16,565
Turner	16,2[illegible]7	—	16,2[illegible]7
[illegible]	16,[illegible]	150	15,98[illegible]
Wilson	16,[illegible]	[illegible]	15,600
[illegible]	1[illegible]	1[illegible]	15,618
Nightingale	1[illegible]	2[illegible]	15,[illegible]5
[illegible]	1[illegible],411	[illegible]	15,0[illegible]3
[illegible]	1[illegible],200	200	1[illegible],000
Till	15,200	300	14,900
Winship	14,820	—	14,820
Webb and Sons	14,8[illegible]	2[illegible]	14,6[illegible]5
Manley and Rogers	14,9[illegible]6	27[illegible]	14,641
Hughesdon	14,65[illegible]	2[illegible]	14,4[illegible]3
Piper and Co.	14,[illegible]	2[illegible]	14,379
Nutt and Co.	14,53[illegible]	300	14,230
Scrivener and White	14,476	347	14,10[illegible]
Cooper and Cullum	14,[illegible]	450	14,[illegible]00
Baker and Constable	1[illegible]	300	14,5[illegible]
Johnson	1[illegible]	—	1[illegible]

LONDON.—For rebuilding warehouse in Houndsditch, for Messrs. Lazarus and Rosenfelds. Mr. H. H. Collins, architect.—

Stuart and Bennett	£1558
A. M. Cohen	1050
Bell and Russell	987

READING.—For the erection of schools in connection with the King's road chapel, Reading. Messrs. Wm. and J. T. Brown, architect. Quantities supplied:—

Simonds	£876 0
Sheppard	8[illegible] 0
Kendell	867 0
Barnicoat	8[illegible]6 0
Matthews	848 10

REIGATE.—For completing house at Reigate. Mr. J. F. Matthews, architect. Quantities supplied:—

Barnes	£990
Nightingale Brothers	935
B. E. Nightingale (London)	928
Gage	9[illegible]
Cook	918
Room	8[illegible]5
Messrs. Holdsworth	875

RUABON (North Wales).—For alterations and additions to the parish church. Mr. B. Ferrey, architect. Quantities supplied:—

	General Works.	Porches.
Black and Readie	£3809	£219
Higham	3150	214
Yates	28[illegible]1	235
Dove Brothers	2795	205
Chester	25[illegible]3	215
Potter	2430	165
Williams	22[illegible]8	180

SLOUGH.—For the erection of four houses at Slough, for Mr. J. Foster. Drawings made by Mr. Pierse Arthur.

Evans	£[illegible]
Jones	750
Shaw	710
Johnson	710

WOLVERHAMPTON.—For alterations and additions to the Wolverhampton Union Workhouse. Mr. J. R. Veall, architect:—

Crutchley	£1023 0 0
Lovatt	979 7 10
Thompson (accepted)	960 0 0
Bowater	950 0 0

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

PRIORY ESTATE, DOVER.—December 15.—For laying out about 13 acres of building land. Premiums of 50 and 25 guineas. Mr. S. Finnis, Biggin-street, Dover.

SOUTH METROPOLITAN SCHOOLS, SUTTON (Surrey).—February 2.—For designs for the erection of an infant establishment adjoining the present schools. Premiums of 10 guineas each for the three designs considered the best. J. Burgess, clerk to the managers, Vestry Hall, Walworth.

HARTLEY, WINTNEY, HANTS.—December 29.—For plans and specifications for the erection of a new church for the accommodation of about 700 persons. Mr. Wetherell, Hartley Wintney, Winchfield, Hants.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HAMPTON COURT AND WALTON BRIDGES.—December 16. Tender for tolls. Mitre, Hampton Court.

ST. JAMES'S CHURCH, GREAT YARMOUTH.—December 12. —For the erection of a portion of this church. J. P. Seddon, architect, 12, Park street, Westminster.

ST. MARY ABBOTT, KENSINGTON.—For the construction of about 1,100ft. of brick sewer. Mr. J. Whitchurch, surveyor, 7, Lincoln's Inn Fields.

LEICESTER WATERWORKS.—December 8.—For the execution of the works comprised in Nos. 4 and 5 contracts. J. H. Williams, secretary.

BARFORD.—For the erection of hospitals and other buildings in connection with the union. R. B. Spencer, clerk to the Guardians.

For the purchase of old bricks, bats, chalk, oak, &c.—Messrs. M. T. Shaw and Co., 141, Cannon-street.

LEWISHAM.—For the construction of six houses.—W. C. Banks architect. 39a, Gracechurch-street, City.

CLEATON MOOR WATERWORKS.—December 12.—Contract C, for excavating ground, &c. Contract D, for supply of cast iron water pipes, &c. Contract E, for supply of sluice valves, hydrants, &c. Contract F, for the construction of a service reservoir, &c. Contract G, for the supply of about 1,550 yards of earthenware pipe. J. Anderson, clerk to the local board, Cleaton Moor.

ST. GILES, CAMBERWELL.—December 8.—For the purchase, collection, and removal of dust, &c. G. W. Marsden, vestry clerk.

LEICESTER WATERWORKS.—December 8.—For the construction of a large storage reservoir, &c., and for the erection of an engine and boiler house, and other works. J. H. Williams, secretary, Waterworks offices, Bowling Green-street, Leicester.

WOOLWICH.—December 12.—For purchase of 100 tons of steel turnings. T. Howell, director of contracts, Pall-Mall.

PROPERTY SALES.

NOVEMBER 25.

AT THE MART.—By Messrs. Candy and Luckin.—Freehold residence, No. 23, British street, Bow road, let at £26 per annum—sold for £280.

Freehold residence, No. 25, British street, let at £25 4s. per annum—£285.

Freehold residence, No. 29, British street, let at £26 per annum—£290.

Freehold residence, No. 31, British street, let at £26 per annum—£2 5.

Freehold residence, No. 35, British street, let at £26 per annum—£300.

Leasehold house, No. 154, Weedington road, Prince of Wales road, Kentish Town, let at £33 per annum, term 99 years from 1847, at £7 per annum—£235.

Leasehold house, No. 156, Weedington road, let at £33 per annum, term and groundrent similar to above—£240.

Leasehold eight houses, Nos. 1 to 8, Nelson place, New street, City road, with workshops and chapel in the rear, producing £115 8s. per annum, term 21 years from 1866, at £92 per annum—£500.

Leasehold eight houses, Nos. 1 to 8, Garden row, Livre street, City road, producing £111 16s. per annum, term 21 years from 1866, at £56 per annum—£230.

At the Guildhall Coffee-house.—By Messrs. Furber and Price.—Leasehold groundrent of £14 per annum for 18 years, arising from Nos. 157 and 159, Fulham road—£120.

NOVEMBER 26.

At the Mart.—By Mr. A. Booth.—Leasehold residence, No. 34, Thurloe square, term 59 years from 1868, at £8 per annum—£3,200.

By Messrs. Price and Clark.—Leasehold residence and business premises, No. 31, Murray street, New North road, let at £70 per annum, term 99 years from 1843, at £5 2s. per annum—£910.

By Mr. Newbon.—Copyhold house, No. 16, Collingwood street, Mile end road—£162.

Leasehold residence, No. 22, Citizen road, Hornsey road, let at £30 per annum, term 80 years from 1862, at £5 per annum—£255.

At Garraway's.—By Mr. F. I. Sharp.—Leasehold 16 messuages, Nos. 1 to 9, Solomon's row, and Nos. 1 to 7, Solomon's place, Chatham, Kent, producing £157 6s. per annum, term 52 years from 1857, at £11 4s. per annum—£740

Leasehold four cottages, Nos. 3 to 6, Queen street, Camberwell, producing £51 7s. per annum, term 53¼ years from 1823, at £3 annum—£120.

Leasehold three residences, Nos. 34, 35, and 37, Cavendish street, New North road, let at £32 per annum, term 21 years from 1867, at £3 each per annum—£215 and £240 each.

By Mr. Lerew.—Freehold groundrent of £13 per annum, secured on Nos. 1 and 2, Alexandra villas, Palace road, Wood green—£260.

Freehold groundrent of £13 per annum, secured on Nos. 3 and 4, Alexandra villas—£260.

Freehold groundrent of £6 10s. per annum, secured on No. 5, Alexandra villas—£130.

Freehold eight plots of land fronting Palace road, Wood Green—£42 per plot.

Freehold four plots of land fronting Park road, Wood Green—£40 per plot.

NOVEMBER 27.

At the Mart.—By Messrs. Wilkinson and Horne.—Leasehold six houses, Nos. 1 to 6, Hornsey place, West Ferry road, Millwall, Poplar, producing £144 6s. per annum, term 70 years from 1848, at £15 per annum—£750.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Robert Arrow, St. Paul's Cray, builder, December 9, at 11—Philip Fuller, Boughen Croydon, builder, December 10, at 11—Anthony Ellis, Lorrimore street, Walworth, builder, December 9, at 12—George King, New Cross, builder, December 18, at 2—George Alexander Croke Stoddart, Colney Hatch, carpenter, December 9, at 1—David Prentice, Lordship lane, Dulwich, builder, December 17, at 2—Joseph Tapner, Euston road, decorator, December 14, at 1—Joseph Thornton, Plaistow, contractor, December 21, at 1—Joseph Ward, Worthing, builder, December 21, at 12.

TO SURRENDER IN THE COUNTRY.

Joseph Coulson, Bolton, builder, December 9, at 10—Edwin Elton, Derby, builder, December 9, at 12—John Norcliff, Mytholmroyd, stonemason, December 10, at 11—Richard Berry Talbot, Stafford, builder, December 11, at 12—Joseph Hawkford, Aston, near Birmingham, carpenter, December 11, at 10—William Cooper Howes, Norwich, plumber and glazier, December 10, at 11—George Vidler, Battle, plumber and glazier, December 12, at 11

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 14, J. Peters, Bristol, carpenter—December 14, G. Beard, Horton, near Chipping Sodbury, timber dealer—December 14, G. V. Broad, Horfield, Gloucestershire, builder—December 17, H. Thomas, Maesteg, carpenter—December 16, J. Richards, Plumstead common, painter and glazier—December 16, W. J. Baker, Jubilee street, Commercial road, East, painter—December 18, F. Beach, Hornsey road, stonemason—December 18, A. Hinkley, Sittingbourne, brickmaker—January 12, A. Munsey, Acton, architect—January 12, W. Stevens, St. John street, Smithfield, gasfitter—January 20, J. Emson, Wolverhampton, gas engineer—January 12, J. Woolfrey, Taunton, builder—December 16, J. Chesworth, Liverpool, builder—December 16, R. Martin, Liverpool, builder—December 17, W. Baxendale, Manchester, joiner—December 22, H. Halton, Hyde, joiner—December 28, J. Lee, Primrose hill, near Huddersfield, stonemason—December 9, C. J. Webb, Springborne, Hants, painter—January 12, W. H. Rankin, Westminster Chambers, Victoria street, civil engineer.

PARTNERSHIPS DISSOLVED.

Gray and Co., Heaton, Yorkshire, stone merchants—Moulson and Kay, Little Horton, builders—Moore and Co., South Shields, glass manufacturers—Smith and Grace, Thrapstone, engineers—W. and E. Shelbourne, Fore street, Limehouse, contractors and lightermen—Schofield and Son, Oldham, timber merchants.

DIVIDENDS.

December 16, J. Lucas, Oxford street, glass merchant—December 15, W. Meatyard, Mere, Wilts, carpenter—December 10, W. Tyson, Wavertree, joiner—December 19, E. J. Wyles, Brighton, builder.

DECLARATION OF DIVIDENDS.

T. Allen, Great Smith street, Westminster, and Hertford, builder, div. 3s. 4d.—R. and J. W. Worswick, Ipswich, builders, div. 4s. 10d. and 11s. 9d.

SCOTCH SEQUESTRATION.

Thomas Allardice and David Napier, Dundee, builders.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load Drawback, 1s.

Teak	load	£10	10	12 10	Archangel, yellow	£10	10	£13 5
Quebec, red pine		3	10	4 15	St. Petersburg, yel.	10	0	12 0
,, yellow pine		3	0	4 8	Finland	6	5	8 0
St. John N.B. yellow		0	0	0 0	Memel	0	0	0 0
Quebec Oak, white		5	5	6 0	Gothenburg, yellow	8	0	9 10
,, birch		3	15	4 15	,, white	8	0	9 0
,, elm		4	0	4 17	Gefle, yellow	9	0	10 10
Dantzic oak		4	5	5 15	Soderham	9	0	10 10
,, fir		2	10	4 0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	10	10	13 0
Memel fir		2	10	3 0				
Riga		2	15	3 0				
Swedish		2	2	2 8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	19
Masts, Quebec red pine		4	0	6 0				
,, yellow pine		4	10	6 0	Pumice Stone pr ton	6	0	8 0
Lathwood, Dantzic, fm		5	10	6 10	Oils, &c.			
,, St. Petersburg		7	10	8 10	Seal, pale, per tun	35	10	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	95	0	0 0
					Cod	39	0	0 0
					Whale, 8th, Sea, pale	38	0	0 0
Quebec, white spruce		13	0	18 0	Olive, Gallipoli	45	0	65 0
St John, white spruce		13	0	15 0	Cocoanut, Cochin, ton	51	0	0 0
Yellow pine, per reduced C.					Palm, fine	44	10	45 0
					Linseed	28	0	0 0
Canada, 1st quality		16	0	18 0	Rapeseed, Eng. pale	33	10	0 0
2nd do		11	5	12 0	Cottonseed	26	0	33 0

Metals.

LEAD —						
Pig, English	per ton	21	0 0	0	0 0	2½
,, Spanish Soft	do	18	7 6	0	0 0	
Shot, Patent	do	22	0 0	22	5 0	
Sheet	do	20	0 0	0	0 0	
White	do	27	0 0	30	0 0	5
COPPER :—						
Sheet & Sheathing, & Bolt	per ton	78	0 0	80	0 0	3
Hammered Bottoms	do	88	0 0	0	0 0	
Flat Bottoms, not Hammered	do	83	0 0	0	0 0	
Cake and Tough Ingot	do	0	0 0	0	0 0	
Best Selected	do	76	0 0	77	0 0	
Australian	do	76	0 0	0	0 0	
Yel. Metal Sheathing & Rods	per lb	0	0 6½	0	0 7	
IRON :—						
Welsh Bars in London	per ton	6	10 0	6	15 0	3
Nail Rod	do	7	12 6	7	15 0	2½
Hoops	do	8	5 0	9	0 0	
Hoops, Single	do	9	5 0	9	7 0	
Staffordshire Bars	do	7	12 6	7	15 0	
Bar in Wales	do	5	15 0	0	0 0	3
Nailrods	do	7	12 6	7	13 0	2½
Foundry Pigs, at Glasg. No 1	do	2	14 0	2	19 6	nett.
Swedish Bars	do	10	0 0	10	10 0	2½
TIN :						
English Block	per ton	103	0 0	0	0 0	2½
do Bar	do	104	0 0	0	0 0	
do Refined	do	106	0 0	0	0 0	
Banca	do	101	0 0	0	0 0	nett
Straits	do	101	0 0	0	0 0	
ZINC :—						
English Sheet	per ton	25	10 0	26	0 0	2½
*Devaux's V. M. Roofing Zinc	do	27	0 0	0	0 0	
* And 4 per cent. discount if laid upon the new system						
STEEL :—						
Swedish Keg, hammered	per ton	15	0 0	15	10 0	2½
Swedish Faggot	do	0	0 0	0	0 0	
SPELTER :—						
On the Spot	per ton	20	0 0	0	0 0	
QUICKSILVER	per btl	6	17 0	0	0 0	
REGULUS OF ANTIMONY						
French	ton	43	0 0	0	0 0	

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 11, 1868.

AN ESTIMATE OF THE PROGRESS OF DESIGN AND DECORATION.

IN order to understand our position and prospects in design our only safe course is to ascertain what we have already accomplished. The favourite way, however, used to be, and is, to turn back to some epoch of art in Greece, in Italy, or in mediæval Europe, regard what was then done, and recommend our doing the same. As the circumstances, if even known, are not even the same as ours, these comparisons and recommendations are not attended with fruitful results. There is not the least harm in our aims being high, but it is evident, whatever our ambition, we are really limited by our means. Therefore it will be well to make our survey of what has been done rather in our own time and in one generation than in the remote past. In fact, the reign of Victoria will give us enough to do, being a generation and a little more. To a certain extent, although it continues the Georgian era, to which may be annexed the reign of William IV., it constitutes in its development a new epoch. The period of the Regency and George IV. is pretty well marked out—one of brilliancy and beauty, but in architecture not of solidity; in sculpture, unable to compete with Canova and Thorwaldsen; and in painting, holding its own even way without achieving excellence. We can draw a line pretty well between the middle era of George III. and the Georgian era of the Regent. We have the time of Pitt, Fox, Nelson, Herschel, Flaxman, Barry, Southey the poet, Kemble, and their foils, Earl Chatham and that brood which developed into Liverpool, Sidmouth, and Castlereagh. It was a time of noble effort for Classic excellence, one as well typified by Flaxman as anyone else, of whom we have noble designs, lessons to Europe, and few monumental works; or by Barry, who showed how to create great examples in art, though he could not satisfactorily work out his teachings.

We may mark the men of George the Regent, not forgetting the Regent himself, and, though we bring Wellington into the gallery, there is less severity than in the foregoing era, but more markedly that beauty which is shown in their portraiture by their true painter, Lawrence,—Wellington (the statesman rather than the warrior), Canning, Mr. Brougham, Byron, Scott, Moore, Shelley, Jeremy Bentham, Davy, Wilkie, Haydn, Martin, Turner, Chauntry, Kean; and its architects were Nash and Smirke. We have given many great names, but we believe their architecture has its connection with the moral aspect of the era, when the period was one of political agitation and of political projection, leaving the realisation for the future, and when Nash conformed to the instinct of the day for beauty but wrought out in compo. It was an age less, perhaps, of sham, as it has been reproached, than of inadequate resources. The whole country was cramped by the exhaustion and exactions of the Great War, the evils of which long continued to affect society, as its legislation with regard to window and brick duties, excises on paperhangings, and taxes on glass, affected the architect and his employer at every turn. The enterprise of the country was not emancipated and restored to the freedom it possessed before the great revolutionary war, and, although there were bold spirits and bold individual attempts, there was a want of general and collective power. The progress of particular branches of industry is apt to blind us to the conditions affecting the mass. To go down to the working classes it was a time of dear bread, dear groceries, dear candles, and the earnings of some of the new trades of engine-wrights and gasfitters only relieved the misery of some portion of the ranks. This was, after all the real picture of society, though there were men making colossal fortunes in the application of some of the new inventions. There was a want of vigour, consequently, in the body politic which reacted on art. There was no money in the exchequer for art; jobbery had too material interests. Jobbery lent itself by its own instinct to the reconstruction of Windsor Castle and Buckingham Palace for its chief patron, to the building of York or Sutherland House for a satrap; but as the funds were provided by jobs, so were the supplies cramped.

These are moral aspects but little regarded by the critics on art, and we think it worth our while to refer to them, and in so doing notice an apparent anomaly and exception. During the Great War, which in its main effects continuously exhausted and oppressed the country, there was great vigour in the manifestations of the public mind in literature, in art, and in the drama, as much as on the ocean or the battlefield; but then it was because the public mind was aroused and the public vigour put forth, though to the exhaustion of resources. There was a great general activity during the war, partly stimulated by the excitement of war, partly by successful commercial adventures connected with our supremacy on the ocean and monopoly of many branches of produce. We dwell upon these considerations because they appear, to some extent, to illustrate what has taken place under the Victorian era, when bold political reforms have enabled the fiscal fetters to be stricken off, and when the cheap bread of the people—notwithstanding any passing discontent—has been the safeguard against Luddite manifestations, and there has been made possible a financial extravagance in the State which has its parallel in the licentious luxury of the wealthier classes.

While drawing attention to these circumstances as affecting art, they must be understood in their relation to its material manifestations more than to its intellectual inspirations. The intellectual development of art is not solely or even mainly dependent on riches or the well-being of the commonwealth, though these latter conditions do favour the development of mental vigour. The production of genius, however, is not statistical; it is not a matter of averages, nor does it issue in any constant crop or fair series of harvests. Under the most favourable auspices it has its long periods of dulness and darkness, as well as long periods of brightness and brilliancy. Without resorting to literary history for examples, we may refer to that of the drama, because it is simpler and affected by fewer disturbing causes; indeed, from the commencement of the Elizabethan stage until now, in a period of three hundred years there has only been one violent action, that of the restriction during the time of the Commonwealth, but which was not long enough to destroy the traditions of the stage. We can, however, easily mark out several distinct epochs, marked by their several stars. This, however, is to be noted, that the inspiring and representative orders have not always been equally represented at the same conjuncture. Shakspeare and his brethren found actors to represent their plays, as did in France, Corneille, Racine, Moliere; but neither Kemble nor Kean had dramatists of their time equal to their effects. The consequence was they were thrown back for their chief triumphs on the Classic drama, but Burbage and his fellows worked with the living author, nay, for that matter played side by side with Shakspeare. Byron and Scott were willing to write for the stage, but could not supply Kean.

When the period for the revival of the drama comes we may rather hope for actors than dramatists. There is this to be observed in the comparison of the dramatic history of England and France, since the creation of a drama in the latter, that the schools of actors have been conformable in their brilliancy and their dulness: Garrick and Le Kain were contemporaries, Kemble, Kean, and Talma; and also that the school of comedy is better preserved in a period of decline than that of tragedy. In pictorial art we see likewise that in a time of dulness it is historical art that suffers, while genre and the naturalistic schools can be fairly preserved.

Bringing these experiences to bear on our progress in design, decoration, and architecture we can during the Victorian era witness a noticeable progress in the general well-being and national riches, in culture, and in material, but we are in no situation to determine what our future will be in what is really and truly architecture. It is questionable whether we have sufficient material to guide our criticisms in ascertaining what is the real influence of the contemporary and living mind on art. In the case of the drama it appears that when the actor has not the stimulus of the living dramatist in England and France, he is driven back on the study of the old or classic drama, which must be more imitative than inspirative. Not that Garrick did not create characters, but they were those from the inferior dramatists of the time, and his genius had not been able to give vitality to those delineations and to transmit them to our times. Most of the dramas of Garrick's days are dead to the stage. There must be something in the relation between architecture and the living popular mind. At the only time when architecture had a spontaneous vitality and development in this country, in the middle ages, there must have been a general harmony of sentiment in the cultured mind, and under such influence the Pointed styles continued their living career. When the Reformation came, the monasteries were shut up, and the schools of architecture and art were closed; so, too, was living architecture. The Elizabethan style was no development, but a decline, going through Jacobean, until at length there was a decided reflux under Inigo Jones, followed by Wren, to what was supposed to be Classic. This course has been followed to our own days, falling back upon the past, becoming more and more Athenian and Ionic, tightened in our leading strings. So far as what are called the Classic styles this is being relaxed for Italian, but the noteworthy feature undoubtedly is the falling back on what are called the national mediæval styles. We may, perhaps, trace the true beginning of this, not to Walpole, whose aspirations were distinctly Gothic, but to the later Georgian era, which gave a great expansion to Elizabethan, and this has been the true lead to Early English and the real styles of mediæval date. Now where is this to lead us? how far can we rule the career of art in the course of the human mind? or how far is the growth of the mind itself to lord it over the direction of art? This is all dim and obscure, and all that we can recognise is, as we have said, a great progress during the Victorian era in the materials for art, in workmanship, in the size, number, and variety of buildings, in the number of trained architects and skilled craftsmen; but the Victorian style we have not seen, nor do we know its semblance.

COLOURING SHOW DRAWINGS.—II.

WHEN the shading of the darker side of the surface is completed, the board should be turned round, and a very light tint of shading laid on at the extreme edge of the opposite side, thus making the lightest tint (or, rather, the uncoloured paper) to show, as already stated, at a position about midway between the centre and one side. In adopting this method of shading care must be taken that each coat is perfectly dry before its successor is laid on. The second mode, as applicable to small surfaces, consists in using the brush

as though it were a lead pencil. A thin wash is first laid on, as in the former method. When this is quite dry the artist takes a sable brush, goose-quill size and with a very fine point, and charges it with a very small quantity of rather strong tint by soaking it well in the colour, the greater part of which is then dried up with blotting paper. The artist proceeds to shade the object by line-touching it over again and again with the point of this brush. At first this will make the surface look rough and irregular in tint, and in going over it subsequently care must be taken to touch the parts missed at first. Thus the process must be continued, the work being gradually contrasted until the darkest line appears at its proper place on the surface. This is a very tedious process, but it has a beautiful effect when well done. The best general tint for shading is a mixture of Indian ink and Paine's grey, in the proportion of about three of the former to one of the latter. A very minute addition of carmine is sometimes advantageous, serving to warm the tint slightly.

Flat tints are sometimes very difficult, and cause much trouble, especially where the surface is much broken up and divided by other features in the picture, as, for example, in the front of a building which it is desired to colour of one uniform tint, but which is broken up by doors and windows. In such cases, before the wash is commenced, the artist must consider the picture attentively with a view of ascertaining (so to speak) the best route to follow with his brush. He should select that which is longest and narrowest, taking care to work on the length, as that will give him most command of his colour; unless, indeed, he finds this plan may break up his wash into too many parts, it being his first object to select such a line as will reduce these to the smallest number. If, too, he has to work round another object, whereby he will have to rejoin his starting point, he must search for a point where the joint will be as narrow as possible, and having commenced his work, to soften off the line he leaves at the outset, and working round to it again, to also soften off the finishing edge, and so "splice" the last tint over the first, which, if skilfully done, will leave no trace of joint whatever.

In preparing the colour for a flat, or, indeed, for any tint, care must be taken to provide an ample quantity at once, as it would prove ruinous to the appearance of the picture if when the surface was half completed the artist found it necessary to suspend his operations in order to grind more colour—ruinous because he would have a useless joint in the work, and also because, even with the utmost care, he would scarcely succeed in making his last tint precisely like the first, especially if it was a compound one.

In putting on flat tints in different planes adjacent to each other, and of uniform material, the tints should be slightly altered, both in colour and strength, in order to secure variety of appearance. This system may be worked out very successfully by using a particular tint in a variety of strengths for the different parts of a single casting; as, for example, in an ornamental piece of metal work having various flat fillets on it, the uniformity of colour would denote it to be one solid mass, while the variety of tints would impart a distinction of feature. In cases where the planes are features of separate details different colours must be used for each detail, each colour being treated according to the system described for one mass having variety of surface. This helps to convey the idea of a distinction of parts. There need be no difficulty in pursuing this system, because the skilful artist can always prepare a variety of tints of the same generic colour. For example, for cast iron a great number of colours can be mixed, all of the proper tint, but each having a very distinctive appearance. Paine's grey alone is excellent for cast iron; the addition of a little Indian ink alters its appearance, but preserves its character. Prussian blue and Indian ink in various proportions are also useful for the same purpose, as are numerous other combinations.

We cannot within the limits of an article like the present describe all the various expedients open to the artist to work up certain effects. We can only point out to him the direction; he must explore the road himself. For large washes of a tint to show wrought-iron work Prussian blue is an excellent colour; it must, however, be used very thin, as it is a difficult colour to "flat" well. Great care must be exercised in grinding it, as it is one of the most powerful and telling colours an artist can use, and the least trace in water will make a very strong tint indeed. The same property obtains when it is mixed with a different colour, which it will completely kill unless added in the most minute proportion. Cobalt is an excellent blue, and used alone makes a good tint for steel, while the addition of a little Paine's grey makes a very good wrought-iron tint; it "flats" beautifully. An excellent tint for yellow brickwork may be made from a combination of cadmium and raw umber, while for red bricks a mixture of carmine and burnt sienna answers well. Capital tints for woodwork can be had from combinations of Indian yellow, bistre, or raw ochre, and a trace of burnt sienna. Stone tints can be had from permanent or Chinese white, Indian ink, and the addition of a little red or yellow toneing tint. In "graining" woodwork it is best to execute the "graining" first, and then to wash on a "flat" of the same or a paler tint over all, the wash softening down the "graining" lines. When a number of planes come successively one within another at different distances from the eye, the one farthest off should be coloured first, each successive one being made a little paler than its predecessor, so that the one nearest the spectator is lightest of all, the darker ones behind thus serving to throw it forwards. The judicious use of shadow lines helps the general effect very much, but they should not be used to such an extent as in a plain line drawing, because they are sometimes apt to make a drawing look heavy. There are many points of this kind, on which the artist must exercise his own judgment, and his success will depend on his innate taste and industry. When the picture is completed the artist should look it over carefully for any omissions, and to ascertain if it needs any little touches to improve its appearance. It may be finally cleaned down with bread in the usual manner.

THE *ATHENÆUM*, CUT GLASS, AND PURITY IN ART.

THE *Athenæum*, in devoting an article lately to Mr. C. L. Eastlake's "Hints on Household Taste in Furniture, Upholstery, and other Details,"* has given us an authoritative dissertation on taste in matters of art. As this will receive some attention it is desirable to advert to its doctrines, which are not simply based on those of Mr. Eastlake, but which are those of the writer himself, and is in continuation of his observations on the furniture of the Great Exhibition of 1862. He laments, naturally, not only the want of common taste, but of common sense, in the tradesmen engaged in the supply of all kinds of furniture. Upon the details of this well-grounded complaint we will not dwell. We concur with him as to the very limited results obtained from the expenditure of hundreds of thousands of pounds on thousands of pupils for art education. On entering upon particulars of want of taste his chief grievance seems strangely enough to be cut glass. Cut glass, whether in the shape of table glass and its cognates, or of chandeliers or gaseliers, he looks upon as an abomination. He calls it eye-torturing cut glass, the results of wasted labour, and a material made to belie itself. He considers it too base even for the theatre, and is barely satisfied with its being relegated to the gin palace. His objections to it are manifold, and though not set out in array, we can discern them. One is that cut glass gives forth "prismatic hues," and we suppose in that respect is eye-torturing. Another is, as we have just intimated, that cut glass is a sham, and a material made to belie itself. In what respect this can be it is very hard to make out. It is an unfortunate optical property of cut glass and prisms to give forth these "prismatic hues," a *lèse majesté* against the purity of white light, of which nature has had the audacity to set the example, and by which science has profited. We make out, too, there must be some moral unfitness in cut glass which disqualifies it for genteel company—by implication, churches and fashionable dinner parties; which renders it questionable in immoral resorts—as theatres, dancing rooms, and music halls; and which places it beyond question in localities where it cannot offend morality, religion, refined taste, or silver forks, namely, in gin palaces.

One shape of the abomination is in dinner services and the like, but we conceive that this can scarcely be the capital offence, though amounting to a very severe form of eye-torturing. A cut glass decanter on a dinner table must certainly bear with it its own condemnation, that of the wine it contains, and that of the Amphitrion or rather hostess who can offend friends and art critics by such a disgusting exhibition. In its way it must be almost as bad as eating fish with a knife when forks are in fashion, if not worse; or eating fish with a fork when knives and forks are in fashion and not using the knife. The capital offence may be committed at night or in summer time, when the shutters are closed by the above-named criminal, in lighting gas or wax tapers in a cut-glass chandelier or gaselier. This results in eye-torturing by bringing out prismatic hues, and would, we should fancy, cause an accomplished art critic at once to absquatulate, or pass some severer censure. We believe, but may be unjust to the writer in suggesting it, that one great reason against cut glass gaseliers is that they were not used by the Athenians in the purity of their art when they erected the Parthenon, nor even by the architects of the Middle Ages.

A part of the affliction of the writer in the *Athenæum* is due to his hearing and reading the outpourings of admiration of self-styled art critics, or, as he dubs them, amateur art critics, at the cut glass in the Paris Exhibition. "Flashy," says he, "as the prisms they desired, and ignorant of the common taste, some of our easy-going guides rose to ecstasy about the exploded mode of using double and homogeneous glass, as if it had been angular, intractable, and glittering crystal." The public will learn from this what constitutes an amateur critic, and what constitutes a professional critic. There is, however, some cream of comfort for the latter, that the public taste is declaring against cut glass, though he rationally doubts whether this is due to any improvement in the public taste, or only to some change of whim. He thinks it is only true critics and men of taste who have given in their adhesion to plain glass against cut glass. However, he avails himself of the relief such as it is, and he particularly congratulates himself on the partial discomfiture of a terrible bugbear, the costly gaselier at the Haymarket. "That gorgeous fountain of prismatic hues and wonder of the Regency, every tint of which tortured the educated eye, has been hoisted up higher than ever in the roof"—as we strongly suspect by the influence of the art critic of the *Athenæum*—and he further threatens that "its next move will surely be out of sight to the limbo of great gewgaws, wherever that may be." His denunciations of its fate do not end with this. "This magnificent offence may, let us hope, glorify,

* Reviewed by us at page 811.

in years to come, the biggest hut of some Gold Coast potentate, or 'drop' by 'drop' flash from the nostrils or the earlobes of a thousand of fair Polynesians."

It is rather dangerous after such denunciations to speak of cut glass; but, although cut glass is guilty of prismatic hues, we very respectfully suggest, for the opinion of the tribunal, that there are other eye-torturing criminals, encouraged by the high, vulgar, and the low, as yet unconvicted. Waterfalls and cascades are sinful in prismatic hues, and Niagara is a monstrous offender. Fountains are artificial, and, we suppose, sham exponents of the same vices. The rainbow is a culprit, and there are waterfalls and fountains notoriously addicted to the display of rainbows. This constitutes a double offence. We can almost let off a deplorable seducer of the innocent and ignorant—the fountain with the rainbow—which the French have persisted in upholding. Whether rainbows and waterfalls can be put down is uncertain in the present state of our jurisdiction. But fountains can; the water they misapply can be cut off, and a special act of legislature will abolish the great mistake of fountain days at the Crystal Palace.

Stained glass, which mediævalists admire and seek to extend, comes under each head of the indictment, and poets have been capable of admiring the prismatic images cast on the marble pavements of cathedrals. The Puritans, in suppressing such abominations, were purer critics in art than they have had credit for.

As to the future of art, we look upon it that waterfalls, cut glass decanters, rainbows, chandeliers, gaseliers, fountains, and stained windows may be looked upon as virtually abolished.

ARCHITECTURAL ALLIANCE.

REPORT OF THE DELEGATES FROM THE ARCHITECTURAL ASSOCIATION ON ARCHITECTURAL EDUCATION.*

HEAD II.—THE BEST SYSTEM OF ARCHITECTURAL EDUCATION TO BE EMPLOYED IN ENGLAND.†

IN the scheme of architectural education which we now set forth *as suggestive only* of what might be done, it must be remembered that we are far from being able to realise its establishment at present. It may take twenty, thirty, or forty years to bring it into existence. [*At all events there is no reason why we should not at once lay down a programme of the most complete scheme in order to form an ideal towards the formation of which we must continually exert ourselves.*] That some day such a system will be rendered necessary as is now just starting in America under the auspices of Professor Ware, and as that which has flourished for the last century in France and Germany, will, we think, be patent to all. Special architectural schools must be formed in various parts of the metropolis, and in all the principal towns situated in the centre of the habitable portions of the country, all being indirectly under the supervision of a central university, in which would be invested the power of holding examinations and granting degrees, and the offering of various honorary prizes for competition. The universities would be supported by government and by endowments, as other universities, the direction, however, resting entirely with the profession; and it is probable, at first, that governmental aid would have to be given to the school [*but they should eventually be self-supporting, and we firmly believe that the large sums spent annually in premiums would be of themselves sufficient to pay the expenses of any schools.*] The course of study should be for three years, and a slight examination in classics, mathematics, history, and drawing would precede the admission of any student. Examinations also in the scientific subjects taught would be established, to test, from time to time, the knowledge of students, and to give them a point to work up to.

* Concluded from page 824.

† Mr. J. Douglass Mathews signs the report, reserving his opinion, however, as to the whole subject-matter of this head, and the report is signed by Mr. Rickman with reserve as to those passages included within brackets ([]) and asterisks (*) under this head and under Head IV.

COURSES OF STUDY.

First year.—Freehand drawing from the round and from the antique; geometrical and architectural drawing and shading; the theory of the elementary part of mathematics, including descriptive geometry; elementary mechanics; elements of design, plans, sections, and elevation; elements of construction, framing of trusses in roofs, &c.; history of architecture.

Second year.—Drawing from the antique and the life; perspective; applied mathematics; descriptive geometry applied to stone building; carpentry; mechanics and physics; geology; design and construction; surveying; history of architecture.

Third year.—Design and construction; specifications; supply of water; ventilation; acoustics; principles of estimating; the strength of materials; architectural jurisprudence; surveying and leveling; practical geology; materials.

Throughout the whole course, the student would have to produce at intervals of a fortnight or a month, a sketch design—in the first year copied more or less from existing examples, and in the second and third years (in addition), every two or three months, a composition (plan, section, elevation, and perspective)—of some building, which would all be submitted at the central university, so that the several schools in London and the provinces would be brought into competition or for medals and prizes. At the end of the third year, if the student passed a fair examination, he would be required to pass two whole years in the office of some architect, working out practically what, more or less theoretically, he had acquired in the school. A portion of this two years might well be spent as assistant clerk of works to some building on the drawings for which he had previously been working. At the end of the two years he would be expected to pass a final examination, which would qualify him for architectural practice, though a strong recommendation would be held out (and here travelling studentships would come into use) to spend six months or more in travelling. In the school nine months only in the year would be occupied by lectures and other courses, and during one month at least of the three months' vacation, the student would be expected to draw and measure old work, and submit the same to the universities, where prizes for the best series would be offered.

HEAD III.—THE OPPORTUNITIES WHICH ACTUALLY EXIST FOR EXTENDING THE SPHERE OF ARCHITECTURAL EDUCATION.

The facilities for architectural education now afforded in London are:—

King's College.—The courses of lectures in the Applied Science Department, intended for civil and mechanical engineers, but which in many cases have been followed by architects. The main course extends over two years, and comprises mathematics and descriptive geometry; chemistry, physics, and mechanics; machinery and manufacturing art; mineralogy and geology; surveying and levelling; architectural and freehand drawing; the workshop; and, lastly, Professor Kerr's lectures on "The Arts of Construction." Evening courses (6—8), mechanics, mathematics, and drawing.

University College.—Mathematics, descriptive geometry, physics, mechanics, chemistry, mineralogy and geology, engineering, surveying, and levelling, mechanical and freehand drawing, and architecture and construction, by Professor Hayter Lewis (this latter an evening class). There are also evening classes here in mineralogy, geology, engineering, mechanics and physics, mathematics, descriptive geometry, and projection of shadows. The schools at

South Kensington are more especially intended for the instruction of art teachers who have to obtain certificates qualifying them to superintend the various art schools disseminated throughout the country. Any instruction, therefore, obtained there can only be partial as far as architecture goes. There are, however, ample opportunities for beginners, to wit:—Classes for freehand drawing and drawing from the antique and the life; class of elementary architectural drawing, of descriptive geometry and the projection of shadows. In the museum is a collection of architectural casts, models of roofs of buildings, and architectural drawings; and there is a most valuable art library, open to the student at all hours. In the evening all the drawing classes are open. In connection with South Kensington are various art schools in London and the provinces, where freehand and other drawing can be learnt, both in the day time and in the evening. There are also private schools, as Heatherly's, in Newman-street, &c. At

The Royal School of Mines, Jermyn street, there are lectures on physics and geology which can be attended by occasional students on certain conditions, and courses of instruction in mechanical drawing and descriptive geometry. In the evening at certain times in the year are courses of eight lectures on physics and eight on chemistry; intended for those in training at South Kensington as art teachers. These can be attended by students for 5s. each course.

The Royal Academy demands a test of efficiency from all before admittance there as students; the test being a design for some building to be made in twelve days in the academy. They give a course of forty lectures in perspective and scenography or the projection of shadows; and four lectures in each of the following subjects—Architecture, painting, sculpture, and anatomy. They offer for competition among the students—A silver medal for perspective drawing and scenography, a silver medal for a measured drawing of some existing building; a gold medal for an architectural design; and a travelling studentship for one year of £100, for a design executed in one month in the academy. There is also a library open at certain hours, and a valuable collection of casts.

The Royal Institute of British Architects offers this year:—A silver medal for an essay; a special prize of £10 for an essay "On the Application of Moulded and Shaped Bricks to Architectural Purposes;" the Soane medallion and £50 (under certain conditions); a prize of £10 10s. for a design for a Gothic theatre; a prize of £12 for an Italian design; a silver medal for measured drawings; two student's prizes—one for designs, the other for drawings of ornamental details; and the Pugin travelling studentship, value about £100. They hold a voluntary architectural examination on those subjects with which every architect must be conversant. They have a most valuable library, open to fellows, associates, students, and to those who are preparing for examination gratuitously; and lectures are given or papers read on various subjects connected with the profession.

The Architectural Association offers this year two prizes in the Class of Design; one in the Class of Construction and Practice; one for an essay; one in the Figure Drawing Class; a prize of £5 for an architectural design; two prizes for measured drawings; a prize for designs for cottage stoves; and a prize (offered by the Sketch Book Committee) of £5, for a title-page; and they publish a valuable and useful sketchbook. There are open to all members:—Classes for design; construction; figure drawing, landscape drawing and colouring; a circulating library, rich in quality if not in quantity; and at ordinary meetings a series of interesting papers connected with the profession.

The Architectural Museum, the new premises of which are now nearly complete, possesses a most valuable collection of mediæval casts in a large room for students, where they can be drawn. The library of

The British Museum, unfortunately open only in the daytime, is easily accessible, and contains every publication known. At

The Crystal Palace there is an extremely valuable collection of casts which might be studied and drawn from to great advantage by those living in the vicinity.

HEAD IV.—MODIFICATIONS AND ADDITIONS TO THE CLASSES, ETC., SET FORTH UNDER HEAD III, AND SUGGESTIONS FOR PROVISIONAL SCHEME.*

Before entering into the question of how far the institutions referred to under Head III. could be modified or added to, it will be advisable to suggest a method by which they can at the present moment be utilised to a greater or less degree. To do this we must class our suggestions into three divisions—Firstly, for those who are not yet articled; secondly, for those who are at present articled or are in any office as improvers; and thirdly, for those who have passed through their articles and are now paid clerks. For the first class in the absence of the central University or school suggested under Head II., as it is more or less necessary that the student should have the advice of some architect as to the exact course of study he should pursue, it would be well if he were articled under these two conditions:—

* Mr. J. Douglass Mathews reserves his opinions as to Head IV., with the exception of that portion enclosed within brackets ([]) and daggers (†), with which passage he thoroughly agrees

Firstly, that it should be for five years; secondly, that in the first two years he should follow out a complete course of instruction at King's or University colleges [*(in the daytime of course), and that his spare time should be spent either in the office of the principal or in some room specially provided for that purpose. In large offices where the number of pupils is considerable (say above 5) and the premium £150 or more, it seems to us that it would be but right that, if the principal had no time himself, he should have a regularly paid instructor, who should superintend the pupils and give them advice. In smaller offices this advice must necessarily come from the principal. But there is this great and important principle to be laid down, "That when a pupil enters an office and pays a premium he has a right to be taught, and it is a grave injustice towards the pupil and his parents to make him do nothing but the work of paid clerks under the pretence that he is learning by it;" in other words, the architect has no right to look upon premiums as a quiet sinecure in consequence of his position, and for which no return on his part is required, except the permission to work on his drawings.*] At the end of the second year the pupil would be able to enter into the regular routine of office work with advantage to himself and to his principal. Even then his individuality should not be lost sight of, but on one or two days in the week he should be allowed to work on his own designs and drawings, which might be destined for the competition prizes of the Academy, the Institute, or the Association. It would be of immense advantage also if, in the last year, he could be sent for three months or more out on some building as assistant clerk of works, because he could there carry on the same work as in the office, and be able to see it all actually carried out. In the last year of his articleship also he should turn his attention (and here evening work will perhaps be necessary) to the subjects asked for in the Voluntary Examination, and this test of ability should follow at the close of his articleship, and according as he had made good use of his time he would be able to go in for proficiency or distinction. A short tour of at least six months should then be made in England or on the continent, and we cannot insist too much on this very important feature of an architect's education—one in which there is a great falling-off at the present day, although the facilities for travelling have been so much increased. [*In no case ought a vacation of less than six weeks to be given,*] and it should be a *sine qua non* that a large part of all vacations should be spent in the delineation of ancient buildings to be submitted to the principal on the return of the pupil to the office. In the second division, those who are already articled, or who are improvers, are to a certain extent already tied down to perform certain duties in the office. We can only, therefore, recommend that they should try and obtain two mornings a week to be occupied in drawing at South Kensington, in one of the local schools, or in the Architectural Museum (when open), and that their evenings, and as much more time as they can obtain in the daytime, should be devoted (1) to the preparation of designs for the Class of Design here or other competitions in the architectural societies; (2) the measuring and drawing, during the summer months, of such ancient buildings as are in or near London, and in the winter measuring and drawing in the Museum at South Kensington or in the British Museum; and (3) attendance at lectures at King's and University Colleges in physics and mechanics, and, more especially, those on architecture and construction by Professor Hayter Lewis, and on arts of construction by Professor Kerr, and those at the Jermyn-street Museum on physics and chemistry. [† For these and all other students it is a point of great importance to test their knowledge at certain intervals, and we believe that the establishment of examinations on various subjects from time to time here in the Association would prove to be of great value, the whole to tend towards the eventual passing of the voluntary architectural examination. The suggestion offered in the first division about going out of the office as assistant clerk of works applies equally here. Above all, we cannot impress too strongly upon all students the importance of reading good professional books continually. The man who, dictionary in hand, goes carefully through the article on "Construction" in "Viollet le Duc," will learn more and will get more good principles in his head than all the lectures in the world can ever teach or give him.†] The third division, paid clerks, we may assume, have only their evenings wherein they can practice any additional architectural studies. The evening classes at King's and University colleges, and at the Jermyn-street Museum, offer instruction in physics and mathematics; the Kensington schools and local schools in drawing from models, and from the antique and life; and our Association in design, in practical construction, and in various subjects akin to architectural study.

We have now to consider as briefly as possible wherein all the institutions named could be modified or added to for the improvement of architectural education.

At University College a great scheme is in course of preparation originated by and under the auspices of (as far as our profession is concerned) Professor Hayter Lewis. We are not prepared to give yet any idea of its development, beyond that it aims at the establishment of an art university which, coupled with the science training already given, will make the course of instruction there more or less complete.

At King's College within the last four years, freehand and architectural drawing has been taught in addition to other subjects. As yet 2 out of 60 only of the students of the applied science department became architects; a greater supply of them would of course tend more to the encouragement of the two subjects named above. The course of lectures on machinery and manufacturing art could be replaced by a course of lectures on the history of architecture. Levelling might be taught with surveying in the second year, and, in "the workshop," more especial attention given to the construction of roofs, scarfing of timbers, carpenter's work, and joinery. An evening course of Professor Kerr's lectures on construction might also be given.

At South Kensington a special room might be found for an architectural studio, where architectural drawing and shading might be varied by measuring and drawing the many architectural casts of doorways, pulpits, and the building models, etc., copying the numerous architectural drawings there, and also in working out designs.

The choice between South Kensington, King's and and University Colleges, must depend somewhat on the talents of the pupil. If he has been instructed in science and mathematics, let him go to South Kensington; if he can draw well, let him go to one of the colleges; if neither, and his health or disposition puts evening work out of the question, he had better go to both in succession.

In the Royal Academy, as yet, architectural students are not encouraged to enter into the antique school, because, being necessarily very much wanting in that power of drawing and shading possessed by painters and sculptors, they would tend to lower the standard of excellence. But in its new premises the Academy might (and we have good authority for believing that they will) set apart a special room for architects in which the finest collection of Renaissance ornament casts in London could be placed, and where architectural pupils might learn architectural drawing and drawing from the antique. The silver medal for measured drawing should be given not only for Renaissance, but for Gothic subjects, and there is no reason why portions of Westminster Abbey should not be asked for in the programme as well as St. Paul's and other Renaissance buildings. The gold medal might in the case of those students who, living in the provinces, cannot follow the evening course of lectures (which extends over four months) be thrown open to them without the necessary attendance at lectures on condition of their passing an examination in perspective. The travelling studentship of £100 is not sufficiently competed for, the probable reasons being (1) that it would cost more than £100 to travel for one year (and its possessor would therefore be much out of pocket), and (2) because the winter is exceedingly unfavourable for outdoor drawing, even in the sunny south of Italy. Now, from the 1st of March to the 1st of December (9 months) would give the student ample opportunities of profiting by his travels, the expenses of which would, with economy, be covered by the above sum. On the return of the student his drawings should be exhibited publicly to the other students, to show the advantages he has derived and to excite an interest in them to do the like. A silver medal for drawings from the antique, open only to architectural students, might well be accorded.

The Royal Institute of British Architects, it must be remembered, derives its income from voluntary sources only. It has, therefore, not the means of establishing any great scheme of architectural education; but there is a very great deal it might do if it would only take up the question in a truly liberal spirit. In the first place, it might give its support to the opinions expressed in this report. Secondly, as its rooms are used only once a fortnight, it might establish courses of lectures on the various subjects set forth in its examination scheme, the fees of which should be paid half by the Institute and half by the student [*or, if articled, by his principal*]. To those students attending these courses the library should be thrown open, books pointed out to them, and small examinations at fixed time should be passed. The subjects of these lectures in some cases might be elementary, in other cases on the more practical points of the profession. Thirdly, the Institute might secure the exhibition room at Conduit street and found in it an architectural studio, under the supervision of visitors, as at the Academy, and as in the schools at Paris, Vienna, and elsewhere.

The Architectural Association, having just taken additional rooms at Conduit-street, has the power of adding still more to the advantages which it now offers. Firstly, in forming a junior class of design, in which the students should be advised to copy old and good architectural forms rather than originate bad ones; in which small subjects should be given to be worked out with details in the Early English, Decorated, Perpendicular, or French styles; and, for the Classic student, adaptations of the orders of Vitruvius, Palladio, Serlio, and others; books being pointed out to the members, as also where they could best obtain their information; and direct but intelligent copying should be specially asked for. Secondly, on another evening of the week the economy of construction might be gone into, and a complete design for a small house, church, or school worked out, with specification, details, &c. Thirdly, on another evening short papers on various subjects connected with the profession (such as ventilation, acoustics, geology, building materials, &c.), might be read, all students taking notes. Fourthly, drawing from copies and casts, of ornament, and architectural drawing might be carried on during other evenings in the week. The Association might also procure drawings of ornament and architectural drawings to be lent out to copy on similar conditions as the books in the library.

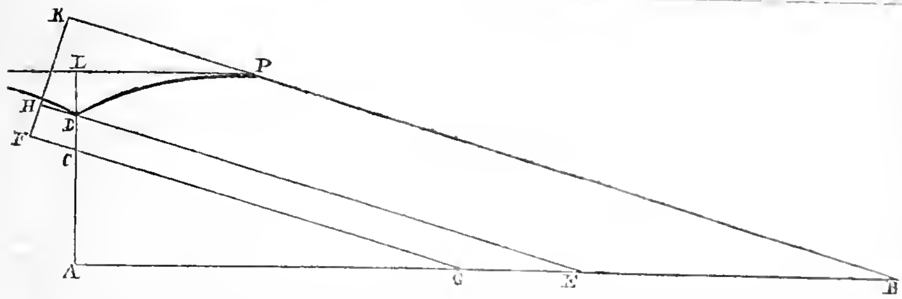
The Architectural Museum in Westminster will shortly be open, and there will be rooms for students in which the composition of ornament might be taught in conjunction with drawing old work; the larger casts also of sedilia, doorways, &c, might be carefully measured and drawn to scale.

In conclusion, we have to apologise for the length of the report—a length necessitated by the numerous considerations which so wide a subject demands; and we believe that we have adopted the best course by first laying down, with all their advantages and disadvantages, the courses of instruction which exist here and abroad at the present day, and on these (as our basis) suggesting the establishment of a scheme which will be beneficial alike to architect and pupil.

T. ROGER SMITH.
R. PHENE SPIERS.
THOS. M. RICKMAN.
J. DOUGLASS MATHEWS.
} Delegates from the Arch. Assoc.

SOUNDING BOARDS.

THE Rev. S. S. Greatheed, of Corringham Rectory, Essex, has sent a letter on this subject to the *Ecclesiologist*. He says: Let us consider what conditions a sounding-board should fulfil. First, it ought to intercept those portions of the waves of sound which would otherwise ascend to the roof of the church, and, when reflected thence, produce a resonance that would make the preacher less audible, in consequence of the path of the reflected wave being much longer than that of the direct wave. Secondly, the part of the wave intercepted from passing to the roof ought to be reflected in a direction where it will be of use—namely, towards the more distant portions of the congregation. Lastly, the sounding-board should be impartial in its distribution of the sound, and not send it all in one direction. Now, the flat sounding-board fulfils the first condition, but not the second. The Blackburn parabolic sounding-board fulfils the first and second conditions, but not the third. I am confident, however, that



sounding-boards might easily be made in a form that will satisfy all the conditions; and the accompanying plan will enable architects and others to judge whether this form is not also the most elegant that has been yet proposed. It is generated by the revolution of a parabolic arc round a vertical axis passing through its focus, and inclined at an angle rather greater than 90 deg. to the geometrical axis of the curve. Since, however, an exact solid of revolution would not be easy to construct on the required scale, I recommend making the horizontal sections octagonal instead of circles. This will both render the construction easier and improve the appearance of the thing: for it will then be similar to a pendent from a vaulted roof. The sharp point, which might seem to threaten the head of the preacher, had better be cut off, and replaced by an ornamental boss, as the loss of a few inches of reflecting surface in this part of the board is of no consequence.

I proceed to show how working drawings of a sounding-board of this kind can be made out. A B is a horizontal line about 4ft. from the floor of the church, drawn in the direction in which the preacher is to face, representing the average level of the ears of the congregation; C a point a little in front of the mouth of the preacher; D about 18in. above C. Determine the point E in A B, where the effect of the sounding-board begins to be wanted; join D E, and through C draw F C G parallel to D E; produce E D to H, and make D H equal to C D: draw H F perpendicular to F G, and produce F H: through K, a point taken in this line, draw K P parallel to C G: then, if C P and K P are equal, P is a point in a parabola whose focus is C, and axis is C G. Let us suppose B to be the furthest point to which the preacher's voice, aided by the sounding-board, can reach In some cases this may fall short of the western wall of the church; but whether it does so or not can only be determined by experience. Then, if K P produced meets the horizontal line in B, P is the limit to which the sounding-board need extend. The other points in the curve, between D and P, will be determined by making the distance from C equal to the perpendicular distance from F K. If P L be a horizontal line meeting A D produced in L, P L will be the semidiameter of the sounding-board.

The figure has been drawn with regard to distinctness, rather than to the proportions which are likely to occur in practice, and, therefore, the sounding-board seems very broad. Supposing the octagonal form to be chosen, it will be convenient to determine the shape of the ribs first. Each rib will be a parabola, which may be determined by increasing L P and all similar lines in the proportion of the radius of the circle circumscribing an octagon to that of the inscribed circle. The spaces between the ribs may be filled with thin pine boarding. An ornamental moulding can be placed round the edge of the sounding-board; but it should not descend below the parabolic surface. The back part of the sounding-board will, of course, be intercepted by the wall or pier against which the pulpit stands. A bracket can be placed here to help to support the sounding-board. When finished, the parabolic surface should be coated with varnish that will dry hard.

SCIENTIFIC HOUSE BUILDING.

PROFESSOR ROLLESTON, M.D., F.R.S., of Oxford, in a communication to the *Lancet*, has called attention to certain important points which the study of recent sanitary literature and of practical house-building has pressed upon his attention. Firstly, it seems to be clearly made out that the interposition of a layer of impervious substance, of whatever kind so that it be impervious, between the level of the *ground water* in the soil and the floor of the house built upon it, confers upon such a house an immunity in cholera epidemics. Facts in support of the truth of this statement are contained in a recent paper published by Professor Pfeiffer, and Dr. Rolleston is of opinion that the indication they afford should lead us to extend over the entire area occupied by a house the same layer of impervious material which is put into the walls as the so-called "damp course." Such a superficial stratum may be cheaply made by a mixture of gravel and gas tar. It would effectually prevent that rising of watery vapour out of the soil which the "aspiring" effect of a warm house does much to intensify over the area it covers. This aspiring effect can be observed to advantage in rooms constructed by a certain school of architects, who by combining modern appliances with mediæval style, have contrived to combine also the maximum expense with the minimum of comfort. In such apartments the doors and windows fit closely; ventilation is, of course, ignored, because in the middle ages the scarcity of glass and its supplementation by lattices, rendered ventilating appliances needless. The fire, however, must be fed from some source or other, and in such rooms a surging movement in the carpet may be noted, showing that the fire is drawing its supply of air through the chinks in the floor and from the damp air beneath; and this must be the case in all warm houses unless an easy access of external air is allowed, otherwise their rooms must be acting, says Dr Rolleston, constantly upon the air in the soil they cover in the fashion of imperfectly exhausted receivers; and that what they thus draw up must be more or less insalubrious needs little argument. To prevent all this Sheringham's valves, on a level with the ceiling, and a layer of asphalte on the earth below the floor is recommended, the outer air having free access to the space between the asphalte layer and the floor. Dr. Rolleston refers further to the necessity for removing the subsoil dampness as a preventive of consumption, as shown by the researches of Drs. Bowditch and Buchanan; and he remarks that there is some little difficulty in reconciling its attainment with the adoption of the present system of sewage drainage, by which the rainfall is excluded, but notes that at Lubeck the ends of sewerage and drainage have been secured by surrounding the drain pipes with a layer of gravel, and thus the old "stone drain" of English agriculture has been economically revived, and the same excavation which lodges the impermeable and small-calibred drain pipe of modern sewerage serves also, by receiving stone and gravel, to dry a water-logged soil.

TREES IN THEIR ORNAMENTAL ASPECT.

TREES, to be seen, must be planted in groups, not in files; and to be ornamental they must be well grown. It is not easy to spoil a country with green leaves, especially when it is undulating, but a great deal is done in that direction by rows of hedge timber, which confine the view and present to the eye a succession of sharp angles and narrow squares, instead of bold, sweeping lines with breadth and extent. Even an avenue, says the *Agricultural Gazette*, though a noble object in itself, is often destructive of the landscape, which is hidden by it as effectually as it would be by a brick wall. We do not advocate any stripping of the country of the trees and foliage, which are its greatest charm, but we would have handsome trees in the right place. Everyone loves trees, and we are only recommending a reasonable instead of an inconsiderate affection. Landed proprietors might relieve their estates of the great and unsightly incubus of fence timber, and increase their profit by judicious planting. There are more arguments for than against indulging a harmless hobby, and this would be a very interesting and useful one. Whether we speak of a large estate or of a small farm, its embellishment with [illegible] and trees requires a little of the landscape gardener's art, both in planting and in cutting through the formal hedgerows. If this latter process is done properly, a novice will be surprised to find, when he has removed half his timber, that there remains, apparently, more than before. It is literally a case of eating your cake, and yet having it. The fact is, by breaking through the rows distant trees are brought into sight, and the eye thus takes in a greater number at once. This is a great advantage of clumps and groups over straight lines; moreover, the sight wanders among them without coming to a full stop as against a wall or a hedgerow. The waving outlines and the appearance of distant objects in varying lights and shades [illegible] ness and [illegible] pleasing in a landscape, and which add very much to its apparent extent. The main things to attend to in planting for ornament are to plant the salient points—that is, the highest and most prominent spots, and to plant bold groups not too near together.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The usual fortnightly meeting of this association was held on Wednesday, December 3, in the hall, 5, St. Andrew-square, Mr. A. Ballantine, president, in the chair. The preliminary business having been disposed of, and several new members elected, the first of a series of three papers was read by Mr. F. C. Sumichrast-Roussy, entitled "The Comparative Merits, Beauties, and Characteristics of Grecian and Mediæval Architecture." Mr. Roussy made a few preliminary remarks on the various causes originating architecture, showing the influence of climate and locality in developing certain forms of designs, and continued by a very highly instructive treatise on the peculiar beauties of the arts amongst the Grecians. The paper was concluded with an analysis of the elements of the beautiful, which he divided into three heads, discussing each separately in a very successful manner. The librarian intimated the names of several new books just added to the library, and also a series of photographs of the Craigentinny Monument, presented by Mr. Campbell, photographer. A hearty vote of thanks to the lecturer closed the proceedings.

LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—A meeting of this society was held in the Town Library, Guildhall, Leicester, on Monday week, G. C. Neale, Esq., in the chair. After the transaction of business in committee, Mr. Thomas Barnard, of Botcheston, was elected a member of the society. Mr. Weatherhead exhibited an example of red ware (known as Samian ware), interesting as bearing the impress of the potter's stamp, MFERNIM, found in Leicester, presented to the museum by G. H. Nevinson, Esq.; also a curious bronze seal, discovered November, 1868, in soil removed from the Cherry Orchard to Evington-street, presented to the museum by O. C. Broomhead, Esq.

SCHOOLS OF ART.

THE annual meeting of the York school of art was held in that city on Tuesday week, the Dean of York presiding. The report which was read showed considerable improvement during the past year both in the number of students and their progress. Several gentlemen having addressed the meeting the prizes were distributed by the Dean, to whom a vote of thanks was then most cordially passed for his courtesy in the chair.

The annual dist[illegible] of prizes of the Trowbridge school of art took place on Wednesday, the 2nd inst. The principal prizeholders were [illegible] Webber, [illegible] Wilkins, E. L. Phelps, [illegible] Taylor, G. [illegible]well, Messrs. C. H. Ryles, [illegible] F. H. Pardt, G. White, Fred. Bullen, and Mr. A. [illegible]

The Liverpool Corporation has sustained a severe loss by the death of Mr. Thomas Duncan, who for many years past had filled the office of engineer to the Liverpool Waterworks. Mr. Duncan entered the corporate service about the year 1844, and until his health broke down some months ago, he was constantly and laboriously devoted to the public service. He died early on Friday morning last, at Leamington, of an internal affection which has troubled him for some time having culminated in dropsy.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MOSAIC DECORATION.

AT the conclusion of Mr. Layard's paper, a sommary of which appeared in our last impression, a lengthy discussion ensued.

Mr. DIGBY WYATT said that twenty years ago he stated publicly in that room that he saw no reason why we in this country should not do all that the ancients did in the matter of mosaic. That we had got so far hitherto was very gratifying, but much remained to be done, and much rested with the architect. Although we had plenty of mosaic workers and plenty of mosaic fit for our buildings, it was a question whether we had buildings fit for mosaic. The use of mosaic in this country seemed to be very much associated with the development and use of brickwork. Brick was the natural material for our use, besides being economical. If we were to have structures in which we had arches and vaults of brickwork, money might be saved which could be employed in decorating with mosaic the surfaces at present left blank. It was essential for architects to make up their minds, before beginning a structure, what its decoration was to be, so that the decoration might ally itself with the architecture, instead of being stuck on to a structure, and thus preventing an homogeneous appearance. While the progress made by Mr. Salviati was highly gratifying, it was extremely satisfactory to see the efforts which had been made by intelligent workers in England. Mr. Rust had been very successful in most of his specimens, and the manufactures of Messrs. Powell, of Whitefriars, were much to be commended. No one tradesman could supply the wants of the civilised world in this matter. In anything which delighted the eye the more that was done the better. Alluding to the recent introduction of enamelled iron, Mr. Wyatt said that it was a material which only required the application of a little taste and a little judgment to become an element of external decoration most valuable to the architects of the future. A point requiring great attention was the selection of the cement for fixing mosaics. If a quickly-drying plaster was used, rain from the outside would be drawn through the interstices by capillary attraction. If, after the cement was dry, the whole surface of the mosaic could be floated all over with oil or some other substance which would fill up the crevices, a really waterproof joint would be arrived at, thus ensuring the protection from damp not only of the mosaic, but of the wall of the building. In conclusion, he proposed a vote of thanks to Mr. Layard for his paper.

Mr. STREET, in seconding the proposition, expressed his almost complete agreement with Mr. Layard's opinions, although he thought that distemper paintings could still be employed with advantage in many situations. While the idea that the ornamentation of a building should form an integral part of its architecture was essentially correct, it would be impossible to think, in most cases, of covering all the walls of a structure at once. Dr. Salviati's material seemed to him (Mr. Street) to be the best. The only doubt was whether the cubes of gold were not larger than those in Venetian work. Some years ago, when at Torcello, he measured the cubes in some mosaic work which was being mutilated, and found them to be not more than three-eighths of an inch square. In designing figures in mosaic it would be well to have excessively clear outside lines, and as little shading as possible, using strong, well-defined lines for shadows. Mosaic decoration was peculiarly adapted for backgrounds to bas-reliefs.

Mr. AITCHISON said that he hoped shortly to see some small building decorated in a perfect and complete manner throughout with mosaic. It was of the greatest importance that coloured decoration should be of an oriental character. He thought that the gold ground particularly afforded facilities for ecclesiastical decoration. The true effect of the gold ground in Italian work was not that of a glittering surface, a neutral greyish green colour being presented. The ancient work invariably exhibited this tint, while modern work had more the appearance of the surface of a brazen vessel. On a close examination of some ancient work at a great distance from the ground, he found that it was executed by means of very long slips of mosaic put into the plaster when wet and left entirely detached, so that there was a shadow all round, which took off the glitter spoken of. When plaster was put flush with the surfaces of the tesseræ the effect was that of a large mass of glittering gold, which was very unpleasant. The pieces used by the ancients, though small, were apparently cut with a hammer, so that an irregularity of surface and edge was presented, and plaster was plentifully used, the picture being about two-thirds mosaic and one-third plaster. We had a large number of distinguished architects who would be extremely glad to give a great deal of their time almost gratuitously to design figures for execution in mosaic in our large public buildings. Many of these distinguished architects would, he was quite certain, be ready to assist with suggestions, and even perhaps with designs, the younger members of the profession. As in stained glass so in mosaic, white was to be used with a most sparing hand. He did not know what the effect of a building wholly covered with mosaic would be, but, judging from the effect of stained glass in the completely gilded building of the Sainte Chapelle, at Paris, it would not be altogether happy. Concerning Mr. Wyatt's suggestion as to the use of an oily or bituminous substance for rendering the joints waterproof, that had been done in Italy. When in that country he (Mr. Aitchison) witnessed the spoliation of some beautiful and costly mosaic work, the white colour in which was obtained by the use of mother-o'-pearl, and he noticed that asphalte had been used. As to the excellence of mosaic as a groundwork for sculpture there could be no doubt, and it might be used for such purpose in this country almost generally, particularly as its cost would not preclude its use.

Professor T. HAYTER LEWIS said that for mosaic designs a very bright style of shade indeed was required. Instead of shadows lines were wanted.

Mr. J. P. SEDDON asked what, compared with the size of the tesseræ, should be the size of the joints, and also why, if a large surface of gold colour of one uniform tint was required, it should be broken up into small pieces if the same effect could be procured without?

Mr. LAYARD, in reply, said that in the Venetian work large surfaces of gold were not of one uniform tint, the skilful mosaicist avoiding a monotony of tint. Regarding the size of the tesseræ they varied considerably in St. Mark's, some being very small. Their size must depend on the taste of the designer. It was really a moot point whether cement should show between the tesseræ or not. In England the appearance of the cement was objected to as being coarse, but the English were too much afraid of coarseness in decoration. The tesseræ could be placed nearer to or farther from each other as thought desirable, but all these were secondary considerations, the great point being the adaptability of mosaic as a material for wall decoration in this country. Alluding, in conclusion, to the failure of fresco painting, Mr. Layard said that Dr. Percy had just declared against *all* painting in London, saying that coal-smoke would destroy every kind of painting on plaster.

Mr. FERGUSSON fully agreed with all that had fallen from Mr. Layard. As regarded the employment of red colours in mosaic, he said that at Constantinople there are some reds which are brilliant beyond brilliancy. These were found not in St. Sophia's, but in the other churches.

Mr. G. G. SCOTT, in putting the vote of thanks, said that there could be but one opinion as to the manner in which the subject had been treated by Mr. Layard. It was unfortunately the case that our modern decorators had not succeeded as they ought to have done in making their work durable. He (Mr. Scott) could not see why this should be so, except in London, where exceptional influences operated. Decorators always said that they must use oil or turpentine, or some vehicle of that kind, and that if they painted in distemper their work would perish at once, although when they painted in oil or turpentine their work was commonly found to fail from the most obvious of all causes—because the oil or turpentine in the paint prevented the damp in the walls from exuding through the surface, as it did in old times. As we did not succeed in fresco painting, then, nothing could be more important than to find another material. Mosaics, though not largely used in the ancient art of this country, was, nevertheless, not objected to by the mediæval artists, as is proved by several instances. In Westminster Abbey there are remains of mosaic which have stood to the present day unmolested except by the hands of pickers and stealers. That the work in the Abbey was done on the spot there were curious proofs. The marble is our own Purbeck, and in the concrete beneath the floor were found the chippings of the glass mosaics. The work was evidently done by Italians. In mosaic, strong lines, such as were seen in brasses, should be adhered to. The shades should be expressed by single lines, and not by hatching. Mr. Scott concluded by alluding to the mosaic work now being executed in Wolsey's Chapel, Windsor, by Messrs. Salviati and Co., and also to the mosaics for the Albert Memorial, Hyde Park. The cement used for the latter would be, he said, that usually used by Dr. Salviati, which had great toughness (although nothing like so hard as common cements) and promised durability. With regard to "stopping" the joints he (Mr. Scott) had almost made up his mind to use common boiled oil, taking great care that the plaster was well dried first.

Mr. LAYARD, in responding, said that the general appearance of the work at Windsor was satisfactory. In all such works, however, there was generally plenty to criticise and abundance of critics, but his general inclination was to take a work as a whole, and not in detached parts.

The meeting then adjourned.

ST. GEORGE'S CHURCH, CROYDON.

THIS church is being built for the English Presbyterian body from designs by Mr. John Thomas Barker, architect, Croydon. It consists of nave and transepts, and will have a tower and spire rising to a height of 120ft. A two-story building adjoins, which will be used for vestries, living and class rooms, and large school room. The whole is being carried out in red brick and Bath stone, with malm facings inside, and when completed will cost £4,000, exclusive of site. Mr. J. Pollard, of Croydon, is the builder.

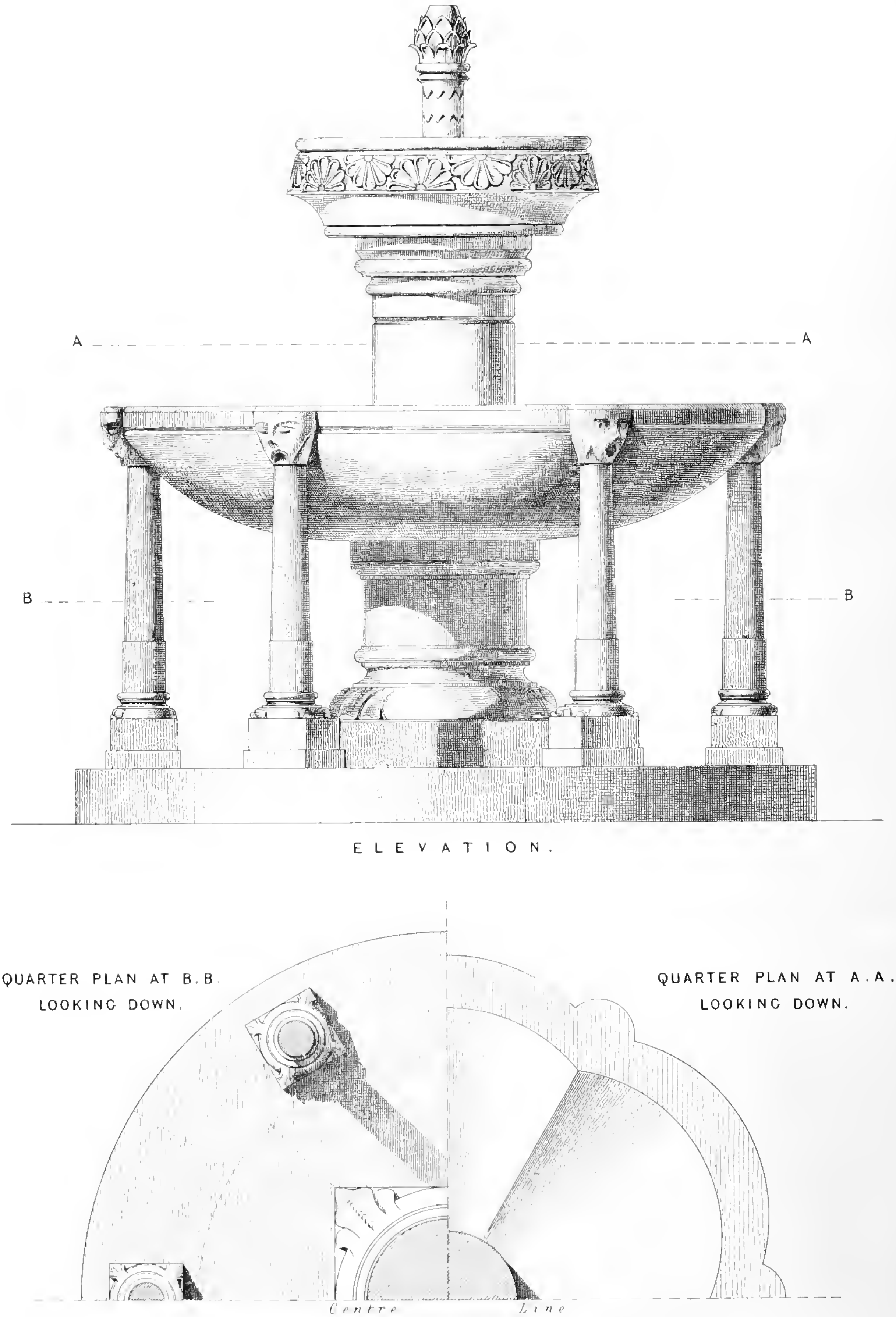
REFERENCE TO PLAN.

A. Porch.	F. Public Vestry.
B. Tower.	G. G. Class Rooms.
C. Lobby.	H. Verger's Living-room.
E. Vestry.	I. Verger's Sleeping-room.

NEW STREET SIGNAL.

AN experiment is being tried this week under the direction of Messrs. Saxby and Farmer, the railway signal engineers, by means of which semaphore signals and coloured lights will be made use of to regulate the street traffic. A pillar has been erected close to the entrance to Palace-yard. It is of an ornamental character, and it is about 22ft. high above the flagstone at its base. The centre of the semaphore arms, which are 4ft. long and 1ft. broad, is 18ft. above the flagstones, and the centre of the bull's eye a little over 20ft. high. The pillar will display three semaphore arms, two of which will face Bridge-street and Great George street, of course in the opposite direction, and will apply to the traffic in these directions. The third arm will face Parliament street on the left, and will extend in the direction of Bridge-street, and apply to the traffic between Parliament-street and Bridge-street. The arms will be moved simultaneously by one action on the part of the constable in charge. If he desires to stop the passage of vehicles or horsee he pulls out a horizontal bar conveniently adjusted near the base of the pillar, and this acting upon the mechanism within the pillar brings the arms to the horizontal position, and turns on the red light by the same pull. The bar has catches on its under edge for keeping the arms at the two positions. The only other position that the arms will take is the slope to the angle of 90 deg., which will be accompanied by a green light. The sloping position and green light prescribe caution, or relaxed pace in passing over the crossing. The lights will be gas jets, with burnished reflectors behind them, and in front a magnifying lens of 6in. diameter, with green and red glasses intervening according to the working of the apparatus. The change in colour is accomplished by the apparatus fitted in the interior of the lamp box, and not by the ordinary "spectacle" disc provision. The pillar is coloured bright green, relieved with gilding; and the semaphore arms, which are curved on the edges, and narrower at the inner than the outer ends, are coloured bright red with a gold border. If the experimental signal station prove successful, it is likely that the system may be applied extensively and advantageously.

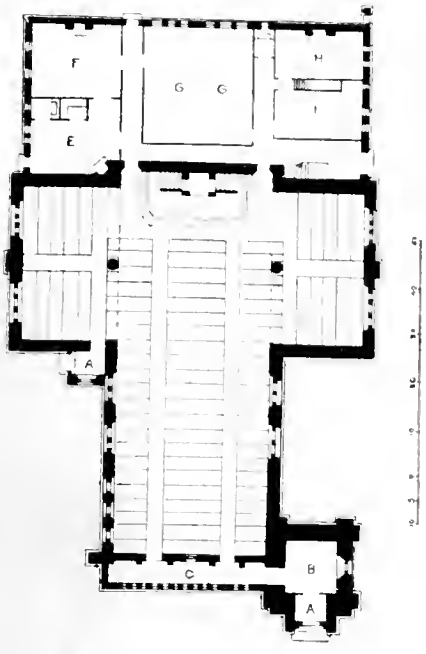
The lectures on sculpture will not be given at the Royal Academy this season.



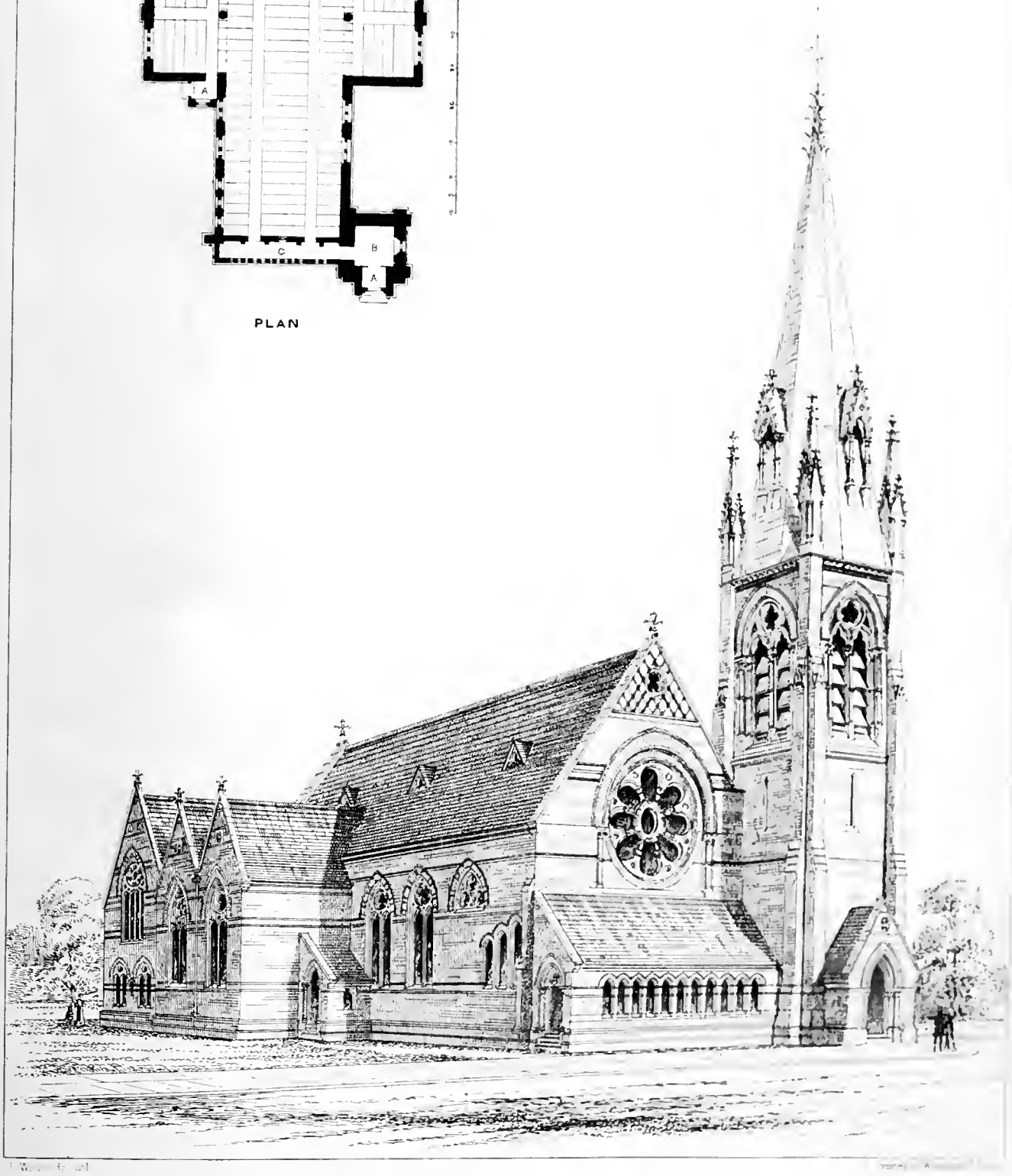
MEASURED AND DRAWN BY J. P. SEDDON.

H. A... Lith. Printed by Whiteman & Bass

Fountain at the Abbey of Sayn.



PLAN



St. George's Church, Croydon. — Mr J. THEO. BARKER, ARCHT

FOUNTAIN IN FRONT OF SAYN CHURCH.

FOUNTAIN IN FRONT OF SAYN CHURCH.

NEAR Bendorf, on the Rhine, in a ravine among the hills at some little distance from the river, is the old church of Sayn, once an abbey. Though not extensive it has many points of interest, and among them may be reckoned the pretty fountain which stands before the west front. We give a view of it from Mr. Seddon's work entitled "Rambles in the Rhine Provinces," together with a plan and elevation to scale from measurements taken by him. The material in which it is executed is dark limestone. It is evidently of the Transitional period, probably of the latter part of the twelfth century.

Building Intelligence.

CHURCHES AND CHAPELS.

The new church of St. Stephen, South Dulwich, was consecrated on Saturday week. Mr. Charles Barry is the architect, and the cost has been between £8,000 and £9,000.

A new Congregational Chapel was opened at Boston, Lincolnshire, on Tuesday week. It is built of red and white facing bricks, with Ancaster stone dressings, and seats 700 persons, at an inclusive cost of about £2,000. Messrs. Innocent and Brown, of Sheffield, were the architects, and Mr. S. Sherwin, of Widebargate, the contractor.

At the meeting of the Dean and Chapter of Gloucester Cathedral last week, Mr. G. Gilbert Scott, the architect to the cathedral, exhibited his designs for the restoration of the choir, which have been long under anxious consideration. The plans obtained the cordial and unanimous approval of the Dean and Chapter, and Mr. Scott received instructions to begin the work without delay. The nave will be immediately prepared for the celebration of Divine service during the time occupied by the performance of this work. The choir when thus restored will be one of the most beautiful specimens of architecture in the country. The estimate for the work now to be begun is about £15,000. The amount of the estimate for the whole contemplated restoration is about £40,000.

On Wednesday week a new Presbyterian Church was opened at Lewes. The style is Lombardic, and accommodation is provided for 400 persons. Attached to the church are vestries and commodious school rooms. The cost has been £2,500; Mr. W. F. Poulton, of Reading, being the architect, and Mr. Sawyer, of Dulwich, the contractor.

The first contract for the restoration of Stathern Church has been completed. The tower has been opened out to the church; a section of the old pewing has been removed from the nave and aisle and replaced with substantial oak benches. The interior of the chancel has been completely restored and fitted with ornamental oak benches. Mr. R. W. Johnson, of Melton and Leicester, was the architect engaged in the restoration, and the works have been erected by Mr. J. Fast, of Melton Mowbray.

The new church of St. Asaph, Birmingham, was consecrated on Tuesday by the Bishop of Worcester. The plan consists of nave, north and south aisles, chancel, and vestry underneath the chancel. The builder's estimate, exclusive of tower and spire, was £5,443, but the cost of land and other charges increased the amount to nearly £7,000. The warming arrangements are very good, and have been carried out by the London Warming and Ventilating Company. Mr. Y. Thomason, of Bennet's-hill, was the architect, and Messrs. Wilson and Son, of Handsworth, the builders.

The church of St. Mary the Virgin, East Barnet, Herts, was reopened on Saturday, November 28, after restoration and enlargement. The church is one of some interest, having been erected in the early part of the twelfth century by an Abbot of St. Alban's for the spiritual benefit of the poor inhabitants of that locality engaged in wood-cutting in the then surrounding forest, and a considerable portion of the ancient fabric still remains. The additions consist of a new south aisle built in the Early English style of architecture, with walls faced with Kentish rag stone, and windows and dressings of Bath stone. The roof, framed with open timbers, is covered with Staffordshire tiles. The arcade, opening from the ancient nave, is of two arches, supported by a polished marble shaft with richly carved capital. The whole of the works have been carried out under the superintendence of Mr. A. R. Barker, the contractors being Messrs. Bove, of Islington.

Shottisham Church, Suffolk, has just been reopened after restoration at a cost of £1,200. Mr. Edward Hakewell is the architect, and Mr. Henry Luff, of Ipswich, the builder. New school-rooms adjoining the church are now being built.

Kirtling Church, Cambridgeshire, was reopened on Thursday week, after undergoing considerable alterations and additions. The north wall has been rebuilt, and a new aisle and new roof to the entire fabric have been erected. Messrs. Clarke and Holland, of Newmarket, are the architects. The warming apparatus has been executed by Messrs. Weeks and Co., of Chelsea, and the carved pulpit, reading desk, and open benches are the work of Mr. Tooley, of Bury St. Edmunds.

The Duke of Norfolk, who comes of age on the 30th inst., has intimated, according to the *Weekly Register*, that one of his first acts on attaining his majority will be to lay the foundation stone of a large Catholic Church at Arundel, Sussex, to cost £50,000, the whole of the expense being borne by him.

The parish church of Hoxne, Suffolk, was reopened on Friday last, after having a new aisle added. The walls are of rubble, with quoins, stringcourses, and enrichments of Portland stone. The church, when originally built, had a nave and two aisles, but another north aisle was added outside the original one many years ago. The aisle just added is a corresponding one outside the south aisle. The church is consequently of great breadth. Mr. Francis, of London, is the architect, and the work was done by local contractors.

Beighton Church was reopened on the 3rd inst., after restoration under the direction of Mr. Rollinson, architect, of Chesterfield. The gallery at the western end has been removed, the western arch thrown open, and the high back pews replaced by benches of stained pitch-pine. The ancient entrance to the roodloft, and a Norman arch over the Pointed arch separating the nave from the chancel, which were both discovered during the progress of the works, have been entirely restored. The Tudor roof has been replaced by one raised to the original pitch. The builders were Messrs. Ash and Clayton, of Sheffield.

BUILDINGS.

The new parish school at Grimstone has been completed and opened by a successful bazaar. The building consists of a large schoolroom, anteroom, and out offices. Red brick and stone dressings are the materials used, and a bell gable in west side forms a feature in the building. The contract was taken by Messrs. Whait and Woolford, who have carried out the works under the superintendence of Mr. R. W. Johnson, architect, Melton and Leicester.

The foundation stone of the Bolney National Schools, Sussex, was laid on Saturday last, by Lady Victoria Wellesley. Accommodation is provided for 130 children. Messrs. Banks and Barry are the architects, and Mr. Skinner, of Storrington, is the builder. The estimated cost is £1,000.

New national schools were opened at Newhaven on Monday week. The style is Gothic, and accommodation is provided for 200 children. Messrs. Habershon, Brock, and Webb were the architects, and Mr. Morling, of Seaford, the builder. The cost was £600.

The Theatre Royal, Whitehaven, will reopen at Christmas, after having undergone a complete transformation internally, from designs by Mr. Jonathan Shepherd, architect.

We are glad to hear that the piece of land situated at the corner of Church and Paradise-streets, Liverpool, which has remained so long vacant, is about to be built upon. The lower portion of the building will be devoted to shops, the upper stories to offices, &c. The style adopted is Gothic, and the elevations will be executed in stone. The architects employed are Messrs. Haigh and Co., of Liverpool.

The mania for theatre building, so prevalent of late in London, has extended to Glasgow. Hitherto only one theatre has existed there, but there are now three. The most recently opened house is the Colosseum, which has been erected by Mr. J. S. Baylis, at a cost of £30,000. Especial care is taken for the comfort of the audience. A remarkable feature in the new building is the unusually large space underneath the stage, which is 30ft. deep, hewn out of the solid rock. This extensive space has been provided to facilitate the production of the numerous effects which the realistic drama demands.

The Woolwich Board of Guardians contemplate building a new workhouse on the highest part of Plumstead common (the most remote part of the whole district, and the farthest from the poor of the united parishes), enclosing for that purpose twelve acres of land, the only alleged advantage being that land is cheap. Apart from the sanitary question, and also that of convenience, a medical contemporary asks whether the board, charged with other responsibilities than the apparent saving of a few hundred pounds, has counted the cost of destroying one of the few open spaces still reserved near to our crowded cities.

On Saturday afternoon the foundation stone of a new Wesleyan School was laid at Farsley, near Bradford, Yorkshire. The style adopted is Italian. The building will be constructed of Horsforth stone, and will accommodate 500 scholars, at a cost of £2 000. Messrs. C. S. and A. J. Nelson, of Leeds, are the architects, their design having been selected in competition.

The Globe Theatre, in Newcastle-street, Strand, which has been erected on part of the site of the unfinished Strand Hotel, was opened on Saturday week. The lessee, Mr. Sefton Parry, has been his own architect in the matter, he feeling himself qualified so to act from his large experiences of theatre building, both in England and America. Construction may not suffer by such an arrangement, but æsthetics may. The theatre is a circular building, thus in a degree conforming to its name. The boxes are on a level with the street pavement, but the pit and stage are 12ft. below the surface of the ground The new house is about equal to the Olympic in size, but the accommodation is said to be far superior, and the ornamentation more attractive. Nearly 2,000 spectators can be accommodated, all of whom will have a clear view of the stage. The works were executed by Mr. S. Simpson, who also built the new Holborn theatre.

A new school has been erected at Gaddesby, at the sole cost of E. H. Cheney, Esq., of Gaddesby Hall. The part at present erected is one division of a block of buildings which, when complete, will consist of separate school-rooms for both sexes, and dwellings for master and mistress. The building is Gothic, of an ornamental character, and is of superior red pressed bricks with Bath stone dressings. The roof is open-timbered, supported on carved corbels, and the walls inside are of pressed brick, doing away with any need of plastering. Messrs. Herbert, of Leicester, were the contractors; and Mr. R. W. Johnson, architect, of Melton and Leicester, furnished the designs.

The new temperance hall and institute at Finedon was opened last week. The site is detached, having streets all round. The building, which is two stories high, comprises—on the ground floor—entrance and staircases, reading-room, spacious club room, kitchen, and dwelling-house for hallkeeper, and over the whole of these is the hall proper, which is a lofty, well-lighted room with handsome open-timbered roof. The building is of red Finedon stone, with Box stone dressings, and is Gothic in character. The works have been carried out by Mr. W. Henson, builder, of Finedon, from designs and under the superintendence of Mr. R. W. Johnson, architect, of Melton and Leicester.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—H. H.—R. C.—W. H. C.—F. and Son.—E. R. P.—P. M. M.—C. P.—I. and W.—I. C. J.—S. W. and Co.—W. C.—C. T.—"Two little Goths"—"Vincent."—E. S.—H. H.—I. P. L.—T. R.—"Fairplay."—G. G. H.—B. L.—H. M.—E. W. G.—I. H.—G. H. G.—E. T.—G. M.—C. S. W.—J. M. S., "Her Majesty's Theatre" next week.—J. M. S., "The Art of European Decoration of Churches" next week.

A REGULAR SUBSCRIBER.—The contract price for the working men's institute illustrated in last week's BUILDING NEWS was £1,210, but the total cost, including the fittings and furnishing of lecture hall, reading-room, &c., together with architect's commission, was about £1,440.

Correspondence.

LOCAL BOARDS.

To the Editor of the BUILDING NEWS.

SIR,—I trust you will permit the correspondence which will doubtless ensue from the letter of "A Ratepayer," in your Intercommunication column last week but one, to appear in your general correspondence, as I am sure the hardships and difficulties caused by the various local boards to architects and their clients are such that most will have something to relate. With the intention in the first instance of improving the social and sanitary condition of dwellings, the Public Health Act has been so fettered by the bye-laws of the various districts that it becomes not only arbitrary but tyrannical. There would not be much to complain of if the Metropolis Building and Local Management Acts were applied to the suburbs; but when these are added to and each district has requirements peculiar to itself, the difficulty of carrying out works in three or four different places may be judged. I will not take up your space by enumerating what I consider the reasonable objections to the Act and bye-laws, but will only say that in a small town in the south of London a detailed copy of the plans and sections drawn to a certain scale and a specification of the materials used have to be submitted to the local surveyor a fortnight before the building is commenced, and no house is to be let without his certificate that the requirements of the board have been carried out. The question asked by "A Ratepayer" is an important one, and it appears that the local magistrates can only decide in accordance with the Act and the bye-laws sanctioned by the Home Secretary.—I am, &c.,

J. D. M.

GROTESQUES.

SIR,—Your correspondent, "A. R. T.," has blown Mr. Moyr Smith's trumpet, in your last impression, with an extravagance which may surely induce that gentleman, if he cares for the opinion of any but mediæval fanatics, to say, "Save me from my friends." I think that a great many of your readers will endorse the remarks of "G. S. A." in a previous number. I can certainly say, both for myself and for others who are known to me, that we have had quite enough of Mr. Smith's grotesques, and cannot tell why we are to be blessed with such a a number of them, unless as examples of a good free touch in lithographing, on which head I give Mr. Smith all credit, and only wish that his evident talents were made use of in producing less absurd and disagreeable forms. Nor can I deny that Mr. Smith's grotesques—*qua* grotesques—exhibit a good deal of ingenuity and invention; but, to my thinking, the revival of this *bizarre* method of decoration as a part of architectural design in the present day is simply a *gross and childish absurdity*, and is one of those things which tend to bring the profession of architecture into contempt among educated and philosophical persons among the outsiders. In what used to be termed the "Dark Ages," which are now dressed out as the "Mediæval Period," such a style of decoration was the expression of a genuine belief in the horrible and the monstrous—how genuine any one must be aware who has paid any attention to the legends of diablerie and witchcraft of those times. That it should be solemnly reproduced now, and that architects of reputation, who in other matters show evidence of refined and educated minds, should be content to disfigure their churches (and offices also, for the leprosy is spreading to "secular" buildings) with figures which seem only meant to frighten children, is only a proof of the extent to which people can become blinded to any absurdity when they once go in, through thick and thin, for any popular movement in art. None but those architects whose judgment and eye has become utterly diseased by their exclusive study and blind admiration of everything belonging to the middle ages, could seriously set themselves to work to perpetrate such things; and it would astonish some of these gentlemen, perhaps, if they could hear the tone in which such absurdities are commented upon by highly-educated and intellectual men *out* of the profession, who are sufficiently masters of their reason to be aware of the origin and real tendency of this current of barbarism. Even in an archæological point of view, the interest of these things has been much exaggerated. If the builders of Canterbury, for instance, had no better taste than to spend their time in carving the two heads delineated by Mr. Smith in your last number, were it not, perhaps, better to allow this melancholy fact to pass into oblivion? But, when a writer begins, like "A. R. T.," to talk about these grotesques "suggesting the embodiment in material of a real and soul felt religion which had almost died out, and is now being happily revived," it is impossible to read such stuff with patience. In the name of goodness, of what sort of a "religion" are these precious productions the embodiment, except of one of abject and ignorant terror and superstition, such as we know did exist in the middle ages, and any attempt at the reproduction of which would be met by the laughter of the common-sense public and the unmixed scorn of all minds of a higher class? I have not the slightest hostility to Mr. Moyr Smith, who appears at least to be a very clever and effective draughtsman; it is against the whole "grotesque" movement, the absurdity of wantonly disfiguring our buildings in this way, that I inveigh. To put such things gravely before us as "art," to decorate our churches with the most odious and uncouth forms that can be invented, is simply an insult to common sense and to artistic feeling.—I am, &c.,

H. H. STATHAM.

5, Batavia-buildings, Liverpool.

MODERN FURNITURE.

SIR,—A quotation from Mr. Eastlake's work, in your last number, contains the passage:—"Chairs are invariably curved in such a manner as to ensure the greatest amount of ugliness with the least possible comfort." Mr. Eastlake, I suppose, was here speaking of the upright curve or ornamental turn usually given to the chair-back. Although this *is* often ugly I think that, for lightness, convenience of grasping, and the prevention of bruises, the chair-back *should* generally be a curved rail; but it seems to me that the curve of chair-backs as usually made is wrong on *plan*. Instead of being concave to the body it should be slightly *convex*, and in the middle, from the top to the seat, should run a pad which would fill the hollow of the spine and really support the body. On leaning back in an ordinary chair the shoulder blades touch first, and in order to rest the spine the body is curled up slightly (contracting the chest)—a position by no means healthy, and often causing (to me, at all events) a feeling of oppression; but introduce a thin bolster so that the shoulder blades may be thrown slightly back and the spine rested, and immediately relief is felt and the breathing becomes freer. Of course, to be comfortable the back legs of a chair should be shorter than the front.

I suppose this idea is not new, but I shall be glad to hear if chairs on this principle are made by any London firm.—I am, &c., A. C. G.

10, Brecknock crescent, December 2.

THE MEASUREMENT OF IRREGULAR PLANE FIGURES.

SIR,—It may not be unacceptable to the readers of your valuable columns if I advance a little on the measurement of irregular plane figures. It is generally the custom of surveyors to employ some mode of straightening the crooked bounds in order to condense the calculation and render the operation simple; exactness seems to have first called for the use of the parallel rule, to continually reduce the sides of the polygon to a figure having one side less, but which will contain the same area. It is grounded on Euclid's proposition of reducing a trapezium to a triangle, but the method is too tedious for general practice, and the one mostly adopted seems a horn ruler or strip of glass, and the parts of the figure are equalised by inspection. It has been thought advisable, from the numeral figures required to work out a large plan, to abandon calculation altogether, and reduce the process to a mechanical operation, to do which several ingenious means have been resorted to, the most novel of which that occurs to my remembrance is to cut to pieces the original mass and weigh the parts in a delicate balance, the area being deducible from tabulated results, but from many inaccurate results I have not seen the system practised a long time. The most modern practitioners make use of an instrument for this purpose, which, exclusive of damaging the plan, registers the contents complete and safe without any calculation, and thereby does away with the liability to error which will be sure to creep in in vast numbers of figures. Tracing paper is procured of good quality and lines ruled thereon one chain apart; it is then placed over the figure whose area is required; the instrument, which consists of a thin strip of wood and a brass slider, is placed over the tracing paper, and by means of a hair in the slider, the irregular parts at either end of each strip are equalised by the eye; from the first strip the instrument is taken to the next strip, and so on to the whole figure; the contents are then read off at once in acres, roods, and poles. Another most simple and reliable practice which I have frequently adopted is to rule tracing paper all over in squares of one chain each, laying the same over the irregular figure and then, counting the squares for the contents, the broken squares at the extremes of the figures are judged of in content by inspection. If some of your readers will look to these things, much valuable time may be saved and

many errors prevented, and if I have not explained these things so clearly as I ought, I shall be happy to furnish practical information thereon.—I am, &c.,

ROBEY CARPENTER, Land Surveyor.

Builder's and Contractor's Offices, High-street, Great Marlow, December 7.

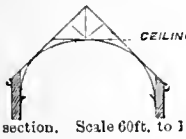
GRAY'S INN SQUARE.

SIR,—Going into this square (north) the other day I was struck with its extremely dismal character; and at the same time the ease and cheapness with which it could be greatly improved. It will be remembered that it is a large quadrangle enclosed by very old houses of uninviting appearance, mostly in want of a thorough renovation, and the general area is a dull monotonous extent of bare gravel without any relief How very simple it would be, and how moderate the cost to a wealthy society like that of Gray's Inn, if a small pleasure ground were laid out in the centre of this quadrangle, the same as in any other London "square." To have grass, trees, and evergreen shrubs in this bald and desolate place would be a vast improvement. Those will form the best idea of the change who remember the alterations made to Kennington-common (now Kennington-park), Bartholomew Hospital grounds, and Paddington-green, from a similar state of neglect and ugliness to improvement and beauty. If it were thought any object to have exceedingly direct access from side to side of the square, a path might be made across the enclosure, or the garden could be laid out in a circular form, so that only a small detour would be necessary. I am sure there is wealth enough, I am sure there is intelligence enough, and I hope and trust there is activity and energy enough in the honourable society to effect this salutary adornment to its property forthwith.—I am, &c., H. R. P.

Intercommunication.

QUESTIONS.

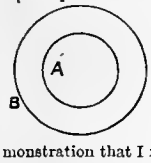
[1162.]—ROOFS.—Will some able correspondent show me geometrically how to determine the proper strength for the principals to a roof of 45ft. span—the principals to be



Cross section. Scale 60ft. to 1in.

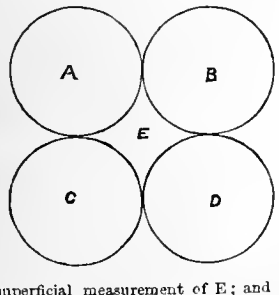
either of iron or wood, to be 12ft. apart, and of the outline shown in the diagram?—A. B.

[1163.]—AREAS OF CIRCLES.—Can anybody give me or tell me where I can get the demonstration of the following problem?—To describe a small circle (A) within a larger one (B) in such a manner that the circle A shall occupy exactly half the area of the circle B; that is to say, if the circle A were taken away it would leave a ring of exactly its own area It is the geometrical demonstration that I require.—C. E. O.



[1164.]—THE CHEAPEST ROOF FOR BUILDING.—Can any of your correspondents give me the necessary information upon the following questions by your next issue? What would make the cheapest and strongest constructed roof for a building being 45ft. between the walls? If an iron roof, what should be the proper size of the tie rods, struts, and principal rafters? also the proper distance between each pair of principals? Supposing the building should have an iron roof, I should then cover it with 1¼in. boards, and the boards covered with Duchess's slates.—WILLIAM SANDS.

[1165.]—SUPERFICIAL MEASUREMENT.—The diameters of circles A, B, C, and D are 6ft. I shall feel obliged if some kind friend would inform me how to ascer-



tain the superficial measurement of E; and again, supposing the said circles were 3½in. diameter, how should I proceed?—GRATITUDE.

[1166.]—TEST FOR PORTLAND CEMENT.—Can you, or any of my brother readers, inform me of a simple and ready test for Portland cement?—CEMENT ADVOCATE.

[1167.]—PAINTING ZINC.—Can any subscriber recommend a composition of oil colours that will adhere to zinc and resist the changes of the atmosphere? I find great difficulty in getting oil paint to stick on at all, and even then it is by no means durable.—VILLAGE BUILDER.

[1168.]—CRUSHING WEIGHT OF DRAIN PIPES.—What is the crushing weight, or fair load for a 9in. and 12in. stoneware vitrified drain pipe when set on end able to bear, supposing their average length to be 2ft. long? and at what depth should they be laid horizontally under a cart road to be out of danger of breaking?—JONATHAN JOINER.

[1169.]—CHIMNEY POTS.—A few days since the sweep swept my chimney flues, and a day or so after down came part of a chimney pot on my roof, all caused by the top of the sweep's broom. I shall be glad to learn if the abominable and everlasting disgraceful pots will ever be done away with, and if we are to retain such unsightly ornaments; and if there are any that are durable and that can be recommended to bear the scraping and brooming of the sweep? SOOT O!

[1170.]—WEIGHT OF ICE.—What is the weight of one cubic foot of ice?—JACK FROST.

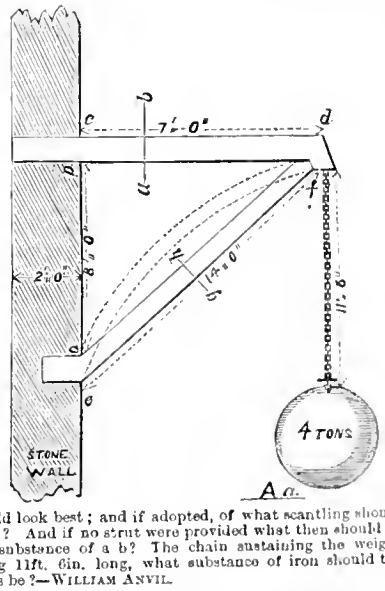
[1171.]—SYLVESTER STOVES.—Can any of your numerous readers inform me where Sylvester's stoves, formerly made by Allen and Son, Glasgow, are now to be obtained, or who has the patent?—JAMES W. JAMES.

[1172.]—INDIAN INK.—How can Indian ink and colour be made to lay well on tracing cloth?—B.

[1173.]—MAY'S SYSTEM OF CONCRETE BLOCKS.—Will some one please inform me if the manufacture of cement concrete blocks (Mr. May's system) is the subject of a patent? and if so, in what respect is it claimed to be a novelty?—CONCRETE BUILDER.

[1174.]—HOUSE CISTERNS.—Would you or some of your readers kindly inform me how the contents of cisterns for house supply may be properly calculated? Eight adults and 12 children under 7 years of age occupy a house, and the washing is done on the premises. It is proposed to fit up two cisterns; one to be supplied from the public service, and sufficient for all requirements, the second to receive and store rain water from the roofs only. I shall be much obliged by having the process of calculating the necessary contents of each cistern pointed out. HENRY CARTER.

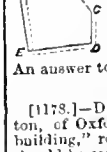
[1175.]—STRENGTH OF BEAM AND CHAIN.—I shall feel grateful if some kind friend will inform me what the thickness and depth of a cast-iron beam should be at a b, and the weight that should be built on its end to sustain a constant weight (A a) of 4 tons. Also the thickness of under strut, and depth of g h. The curved dotted strut



would look best; and if adopted, of what scantling should it be? And if no strut were provided what then should be the substance of a b? The chain sustaining the weight being 11ft. 6in. long, what substance of iron should the links be?—WILLIAM ANVIL.

[1176.]—WEIGHT OF CEMENT CONCRETE.—What is the weight of a cubic yard of cement concrete?—T. T. W.

[1177.]—HEDGES AND DITCHES.—If in the annexed diagram, A B C D E, the dotted line represents a hedge, and the clear line a ditch by the side of the hedge, which enclose a piece of land, In measuring this field what portion of the hedge and ditch is considered as belonging to the field, and what distance from the centre of the hedge is allowed for the ditch? An answer to this will oblige.—NIX.

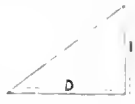


[1178.]—DAMP-PROOF FLOORING.—Professor Rolleston, of Oxford, in some remarks on "Scientific House-building," recommends that the floors of outhouses, &c., should be covered with a layer of gravel mixed with gas tar. Can any reader of "Intercommunication" give the proportion one ingredient should bear to the other?—ANTI-RHEUMATISM.

REPLIES.

[1112.]—STRENGTH OF WALLS.—If "J. L." would give a little more attention to what I stated respecting this question, he would see that I have not made a "muddle," as he terms it, of the equation. I suppose he would be good enough to point out in your next what is the difference between my equation and his, which he imagines to be the only "correct card." His values for the symbols I and H are the same as mine And perhaps he would inform me if it were possible for anyone with an eye in his head not to perceive by the dotted lines which way the wall would turn, and to see that A has been put, by an error in the cut, on the wrong side of the wall His remarks are merely quibbles. A G will consequently be the same as a b in his cut; that is, the horizontal distance from the joint A to the centre of gravity. His assumption of W = the weight of the wall is an absurdity, for the weight of the whole wall has nothing to do with the question of the strength and stability, which are always calculated for a cross section, considered to have a length of one lineal foot People are very apt to consider a thing a "muddle" when they do not comprehend it The centre of gravity of the wall, supposing it were rectangular in shape and homogeneous in consistency, will, of course, be in the middle as every schoolboy knows. I would advise your correspondent not to jump so quickly at wrong conclusions. HUTTON.

[1114.]—I am much obliged to "J. L." for his explanation why the moment of the earth should be doubled for stability. For a rectangular wall, this gives a thickness for stability twice that required for equilibrium, but for a wall of any other form, as in the sketch, it does not do so. Therefore, is it to be taken as a general rule, applicable in all cases, to double the overturning force to find the thickness required for stability, and not to double the thickness found for equilibrium? In a wall of this form, for instance, the weight is $\frac{W H D}{2}$, W being the weight of a cubic foot, and its moment is $\frac{W H D}{2} \times \frac{2 D}{3} = \frac{W H D^2}{3}$, the earth or water pressing against the vertical side. Then if O = moment of earth or water, for equilibrium $O = \frac{W H D^2}{3}$, and $D = \sqrt{\frac{3 O}{W H}}$; and if thickness thus found is to be doubled for stability, it will be $D = 2 \sqrt{\frac{3 O}{W H}}$. If, however, the moment of the overturning forces is to be doubled, it will be for equilibrium $O = \frac{W H D^2}{3}$, and for stability $2 O = \frac{W H D^2}{3}$, and $D = \sqrt{\frac{6 O}{W H}} = \sqrt{2} \sqrt{\frac{3 O}{W H}}$. The base D found by this method being to that found by the former as $\sqrt{2} : 2$.—X + Y.



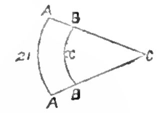
[1128.]—CALCULATION OF PRIME COST.—Recurring to the question of prime cost I think most men will agree with "Builder's Clerk" that it is not solvable with mathematical accuracy, nor with so close approximation as Mr. Duffield professes to have attained, whenever more than one job is being carried on from a central establishment. How, in such cases, can the values of items 4, 8, 10, and 12, in my calculation given in your last number, be other than approximate? In very exceptional cases, item 4 may not exist; the entire of the plant and materials may be purchased specially for a contract, and the former and surplus of the latter sold when the works are completed, then items 8 and 12 can be had exactly Item 10 will remains to be disposed of. Fancy a job so small that the foreman on the ground keeps all the accounts connected with it, or so large that a special office staff is set up for its working. Fancy all those conditions fulfilled, then in the absence of clerical errors you have your prime cost to a shilling, and some extremely fanciful notions also.—HENRY CARTER.

[1128.]—In further comment on this subject I beg to say I like the reply given by "A Builder's Clerk," in yours of the 4th, to Mr. Duffield, and further I should like to be informed by the same professional gentleman if there is a better way of preserving the prime cost of a contract than the one employed by myself In my waste book among other matter is entered the material used in the contract at as near per cent. as I can conveniently get, and also exactly my labour charged and sundry incidentals From this book, as per double entry, it is all journalised and twice posted contrawise in the ledger, accounts being opened for things as well as persons or contracts. When a contract is closed my prime cost is roughly summarised, and if less than the estimate I make the difference dr. to profit and loss, but if the percentage is greater, then of course the profit and loss is debited and the contract credited I conclude that approximation to the prime cost is only possible, yet my accounts will show the same nett profit in total at the ledger's close as though the cost price was set down ever so truly, for in the goods accounts on the dr. side stands all my prime cost or things that I buy, and on the other side all that I sell or charge for, including not the supposed percentage of contracts, but the amount of estimate, as although in this account the actual percentage is originally credited, yet the difference, of a gain is credited also for this goods account and the profit and loss account, *mes synonymous*. Mr. Duffield is too hasty and too conclusive in his reply to Mr. Badger, for I fear from the tone of his communication he does not keep his accounts even so clearly and as completely as the last named gentleman, whose books by the Italian method are quite a model.—ROBEY CARPENTER, land surveyor, Great Marlow.

[1138.]—THIEVES' VINEGAR. Thieves' vinegar contains the volatile oils of wormwood, rosemary, sage, spearmint, rue, lavender, calamus aromaticus, cinnamon, cloves, nutmegs, and garlic, extracted by maceration in strong vinegar. After the fluid is filtered The repute of this vinegar as a disinfectant is founded upon a story, that four thieves, who plundered the dead bodies during the plague at Marseilles with perfect security, on being questioned respecting the cause of this impunity, confessed, on the condition of their lives being spared, that they attributed it solely to the use of the above aromatic vinegar.—K. G

[1143.]—LAYING RAILS.—I think that "Contractor" may ascertain near enough for practical purposes the length of the iron rail by stating the case, that as the radius of the curve described by the outer rail is to the radius of the curve of the inner rail, so is the length of the arc, 21ft., to the length of the arc required—in this case 20.18ft., supposing the outer radius to be 202ft. 6in., and the inner 197ft 6in.—Z.

[1143.]—"Contractor" can compute the length of the inner rail thus:—



A B being the gauge.

A A : B B : : A C : B C

21 . x : : 200 : 200 — 4' 8½'

$\therefore x = \frac{2 \times 195.2916}{200} = 20.505' = 20' 6'$, the required length of inner rail —C. D.

[1143.]—I see your correspondent "Contractor" is in want of a solution to his very practical query. If I were laying anything out of a similar kind I should chalk it out one-tenth the size on the floor of a large room, and for all practical purposes that would be near enough. But to demonstrate it by figures is the easiest way I know. The radius is 200ft., therefore 200 × 2 = 400ft. = diameter; then 400 × 3 1416 = 1256 64, circumference of the outer rail. But there is a distance of 4ft. 8½in. gauge between the rails; therefore 4ft 8½in. × 2 = 9ft. 5in.; then 400 — 9ft 5in. = 390ft 7in., diameter of inner line of rails; 390ft. 7in. × 3 1416 = 1227.0566, circumference of inner rail. And both the circumferences being got, any parts of them included between two radii will bear the same proportion to one another as the two circumferences do to each other. Therefore, as

1256.64 : 1227.0566 : : 21 to 20.50 or 20ft. 6in. length of inner rail.

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              21
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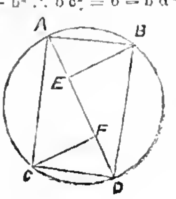
Hoping this will satisfy "Contractor."—GRAY.

[1144.]—THE STRONGEST BEAM THAT CAN BE CUT OUT OF A LOG.—On the assumption that "One who Takes Nothing for Granted" is familiar with the formula for the breaking weight of timber, this construction is readily explained thus:—Let a B = b; B D = C; and A D = d. Now the breaking weight varies as $C \times \frac{b c^2}{l}$.

Breaking weight varies as $b c^2$. In order for $b c^2$ to be a maximum, you must equate = o and differentiate $c^2 = d^2 - b^2 \therefore b c^2 = o = b d^2 - b^3 = o$ differentiating—



$\therefore d^2 \, d b - 3 b^2 \, d b = o$

$d^2 \, d b = 3 b^2 \, d b$

$d^2 = 3 b$

$b^2 = \frac{d^2}{3}$

It is evident that by this construction the beam fulfils the condition necessary for it to be a maximum, for

A D, A E = A B²

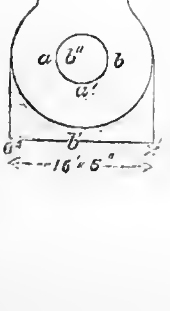
$d \times \frac{d}{3} = b^2$

$\frac{d^2}{3} = b^2$ A E D. C. D.

[1144.]—The way I would prove Molesworth's formula for cutting the strongest beam out of a log is by comparison of two beams cut out of a fir log, say 12in. diameter and 12ft. long. The scantling of a beam cut out of this log, according to the formula, would be 9 8in. by 6 93in; let the other be 6in. wide; its depth will then be 10.4in. Now applying the formula $W = c \frac{b d^2}{L}$ to these two beams we obtain—

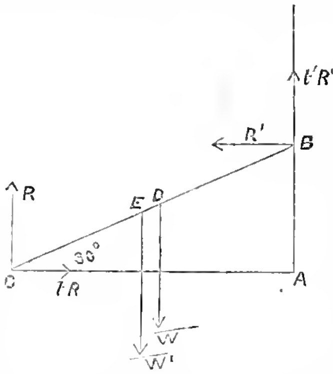
In the first—$W = 4 \times \frac{6.93 \times (9\ 8)^2}{12} = \frac{4}{1} \times \frac{6\ 93 \times 96}{12} = \frac{2661\ 12}{12} = 221.76$ cwt.; and in the second—$W = 4 \times \frac{6 \times (10\ 4)^2}{12} = \frac{4}{1} \times \frac{6 \times 108}{12} = \frac{\ }{12} = 216$ cwt. The former is, therefore, the stronger beam. In the same way it may be shown that the former is stronger than a beam of any other scantling cut out of this log. ∴ a beam cut according to the formula is the strongest beam that can be cut out of the log.—W. E. S.

[1145.]—STRENGTH OF JOINTS.—The relative proportions of the pin and head of the links composing the chain of a suspension bridge have been arrived at experimentally by Sir C. Fox, after the construction of the Kieff Bridge, in Southern Russia. He conducted three experiments. 1st, With a link similar to that used in Kieff Bridge, viz., O X = 10¾in. × 1in., a b = 4 5in., O¹ X¹ = 15.5in; this should have stood at least 210 tons, but it failed with 180 tons, by going at a and b, and a' and b'. 2nd. O X = 10¾in. × 1in., a b = 4.5in., O¹ X¹ = 18 5in. This one gave way with the same weight, and at the same places. This naturally led him to suppose that the bearing surface at a b was not sufficient. 3rd. O X = 10¾in. × 1in., a b = 6in., O¹ X¹ 16 5in, as shown in sketch. This was torn with 240 tons. He recommends a b = 6.5in.

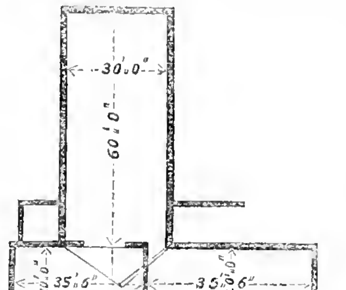


From this the rules are deduced:—1st, Two thirds diameter at O X = diameter of pin; 2nd, O X + a b = O¹ X¹.—C. D.

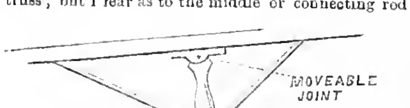
[1149.]—FRICTION.—The annexed diagram represents all the forces acting. R = reaction of the ground; R¹ of wall; D is the centre of gravity of the ladder, which is at its middle point; and E is the assumed point that the man has reached on the ladder just as it is on the point of sliding; therefore the frictions will act in the opposite directions to which the motion takes place, and are represented by t R and t¹ R¹; t and t¹ being the coefficients equating the several forces, and taking moments round C. R + t¹ R¹ = W + W¹ (1); R¹ = t R (2). W × C D × cos. B C A + W¹ × D E cos. B C A = t¹ R¹ × C B cos. B C A + R¹ × C B, sin. B C A from (1), and (2) $R = \frac{W + W^1}{1 + t\,t^1} = \frac{238}{1.3} = 183$ q. p. R¹ = t R = 183 × .6 = 109.8; substituting these values in (3) we have 84 × 15 cos. 30° + 154 C E cos. 30° = 54 9 × 30 cos 30° + 109.8 × 30 × sin. 30°; taking cos. 30° = .866 and sin. 30° = .5, and solving for C E, $C E = \frac{1982\ 1}{133\ 364} =$ 14.86ft. This the length up the ladder the man can go. If the vertical height be required, it = C E × sin. 30° = 14.86 × .5 = 7.43ft.—C. D.



[1151.]—ROOF CONSTRUCTION.—I feel somewhat interested in the inquiry made by "R School," having put on a roof precisely the same in construction to schools called Rector's Park Schools, Sunderland. The scantlings are very much the same, and plastered to the span; and, in addition to its own weight, each portion of the roof has on it an immense ventilator, as large almost as a small entrance lodge. When it was sparred ready for slating it was tested by a hurricane of wind, which, acting on the ventilators, brought the entire roof away from the gable wall, shaking and straining it tremendously. I got it forced back to its position, and, so far as I know, it stands all right and safe. I give a rough sketch of the plan of the building. The pitch of my roof appears to be much higher



than my friend's, for I find on referring to certain data the legs for the 30ft. span are 22ft., the rods 11ft. 6in. each, strut 3ft. Thus, so far as each leg is concerned, it is a complete truss; but I fear as to the middle or connecting rod



being right as a tie for a roof of a flat pitch. My own conviction is, that no principle which excludes the old-fashioned tie beam or tie rod from foot to foot is right or safe. I have put on a spandrel roof, which would certainly have come to grief; in fact, three of the legs did give way, and three of the spandrels broke, and tie rods had to be resorted to to prevent the entire roof falling in. I am thoroughly convinced that for a roof of the ordinary flat pitch it is neither wise nor safe to have anything but a good king or queen post, coupled with foot beam or rod. I cannot tell my friend the weight.—PRACTICAL BUILDER.

WATER SUPPLY AND SANITARY MATTERS.

A LOCAL paper says that the corporation of Sudbury has received a peremptory order from the Secretary of State, directing that body to proceed within fourteen days to take steps for the construction of waterworks for the town. The corporation has directed Mr. Hennell, engineer, of the Adelphi, to make a survey of the town.

Professor Frankland reports that the water supplied by the Southwark and Vauxhall Company which was "exceptionally contaminated" during August, September, and October, has now returned to its normal condition.

A new catchpit and interceptor has been invented by Mr Chesshire, of Newhall street, Birmingham. It consists of an iron box or tank, one corner of which is screened off by a coarse perforated iron sieve, which permits the aqueous fluid to pass directly into the drain, and retains its more solid matters. The bottom of the tank is covered with coarse cinders, with a layer of ashes above them, and it is then placed beneath a watercloset or dry seat, as the case may be. It is stated that only one seventeenth, or 6 per cent. of the solid matter passes through the interceptor, and that the contents retained contain 40 times more nitrogen and 300 times more phosphoric acid than the outflow fluid. The tank requires removal from time to time for the purpose of cleansing, the period varying according to the use made of it. The mode of fixing is simple, and the contents, when mixed with a sufficient quantity of earth, form a valuable manure. Mr. Chesshire states that it is the united presence of fœcal matter and water which alone gives rise to smell; and that the immediate separation in the interceptor purifies the drains and preserves the solid matters from unwholesome decomposition. The interceptor is to be tried at the Military Hospital at Netley. It is an apparatus well suited for particular places.

BUILDING AND LAND SOCIETIES.

THE members of the National Freehold Land Society held their quarterly meeting at the Guildhall Tavern, on Friday evening, 27th ult., Mr. Monro, one of the directors, in the chair. Mr. W. E. Whittingham, the secretary, read the account for the quarter ending October 30, as follows:—Receipts—Cash, July 31, 1868, £21,484 1s. 3d.; deposits from members, £132,709 4s. 1d.; advances to members repaid, £24,284 10s. 2d.; British Land Company, £49,417 6s. 7d.; other advances repaid, £29,032 19s. 6d.; entrance and transfer fees, £118 9s.; fees for surveying property, £119 15s. 6d.; total, £257,171 6s. 1d. Payments—Deposits withdrawn, £112,891 12s. 5d; advances to members, £29,398 11s. 1d.; British Land Company, £61,965 0s 10d.; other advances, £39,000; dividends and commission, £296 9s. 4d.; sundry expenses, £1,781 5s. 8d.; cash, October 31, 1868, £11,838 6s. 9d; total, £257,171 6s. 1d. The Chairman briefly moved the adoption of the report. The motion was seconded by Mr. Crellin. The report was adopted, and on the motion of Mr. Clarke, seconded by Mr. Smith, a vote of thanks was given to the chairman, and the proceedings terminated.

WAGES MOVEMENT.

THE master builders of Halifax have addressed a circular to the operative masons, requiring certain alterations in the trade rules now in force. From these it appears that the rules relating to the reckoning of time and quarter time and payment of wages are to be rescinded, and in future 7d per hour shall be the rate of wages for skilled workmen throughout the year; that all rules forbidding or interfering with the employment of machinery or machine-worked materials, or forbidding the use of stone worked at a quarry, or elsewhere than the place where it is to be used, are to be abolished. All trade rules, disputes, demands, and differences shall be settled for the future by courts of conciliation and arbitration. The masters also declare that at any time, upon six days' notice, they will be prepared to meet the men publicly to appoint arbitrators and mutually select an umpire. The alterations are to come into force on June 1, 1869. A circular has also been issued to the operative stone masons and bricklayers' labourers in the town, by which the ordinary rate of wages to be given throughout the year is fixed at 4½d. per hour. All disputes in this branch are also to be settled by courts of arbitration.

The board of arbitration lately established in the Potteries district, and which is composed equally of representatives of masters and men, have held their first sitting this week, the dispute submitted resulting in favour of the men. The subject was the preparation of clay for the use of potters. By a new process the labour of the men has been reduced, and at some works it has been sought to make a reduction of wages in consequence. This was resisted by the men, and the arbitration board was appealed to. The board decided that the deduction ought not to be made. Thus the board adopt the view of the men that, if they are saved some trouble, the masters are benefited by the improvement of their ware under the new process.

A partial strike has taken place among the masons of Blackburn, but is at present confined to a single establishment. The men have struck for the express reason that there are some other men (non-society men) working stone at the quarry. The masons refuse to allow the stones worked by these men to come on the ground at Blackpool, or, being on the ground, as they now are, they will only fix them in case the firm will send no more, and will allow these to be reworked.

STAINED GLASS.

LAST week a window was placed in the south aisle of the parish church of Knaresbro', in memory of the late Mr. and Mrs. Powell. The subjects represented are the six corporal works of mercy mentioned in St. Matthew, 25th chapter, verses 37, 38, 39, and 40. The window has been designed and executed by Messrs. O'Connor, 4, Berners street.

The west window of the north aisle of St. Andrew's, Wells-street, has been filled with painted glass. The treatment is one of grisaille, with scarcely any colour. The upper lights are filled with angels playing upon instruments of music, and the lower ones with full-sized figures of King David, Miriam, the Blessed Virgin, and St. Simeon. Messrs. Clayton and Bell are the artists.

STATUES, MEMORIALS, ETC.

THE whole of the statues are now placed in their respective niches in the ornamental parade facing the Speaker's residence in New Palace-yard. These statues are placed in the following order, viz., Alfred the Great, William the Conqueror, Henry II., King John, Henry VIII., and William III. The two last were only placed on their pedestals on Tuesday week. These six statues have all been sculptured by foreign artists.

A memorial brass in the mediæval style, sunk in a slab of black Irish marble, has recently been placed in Elvaston Church, Derbyshire, to the memory of the late Earl of Harrington. The brass was executed by Messrs. Hart and Sons, of Wych-street.

NOTICES OF BOOKS.

An Elementary Course of Plane Geometry. By RICHARD WORMELL, M.A., Medallist in Mathematics and Natural Philosophy (London), author of "Arithmetic for Schools and Colleges." London: Thomas Murby, 32, Bouverie-street, Fleet-street, E.C.

IF the draught of knowledge could be rendered more agreeable to the mental palate than it generally proves, in all probability we should be a better educated people than we are. But it frequently occurs that, notwithstanding the valuable effects that are to follow the reception of the potion, the taking of it is attended with so bitter a taste that it is only the minority who have the courage to undergo the trial. At the present time the axiom still holds true that "there is no royal road to the acquisition of knowledge," but it will be nevertheless universally admitted that of late the "road" has been very much improved and its surface rendered smoother for the feet of the wayfarers. The author of the volume on our table has succeeded in investing the subject with a considerable amount of practical attraction, and illustrates each point by an appeal to the common sense of the student, in a manner that at once enlists his interest and arrests his attention. Lines and planes, angles, circles, and triangles are described in detail, and the T-square, the level, plumb line, and square introduced, to show the application they have to the rudiments of other branches of education, and how they bear upon many points of technical and professional training. At the end of every chapter a number of questions for self-examination are added, sufficient to enable the learner to fix, by means of their solution, the substance of the chapter in his memory.

Besides investigating the usual problems and examples occurring in plane geometry, considered solely with reference to figures, Mr. Wormell treats the subject in accordance with the strict meaning of the term, signifying the measurement of the earth. He illustrates the use of the surveyer's ordinary cross staff, by which lines or offsets are set off at right angles to the base or main lines,—gives briefly the principle of determining the relative level between any distant points. We think the "diagonal scale" might have been omitted, as it is entirely obsolete now, having completely been superseded by the more accurate and convenient plotting scales. The proportional compass and the pantagraph are also alluded to, and their use described. What is termed the oblique semi-oval, our engineering and architectural readers will recognise as the elevation of the arch of a skew bridge, the section of which on the square is a semicircle. The method given by the author will be found useful for drawing in the elevation when plotting a bridge design on the skew. Excellent rules are afforded for finding and delineating the curves of the Ionic volute, the involutes, and the figures of star polygons. These latter may be accomplished with equal facility either by reduction or extension. One of them, the star pentagon, is frequently used in ornamental work, and forms a prominent feature of what is called the Gothic rose. We consider this little volume to be well calculated, from its general style and method of treating the subject, to spread the knowledge of plane geometry among many who, for the reasons given at the commencement of this article, have hitherto held aloof from the study of that which they had been accustomed to regard as a distasteful and difficult branch of learning. A perusal of the first chapter will be sufficient to dispel this idea, and the farther the student advances the better reason he will have to be pleased with his task. In addition to the usual diagrams necessary to elucidate the principles and propositions enunciated in the text, there are a large number of drawings and cuts of the mathematical instruments alluded to, together with several very good examples of Gothic tracery and tesselated pavements, cornices, and mouldings. The type is clear and large, and each problem is stated previously to its demonstration, and printed in strong black letters, so as at once to arrest the eye. The whole get-up of the book is plain and unpretending, but exactly what is suited to its pretensions and the class of readers it will have especial attraction for, although it might be read and studied with advantage by every amateur tyro as well as professional.

The Mechanic's and Student's Guide in the Designing and Construction of General Machine Gearing, as eccentrics, screws, toothed wheels, &c., and the drawing of rectilineal and curved surfaces, with practical rules and details. Edited by FRANCIS HERBERT JOYNSON, author of "The Metals Used in Construction." Edinburgh: William P. Nimmo. 1868.

THE "gearing" of wheels, and the manner in which "racks," "pinions," "levels," and "spurs" act so as to transfer and communicate motion in various directions, and at almost any distance, is always a fruitful source of bewilderment to those who commence the study of mechanical engineering. Yet all the movements, no matter in what direction or of what order of curve they may belong to, can be accurately defined and set out on paper previously to the erection of the machinery. In fact, the correct delineation of the proper curves, the form of the teeth, their pitch and number, must be all precisely ascertained before the patterns can be made for the use of the foundry shop. The little work before us consists of a selection of practical problems bearing upon the handicraft of the mechanical engineer and the millwright. The majority of the numerous combinations that prevail in the practice of mechanics, and to which is to be attributed the almost marvellous effects produced, are worked out by diagrams and drawings made to scale, so that the student and beginner can trace every successive step by which the desired result is obtained. Chapter IV. will be found particularly interesting and instructive. It contains details and calculations connected with shafts, pulleys, and pedestals, together with several tables for facilitating the determination of their dimensions and effecting a saving of time and labour. We are glad to observe that the author recommends the adoption of wrought-iron shafts rather than cast. The violent strains of torsion to which large and heavy shafting is liable render it almost necessary that a less brittle and more reliable material should be chosen for the purpose.

In computing the diameters of shafts, the horse-power of the engine working them and the number of revolutions that the shaft has to make per minute must be given as the principal data for the calculation. All shafts may be divided into two classes—prime movers and secondary ones. The former are connected directly with the engine or other motive power, and the latter derive their motion from the former. Putting C for the constant, D for the required diameter, H the horse-power of the engine, and R the number of revolutions per minute, we have $D = C \times \sqrt[3]{\frac{H}{N}}$

This rule is generally applicable, but the value of the constant C varies. In wrought-iron prime movers it is 7; for wrought-iron secondary shafts it is 5·25; for cast-iron prime-mover shafts it is 7.5, and for cast-iron secondary ones, 6. Probably steel will come into extensive use for heavy shafting, not so much on account of its more power to transmit motion with a less amount of material, but for the superior resistance it offers to a strain of torsion. Supposing the same work were required to be done by a couple of shafts, one of which was of wrought-iron and the other of steel, then the diameter of the former being represented by unity, that of the latter would be equal to 0.86. As the diameter of the steel shaft is smaller than that of the iron one, its weight will also be less. Their relative weights will, in fact, be in the proportion of $(1)^2$ to $(0.86)^2$. There is another advantage that is possessed by steel over iron in this respect. It is in a very great diminution of friction between the rubbing surfaces. If unity represent the power necessary to overcome the friction of a wrought-iron shaft, then 0.625 will be a fair estimate of that required in the case of steel. The absolute strength of the two metals to resist a transverse strain is nearly equal, there being a trifling advantage in steel, but not amounting to more than about, on an average, two per cent. A chapter upon the geometrical problems likely to be of service to the mechanical draughtsman and designer brings the work to a close. Many of these are to be found in the ordinary treatises upon that particular branch of art, especially in those we have lately reviewed in the columns of the BUILDING NEWS. At the same time a few have been introduced possessing no especial interest for any persons except those intending to become mechanical engineers and millwrights. There are eighteen diagrams and plates attached to the volume, some of which are drawn to scale, and the whole are highly illustrative and explanatory of the contents of the text. We are of opinion that Mr. Joynson's little book will be found of great use in the drawing office, where calculations are always in progress for ascertaining the proportions of wheels, shafting, pulleys, plummer-blocks, and the numerous other details of mechanical appliances both on a large and a small scale.

RAILWAY ITEMS.

IN addition to the proposed new metropolitan railways referred to in our two last numbers, plans have been lodged in the Private Bill Office of the House of Commons for the following schemes:—A new underground railway from the southern end of London Bridge to Clapham Common, which will be for the entire distance under the highway, and will be provided with numerous ventilating shafts; a new line to be called the "Metropolitan and Islington," extending from the Metropolitan line in Clerkenwell to Cloudesley-road; and a new "Eastern Metropolitan Underground" line, from the City to the East, viâ Whitechapel and the Mile-end Road. The works of the Waterloo and Whitehall line on the pneumatic system, carried under the Thames in an iron tube, which have so long been stopped, are to be revived, and a bill has been lodged for the extension of the line from Waterloo Station to the Elephant and Castle.

The promoters of the new Brighton line are sanguine of the success of the undertaking, should the bill pass. There are only two tunnels on the line, one at Gipsy-hill, 187 yards long, and one near the point where the line will cross the Reading branch of the South-Eastern Railway. The gradients are easy throughout, nine-tenths of the route being on level reaches, and the curves are all on long radii. There are no viaducts on the line, and no embankments worth mentioning. The Brighton station will be near the Pavilion, on a low level. The cost of the line is estimated at one million and a third sterling. The promoters propose to insert in their bill their maximum fares, which, being moderate, will make the line a popular one.

On Thursday week the directors inspected that portion of the Metropolitan District Railway between Brompton and Westminster Bridge, which is now nearly completed, and will be shortly opened. Messrs. Kelk, Waring Brothers, and Lucas are the contractors.

Our Office Table.

It is believed that one of the first measures to be introduced into the new Parliament will be a bill altering the constitution of University College, and enlarging its objects so as to include the promotion of the fine arts.

The question as to whether the decision of the Metropolitan Asylum Board in respect of the plans for the Hampstead Hospital was fairly arrived at it is likely to come under the notice of the law courts.

Messrs. Christie, Manson, and Woods have received instructions to sell the property of the late Sir Charles Eastlake, P.R.A., on Monday next. The magnificent art library, however, which was formed by Sir Charles with great labour and zeal, is not to be dispersed, the trustees of the National Gallery having arranged to purchase it. The public will thus have the opportunity of consulting the many and rare works contained in it.

At the last meeting of the Academie des Beaux Arts M. Charles Blanc was elected to fill the vacancy caused by the death of the Comte Walewski. At the same meeting the honorary membership vacant by the death of Dr. Waagen was filled by the election of Mr. Charles Perkins, a well-known American writer on art, and author of "Italian Sculptors, being a History of Sculpture in Northern, Southern, and Eastern Italy," and of "Tuscan Sculptors."

The Liverpool Corporation recently purchased a steam roller for the purpose of levelling and smoothing newly-made and mended roads. In that capacity the monster (locally known as the "demon crusher") has been a great success; but it is reported to have so injured the network of gas and water pipes in the streets in which it has been used that the corporate authorities have determined to greatly decrease its weight or cease using it altogether.

Mr. Graves, the well-known printseller and publisher, has just prosecuted a person named Solomon Alber, of Great Prescott street, Whitechapel, for pirating his copyrights by means of photography. According to the police reports, Mr. Graves is made to say that "the painting and engraving of the 'Railway Station' cost him £24,000." This, says a contemporary, is a statement needing considerable qualification. It appears that a person now dead, who made the matter one of pure speculation, succeeded with a great outlay of time and money, in getting many hundreds of people to subscribe to the plate. In the aggregate the promises to take impressions amounted to very nearly £18,000 or £20,000. It was for the subscription book, with the picture and plate, that Mr. Graves paid his money. This puts a very different face on the matter.

Hackney Union, says the *Parochial Critic*, has had a piece of luck. They have found an architect who will increase the accommodation in their workhouse at Homerton, from that for 108 able-bodied paupers up to 350, including dormitories, day-rooms, work-rooms, at a cost of not more than £30 per head for the new building, and £6 per head for the alteration in the old; the total cost being £7,900 or £8,000. Contrast this with the £50,000 and £60,000 expenditure, and the rate of £60, £70, and even £80 per head called for by the Poor Law Board in some of the metropolitan parishes. The name of such an architect deserves to be chronicled. It is Mr. Lee; and if we remember rightly the Poor Law Board recommended him to the Hackney Guardians. Would that they could find a Mr. Lee for every parish!

Mr. Barkentin, says the *Ecclesiologist*, has in hand, from the designs of Mr. Burges, a new chalice for St. Andrew's, Wells-street—the gift of an anonymous contributor. On the base of the chalice will be six large medallions, representing respectively the Crucifixion, the Blessed Virgin, St. John Evangelist, St. Andrew, the Annunciation, and (on the sixth) a fragment of that gilded glass, of early Christian date, of which some rare specimens have from time to time been found in the catacombs. This fragment is the gift of Mr. Burges. The knob will have six enamels, representing the Four Rivers of Paradise, and the Tree of Life and the Tree of Knowledge. The bowl will be encircled round its base with eight enamelled medallions, all being types of our Lord from the animal creation: viz., the Agnus Dei, emblem of His Innocence; the Pelican, emblem of His meritorious Death; the Lion, emblem of His Resurrection; the Eagle, emblem of His Ascension; the Antelope, emblem of His loftiness of soul; the Phœnix, emblem of His new Life; the Ox, emblem of His Sacrifice; and the Swan, emblem (by its dying song) of the voluntariness of His Death.

The Municipality of Vienna have resolved upon the erection of a new townhall, and invite architects of all nations to send in plans conformable with certain regulations which are to be obtained from the Austrian Consul-General in Paris.

The other night the tower of St. John's Church, Goole, was burnt out, as was the transept underneath, including the pulpit and desk. The fire was owing, it is believed, to the defective fitting of a "sunlight."

We regret to notice that the "Ecclesiologist" is to be discontinued. That periodical has now been in existence nearly twenty-seven years, and in conjunction with the Ecclesiological Society has done good suit and service for art. In concluding with natural regret their final number, the editors state that it is abandoned now because higher duties claim the less divided attention of those who have conducted it from its commencement to its close.

With regard to placing trees and shrubs near our public buildings, there is a curious example in what may be called the grand front in Pall Mall, of that anomalous structure, St. James's Palace. There is a place fenced off with common area railings, and paved. This is now decorated with three scrubby shrubs, in odd tubs and pots, very probably placed there by the messenger under whose windows they are. In France there would be some architect of the palace who would prevent the spontaneous growth of abnormal excrescences, and who, if plants were wanted, would obtain them from the palace gardens. Next year perhaps a few orange trees will replace the shrubs and relieve the brick wall.

In addition to the £250,000 bequeathed by Mr. Peabody for improved house accommodation for the poor of London, he has now granted an additional £100,000 for the same purpose, making in all the unprecedented sum of £350,000. What else Mr. Peabody means to do he has not said But it now appears that his last gift was, as he says, "in pursuance of an intention which I have entertained since the creation of the fund." Who knows but what he means to make it half a million sterling. When it is borne in mind that Mr. Peabody has been granting similar sums for similar purposes in America, it will be admitted that he occupies the highest place among the merchant princes of the world who have bequeathed benefactions for the benefit of the poor.

Something of the noble spirit of the mediæval artists is to be found in Dr. Manning's recent utterances respecting the new Roman cathedral in Westminster. It was natural for men to ask when the building would be finished, and if there would be a probability of its consecration by Dr. Manning. The archbishop says—"I hope not, for if the cathedral were to be finished in my day it would not be a metropolitan church worthy of England." The grand style in which Dr. Manning works may be inferred from the fact that three acres of ground have been bought for the purpose at the West-end of London, and with an independent frontage on almost every side, at a cost of £36,000. The building is to be constructed upon the largest proportions of scale, and in the Early English style, as "a sound judgment prevails in favour of grandeur, stateliness, solidity, spaciousness, and majestic elevation." If Dr. Manning's grand resolve is steadily maintained, art and religion will have once more combined to produce a noble result.

The forty-first annual report of the Council of the Royal Scottish Academy has been issued. The Council congratulate the Academy on the marked increase in the prosperity which, during their term of office, has rewarded the labours of the institution. The last exhibition is stated to have been the most successful ever held by the Academy both as regards the number of works sold and the number of visitors. The sales amounted to £7,000, being an increase of £1,000 on the preceding year.

It is calculated, on pretty accurate data, that the quantity of granite quarried annually in Aberdeenshire is upwards of 80,000 tons, and of that nearly 40,000 tons are exported. The number of tons of granite exported from Aberdeen from 1840 down to the beginning of 1868 were:—1840, 25,557; 1850, 30,385; 1860, 24,666; 1865, 32,023; 1867, 43,790; 1868 (to 30th September), 31,600.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Engineers.—The annual general meeting, 7.30.
Royal Institute of British Architects.—"Notes on the Celtic, Roman, Moorish, and other Architectural Remains in Algeria," by Professor T. H. Lewis.
Geographical Society, 8.30.

TUESDAY.—Institution of Civil Engineers.—"On Machines employed in Working and Breaking down Coal, so as to Avoid the use of Gunpowder," by Mr. Samuel Parker Bidder, jun., Assoc. Inst. C.E., 8.
Anthropological Society, 8.
Statistical Society, 8.

WEDNESDAY.—Society of Arts.—"On Artificial Freezing," by Dr. B. H. Paul, 8.

THURSDAY.—Linnean Society, 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

748 C. SCHOLEFIELD. HANGING WINDOW SASHES. Dated March 4, 1868.

This invention consists in connecting the sashes by means of two cords (or other pliable material), hereafter called the suspender, being attached to a top corner or some other part of each sash. Each suspender is then passed over a pulley or pulleys, shoe or shoes affixed over each sash. By this arrangement one sash balances the other in all positions, so that, when either the higher or lower sash is pulled down or raised up, the other sash ascends or descends a corresponding distance.—Patent abandoned.

777 J. EASTWOOD. MACHINERY FOR PREPARING SIZE. Dated March 6, 1868.

This invention relates, first, to the "dashers" employed in the washing of flour in the preparing of size, and consists in constructing such dashers or square shafts with a pair of flanges or collars thereon, betwixt which is received the fork of a lever working on a fulcrum; this lever is for the purpose of raising and lowering the dashers, as required, or, where convenient, pulley blocks may be employed. Second, to further improvements in the apparatus employed for heating and boiling size or other glutinous compounds, for which letters patent were granted to the present patentee in the year 1865 (No. 2883).—Patent completed.

801 F. J. BAYNES. KITCHEN RANGES. Dated March 7, 1868.

According to this invention, the inventor claims, first, in the mode of arranging bars of kitchen ranges, or other cooking stoves, to be actuated so that they may be capable of being turned at one time into a position to form part of the front of the fireplace, and at another time of being turned up to reduce the size of the fire as well, and in supporting it, substantially as described Also in the application of supporting, or bottom, bars to kitchen ranges in position at or near the line of the flue passages under the top plate, to the oven and boiler as stated. Second, the arranging kitchen ranges with boilers *m* and *n* to be heated in manner, substantially as described. Third, the arranging ash pans with screens or sinder sifters, substantially as explained.—Patent completed.

810 Lieutenant Colonel A. F. BAIRD. EARTH CLOSETS. Dated March 9, 1868.

This invention has reference to improvements applicable to earth closets, and is a further development of the invention patented by the present patentee, dated August 15, 1867 (No. 2351.) As in the former arrangements he has a hopper for supplying the earth to a shoot or valve or flap box, and a weighted flap or valve working therein, whereby the deodorising earth is supplied to the receptacle for excrementitious deposits; but in lieu of the arrangements for putting the closet into and out of action, described in the specification above referred to, he adopts the following arrangements:—He makes the weighted flap or valve (which is to move on its pivots or axle having bearings in the shoot or valve box) with its weighted portion at a right or other angle to the non-weighted portion, which latter has a part or projection thereof or therefrom so curved or formed that, being of sufficient size, it shall act as a flap or valve for closing the entrance from the hopper at the same time that the weighted portion is, leaving open the entrance from the shoot or valve box to the receptacle for deposits, by which new arrangements the valve or flap itself can thus be provided with a cavity or portion into which the dry earth is to be received from the hopper, and discharged by the action of the mechanism into the receptacle for excrementitious deposits, and thus also act as a measure for measuring out a sufficient quantity of dry earth at each action, and no more. At the angle at back (though any other convenient position may be adopted), another smaller projection is provided, so that, by having a rod or rail attached to the seat of the closet by means of side pieces or portions of the seat (which is to be a moving seat, as in the arrangements formerly specified under the patent above referred to), such seat will cause the flap or valve to open the hopper to the shoot, and the shoot to the receptacle for deposits, as may be required.—Patent completed.

Trade News.

TENDERS.

DERBY.—For sewering and completing Dashwood and Belgrave streets, Derby. Mr. George Thompson, borough surveyor, engineer:—

Tomlinson	£448
Thompson	425
Harpur	423

FINSBURY.—For erecting warehouses in Ropemaker-street, Finshury, for Messrs. Bartholomew and Son. F. G. Widdows, Esq., architect. Quantities supplied:—

Enoor	£6197
Webb and Son	6130
Chesham	5794
Colls and Son	5684
Bishop	5650
Newman and Mann	5586
Pritchard	5557
Henshaw	5347
Brass	5329
Browne and Robinson	5280
Kilby	5227
Hill, Keddell, and Waldram	5196

GONSTONE.—For erecting new Infirmary, &c., Godstone Union. Mr. A. R. Stanning, architect:—

Knight, Dover	£3900
Morris, East Grinstead	3899
Worsell, Oxted	3891
Cooper, Banstead	3600
Galyer and Moore, Godstone	3550
Sherewood, Lambeth	3540
Cooke, Redhill	3535
Grover, Islington	3495
Barnes, Nutfield	3400
Kesterton and Head, Lingfield	3293
G. Smart, Battersea	3250
Webb and Sons, Bow	3250
Dannel, Bletchenly	3200
Henshaw, London	3164
Till, Hampstead	3150
Macey, London	3109
Colls and Sons, London	3080
Bayes, Enfield	3072
Nightingale, Lambeth	3063
Knight, Addiscombe	3059
Regis, Redhill	3050
W. W. Johnson, Paddington (too late)	3049
Woodward, Finshury (accepted)	2900
Constable and Baker, Highbury	2890
R. Dye Gage, Redhill	2510

LONDON.—For alterations to the Barley Mow Tavern, Smithfield. Haywood and Blashill, architects:—

Mather and Read	£295
Langmead and Way	280
Tully	277
Nind	235

PEVENSEY (Sussex).—For erecting two cottages at Pevensey, for the St. John's Hospital trustees:—

Jason Thompson (accepted)	£250

LEWISHAM.—For erecting six houses at Lewisham. Mr. Banks, architect:—

Belham	£2700 0
Smith	2623 0
Staines and Son	2478 0
Bennett	2451 0
Jackson	2435 0
Hanks	2400 0
Werell	2325 0
Raby	2217 0
Turner	2097 0
Harrison and Edwards	1880 0
Dixon	1910 0
King	1890 0
J. and W. Hobern	1798 0
Walker	1794 0
Blackman and Morley	1770 0
Ladd	1764 0
Williams	1740 0
Wise	1740 0
Pethick	1700 0
Hughesdon	1650 0
Bridel	1435 0
Heaysman	1388 10

STOKE-ON-TRENT.—For converting the old schools of the parish workhouse into hospital wards for imbeciles:—

Sutton	£736
Peace (accepted)	580

TONBRIDGE.—For erecting new Wesleyan schools at Tonbridge. Mr. Baker, architect:—

Wheatley	£798
Punnett	770
Woodroffe	760
Dove (accepted)	750

TOTTENHAM.—For erecting 44 almshouses, chapel, and lodge, with boundary walls, drains, &c., for the Worshipful Company of Drapers, at Elmslea, Tottenham, Middlesex. Mr. Herbert Williams, architect. Quantities supplied by Mr. Charles Reilly:—

Trollope and Sons	£15,989
Brass	15,667
Piper and Co.	15,391
Couder	14,997
Barnsley and Sons (Birmingham)	14,670
Ashby and Sons	14,165

COMPETITIONS.

INDIA.—Public Works' Department.—Competitive examinations for forty appointments in the Engineer Establishment in the month of December next. W. T. Thornton, India Office.

SOUTH METROPOLITAN SCHOOLS, SUTTON (Surrey).—February 2.—For designs for the erection of an infant establishment adjoining the present schools. Premiums of 40 guineas each for the three designs considered the best. J. Burgess, clerk to the managers, Vestry Hall, Walworth.

HARTLEY, WINTNEY, HANTS.—December 20.—For plans and specifications for the erection of a new church for the accommodation of about 700 persons. Mr. Wetherell, Hartley Wintney, Winchfield, Hants.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HAMPTON COURT AND WALTON BRIDGES.—December 16. Tender for tolls. Mitre, Hampton Court.

LEWISHAM.—For the construction of six houses.—W. C. Banks, architect, 39A, Gracechurch-street, City.

CROYDON.—For about 2,000ft. or 3,000ft. of York paving. Mr. T. L. Robinson, High street, Croydon.

ST. GILES'S, CAMBERWELL.—December 21.—For the re-erection of Taylor's Bridge. G. W. Marsden, clerk, vestry hall.

DERBY.—December 14.—For the woodwork and roof for carriage shed at Derby Station, and for additional offices at Leicester. J. Moore, secretary pro tem., Midland Railway, Derby.

NEWCASTLE-ON-TYNE.—December 16.—For lighting the barracks with gas. Colonel W. G. Hawley, R.E. Office, Manchester.

STRATFORD.—December 7.—For lighting and warming the new townhall. C. Wilson, Rokeby House, Stratford.

UPPER MOOR, BODENHAM, HEREFORDSHIRE.—For the erection of new farm buildings, and alterations to farm house. F. R. Kempson, architect, 34, Castle street, Hereford.

ARSLEY, NEAR BIGGLESWADE.—December 18.—For alterations and additions to the vicarage. W. Watson, Esq., surveyor, Henlow, Biggleswade.

PROPERTY SALES.

NOVEMBER 30.

AT THE MART.—By Mr. Murrell.—Leasehold six houses, partially built, situate in Malvern road, Cambridge road, Kilburn Park, term 99 years from 1864, at £8 8s. per annum—sold for £160.

Leasehold residence, No. 8, Arlington street, Piccadilly, term 3½ years unexpired, at £80 per annum—£300.

Leasehold five houses, Nos. 1, 2, 5, 6, and 7, Ainger terrace, Ainger road, St John's wood, annual value £325, term 99 years, from 1862, at £9 each per annum—£500 to £530 each.

DECEMBER 1.

At the Mart.—By Messrs. Glasier and Sons.—Copyhold two cottages, Nos. 1 and 2, The Vineyard, Mortlake, producing £18 12s 8d. per annum—£150.

Freehold residence, known as Lasswade House, Westwood Park, Forest Hill, let on lease at £106 per annum—£1,560.

Freehold house and shop, No. 16, New street, Covent Garden, let on lease at £105 per annum—£2,040.

By Mr. Frank Lewis.—Leasehold premises, No. 173, Fleet street, term 21 years from 1857, at £140 per annum—£120.

Leasehold premises, No. 55, Exmouth street, Clerkenwell, let at £60 per annum, term 47 years unexpired, at £8 per annum—£450.

DECEMBER 2.

By Mr. Saffell.—Freehold house and shop, No. 4, Union terrace, Commercial road East, let at £70 per annum, and a building in the rear in Caroline street, let at £20 per annum—£1,370.

Leasehold two houses, Nos. 1 and 2, Paddington road, Westbourne Park, term 95 years unexpired, at £15 per annum—£635.

Leasehold two houses, Nos. 1 and 2, Blagrove road, Paddington road, annual value £33 per annum, term 95 years unexpired, at £7 each per annum—£485.

By Messrs. Prickett and Son.—Freehold plot of building land, situate at Finchley—£85.

Freehold plot of land, situate at Finchley—£87.

Freehold plot of land, situate at Finchley—£56.

Freehold plot of land, situate at Finchley—£20.

Freehold building land, situate in Chetwynd road, Kentish Town and Upper Holloway, in 16 lots:—Lot 1, £92; lot 2, £80; lot 3, £87; lot 4, £90; lot 5, £90; lot 6, £88, lot 7, £269; and lot 13, £89.

DECEMBER 3.

At the Mart.—By Mr. G. B. Houghton.—Freehold two residences, known as Isabel cottages, Nos. 4 and 5, Pemberton road, East Moulsey—£585.

By Messrs. R. and J. E. Low.—Leasehold stabling, No. 4, King's Arms yard, Glasshouse street, Regent street, let at £40 per annum, term 23 years unexpired, at a peppercorn—£325.

Leasehold stabling, Nos. 2 and 3, King's Arms yard, Glasshouse street, Regent street, term 14 years unexpired, at £81 per annum—£105.

By Mr. W. H. Moore.—Leasehold three houses, Nos. 12, 19, and 20, Georgiana street, Camden Town, let at £36 per annum each, term 72 years unexpired, at £4 each per annum—from £400 to £425 each.

Leasehold house, No. 33A, Cardington street, Hampstead road, let at £45 per annum, term 24 years unexpired, free from groundrent—£435.

Freehold house, No. 27, Cardington street, let at £45 per annum—£730.

Leasehold house, No. 89, Charrington street, Camden Town, annual value £60, term 81¼ years from Michaelmas last, at £5 per annum—£6.5.

Leasehold house, No. 101, Ossulston street, Euston road, let at £40 per annum, term 12 years unexpired, at £3 10s. per annum—£205.

Leasehold improved groundrent of £7 per annum (for 53 years) arising from No. 21, Roberts mews, Hampstead road—£100.

Leasehold improved groundrents of £11 10s per annum (for 80¼ years), arising from No. 1, York place, York road, Wandsworth road—£2 0.

Leasehold two residences, Nos. 34 and 35, Rochester road, Camden road, Camden Town, producing £95 per annum, term 50 years from 1854, at £12 per annum—£990.

Leasehold house and shop, No. 4, Aberdeen place, Stoke Newington, let at £55 per annum, term 50 years from 1863, at £10 per annum—£450.

At Garraway's.—By Mr. Fairbairn.—Freehold estate, comprising about 2¼ acres of land, with plant and machinery, situate at Buckhurst hill, and known as Watkins's Patent Steam Brick Factory—£1,900.

DECEMBER 4.

At the Mart.—By Messrs. Wilkinson and Horne.—Leasehold premises, No. 79, Lombard street, City, term 80 years from 1854, at £200 per annum—£13,500.

Leasehold premises, No. 90, West Smithfield, and No. 29, King street, Snowhill, term 17 years unexpired, at £125 per annum—£5,160.

DECEMBER 8.

At the Mart.—By Mr. Murrell.—Leasehold estates, comprising Esgairhir and Esgairfraith Lead and Copper Mines, in the parish of Llanfinangelgenewrglyn, in the county of Cardigan, together with buildings and plant, area about 1,3.5 acres, term 21 years from 1854, at a Royalty of 1-14—£540.

By Messrs. Owen and Jameson.—Freehold house, No. 2, Princes street, Rotherhithe, annual value £28—£235.

BATH STONE OF BEST QUALITY.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Robert Charles Barbee, Wood green, builder, December 23, at 11—Edward Brown, Dale road, Kentish Town, builder, January 11, at 11—Robert Hammond, Liverpool-street, City, and Colville gardens, Notting hill, civil engineer, December 21, at 1—John King, Bloomfield road, Mile end, builder, December 18, at 11—Samuel John Longley, Great Dover street, Borough, builder, December 18, at 1—Alfred William Routledge, Millman street, Bedford row, and Hand court, Holborn, builder and cabinet maker, December 21, at 12—William Thomas Seal, Richmond, Surrey, builder, December 23, at 1—James George Surrey, East Greenwich, plasterer, December 29, at 11.

TO SURRENDER IN THE COUNTRY.

Robert Kirkwood, Newcastle-upon Tyne, plasterer, December 18, at 12—Henry Lees, Bardsley, engineer, December 21, at 11—George Peacock, Redfield, Gloucestershire, carpenter and builder, December 23, at 12—Robert Riches, Norwich, carpenter and cabinet maker, December 18, at 11—James Ashton, Woolton, near Liverpool, builder, December 14, at 12—John Bell, Stockton, joiner and builder, December 16, at 11—Henry Burrage, Brighton, plumber and glazier, December 19, at 11—John Caine, Hulme, joiner, December 17, at 9.30—John Hopwood Deady, Manchester, builder, December 16, at 11—John Tebbutt, jun., Rowell, Northamptonshire, builder, December 11, at 12—Thomas Witt, Stoke Damerel, engineer, December 14, at 12.30.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 14, J. Beale, Richmond road, West Brompton, builder—January 14, C. Wisher, Pitt street, Commercial road, Peckham, builder—January 18, C. Cornes, Hammersmith, carpenter and joiner—January 18, A. H. Angell, Chalvey, near Slough, builder—December 30, R. J. Jones, Liverpool, builder—January 12, M. Duckworth, Upper Pollard street, stonemason—December .., S. Cave, Tunbridge Wells, builder—January 22, H. Sharman, Lacemere, builder—December .1, G. Raves...ft, Crewe, builder—December 18, W. Brown, Hat...ley, plumber and glazier—December 2., W. E. ... Manchester, ... and builder—January .., W. J...s, Macclesfield, builder—January .., O. Davies, D...gely, builder.

PARTNERSHIPS DISSOLVED.

Buchanan and ...althard, D...ke street, Westminster, civil engineers—Farrar and D...t, Bradford, Yorkshire, joiner and builders—Lu...r and Co., Moorgate street and Birmingham, galvanised iron manufacturers—G. P...ck and G. Gibbings, Leyton, builders.

DIVIDENDS.

December 28, R. Harradine, ...e street, Edmonton, builder—December 18, F. Scurr, Darlington, joiner.

DECLARATION OF DIVIDENDS.

J. Abbot, Newton heath, near Manchester, joiner, div. 1s 9½d—J. Potts, Adswood, near Stockport, brickmaker, div. 6s 11d—Capner and Jones, Birkenhead, timber merchants, div. 3s 6d.

BANKRUPTCY ANNULLED.

Charles Robert League, Devonshire road, Wandsworth road, and Old Jewry, surveyor and auctioneer, November 30.

SCOTCH SEQUESTRATIONS.

William Summers, Glasgow, glazier, December 14, at 12—Frederick Smith, St. Andrews, glazier, December 12, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load Drawback, 1s.

Teak ......load	£10	10	12	10	Archangel, yellow ..	£10	10	£12	5
Quebec, red pine	3	10	4	15	St. Petersburg, yel...	10	0	12	0
,, yellow pine..	3	0	4	8	Finland	6	5	8	0
St. John N.B. yellow	0	0	0	0	Memel........	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	0	9	10
,, birch........	3	15	4	15	,, white	8	0	9	0
,, elm	4	0	4	17	Gefle, yellow	9	0	10	10
Dantzic oak	4	5	5	15	Soderham	9	0	10	10
,, fir	2	10	4	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	10	13	13	0
Memel fir	2	10	3	0					
Riga	2	15	3	0					
Swedish	2	2	2	8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14		10
Masts, Quebec red pine	4	0	6	0					
,, yellow pine..	4	10	0	0	PUMICE STONE per ton	0	0	8	0
Lathwood, Dantzic, fm	5	10	6	10	OILS, &c.				
,, St. Petersburg	7	10	8	10	Seal, pale ....per ton	35	11	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	85	0	0	0
					Cod	30	0	0	0
					Whale, Sth. Sea, pale	34	0	0	0
Quebec, white spruce	13	0	18	0	Olive, Gallipoli......	65	0	64	0
St. John, white spruce	13	0	15	0	Cocoanut, Cochin, ton	51	0	0	0
Yellow pine, per reduced C.					Palm, fine	41	10	45	0
					Linseed	29	0	0	0
Canada, 1st quality	10	0	18	0	Rapeseed, Eng. pale..	33	15	0	0
2nd do......	11	5	13	0	Cottonseed	26	0	33	0

METALS.

LEAD—

Pig, English ....per ton	21	0	0	0	0	0		
,, Spanish Soft ...... do	18	7	0	0	0	0	} 2½	
Shot, Patent ...... do	22	0	0	22	5	0		
Sheet .... do	20	0	0	0	0	0		
White .... do	27	0	0	30	0		3	

COPPER:—

Sheet & Sheathing, & Bolt ....per ton	78	0	0	80	0	0	
Hammered Bottoms ...... do	85	0	0	0	0	0	
Flat Bottoms, not Hammered .. do	83	0	0	0	0	0	
Cake and Tough Ingot ...... do	0	0	0	0	0	0	} 3
Best Selected .... do	76	0	0	7-	0	0	
Australian .... do	70	0	0	0	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	6½	0	0	7	

IRON:—

Welsh Bars in London ....per ton	6	10	0	6	15	0	3
Nail Rod .... do	7	11	6	7	15	0	
Hoops .... do	8	6	0	8	0	0	} 2½
Hoops, Single ...... do	9	6	0	9	7	0	
Staffordshire Bars........ do	7	11	6	7	15	0	
Bar in Wales .... do	5	15	0	6	0	0	3
Nailrods .... do	7	12	6	7	15	0	3½
Foundry Pigs, at Glasg No 1 .. do	2	14	6	2	19	6	nett.
Swedish Bars .... do	10	0	0	10	10	0	2½

TIN:—

English Block ....per ton	103	0	0	0	0	0	
do Bar .... do	104	0	0	0	0	0	} 3½
do Refined .... do	106	0	0	0	0	0	
Banca .... do	101	0	0	0	0	0	} net
Straits .... do	101	0	0	0	0	0	

ZINC:—

English Sheet ....per ton	23	10	0	26	0	0	1½
*Devaux's V. M. Roofing Zinc .... do	27	0	0	0	0		

* And 4 per cent, discount if laid upon the new system

STEEL:—

Swedish Keg, hammered ......per ton	13	0	0	13	10	0	1½
Swedish Faggot .... do	0	0	0	0	0	0	

SPELTER:—

On the Spot ....per ton	20	0	0	0	0	0
QUICKSILVER ....per btl	6	17	0	0	0	0

REGULUS OF ANTIMONY

French .... ton	41	0	0	0	0	0

BREAKFAST.—A SUCCESSFUL EXPERIMENT.—The *Civil Service Gazette* has the following:—"There are very few simple articles of food which can boast so many valuable and important dietary properties as cocoa. While acting on the nerves as a gentle stimulant it provides the body with some of the purest elements of nutrition, and at the same time corrects and invigorates the action of the digestive organs. These beneficial effects depend in a great measure upon the manner of its preparation, but of late years such close attention has been given to the growth and treatment of cocoa that there is no difficulty in securing it with every useful quality fully developed. The singular success which Mr. Epps attained by his homœopathic preparation of cocoa has never been surpassed by any experiment list. Far and wide the reputation of Epps's Cocoa has spread by the simple force of its own extraordinary merits. Medical men of all shades of opinion have agreed in recommending it as the safest and most beneficial article of diet for persons of weak constitutions. This superiority of a particular mode of preparation over all others is a remarkable proof of the great results to be obtained from little causes. By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating round us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 18, 1868.

THE ART OF EVERGREEN DECORATION TO CHURCHES AT CHRISTMAS AND OTHER FESTIVALS.

THE decoration of our churches at Christmas and other festivals is a custom that has grown rapidly, and has developed an art of some importance to the architect and decorative artist. From early Christian times it has been a habit, and a very pleasing one, to decorate or strew with foliage and flowers the tombs of the departed, and this appropriate and beautiful token of reverence could not have long been withheld from the sacred edifices themselves. Time-honoured though the custom must be, everybody knows what miserable displays of evergreens decked our churches a few years ago, when a few straggling sprigs of holly stuck into all the conceivable crevices and suspended from lamp-brackets and tie beams formed the meagre stock garnishing of our sacred structures. Mr. Edward Young Cox, of the firm of Cox and Son, ecclesiastical decorators, of Southampton-street, Strand, has just issued a work on the art under consideration,* intended to serve as a practical compendium on the subject for the guidance of the most inexperienced amateurs. The author professes to consider the subject æsthetically, and, without discussing the vexed question of the proper limits for ecclesiastical decoration, gives a variety of methods and designs that may at least be suggestive. Without commenting on the manner our author has fulfilled his task, we may simply say that he has wisely treated the art as one hardly yet systematised and defined, and has chosen rather to give a variety of methods and rules than to lay down any precise principles of his own.

Allusions gathered from numerous sources, and extracts from "Brand's Popular Antiquities of Great Britain," are interesting, and prove that both before and since the Reformation the practice of decking churches with foliage and flowers was sanctioned, and the usage extended to other festivals besides that of Christmas. Spenser, in his "Shepherd's Complaint," touches on the custom of garnishing the posts and "kirke pillars" with "hawthorne buds," "sweet eglantine," and "girlonds of roses." This allusion appeared in 1579. Stowe, about the same time, mentions the custom of dressing houses, conduits, and standards, as well as parish churches, with "holme," "ivy," "bayes," and other green gifts of the season of Christmas; and many other references and churchwardens' entries show that after the revision of our ritual, and during the sixteenth century, flowers and foliage were used for the same purpose both at the Nativity and at other festivals, as Palm Sunday, Easter, Whitsunday. As Mr. Cox observes, the corruption of the evergreen shrub "holly" from "holy" is significant of the antiquity of the usage. The citations are amply sufficient to show that this mode of commemorative decoration is not new, and has been applied to houses and secular objects as well as to our Christian sanctuaries.

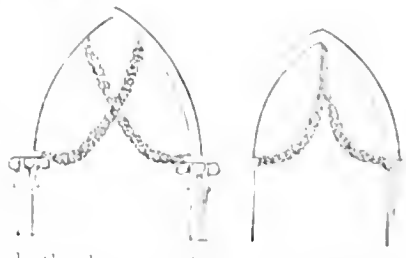
On the threshold of the subject we may stop to inquire, What should be the governing principles of such adornment? Should the architectural lines of the structure be followed as a basis, or should the ornamentation be placed quite irrespective of and at variance with it? The author takes Mr. Ruskin as his guide, and says, "An ordinary house decorator has no idea of colouring beyond that of 'picking' out the mouldings; and a large proportion of modern architects have not risen above this level of taste." Mr. Ruskin, in his "Seven Lamps," chap. IV., speaking of colouring, instances the stripes of a zebra, the leopard's spots, and the plumage of birds, to prove thereby that the variegation does not follow the anatomical and muscular systems, but is often opposed to them. He says, "Never paint a column with vertical lines, but always cross it." We cannot altogether agree with Mr. Cox or his authority. Ruskin's rule, "to simplify colour when form is rich, and *vice versa*," is certainly in favour of a *general* agreement of the constructive forms with the decoration; and, admitting the value of putting our decoration boldly on the plain or wall surfaces, we do not think the points of interest in form should be totally neglected, ignoring the unity and harmony of the two arts. Admitting even the analogy of nature we cannot see that purely conventional art should be subject to the same laws that govern the forms and adornments of the natural world, for it would be subjecting the reason of man to expect our decorative art to follow the markings on shells or the variegation of the animal world, especially its irregularities, as Mr. Ruskin would have us. We do not say, however, that the main lines and features of a structure should always be implicitly followed, but we contend they form the only reliable basis for decoration, or we sacrifice that homogeneity and connection so essential to the whole composition.

Beginning with the structure itself the decoration should be displayed along the nave walls or arcading, and Mr. Cox suggests two or three different modes of festooning or wreathing on the very applicable and simple principle of the catenary. A variety of effect can be produced in this way by considering the effects of suspending the wreath or trail from different points, and the method is at least inexpensive and easy, a great recommendation in these festive decorations. There is perhaps an objection to festooning, in a strictly-correct art sense; for our Gothic churches, it has rather too much of the Classic or Italian frieze character about it, and the suggestion of a series of equal festoons "all round the nave, either above the windows of the aisles or the arches," would certainly be open to the stricture. A double series of intersecting festoons is less open to the above remark, as also another variation, namely, a double series of festoons, the under one being suspended from the lowest points of

the upper series, as here shown. Better still, loops of foliage crossed at the ends.

We certainly prefer to follow the arch curves either by inserting into the hollows of the arch mouldings, or along the labels, bent splines or laths covered with foliage, to the method of Mr. Cox, namely, that of hanging large festoons across the arches below the openings

looped up with pendants in the spandrels. The lines of evergreen thus crossing the arch curves at nearly right angles cannot have a very pleasing effect, the opponent lines being too contradictory and sharp. A very pretty and much more effective manner of looping the festoons or wreaths would be to suspend them at the springings and apex of the arch or allow the two chains of evergreen to cross in the centre. The chancel arch might be thus treated.



In the chapter on the "Methods of Forming Wreaths of Evergreen" our author gives various ways of fastening the foliage. The most expeditious is to stretch the rope, which should be of the required length of the wreath, across the room at an easy height, and begin by disposing the sprigs of holly and bunches of berries round it, fastening with twine, and arranging the next bunches so that the stalks may be hidden, and tying a knot at every twist. The sprigs should be first assorted in heaps of different kinds, and bunches of berries inter-spersed through out the length. Instead of the twine, the twigs are better tied by fine copper or brass wire. The latter we recommend. Flat wreaths are preferred to round ones by some, and stout string or whipcord is a more pliable foundation for them than rope. For ladies, Mr. Cox suggests green worsted binding, the twigs, flowers, and berries being sewn on. This gives a broad, flat wreath, applicable for twisting round large columns. For foliated chaplets round capitals, "it is found a good plan to use a band of hoop iron with a hole punched in each end" for fastening by wire or string.

As there are generally deeply undercut members to capitals of pillars and always a necking, we prefer a simple wire or rope wreath to the above, which, at any rate, is troublesome if always obtainable at the moment.

The author recommends the use of yellow everlastings (*Anaphalium*) introduced here and there on the wreath in the same manner as holly berries, and they can be afterwards tied to the wreath at the most effective points. Several useful precautions are added for the benefit of wreath-makers—first, that all the leaves should be directed upwards; second, that the fewer nails or tacks used the better, to avoid injury to the plastering or stonework; and, lastly, that a sprinkling of water occasionally over the foliage will keep the wreaths fresh.

We cannot speak very favourably of some of the designs that illustrate this part of the subject. Festooning from capital to capital may be an easy but certainly not an artistic mode of adorning the nave; nor do we like the patches of surface foliage or diapering (shown in plate 2) partly filling up the spandrels, nor the tufts that, finial-like, crown the apices of the arches. The vertical trails hanging along the side walls are to our minds also unmeaning, and look too much like milliners' work; moreover, they would be apt to get disarranged. The trellis work formed of cross laths filled in with evergreen seems too heavy; but the cross diaper work shown on plate 1 or an evergreen trellising crowned with a cornice of leaves and berries or a flat band of foliage is certainly effective, and can be well and easily applied to relieve the wall surfaces below the springing of arches or between the windows. Of course the laths should be disposed diagonally in a Gothic building. A sparse sprinkling of leaves or a dotted appearance is always distasteful, and on this account we cannot approve of the dossel decoration formed of holly and berries tacked on in vertical lines. The design for a temporary reredos is weak and confused, and the sprigs of holly stuck at the summits of the arches are quite repugnant to Gothic taste.

For the columns or pillars we think the

* "The Art of Garnishing Churches at Christmas and other Festivals." By EDWARD YOUNG COX. With photographs, lithographs, and wood engravings illustrating the original designs of several architects, and numerous ancient examples. London: Cox and Son, ecclesiastical warehouse, 28 and 29, Southampton-street, Strand.

mode of adornment should much depend on the shape or section of them. A twisting wreath is simple and looks as well as anything. This may be crossed to form a diagonal diaper, as shown by Mr. Cox. For clustered shafts, or those quatrefoil on plan, we certainly suggest the vertical mode of decoration, or trails of evergreen inserted in the quirks or hollows. Laths covered with leaves would be better.

A simple diaper or diagonal lines of green forming a lattice pattern, just described, are the simplest modes of wall decoration. For the diapers the frame or groundwork can be made in various ways. For simple designs a lath or wire framework is the best; our author recommends perforated zinc as the best ground work, which should be cut out to the shape of the device, and the leaves and sprays of evergreens sewn on, beginning at the bottom of the device, the leaves being fastened across their veins, and the stalks overlaid by the next row. Everlastings are easily fastened to the zinc by passing the stalks through the perforations. Thin wood or thick cardboard we certainly prefer for small crosses, monograms, and devices, and the flowers or leaves fastened thereon with glue or thick paste. For devices fixed high up the larger leaves and the coarser workmanship suffice, but for those near the eye the small leaves should be used.

The east end of the church should, as our author observes, have the most lavish display, though we take exception to some of the designs, which show Mr. Ruskin's anti-architectural treatment. We do not pretend to follow Mr. Cox through his work, but he gives many valuable hints and directions for making monograms and devices with everlasting flowers and moss. "Natural flowers," he says, "should be provided with little zinc tubes filled with water, which can be soldered in any position, like inverted extinguishers, or hung by hooks." He also gives various modes of forming and emblazoning texts. Coloured paper cut to the shape and affixed to a ground of different tint is perhaps the simplest mode; evergreen borders can be put round the letters or text in a zigzag line, and bunches of scarlet berries placed at points. The plan usually resorted to of covering cardboard letters with evergreens and fastening them separately to the walls is objected to on the score of defacing the plaster or stone by tacks; but we think this objection could be overcome by placing the letters on a frame of wire or lath. "Prepared cloth," white glazed calico, coloured cloth, &c., are often substituted as a ground for the evergreen texts. A profusion of alphabets and lists of texts suitable for different seasons are given, not the least suggestive feature of Mr. Cox's handbook. It would be entering into the region of symbolism to discuss the variety and applicability of the devices that can be used to cover walls, the gallery fronts, &c. Individual circumstances and taste must do this.

Without going into the chapters on "appliqué work," and other means of church embroidery, worked and illuminated banners, etc., we will simply notice the features on which decoration may be applied.

Window sills, at least those that slope, are available for devices or simple texts, and these are well relieved on grounds of moss or evergreens. Connecting the sills by a band of evergreen, or by a continuous text, as "His name shall be called Wonderful, Councillor, the Mighty God, &c.," is a capital method of relieving the walls and forming a connection. Pulpits and reading desks may be garnished by simple wreaths tied or tacked round the top members or capping, and devices or symbolical designs introduced into the panels or faces. Lightness and delicacy are of course essential in these parts, being so close to the eye. Everlasting flowers worked in devices are pretty, and very applicable here. The font, as our author says, demands especial care at the festival of Christmas. He says, a floating floral cross made of board perforated with holes for the stalks of flowers, as white lilies, has a "beautiful and appropriate appearance." A leafy canopy made on an iron framework, and the sides of font festooned or ornamented with devices, constitute a very effective decoration, however; and the horizontal members and angles can also be emphasised by evergreen chaplets and bosses of red berries or everlastings. Lecterns, coronæ, and standards are all easily decorated by garlands, twisting wreaths round the stems, and the stem of font can also be relieved by a spiral wreath. Among the evergreens suitable for Christmas taken from an ample list in Mr. Cox's book are holly, variegated holly, ivy, laurel, box, yew, and arbor vitæ.

On the whole, Mr. Cox's book is a suggestive one, and the most useful and complete manual of the art we are acquainted with, though he does not say anything about the porch and exterior; to the former, at least, we should like to see the festal garnishing carried.

DRAINAGE OF TOWNS IN THE VALLEY OF THE THAMES.

IT will strike any one who has taken any interest in the manner in which the authorities have dealt with the subject of the purification of the Thames that, in order to effectually carry out the object of their remedial measures, it was necessary, not merely to forbid the discharge of the London sewage into the river, but of all towns situated higher up the stream. Some time back, therefore, an injunction was obtained by the Board of Conservancy to restrain the towns of Oxford, Eton, Windsor, and Abingdon from continuing to make the Thames their common sewer. To have summarily put into execution the "mandamus" of the court would have been a harsh and unwarrantable proceeding, and one which no donbt would have caused an appeal for a reasonable time to comply with the terms of the injunction. Accordingly a full year was granted to carry out the works indispensable for a proper diversion of the ordinary and hitherto used sewage channels. We now come to a portion of the history of the affair that it appears very difficult to account for. The local boards of the various towns concerned in the sanitary prohibition professed themselves either ignorant of the proper course to be adopted or unwilling to undertake the responsibility of acting promptly and decisively. In order, therefore, to shift the onus of the future operations upon some other shoulders than their own, they petitioned the Home Secretary to tell them how to get rid of their sewage, and extricate themselves from the dilemma in which they were placed. What appears difficult to account for is the circumstanee that had the boards consulted any eminent civil engineer, he would have given them a plan for effecting the desired object. Why did they not, like the local authorities of other districts, call in professional advice, and put themselves under the guidance and directions of a sound, practical man? As the matter stood, the Home Department listened attentively to the petition, and, after mature deliberation, appointed Colonel Ewart, R.E., to inquire into "the plans for the drainage of the several towns situated in the valley of the Thames, with a view to the purification of that river."

We question very much if Colonel Ewart was the best person to appoint to such a duty, as we are not aware that the Royal Engineers have had anything to do with extensive schemes of town drainage. That he has set about his task with all the ability and energy at his command there can be no doubt; but yet he can scarcely be regarded as an authority upon sewage plans. One very important point was secured by his nomination to the office, and that was the ensuring of a genuine disinterested report, where every project or proposal would be considered with regard to its absolute merits, and nothing else. As an officer of Engineers, Colonel Ewart would be unbiassed by any motives or considerations that might carry undue weight with a civil professional man, and his report is characterised by the absence of all partial statements or prejudicial views. The natural features of Oxford, Eton, Windsor, and Abingdon, and the extreme lowness of the valley in which they are situated, preclude the possibility of distributing the sewage by gravitation over more than a portion of the total area of land required. Consequently, pumping must be resorted to, in order to obtain command over the remaining portion of ground required to profitably utilise the sewage. This forms a great obstacle, owing to the expense it entails in the carrying out of a proper and efficient system of sewage and drainage. Nevertheless, it is high time that it no longer be so regarded. Every town promising or likely to possess more than ten thousand inhabitants must sooner or later adopt a plan of utilisation of its sewage, and as not one in twenty is so advantageously situated as to be able to apply the gravitation principle, the only other means of accomplishing the result is by having recourse to pumping. In the prosecution of the trust imposed on him, Colonel Ewart not only examined all the plans that were submitted to him, but visited the few localities possessing a system of sewage utilisation. It is scarcely necessary to state that Croydon was one of the places carefully inspected, together with Canterbury, Broadmoor, Aldershot, and Bedford. After fully investigating the merits of the dry earth system, and acknowledging that it is of value in small villages, barracks, hospitals, and outlying districts, the reporter decides that, in his opinion, it is not the best suitable for large towns, an opinion in which we concur. It is very succinctly remarked that the general use of earth-closets necessitates the general abolition of water-closets, which would be a very impracticable and unwise proceeding to take in towns where the latter are established and used by nearly all the better class of householders. We admit freely that great benefit has been derived in India and elsewhere by the partial adoption of the earth-closets in peculiarly situated localities, but at the same time consider them utterly unsuitable for the exigencies of a large city or town.

Having once determined that the principle of "water carriage" shall be that adopted for the conveyance of sewage, the next step is to inquire into the best methods of applying that principle. The questions that arise in connection with it are numerous. Is the rain water to be conveyed, also, in the same channels with the sewage, or are they to have separate means of transport? Is the sewage to be delivered upon the land, direct from the sewers—as at Lodge Farm, Barking? or is it to be disinfected and deodorised and run into the nearest water-course, as at Canterbury and Leicester? It is well known that complete failure has attended all the attempts undertaken with the view of purifying sewage by the use of chemical precipitants. There is a constant outlay for the purchase of the necessary drugs and reagents, and the result has been exceedingly unsatisfactory in every instance. In the opinion of Colonel Ewart, no chemical methods hitherto invented will purify the sewage of the towns in the valley of the Thames to such a degree that it could be discharged into the river without violating the Thames Navigation Act. The principle of "water carriage" may be divided into three heads—namely, the separate system, the mixed, and the joint system. The first of these does not admit of the introduction of the rain and surface drainage into the sewers that convey the sewage. The mixed system takes a portion of the surface drainage as well as the sewage in the same drain, but leaves another portion of the rain water to pass off by the natural channels. The joint system is that adopted by the Metropolitan Board of Works, and, therefore, requires no further description.

After a careful consideration of the merits of these three systems, Colonel Ewart decides in favour of the "separate system," a decision we by no means concur in. The objections raised in the report against the "London plan" are that accumulations of sand and fœcal matter form in the sewers, that their ventilation is defective, and that the sewage is so much diluted as to be of little use to the land. In answer to these, it may be stated that if the gulleys are properly made and properly trapped, the objections are not valid; that London is the most healthy city in the world, and that the results at Lodge Farm, Barking, leave no doubt of the fertilising powers of the London sewage. Against the "separate system" there are many and weighty objections. In the first place, two separate systems of drains and sewers must be constructed, which in itself is in many cases almost a direct prohibition, owing to the enormous expense that would have to be incurred. According to Mr. Bazalgette, to drain London upon the "separate system" would cost £12,000,000. It is true that in the towns under consideration, the old drains may be used for that purpose, but while this may effect a pecuniary saving in these particular instances, it is no argument in favour of the plan. In addition to the cost of an additional set of drains, the separate system entails considerable expense in the shape of reservoirs and settling tanks. It is absurd to imagine that surface drainage could be rendered clear and pure by "careful scavenging of the streets." The recommendations in the report respecting the ventilation of the foul sewers, the area of land to be taken, and other details, are all well known to sewage engineers, and call for no especial notice. Before adopting the principle of drainage advocated in the report we have alluded to, we would advise the local authorities of the towns in question to have a careful estimate prepared by a competent civil engineer of the cost of applying the "separate" and "joint" or "London system" of sewerage to their districts. If they once commit themselves and the ratepayers to a certain course, they will have no option but to proceed, no matter what the expense may be.

ASSOCIATED ARTS INSTITUTE.

AT the fortnightly meeting of this Institute, on Saturday last, Professor Westmacott, president, in the chair, Messrs. John Nicholas Parting, Frank Cox, and Charles Gliddon were duly elected members. After a few introductory remarks by the chairman—

Mr. Richard Redgrave, R.A., read a paper on—

THE TREATMENT OF SUBJECT IN PAINTING.

The choice of a suitable subject, said Mr. Redgrave, in his prefatory remarks, is one of the signs of a vocation for art, while the treatment of that subject when chosen indubitably marks the measure of a man's genius, and shows whether or not he is a true painter. Although, on cursory consideration, it would be thought that an extremely literal rendering of his subject by the painter would evince the truest treatment, it should be recollected that all incidents occurring in real life are *successive* in their action, while the painter is confined to a momentary representation of the incident chosen. While naturalness and individuality should not be overlooked, the painter must in a great degree render the qualities of the mind by nobleness of aspect or dignity of action. Paul said his personal appearance was mean, but was the painter to so represent the great Apostle to the Gentiles? Everything in a picture of real life or contemporary history should be in harmony with the event described. In treating the great events of past ages, much more the relations of poetry or fiction, great latitude taken by the painter may be used so as to bring home the truths of history or the inventions of the poet far better than a more literal rendering. Froude, in his "Science of History," says:—"The poet is not bound, when it is inconvenient, to what may be called 'the accident of facts.'" This truth applies equally to the painter, who, if allowed an equal control over "the accident of facts," will so dispose them as to present the greater truth on his canvas. In the best period of the art of the old masters compositions are found in which the canvas is filled up with mere spectators of the incident going on, themselves little moved [illegible] with the story; or, again, the composition is crowded with a host of individuals of the painter's own time, spectators of an incident it may be, of long past ages. Such is the "Building of the Tower of Babel," by Benozzo Gozzoli, on the walls of the Campo Santa, at Pisa. Another treatment adopted by the painter was seen in Leonardo's "Last Supper," where the Apostles are placed on one side of the table, the other side being unoccupied. This treatment is quite the reverse of a literal one, as the Oriental custom of reclining on couches at meals is totally ignored. Yet, in the hands of Leonardo how noble is the treatment! Such compositions were originally placed in refectories of monasteries, so as to make our Lord's table, as it were, the dais table, at which sat the nobler guests, the other tables being occupied by the monks themselves. A relation between the figures in the pictures and the spectator is obtained in some works by a figure or figures within the picture looking out to the spectator, or pointing to the action going on, and appealing by look or gesture to those without. This mode of treatment is exemplified by such works as the Madonna da Foligno, where, on one side, St. Francis looks at the Virgin, and points out of the picture as if imploring her regards for the people; while on the other side St. John the Baptist looks at the spectators and points to the Madonna, as if calling on them to pay adoration to her. Sometimes the principal figure is made to look pointedly out of the picture to the spectator, wherever he goes within sight of the figure. This effect, simply the result of the sitter looking at the painter during his work, has been made to appeal strongly to untutored worshippers in an ignorant age. Some painters have grouped together in one composition incidents completely remote in time and place, almost telling the tale of a life on a single canvas. Thus in the Pinacotha at Munich there is a picture by Memling of the "Seven Sorrows of the Blessed Virgin," depicting seven of the scenes in the life of our Lord which pierced with woe the heart of Mary. In many of the frescoes of the fifteenth century this treatment, somewhat modified, is adopted, as in the "Life of Abraham," and the "History of Job," by Gozzoli, in the Campo Santa, and in "The Calling of Moses," by Sandro Botticelli in the Sistine chapel. Incongruous as such treatments seem when described, they appear far less so when seen. Though they can hardly be justified, how happily has Raphael —who always availed himself of any license in art—worked out a succession of incidents in his noble cartoon of Ananias and Sapphira! Who can say in this case that an adherence to rule would have resulted in a composition equally grand and noble as that achieved by its infraction? In the painter's treatment of his subject he has to consider the local scenery of the action, the costume and the national character of the actors, and to determine, not merely what these are, but how he may make them tell on the feelings of the spectator. It would be a great outrage on the common sense of the spectator if an artist of our own day, in a painting of the taking of Magdala, were to depict the English general and his forces either naked or in a classic costume. Yet, even this treatment, absurd as it now seems, when set aside by Benjamin West in his picture of the "Death of Wolfe," in favour of a more literal rendering, was considered a great error in judgment on his part—an error which only his success justified. The question is widely different when the incident or action took place in times long past, and when the ideas of those to whom the painter appeals are quite unsettled or wholly at variance with the literal truth. When art revived in Italy in the middle ages, and was patronised by the church in the interests of religion, the knowledge of the East and its people was very limited, and the painters treated Scripture subjects with the costume and accessories of their own time. This treatment is seen in the fresco in the Campo Santa of "The History of Joseph," in which neither the sandy plains of the delta of the Nile nor the massive palaces of Egypt compose the background, but the lighter architecture and hilly scenery by which the painter was surrounded, while the children of Jacob are attired in the tabard coats, the tight hose, and the quaint caps of the fifteenth century. Such treatment may have had the effect of bringing the subjects more home to the feelings of the ignorant, but whether this was so or not, mediæval artists most frequently treated the facts of Scripture history in accordance with the habits of their own age and [illegible].

[illegible] the painters of the fifteenth and sixteenth centuries was the adoption of any [illegible] by their [illegible], arising, perhaps partly from the respect paid to works [illegible], but [illegible], Mr. Redgrave thought, to a [illegible] to carry on the art. They made no scruple of using the compositions of their predecessors, or in taking groups or single figures almost literally into their compositions. Thus Raphael adopted complete figures from the works of his master, Perugino, as in the picture of "The Marriage of the Virgin" at Milan, and both Raphael and Michael Angelo drew upon the works of Luca Signorelli and Massaccio. This custom conforms to the practice of the Greeks, who, in the best times, sought for perfection rather than originality, to improve on the works of their predecessors rather than to invent themselves. Thus, in architecture, the simple and severe Doric order was from age to age refined by them in proportion, though not altered in its details. Another treatment of the subject in painting which, when judiciously employed, is very impressive, is that wherein the main incident of the story is rather suggested than displayed, as in Paul de la Roche's "Two Children of Edward IV. in the Tower," and Sir Edwin Landseer's "Suspense." Mr. Redgrave, after a few remarks on the treatment of subject by the landscape painter, concluded his paper with a few general observations. In the treatment of any subject, he said, either as to its general effect or its accessories and details, the painter is not to be confined to the limits of the probable, but is allowed the freedom of the possible. He may combine objects not usually in relation to one another. Seasons and times may be interchanged if the object is to add poetry or sentiment to the scene. Each mode of treatment had its merits—the imitative, as a mode of study to lead up to that more general treatment which seized the spirit of the whole instead of forming an agglomeration of details. Though the artist should earnestly study nature, not only in its general aspect, but in its minutest details, by the separate and careful imitation of parts, these latter, as the hand gets practice and the mind acquires vigour, should be rendered wholly subservient to that general treatment resulting from the union of the poet's mind with the painter's hand.

The Chairman, in an able and somewhat lengthy speech, highly eulogised the paper read for the soundness of the principles inculcated in it, and a vote of thanks having been passed by acclamation, and responded to by Mr. Redgrave, the meeting adjourned.

WORKING MEN'S VIEWS ON ART SUBJECTS.

A MEETING of the Birmingham Society of Artisans was held at the Midland Institute, Birmingham, on Saturday night, Mr. Freeth presiding.

Mr. SWENE read a paper in which he directed attention to the principles or laws of ornamentation deducible from the structure of plants and animals. The most simple and perfect connection of lines in nature is by radiation, that is, by their all springing from one point or closing towards it; as the boughs of trees, though they intersect and fly amongst each other irregularly, indicate by their general tendency their origin from one root. An essential part of the beauty of all vegetable form is in this radiation, and it is carried out also in the [illegible] world. The law of radiation was well [illegible] to many nations among the ancients. [illegible] observed that "in the surface decoration of the Moors, all ornaments play out of a parent stem, and the eye is never offended, as in modern art, by the [illegible] introduction of an ornament without any reason for its existence." The same law is curiously connected with certain forms of Greek, Byzantine, and Gothic architecture. In a very few of the things manufactured in the present day the law is observed, but, as a rule, the branches of chandeliers, for instance, are stuck on anyhow, and the foliage on fenders sticks out all sorts of ways. Another law is that of repetition—one object or group of objects imitating or repeating another. This law, when carried out easily and freely—not formally and lifelessly—gives grace and power, but it is neglected in most modern manufactures, or else is replaced

by lifeless reduplications. The ancients had an eye for this natural law of repetition or imitation. Another law is that of alternation. The boughs of a tree, or the leaves on a bough, do not grow directly opposite each other, but they are arranged alternately on either side of the stem; or, if they have a circular arrangement, they grow out apparently at all points, but they are really arranged in a most orderly manner, not one being in the way of its fellow, but each one placed in the very best spot which could be selected for it, with a view to its freedom and welfare. These natural laws, which are so much neglected in this and other civilised communities, and the neglect of which has so debasing an effect upon our manufactures and such a deadening influence upon the taste of the community, seem to be carried out instinctively by some savage tribes. Every bit of ornament on the oar with which a South Sea Islander propels his canoe, so far from being a useless encumbrance, actually increases the strength of the oar, and the laws of radiation, repetition, alternation, and adaptation are obeyed as it were by instinct. This law of adaptation is one of the most important in the whole sphere of art manufactures. The necks of glass decanters are often seen ornamented with sharp "pin-headed" diamond-shaped figures, as if for the very purpose of threatening the hand that seized the decanter. How much better to flute the neck, which not merely makes it more agreeable to handle, but is much less expensive. He mentioned several instances of "adaptation" in nature. The ivy, when growing in an exposed situation, has its leaves arranged spirally all round the stem; but when it climbs up a wall, the leaves all grow on one side. The Greeks and the Egyptians knew well the value of adaptability, and carried it out with a degree of thoughtfulness and care of which few manufacturers or designers in these days had any notion. In England it was not rare to see dinner-plates with all the ornament in the centre, where it could not be seen, cut-glass decanters from which wine could not be poured without spilling it, and fireplaces with ornaments projecting so as to be positively dangerous. He saw some time ago in a working man's house a guard intended to keep the children from the fire. It was not a bow, but square. It was made of polished steel, and it was decorated at the corners with sharp spiral points sticking out at the children. This was the notion one intelligent artisan had of ornament and of suitability. One thing which should be constantly borne in mind was glanced at under the head of the law of radiation; that is, that ornament should not be merely laid on, but should grow out of, and form part of, the thing ornamented. The Egyptians made their columns representations of bunches of papyrus tied together, and their capitals were consequently, and naturally, and beautifully, the flowering of the papyrus. There was nothing superfluous, n thing to spare, nothing could be taken without injuring the whole; but with regard to English ornament, a great deal of it might be taken away with advantage. Some people imagine that beauty and utility are inconsistent, whereas beauty is the perfection of utility. Nothing can be beautiful which is not exquisitely adapted to its purpose. People deceive themselves very much who think they have a "beautiful" carpet because it is so expensive that they dare not walk upon it. The demand for technical education is an indication of revolt against the notion that useful things must or ought to be ugly. England must rise above that idea if she would maintain her place among the nations.

Mr. SARGEANT lamented that there was so much truth in the stricture of Mr. Swene upon English manufactures. He thought that one great cause of decline was the excessive division of labour. The engineer nowadays paid no attention to decoration, but put up bridges like that in Great Charles-street. On the other hand, the decorator paid no attention to construction, and, when he produced an article intended for use, it was very pretty, but failed to serve its purpose. This cause of failure, in his opinion, ran through the whole of English life—religion and politics, as well as manufactures. Take art. Morland was a man of such manual dexterity that he could paint anything his mind conceived; but having no poetry whatever in him, he only painted pigs. There were, on the other hand, men of poetic natures who could not reproduce on canvas what they were capable of imagining. The repelling and disorganised units of society required to be brought together and harmonised and directed.

Mr. SWENE observed, in confirmation of Mr. Sargeant's remarks, that the great artists of the fourteenth, fifteenth, and sixteenth centuries—Benvenuto Cellini, for example—had many-sided powers. They were acquainted not merely with one department, but with every province of their art. There was a thoroughness about them which could not be expected where men learned only to make a pin's head, and went on during a lifetime without knowing how to sharpen the point.

Mr. BARNES said another great cause of the inferiority of manufactures was that the masters had struggled upward without being educated for their new position. They knew the manipulative portion of the work, but for the rest, they went blundering on, and they did not fail utterly because if they did not know, neither did their competitors—in this country at least. The manufacturers of other countries knew, it seemed, and the English must now learn too, or else be beaten. With regard to the art training at the School of Design, he utterly abhorred the whole system.

Mr. LOWE, and one or two other gentlemen, made some observations, which brought the discussion to a close.

THE MANUFACTURE OF PAVING STONES.

THE *Scotsman* contains some useful information on this question. There are two counties in Scotland which produce paving-stones—Forfarshire and Caithness. The pavement quarries of Forfarshire are the oldest and most extensive in the kingdom. Of late years the trade has been very largely developed, and the number of workmen employed in it greatly increased, in consequence of the introduction of planing, cutting, and dressing machines. The planing-machine now in use in almost all pavement quarries was invented by the late Mr. James Hunter, of Leysmill, near Arbroath, who was for many years manager on the quarries belonging to the late Mr. Lindsay Carnegie, of Spynie and Boysack, and later to his son and successor in the estate.

During the last few years many improvements have been introduced in the manufacture of paving stones. The principal is the substitution of chilled cast tools for the steel tools first used. The chilled tools are at once cheaper and more durable. The machines, which are sent to all parts of the country where there are quarries, form a considerable article of manufacture at Arbroath. Had it not been for them, the pavement trade could never have attained its present dimensions. The larger of the cutting-machines consist of enormous masses of iron. The cutting is done by means of tools placed in revolving discs, and great slabs of stone are cut through or split up with as much ease as if they were pieces of cardboard. The dressing-machines are used for dressing stair-steps, coping, and much of the general mason-work still commonly done by manual labour.

The Forfarshire pavement quarries, which these machines have been largely instrumental in making famous, extend from Leysmill, in the east, which is situated about three miles inland, to near the fine old castle of Glamis, in the west—a distance of about sixteen miles. From north to south, they stretch from Montrewmont Muir to the Sidlaw Hills—about twenty miles. The quarries are thus all situated in the southern or more lowland portion of the county. The pavement produced throughout all this district, as well as that worked in the near neighbourhood of Arbroath, is known in commerce as Arbroath pavement. The stone is a freestone, and is found in the lower beds of the Devonian or Old Red Sandstone formation. It is solid in composition, and therefore very durable, but is easily worked and dressed. It is extensively used not only for paving streets out for all inside work of houses and other purposes.

There are very many quarries in Forfarshire, the principal being the Carmylie Quarries, where there are 300 men constantly employed. The machinery consists of eight planing machines, several cutting machines, eight saws for jointing pavement, one machine for making steps, coping, and tabling; two polishing-machines, six steam-engines, and from twelve to fourteen steam and other cranes. The quarries turn out almost any weight or size of stones—stones weighing 20 tons and measuring 200ft. superficial. The large stones are suitable for calender works and similar establishments where great stone tables are required. Many of these stones have been sent away from the quarries of late. The Carmylie stones are famed over the world as paving, and for steps, cisterns for paper makers, chemical works and bleachfields, columns, balustrades, and other architectural ornaments. For these and similar purposes they are widely exported to the various cities of the United Kingdom, to many countries in Europe, to the United States, Australia, and the colonies generally. Many towns in Scotland are paved with Carmylie stones. They have been, or are being, used as paving, steps, copes, &c., at a large number of public buildings—such as the new Glasgow College, the New College, Edinburgh; the Bank of Scotland, Edinburgh; Craiglockhart Poorhouse; the new markets, Edinburgh; the extensive works of Baxter Brothers, Dundee; The Denburn Railway station, all the principal buildings in Aberdeen; the Perth railway station, &c. The weight of stones sent away from the Carmylie quarries daily is about 150 tons.

The Caithness flagstones, the working of which represents a considerable part of the industry of the county, belong to the middle formation of the Old Red Sandstone. Great numbers of fossil fish and plants are found intercalated amongst the flag-beds of commerce, having been buried in the ancient mud of the Old Red waters. These fossils are a marked feature on almost every slab of Caithness pavement. Although the fish remains lie by thousands, it is seldom that anything like a perfect specimen is got. However, they are beautiful in their ruin—their blackened, enamelled, and glistening scales and plates standing out in contrast with the sober grey of the matrix. The flag-beds have suffered much in geological ages from dislocations by "faults" and other causes.

The geological character of flagstone having, of course, a close relation to the commercial and industrial value, it may not be out of place to quote what an eminent geologist states concerning the flagstones of Caithness. In his "Siluria," Sir Roderick Murchison says:—"The flagstones of Caithness are in many places impregnated with bitumen, chiefly resulting from the quantity of fishes embedded in them. Their most durable and best qualities as flagstones are derived from an admixture of this bitumen with finely laminated silicious, calcareous, and argillaceous particles, the whole forming a natural cement more impervious to moisture than any stone with which I am acquainted." Sir Roderick then gives analyses of several specimens of flagstone and the accompanying bituminous shales from Mr. Traill's quarries at Castlehill, and considers that they are of "high value, having been prepared by that distinguished chemist, Dr. Hoffman." These analyses are as follow:—

Mineral analysed	Silica and Silicates insoluble in H.O.	Oxide of Iron and Alumina.	Carbonate of Lime.	Organic Matter.	Water loss at 100 C.	Salts of magnesia, the alkalies, &c.
No. 16, top flag ...	68.40	10.21	10.93	3.88	0.42	6.16
No 7, middle flag	69.45	11.50	10.66	5.79	0.40	2.20
Bituminous shale	69.96	8.15	7.72	10.73	0.53	2.91
No. 1, bottom flag	61.69	4.87	21.91	3.40	0.20	8.23

Sir Roderick adds:—"These results completely sustain the opinion I was led to form on the spot, that the peculiar tenacity and durability of the flagstones is due to the manner in which silica and alumina are cemented together by certain proportions of calcareous and bituminous (organic) matter."

A portion of bituminous schist got near Barrogill Castle, Dr. Hoffman reported yielded—of fixed matter (mineral), 70 parts, and of volatile matter (organic), 30 parts. In time, probably, these oil-yielding shales may become worth working. They exist in great quantities.

As a proof of the durability of the Caithness pavement, a circumstance which occurred in Leith Walk, Edinburgh, about three years ago, may be mentioned. A fire broke out in a building in that quarter, and the hose for the engines was laid across the road. The ordinary traffic line being thus impeded, the cabs, carts, and waggons, some of the latter heavily laden, took to the footway, and the consequence was that for nearly 200yds. of the sandstone flags—from the north of England and other places—were broken under

the unusual weight, whereas a portion, several feet in width of the same road, laid with Caithness flags, bore all the same traffic without being injured; even the sawn edges were not chipped.

FIRE-PROOF FLOORS.

IT is rather strange that there should exist such an apparent reluctance on the part of those building to adopt the system of fire-proof floors. In many new erections which have come under my notice, and are evidently intended to be occupied as offices or warehouses, or the two combined, I have been rather astonished to find that the floors, as a rule, are all constructed after the old style, that is, of timber, so that in the event of a fire occurring on either of the floors, its progress is not impeded, but on the contrary it is assisted in its ravages by the inflammable construction of the floors. In some instances it may be found that one or more of the floors are constructed on fire-proof principles, and the remainder are of wood. I have recently had my attention called to a building where this has been the case, owing to the fire having broken out in a room the floor of which was of timber, and that under it constructed on Phillips's patent principle. I refer to Mr. Lorsont's American Cloth Manufactory, situated at North Woolwich, which was partially destroyed by fire on the evening of November 25. The building consists of a large rectangle, divided equally into four rooms on the ground and first floors, the dimensions of which are about 50ft. by 25ft. A third story was carried up occupying the central part of the building, and extended over the lower rooms, about 15ft. on each side the central wall, being the same width as the lower portion of the building. The end walls, 14in. thick, were built upon flitched timber beams with one iron column under the centre in each of the four rooms. The floor between the first and second story was constructed by Messrs. Phillips, consisting of their patent I girders 8in. deep, placed 5ft. apart from centre to centre, with ⊥ 1¼in. by 1¼in. by 3-16in. bars with slotted ends fixed on lower flange of girders 3in. apart. Upon these bars a layer of concrete 6in. thick is laid, which receives the asphalte covering; the ceiling underneath is plastered in the ordinary way, but without wood laths. The girders are each supported in the centre by light iron columns connected at their caps by iron ties securely bolted. The floor above was constructed of timber in the ordinary way, and this was the floor of the top room where the fire originated. This room was technically called the "trowelling" room, in which were stowed large quantities of materials used for trowelling or coating the cloths, consisting of various preparations of oil, petroleum, and varnish, all of an inflammable nature. On the evening of the explosion, it appears that the foreman went into the trowelling room to turn over some cloth that was drying, to do which he set his lantern upon the floor, and had no sooner done so than he perceived a flame curling round the light, which immediately filled the room, he having only just time to make his escape by the door opening on to an outside stairs. The alarm was given and the two stand pipes were soon at work, but from the nature of the burning material the fire raged and soon found its way to the floor below, where fresh fuel was added, but beyond this floor the fire did not extend. The intense heat has shrivelled up the asphalte, but failed in any degree to affect the floor, so far as the actual action of the fire had upon it. The burning of the beams which had supported the brickwork above, causing it to fall bodily upon the fireproof floor from a height of 12ft., broke through the concrete in a few places and slightly bent several of the girders, driving down the iron columns underneath, which rested upon concrete foundations. In the fourth room, where the fire was got under before the beam was so far burnt as to let down the wall, but which was afterwards taken down, the floor is uninjured.

W. B.

CHEAP ICE HOUSES—A GOOD PLAN.

AS the time for securing the harvest of ice is approaching, a few hints looking iceward may not be amiss. We remember when the ice business was unknown; only some enterprising householders or wealthy men thought of such a luxury as an ice house. Yet as ice has slid out of the category of luxuries and become a comfort, if not a necessity, it is within the power of all living in the country and having access to a pond or a stream to provide themselves and possibly their neighbours with a sufficient supply of this comfort to assist in preserving perishable articles and to temper their beverage of water. In cities and large towns men singly or in companies undertake to provide the dwellers with ice, a crop that costs nothing to plant, tend, or raise but only to gather and store, but yields handsome returns. But in the country the convenience of daily delivery of the gelid luxury is impossible and inconvenient. To our country readers, therefore, some suggestions on the construction of ice houses and the preservation of ice may not be amiss.

A family ice house, says the *Scientific American*, need not be an expensive structure. It may be built cheaply, subserve its object excellently, and add to the attractions of a homestead by being a sightly object. A building of 12ft square and 8ft. or 9ft. high is sufficient for the wants of the most exacting family. It may be a frame building, entirely above the surface of the ground, and better if supported on posts, elevated a few inches, to be certain of good drainage. Built of joists, 2in. by 3in., with an outer boarding, having inside another series of uprights, also boarded, from 6in. to 10in., removed from the outer shell, with a solid floor of plank, the space between the two walls filled with tan, sawdust, straw, or chaff, and a roof of good pitch, the ice house is complete. A drain for water should be made from the floor, and the space above the uprights, between a loose flooring and the pitch of the roof, filled with straw, hay, or some similar dry, porous material. On the roof should be a ventilator, the top defended from the rain or snow.

The ice should be packed in one solid mass, the sides not reaching the inner walls of the building, but allowing a space of from 6in. to 12in. all around. The top of the ice should be covered with straw, and the door should be like the sides of the building, or double doors should be made, one in the outer and the other in the inner wall. Plant morning glories or any climbing plant around the building and induce them to creep up the walls and over the roof as an additional defence against the fervid sun of summer.

Two workmen, if not practical carpenters, can put up such a building in one, or at most, two days, which if taste and judgment is used will prove to be a sightly addition to the attractions of a country home, and a useful adjunct to the farm, its contents being convenient and comforting in health and invaluable in sickness. Such an ice house would prove also convenient as a refrigerator on a large scale, preserving food of various kinds and the products of the dairy.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

A MEETING was held on Wednesday, December 2, at which the secretary of the society, Mr. James Parker, gave an account of the Roman occupation of Dorchester, in this county. He also made some remarks upon the numerous discoveries of Roman remains in Dorchester, which city had sprung up in consequence of the neighbouring camp. The Rev. W. Jackson made some remarks upon the question of the Isc, the origin of the Isis; and after a careful paper on "Apsidal Churches," by Mr. E. G. Bruton, the meeting separated. At the meeting on Wednesday week, Professor Westwood exhibited an Anglo-Saxon MS. of the Four Gospels, in beautiful preservation, and of a date not later than the tenth century. Bound with the volume was a Lectionary, also in a fine state of preservation, and at the end, in a somewhat later handwriting (about the year 1100), a copy of the letter from Fulco, Archbishop of Rheims, in which reference is made to Grymbald, whom tradition has associated with Oxford. There was good evidence to show that the book was probably written for the rich Abbey of Hyde, near Winchester. A lecture was also delivered by E. J. Payne, Esq., upon "The Romans in Spain," in which he showed how much of the Roman customs and language had been preserved, and at the same time many of their works, especially some fine aqueducts, of which he exhibited drawings.

Many buildings at Akyab have been destroyed by the recent cyclone in the Bay of Bengal.

ARCHITECTS IN INDIA.

To the Editor of the BUILDING NEWS.

SIR,—I have just been reading your numbers of August 7 and 21, on "Engineering Architects in India." As I happen to be one, allow me a word or two on the matter. As you say, unfortunately for architecture, it has been confined to the practice of engineers (of the military) now for so long that the hope or chance of a change is but slight, or at least for some considerable time to come; and the engineers themselves, so blind and ignorant are they as a rule of architecture, in practice or requirements, will most assuredly make "no surrender." The other class, friends of and friendly to the military engineer, are disposed to make no change, and as to the public here, thinking, heedless or knowing little of such matters, that no good can be looked for in this quarter, hence no action can be taken, and so for some many years to come, unless some new broom be set to work, shall we jog along content with military art." You go on to say, "How many of the young men are there who would be glad to spend some six or seven months of their junior time in India, acquiring knowledge and practice, &c." May I, Sir, ask, Practice in what? Most certainly not in architecture; and if you mean engineering and construction, it is far easier learnt at home, where there are more varied and infinitely greater opportunities. India is no school for the student—of that I am very certain, but a field for the practical man to carry out what he has learnt at home, and these are works that are almost without exception in idea born, and in detail of construction, material, &c., matured at home.

As for the student who is to go out to India on a professional tour of "some months," with the chance of his stay "being rewarded by some commission or attended by some professional occupation," I fear, Sir, his chance is in the most trifling degree too remote to entertain. I have been in India, living for three years in one of the largest cities, have repeatedly endeavoured to obtain some commission, and have not succeeded. Had I been here on an attempt to establish myself in practice as an architect without an appointment to back me, I should simply have starved.

Allow me to state a few facts about Calcutta, where, if anywhere in India, a man might look for success or for employment. There are some five or six large public buildings in course of erection, and there is a fair number of new buildings in some new streets for dwelling-houses (European). Now, see the chance for the "student" to pick up a chance commission where, as you will see, a resident could not! The public buildings have been designed by the consulting architect to the Government of Bengal, the streets and their buildings are being carried out by a contracting firm as a speculation, which, as speculating builders invariably do, employs no architect. The result of the latter is, as you will readily conceive, architectural monstrosities in the brick-cemented, speculating builder style, as at home. This is an encouraging state of affairs for a young man to come out to to study with chance of a stray commission.

Now, Sir, see what encouragement our governing powers give. At the early part of this year, after about a three or four years' engagement, and after having obtained in this time designs for the Post Office, the Imperial Museum, the High Court, and the University Buildings from their architect (an architect who signs himself "M.R.I.B.A.," therefore one of that estimable body), they comfortably get rid of him, and hand his work or drawings finished or unfinished, but chiefly [illegible] to the tender mercies and cruel damnation of the public works engineers, who cut down [illegible] and alter to suit their own ignorance [illegible], freely encouraged by the heads of departments. Such is the encouragement a liberal and paternal government gives to architecture here.

A word about your student, who is to come to make a few studies in a few months. He will soon find his few months grow into many, or his months gone and his [illegible] empty [illegible] as empty as his purse, with the prospects of the chance commission he is to pick up. He may get to Ahmedabad and [illegible] easily, and he can leisurely and [illegible] visit the cities in the Gangetic valley, but if he would explore the riches of the interior of Assam and Sylhet, the glorious remains in Orissa and the Northern Sircars, those in Behar, Maha

vellipore, in Madras, and numberless others, to say nothing of Ceylon or Cashmere and the Punjaub, he will soon have to leave the high roads and take to the by-ways and roadless ways; 400 miles of Palkee Dâk to Orissa, and then some 200 or 300 more when there to get from place to place, will soon run into the few months' trip. Two months of travel to get two weeks' study and sketching would need more than a student's purse to pay for: he would have to camp it (no great hardship that), to take his servants with him (this is indispensable), his cooking utensils—in fact, all he would want he would have to take with him, excepting food; and in the way of food he must content himself in great measure with leguminous food, and trust to his gun to find him something savoury. He would need be a far different man from the general sketching man, delighting sometimes in the name of student, sometimes "rentiér," that I have met in my wanderings in Europe, comfortably turning out of his hotel in the morning, sometimes sketching until breakfast time, never by any chance becoming so engrossed in his work as to let that pass by unheeded. After breakfast again leisurely out sketching, with plenty of etching and pretty picture making until dinner bell sounds, when in he turns again, with half-finished sketch on board, to be completed on the morrow. This is doing it comfortably and gentlemanly. Nothing such as this would your student get here. Eight months out of the twelve sketching out of doors would be an utter impossibility after nine a.m. or before five p.m. I have enthusiastically tried it myself up to ten a.m., in the month of October, and paid the penalty with a slight fever. I am not raising difficulties where none exist, and may be allowed freely to give an opinion on such a matter, as I have had a fair share of architectural study in Europe, occasionally a turn of the feather-bed hotel style, and would gladly and readily launch out into an Indian study and sketching tour; but such a thing requires more time and money than men at home would be inclined to think.

"Monuments of our sway that are to commemorate our endurements and our merits," you say! Then, if monuments, nearly all we have erected in the so-called "City of Palaces" are monuments of pretentious ignorance—so many separate instances of military engineer architecture. Baker-street and all the numerous similarly built streets are almost preferable to the ignorance that flaunts itself in India. Sir J. Rennie did not put architecture in the civil engineer's curriculum in order that he might practice it, any more than that he added mineralogy and geology in order that a man might live with Hugh Miller.

In conclusion, with reference to your remark as to the exploration of India, the peculiarities of country and climate are such that it can never be explored by individual and private enterprise, unless some rich archæologist do it. Nearly all that is now known of India and its architectural riches has been made known and reported on by men on some service, political or other, and therefore by the State. Time and cost are the two formidable obstacles against any speedy researches of Indian architecture. The Hooghly Bridge, of which you make mention, will, I fear, be the "blot"—it has come down already to a floating bridge, and things bid fair to take it from the hands of the original schemers of it, to one of whom, the late consulting architect to Government, we might have looked for something good—for something at least out of the hideous, and have put it under the fostering wing of the Government and their Public Works Department. The illustration in your paper of a week or two back of engineer's architecture—*at home too*—will lead you to imagine what it must be out here.—I am, &c.,

Calcutta, October 8, 1868. AN ARCHITECT.

NEW HOSPITAL, NEWCASTLE-UPON-TYNE.

THE ceremony of laying the foundation stone of the new hospital in connection with the Newcastle-upon-Tyne Poor Law Union Workhouse was performed on December 9, by Henry Milvain, Esq., J.P., vice-chairman of the board of guardians. The hospital is intended for the accommodation of 200 patients, being sick and infirm inmates of the workhouse; and the estimated cost of its erection is £14,000. The building will face the turnpike road, and is situated to the west of the present workhouse, forming three sides of a quadrangle, the latter being open towards the south. The east and west wings will be two stories in height, each containing two sick wards 94ft. long, 24ft. wide, and 14ft. high. The range on the north side of the quadrangle will also be two stories in height, and contain two wards on either side of the centre building, 88ft. long, 24ft wide, and 14ft. high. The centre building will be three stories in height, and is appropriated to nurses' rooms, sculleries, surgery, committee room, &c. Attached to each ward will be a set of water-closets and bathroom, separated from the main building, and constructed so as entirely to preclude the admission of any effluvia into the wards. At the south ends of the east and west wings, and at the junctions between these wings and the north range, day rooms will be provided for the use of those patients who are approaching the convalescent stage. To the rear of the centre building will be erected the cooking kitchen, which will be fitted up in the most approved style to meet the requirements of a hospital. The arrangements for ventilation, drainage, and water supply are most complete and efficient. The eastern side of the building is appropriated to females, and the western side to male patients. The walls will be entirely of stone, and the style may be called domestic Gothic, adapted to modern requirements. The work has now been in progress for some three months, and has been executed so far in a satisfactory manner by the eminent contractor for the mason work, Mr. Robert Robson, of Wideopen, under the superintendence of the architect, Mr. Septimus Oswald, and his efficient clerk of the works, Mr. Geo. Nixon.

CONVENT OF ST. MARGARET, EAST GRINSTEAD.

WE give this week a double-page illustration, with plan, of these buildings, which are now in course of erection for a sisterhood in connection with the Church of England. One side of the quadrangle is deferred for want of funds. The works are being erected by Mr. Fabian, contractor, of Brighton, and will be completed the early part of next summer, at a cost of about £10,000. Mr. George Edmund Street is the architect.

ARCHITECTURAL ASSOCIATION.

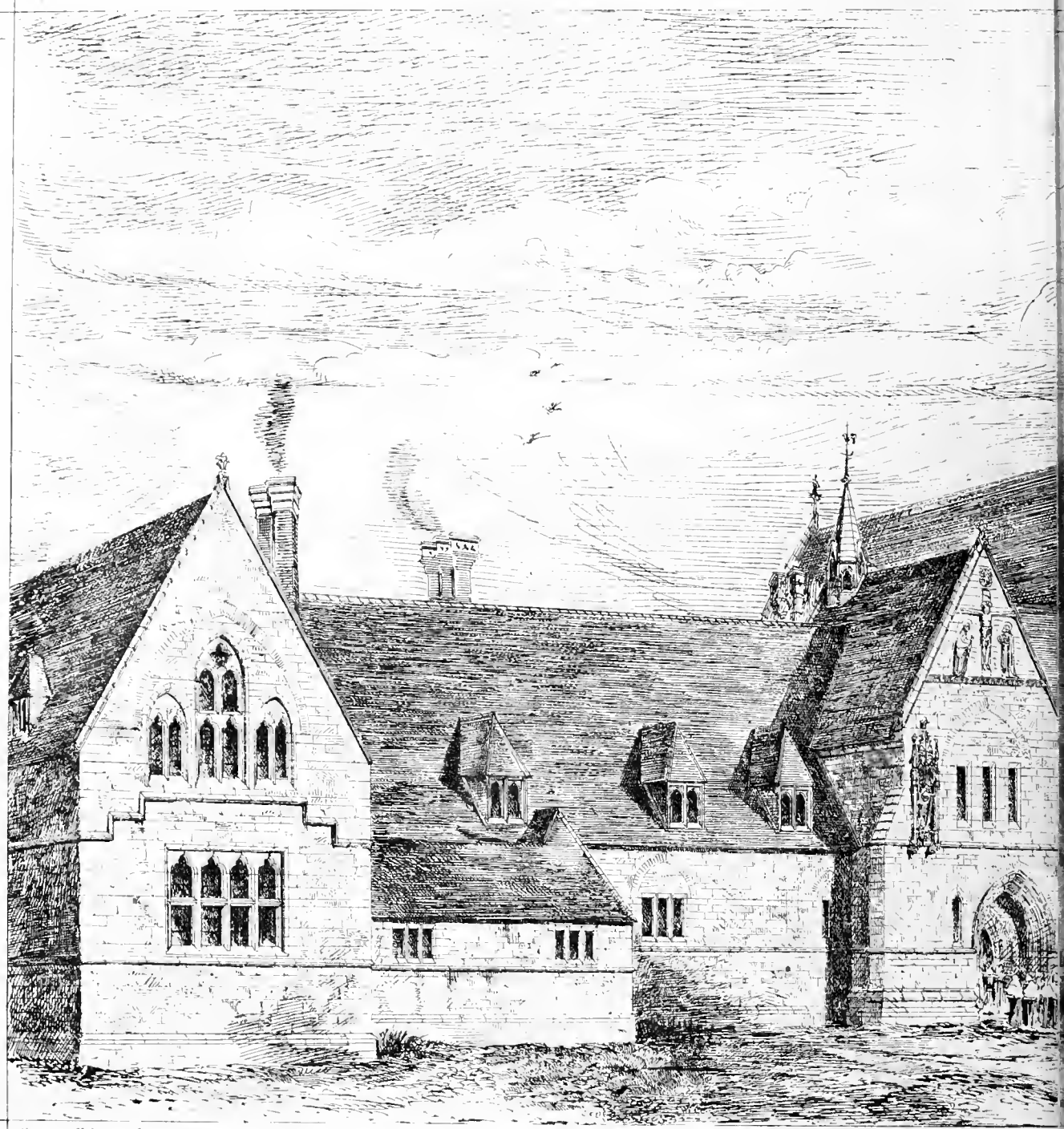
ON Friday evening last, at the ordinary general meeting, Mr. W. White, F.S.A., F.R.I.B.A., occupied the chair, and the following gentlemen were elected members:—Messrs. Charles I'Anson, Ernest Geldart, S. P. Close, A. W. Dresser, Charles B. Oliver, Daniel Bell, G. Saunders, F. P. Johnson, Richard C. Page, James O. Parsons, S. R. Neate, George V. M'Clellan, and Charles Coates. The members then unanimously sanctioned the appointment of the delegates nominated by the committee of the Association to serve on the Architectural Education Committee, those gentlemen being Messrs. White, Spiers, Tarver, and Ridge. Mr. Phené Spiers then directed the attention of the members to the drawings and designs for a proposed natural history museum which have recently carried off the £100 Travelling Studentship offered by the Royal Academy, their author being Mr Herbert Marshall, a member of the Association. The chairman next called upon Mr. E. I'Anson, F.R.I.B.A., to read a paper on "Russian Architecture" Mr. I'Anson, in commencing, said that, although he had already read a paper on Russian architecture at the Institute, the subject was by no means a hackneyed one, and he thought that a paper of the kind would prove more acceptable than a dissertation on those styles of architecture which had mainly engrossed his attention during his professional career, viz., Italian and French Renaissance and the modern works of Paris. As a proof of the comparative novelty of his subject he referred to the scarcity of photographs of Russian buildings, although there were many Russian works which were well worth study. After graphically describing the architectural aspects of the Kremlin of Moscow and the buildings contained within it (the description being substantially the same as that by the same author, given on page 59 of the present volume) the author dwelt on the prominence given in Russian churches to the iconastasis or altar screen, and to the lavish manner in which that and all portions of the church are decorated with the most costly materials. As a novelty he referred to the Cathedral of St. Basil, only 150ft. square, yet containing on the upper story nine distinct chapels, and twelve on the ground story. Each of these had its own iconastasis, gorgeously decorated with sacred pictures in frames of fabulous value. As to the architecture of these Russian churches, Mr. I'Anson had not the least doubt that it was taken from Constantinople, whence the Russian faith came. From the great sums of money expended on the interiors, the exteriors of Russian churches are necessarily composed of the poorest materials, and from the severity of the climate constant white-washing, painting, and plastering are necessitated. Though this is the case, the Russian churches have been preserved almost in their integrity since their erection in the fifteenth century, but only through the deep religious feeling of the people. The emperor's palace within the Kremlin contains a valuable collection of early Byzantine works, such as ivory thrones, &c., and specimens of furniture, &c., in the richest style of Oriental art. The striking feature of St. Petersburg is the prodigal liberality with which it is laid out, with its streets, squares, and granite-quayed walls. The great street, which is called the Nevski Prospect, is a couple of miles in length and twice the breadth of Portland-place. St. Isaac's Church has a central dome, with four small cupolas around it. That dome is absolutely covered with gold plates. Common to most Russian towns are buildings corresponding to the bazaars of Constantinople. In the Kazan Church, St. Petersburg, the granite columns to the four porticoes are monoliths, 60ft. high, with capitals all in one. Lapis lazuli is abundantly used in this church At St. Petersburg there are two very magnificent collections of pictures, and a remarkably fine collection of Greek work from Kertch. Malachite, porphyry, gold and other materials are lavishly used in church decoration. At the conclusion of the paper, which was illustrated by numerous drawings, plans, and photographs,

A short discussion ensued, in which the president. Mr. Phené Spiers, Mr. Blashill, Mr. Ridett, Mr. Quilter, and another gentleman took part. In reply to some of the points raised, Mr. I'Anson said that one of the peculiarities of Russian architecture was the extreme poverty and gorgeous magnificence which stood side by side. Marble buildings and humble wooden cottages stood in juxtaposition. At the Paris Exhibition there was a caricature of a Russian wooden building designed by a French architect. He (Mr. I'Anson) had not brought Russian architecture before the Association as a high type of art, but merely to show how one great section of Europeans had tried to adapt construction and design to their needs. In responding to the vote of thanks accorded him, he said he should have great pleasure in lending any of his sketches for reproduction in the Association's "Sketch Book."

SCHOOLS OF ART.

ON Tuesday evening Lord Houghton presided at the annual distribution of prizes at St. Martin's School of Art A statement made by the Rev. R. G. Maul, the honorary secretary, showed that at the examination held in March by the Science and Art Department at South Kensington, 85 students presented themselves and worked out 79 papers successfully in geometry, perspective, free-hand and model drawing, for which certificates and 27 prizes were granted, consisting of books, water colours, &c Seven free studentships had been awarded for the most satisfactory works sent up during the year. One of the ten gold medals offered by the Science and Art Department, and competed for by all the art schools in Great Britain and Ireland, had been given to E. F. Clarke, and the second prize (£5), offered by the Plasterers' Company for the best design in plaster, had been awarded to Geo. Jepp. Mr. O'Neill's prizes were awarded to Annie Walker, J. Lucas, and L. G. Luker; while A. Johnson, S. Hodson, and Mary Cornelison were declared the winners of the prizes of the Sketching Club. After distributing the prizes the noble lord delivered a brief address. He said it was impossible to look at the works exhibited in the room without acknowledging their general excellence, and seeing that in their execution the great models of study had been followed. The schooling on the whole was a good one, because it did not teach mere showy and fantastic effects, but it required and favoured accurate, simple, and masterly drawing. Mr. Digby Wyatt and Mr. O'Neill addressed the meeting. Cordial votes of thanks to the noble lord, Mr. Casey, the head master, and the Rev. Mr. Maul, terminated the proceedings.

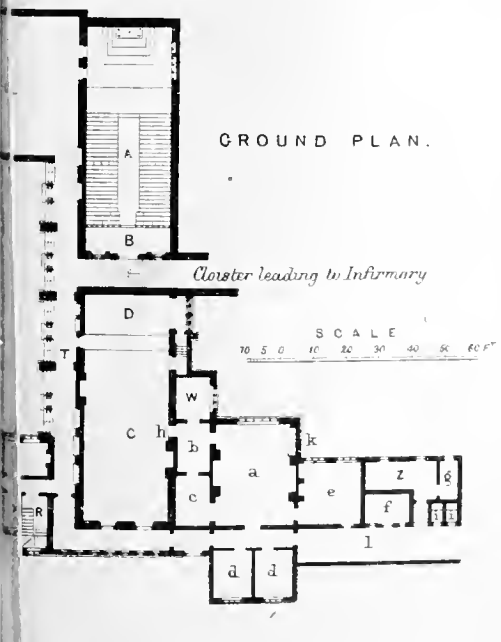
The annual distribution of prizes to the students at the Maidstone School of Art took place on Friday evening last. From the report it appeared that the school was opened on January 29, 1867, under the care of Mr. J. B. Williamson. Three classes had been formed from the commencement, and 127 students had passed through the school, 62 being now under instruction—builders, clerks, bricklayers, ticket writers, upholsterers, carpenters, engineers, masons, and others. The report closed with a suggestion, which we trust may be acted upon, that prizes should be offered by the townspeople.



George Edmund Street A.R.A.
Architect.

Convent of S. Margaret,
East Grinstead,
Sussex.

GEORGE EDMUND STREET, A.R.A. ARCHT.



GROUND PLAN.

Reference

A. *Chapel*
B. *Ante Chapel*
C. *Refectory*
D. *Dais*
E. *Oratory*
F. *School Room*
G. *Class Room*
H. *Guest Room*
I. *Library*
K. *Mistress of the Novices*
L. *Corridor*
M. *Passage*
N. *Gateway*
O. *Assistant Superiors Room*
P. *Waiting Room*
Q. *House Keepers Room*
R. *Stairs*
S.S. *Sister*
T. *Cloister*
U. *Portress*
V.V. *Bed Room*
W.W. *Pantry*
X. *Stores*
Y. *Court*
Z Z. *Coals*
a *Kitchen*
b *Sewing Room*
c *Cooks Pantry*
d d *Larder*
e *Scullery*
f *Knives*
g *Dust*
h *Hatch*
i i *Water Closet*
k *Hot Plate*
l *Passa Yard leading to Laundry &c*
m *Cross*

RECOLLECTIONS OF ENGLISH ENGINEERS.*

THE merit of first bringing into public notice, through the medium of the press, the incidents and routine of an engineer's life is undoubtedly due to Mr. Smiles. However interesting, either in reality or in fiction, the events occurring in the lives and practice of the members of other professions might be, it was not considered that those pertaining to the civil and mechanical engineer were worth recording. It is true that there are but very few sensational incidents which arise to break the somewhat monotonous course of the engineer, especially at home, and, besides, "his works live after him." It would be difficult to endow his practice with the halo of romance that attends that of the barrister and the medical man. No thrilling trials, no curious and absorbing relations of fearful crimes, in which, after long eluding an active search, the criminal is finally brought to justice by some splendid *coup de main* or subtle ingenuity of a cunning detective, distinguish the "lives of the engineers." They furnish no materials for the production of a volume similar to "The Memoirs of a Physician," nor are they rich in "beautiful maniacs," or in the exciting details of cataleptic idiosyncracy. That, nevertheless, they contain sufficient materials to furnish an interesting and instructive volume is evident, not merely from the one we have alluded to but from that now under notice. Our author has followed the path opened up by Mr. Smiles, and introduces us to some new phases of a profession that has done more than monarchs and statesmen to civilise mankind, and bring into union and combination the people of every land under the sun.

With the exception of Brunel and Stephenson, and a few others, the earlier engineers do not appear to have been particularly amiable or gentlemanly in their manner and bearing towards their pupils, assistants, and those with whom they were brought into contact. Many of them were characterised by an insolence and obstinacy which were only equalled by their total want of professional skill and ability. In fact, it would be impossible to expect anything else of some of them, if we bear in mind the circumstances that gave rise to their position. There is no parallel case in history where the services of a particular class of men were required so suddenly and so extensively, and, moreover, where the supply was so inadequate, in every sense, to the demand. Men were thrust at one jump into situations of trust and responsibility for which they were utterly unfit, and, what is worse, numbers of them never took any pains to qualify themselves for the post that they voluntarily accepted. In addition, some, and these were invariably the most ignorant, not only refused to accept hints from members of their staff and others who were better acquainted with the details of the profession than themselves, but treated with contempt and scorn any suggestions that were thrown out for their good and advantage. One can hardly credit, what we have the authority of the writer for, that a resident engineer did not know how to measure properly a "batter level," an implement used for ascertaining the slopes of the cuttings and embankments. For the violent and vituperative language which some of the "chiefs" were in the constant habit of indulging in, there is, perhaps, some palliation. In the first place, the practice of swearing, like that of drinking, was much more prevalent at that time than at present, and, secondly, there is no question but that the pupils and assistants were frequently a very rough lot to deal with. There is no doubt that some of them were not amenable to anything under "strong language," and it must also be borne in mind that many of the "chiefs" themselves were nothing better than foremen. There were no young men of family and education crowding into the ranks of the profession as at present, nor was it recognised as an educated and learned profession. It is only very recently, indeed, that that title has been accorded to it.

The position of the engineer was, in the early days of steam locomotion, infinitely superior in point of authority and personal importance to what it is now. His dictate, his certificate, and his recommendation and advice were paramount with the directors and company. It is rather singular that this should have existed when the men who filled the situations were by no means so well calculated to perform those offices of trust as those in a similar position at present, when the conditions of affairs are reversed. An engineer-in-chief is now so hedged in by his directors, so watched by the shareholders of the company, and his power and even his discretion so circumscribed, that he may be said to be a mere phantom of his former self. It is a common remark that the enormous preliminary or parliamentary expenses which attended the obtaining of the Acts for our early railways, is the reason of their cost contrasting so unfavourably with those of other countries. There is a great deal of truth in this remark, but it must also be recollected that large sums, totally unnecessary, were spent upon the actual construction of the works. In numerous instances, the absolute want of all theoretical and practical knowledge of constructive details was only compensated for by the lavish and indiscriminate use of materials. Engineers were, in fact, only feeling their way, and there is no wonder that, in order to be on the safe side, they trusted to weight and the mass to supply the defects of the actual construction. The author mentions that Brunel's work was characterised especially by a skilful attention to scientific rules; and his masonry was distinguished from that of many of his *confrères* by its comparatively small dimensions. The relation of the failure of the Dee Bridge, and the trial that ensued, is extremely interesting. It is scarcely necessary to remark now that the principle of design adopted for the bridge in question has been long abandoned, and was not sound in theory. At the same time no blame could be fairly attached to the engineer of the line, who, as it was, narrowly escaped a charge of manslaughter. The accident was the cause of the scientific inquiry that was shortly afterwards carried out by a royal commission, respecting the application of iron to railway structures.

There is one point in which railway engineering of the early days has no compeer. It is the question of payment. The salaries of the engineers, the balance to the contractor, was paid in specie, not in shares, bonds, debentures, or any other security floated in the market. Unquestionably, the status of the profession, if less educated, less refined, and less acknowledged, was more honourable, more *bonâ fide*. Not only are the contents of the volume under notice replete with anecdotes of the field and the office which may amuse and interest all readers, but several very good hints and suggestions are scattered here and there with respect to failures that have occurred in works of construction. It would not be difficult for us to identify some of the "chiefs," who are not mentioned by name, but were we to do so, we should defeat the object of the writer, and also in some degree disappoint his future readers, who will probably like to find out themselves "whom the cap fits."

* "Personal Recollections of English Engineers and of the Introduction of the Railway System into the United Kingdom." By a CIVIL ENGINEER, Author of the "Trinity of Italy." London: Hodder and Stoughton, 27, Paternoster-row. 1868.

The collection of paintings—principally of the Dutch school—which formerly adorned the mansion of the late Sir Henry T. Hope, in Piccadilly, has been lent by his widow to the South Kensington Museum, where a large room has been specially fitted up for their reception.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of M[illegible], N.B., has recently had after restoration. [illegible] the [illegible] was erected [illegible] the late Mr. John Henderson. [illegible] consisted [illegible] of about [illegible] ft. to the length of the building and the formation of a transept at the east end. The church now accommodates [illegible] persons. The cost of the alterations was about £[illegible]. Messrs. Peddie and Kinnear were the architects, and Mr. Arthur [illegible], the contractor.

The ancient church of Whissendine, Rutland, has for some time past been under restoration. Mr. A. Goddard is the architect, the contractor being Mr. J. East of Melton Mowbray. A large public room and institute is about to be erected in the village from designs by the same architect, and at the expense of the vicar.

On Monday week a new church at Appleton-Roebuck, about nine miles from York, was consecrated. The plan consists of nave and chancel, with bell turret, porch, and vestry. The materials used were Bradford sets for the walls, with Ancaster stone dressings. The cost of the building is about £2,[illegible]. The design is [illegible], and is by Messrs. J. B. and W. Atkinson, architects, of York.

The new Episcopal Church at Dumfries was consecrated last week. It has been erected from the designs of Messrs. Slater and Carpenter, of London, the Duke of Buccleuch being one of the chief contributors to the building fund. It has a wide and lofty nave, side aisles, chancel with vestry, and a tower and spire 12[illegible]ft. high at the north-west angle. The walls are built and faced inside and outside with coursed Dumfries stone with bands of Prudham stone. The columns of the arcades and the inner order of the arch mouldings are also of Prudham stone. The covering of the roof is of Silbethiocult slates. The style is severe Early Pointed, necessarily on account of the hardness of the stone and its consequent expense in working. The clerestory has three lancets in each bay, of lofty proportions, thus a great effect of height is gained. The nave has in the west wall a triplet of three lancets, with a rose window over, and a moulded doorway with carved tympanum beneath. The chancel has three broad lancets, with an arcaded reredos below. The roofs are of deal, that of the nave has massive moulded tie beams and king posts with moulded and carved braces and wind braces. The seats are open and very simple in design. The paving is of Caithness stone. The lower stage of the tower forms a north porch, and has deeply recessed and moulded doorways with carved tympana. The tower batters slightly. The windows of the belfry are simple pointed recessed lights, over which is a double corbelled cornice, from which springs the spire. About half way up the spire are cusped openings, over which are moulded and arched canopies, forming in effect a crown round the spire. Many of the windows of the church and chancel are filled with stained glass by Clayton and Bell. The whole of the works have been carried out by Messrs. Crackston, of Dumfries, Mr. Palfrey being the clerk of works.

BUILDINGS.

The Eastbourne New Gas Company's works were formally opened on Saturday, December 5. The works, which were commenced in May last, are now completed, and in full operation. The coals are brought on to the works by a railway siding, and [illegible] the railway trucks into smaller trucks, which are then raised by a hydraulic lift and [illegible] on an elevated tramway into every part of the [illegible] stores, which are situated on each side of the retort house. The retort house is built for [illegible] clay retorts, each [illegible]ft. long. The works are also provided with an annular condenser, two engines, which work the two exhausters as well as the water, tar, and liquor pumps, and the hydraulic lift; a scrubber, [illegible]ft. diameter by 2[illegible]ft. high; two purifiers, [illegible]ft. square by 5ft. deep; the two purifiers from the old works will be used in addition to these; a brick gas-holder tank containing a holder [illegible]ft. diameter by 2[illegible]ft. deep; a station meter, a governor, tar and water tanks, &c., and a manager's house and offices. The works were constructed from the designs and under the superintendence of Mr. Alfred Williams, of 64, Bankside, London, the company's engineer.

On Saturday afternoon the president of the society laid the foundation stone of a new Mechanics' Institute and School of Art at Keighley. The style is Gothic, and the building comprises a lecture hall, capable of seating 1,000 persons. The cost of the building, including land charges, will be about £12,000. Messrs. Lockwood and Mawson, of Bradford, are the architects, and the work is being executed by local contractors.

On Tuesday week new parochial schools were opened at Uppingham by the Bishop of Peterborough. The buildings are constructed of local limestone with Bath stone dressings. The cost is about £2,200. Messrs. E. F. Law and Sons, of Northampton, are the architects, and Mr. Bassett, of Little Bowden, the builder.

Much has been said and written of late as to the advantage of using Portland cement concrete as a substitute for brick and stone in the erection of various kinds of buildings. The Duke of Northumberland, according to the *Newcastle Daily Journal*, has been the first to practically test this mode of construction in the north by ordering the erection of a cottage of three rooms, scullery, and other conveniences, at Church Bank, Alnmouth. The site is on a sand bank close to the seashore, and contiguous to an old cemetery once connected with the main land, but now, at certain times of the tide, an island. The material used in the construction of the cottage is Portland cement and gravel from the seashore. The foundation is on the sand 6in. thick, and 18in. wide. On this there is a base course, and above the walls are 9in. in thickness. Part of the erection is two stories in height. The roofs are all flat, and are constructed entirely of concrete and old wire rope. The ceilings are divided into panels by ribs at right angles, and require no plastering. A wall on the upper floor is supported on a concrete beam 13ft. span; a large cistern is formed under the roof of the pantry for rain water; the sides of the cistern being the walls of the bedroom will severely test the impermeability of the material. No wood is used except for doors, and no iron except about five shillings worth of old wire rope. We understand the cost will be about 20 per cent. in favour of concrete over brick and stone, timber and slates, with the additional advantage of being fire, weather, and vermin proof. The building has been erected by Messrs. W. B. Wilkman and Co., of Newcastle-on-Tyne.

The almost unparalleled increase of Dewsbury and Batley during the last ten years has compelled the Gas Company to enlarge their works by establishing branch works near Batley; and they have further increased them this year by the addition of a telescope gasholder, 120ft. in diameter and 64ft. high. The tank is constructed of ashlar and puddled; and the work has been executed by Mr. Brier, of Dewsbury. The whole of the works have been erected from designs prepared by and under the superintendence of Michael Sheard, of Batley, C.E., at a cost of near £13,000.

BUILDING AND LAND SOCIETIES.

THE Conservative Land Society had its sixteenth annual meeting on Tuesday afternoon. The report of the board stated the receipts for the year ending September 30 to be £188,342 19s. 6d., and the grand totals to be £1,288,846 7s. 3d. since the formation of the society; the total withdrawals being £328,984 19s. 6d., and the £50 shares issued to £1,527,700. The sale of land was £583,650 15s. 1d.; the reserve fund was £15,089,132. The increase in the various sources of income for the year reached £81,824 9s. 3d. The dividend for the year was declared to be 6 per cent. The rate of interest on shares remained at 5 per cent., and on deposits at 4 per cent per annum. The report stated that the land business was now carried on by the United Land Company (Limited), and the advances on building loans on security, &c, were made by the Conservative Land Society, the combined principle of action having worked successfully.

The thirteenth annual meeting of the York Building Society was held on the 7th inst. in that city, the Sheriff presiding. The report stated that the number of shares issued has been 454, nearly double that of any previous year; the withdrawals have been 182, but in these are included 59½ that had arrived at maturity, upon which £100 purchase has been paid, with a bonus of 10s. 6d. per share. Advances to members have been made amounting to £15,645, a sum considerably in advance of any previous year. Interest at the rate of 4 per cent. per annum is allowed on prepayment of subscriptions, they being repayable at call, whilst interest at 3½ per cent. is allowed on the paid up shares, which amount at the present time to £12,025. The receipts to the credit of the Contingent Fund amount to £160 11s. 5d., exceeding the expenses of management by £25 11s. 10d., one third of which has to be carried to the Reserve Contingent Fund, which will then stand at £153 8s. 11d. The directors propose to pay a bonus of one guinea on all shares of £100 becoming payable during the ensuing year. The abstract of the accounts of the society were then submitted to the meeting, and both that and the annual report duly adopted by the meeting.

NOTICE.

FRIDAY NEXT being CHRISTMAS DAY the "BUILDING NEWS" will be PUBLISHED on THURSDAY, December 24, at the usual time. Advertisers and others are, therefore, respectfully requested to forward all Communications by FIVE P.M. on the preceding WEDNESDAY.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

RECEIVED.—T. J. F. W.—G. T.—I. F. M., with drawing of dry-ash scheme.—I. W.—S. W. and Co.—G. P.—S. and H.—W. F. Y.—W. H. L.—C. B. A.—T. M.—W. W.—I. N.—J. M. and Co.—J. P.—E. W. G.—G. R. and Co.—R. S. N. and Co.—W. H. L.—F. W. C.—C. B.—I. N.

BOOKSELLER'S question is purely a legal one. It is better to consult a respectable lawyer.

ART.—On a preceding occasion we inserted your letter, though not authenticated. We cannot do so the second time, and particularly as you indulge in personalities in reference to Mr. H. H. Statham.

"Geo Turner's," "Young Architect's," "A Beginner's," "William Carlisle's," and "J. L's" questions, with others of the sort, will be inserted the week after next under a separate heading.

Several questions and answers for "Intercommunication" are postponed till next week.

Correspondence.

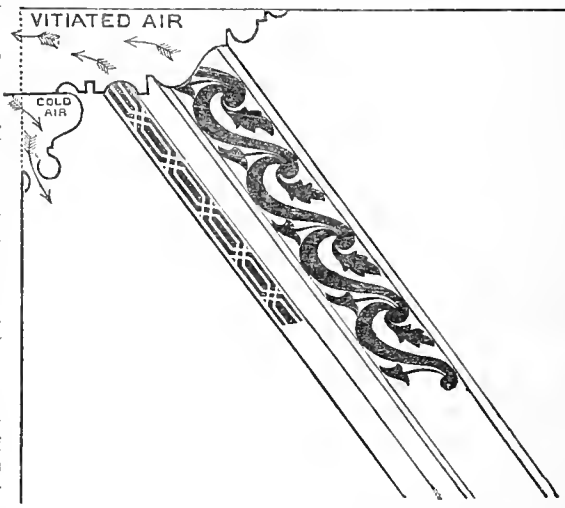
POTTS'S PATENT VENTILATING CORNICE.

To the Editor of the BUILDING NEWS.

SIR,—The comments upon this invention in your last number by Mr. J. J. Cole appear to have been made from a misconception of my ventilating system. I called at his office, when he most courteously discussed the subject with me, and explained the details of his plan, which he had referred to in his letter. We found that in ventilating by means of the cornice we differed essentially in our modes of effecting that desirable purpose. Mr. Cole considered that on my publicly stating this difference of our modes I should supply a diagram to show my main feature of construction. It is here shown, the arrows marking the currents of vitiated and cold air respectively. It will be seen that on my plan the former air is discharged near to the ceiling, while the cold air is advantageously taken from the highest available point, the plan being of the most simple character and in strict accord with natural laws. Mr. Cole also stated I might well intimate to architects that their designs, however elaborate, might be effectively carried out on my plan. I shall soon publish testimonials from eminent scientific and professional authorities, both as to its satisfactory purification of the air of rooms and beauty in effect.—I am, &c,

WILLIAM POTTS.

Wood's Hotel, Furnival's Inn, December 10.



HER MAJESTY'S THEATRE.

SIR,—On turning over the back numbers of the BUILDING NEWS after a somewhat lengthened stay in Italy, I have been pleased to see your account of the forward state of the new opera house. It is especially a matter of rejoicing that the acoustic qualities of the theatre have so far been studied that the decorations are to be free from raised ornament. It has long appeared to me a matter of regret that none of the existing journals should consider the decoration (internal) of public buildings to be of sufficient importance to merit special and systematic criticism. Were these works criticised, say in a paper like your own, with even the care and judgment that are bestowed on any other artistic productions in which the general community is interested, we should probably be tortured by less of those crude, vulgar attempts at embellishment which meet the eye on every side. And notably theatres might be a little less offensive. On Friday night last I visited the newest, and, as the advertisements term it, the "most elegant and commodious theatre in London," and was disappointed to find nothing but what I can only term the old gin-palace style of decoration. Tastes differ, however, and your contemporary, in what appears as a compromise between an official description and a leader, speaks of the effect as "bright and *smiling*." I do not indeed say that the interior of the Globe Theatre is coarser than that of the average of our playhouses, but the fact is that, if we except the Princess's and the Haymarket (which are very far from good) and the Queen's, which is unfortunately marred by the archaic treatment of the figure subject (in itself a noble work of art, but utterly inapplicable to its present use), there is not a single theatre possessing the slightest pretension to artistic merit in the adornment of its "salle." Perhaps this is hardly to be wondered at considering the singular ignorance and indifference to art that exists not only in the British playgoer, but also in the gentleman who "does" the theatrical criticisms for the newspapers.

I am only enunciating a truism when I say that the love and appreciation of harmony in colour and harmony in music are usually co-existent. The old Her Majesty's Theatre was always delightful to enter. In spite of much that was false in the drawing of the details, the general scheme of the whole, the richness and yet subdued tone of the colouring (especially after the restoration on Mr. Mapleson's accession), and the bright play of fancy that gave life to it all rendered the long *entr'actes*—inseparable from grand operas—a striking contrast to those spent in that vast wilderness of depressing ugliness and gloom, the Covent Garden Opera House. And in a country where the *foyer* is not a recognised institution, it is no small advantage to be able to amuse the eye whilst you please the ear.

Let me ask you to visit St. James's Hall if you have not yet done so since it recently emerged from its long-standing grubby state to a condition of the butterfly-like brilliancy, and you will, I think, share the feelings with which I listened the other night to Beethoven's matchless septet. I suppose few persons with a soul for anything above yellow ochre and French blue have ever admired the dire crudities of Mr. Owen Jones's colouring (except under peculiar circumstances, when I should be one of the first to do him honour); but, objectionable as was the original decoration of the hall, it might have emanated from Titian or Veronese when compared with its restored condition. I am happy to say that I have no idea who has been permitted during the vacation to dazzle and half-blind the eyes of visitors, but I apprehend that Mr. Jones himself (with all the strength of optic which he must possess) would stand aghast at the terrible masses of pure vermilion above the windows, and at the huge sticks of sealing wax that have been made to take the

place of the gilt rain-water pipes that formerly did duty for columns. [illegible] the nature of the evidence that they [illegible] disagreement is a positive [illegible] order that at any rate it may [illegible] those who may have the arrangement of the [illegible] of Her Majesty's Theatre.

Trusting that I have not trespassed [illegible] yours sincerely, [illegible].

P.S.—Since the purchase of the old box formerly [illegible] Her Majesty's were exhibited at a recent [illegible] Crystal Palace exhibition. Might not the [illegible] boxing of these be studied with advantage in the new theatre?

Intercommunication.

NOTICE.—As several numbers have passed [illegible] the figures and formulæ [illegible] correspondents are frequently requested to write as legibly as possible, and to write on only one side of the paper. Queries and answers [illegible] the names put to them for the purpose of publication and indexing. Answers to queries will [illegible] corresponding number and name of the query to which they refer.

QUERIES.

[1179.]—PAVING SIDE-WALKS.—[illegible] will you readers kindly inform me of the best way of laying a circular saw for ripping and [illegible] by hand? Should I gain more power by using the saw I spindle of flywheel [illegible] a leathern cylinder worked [illegible] hang from flywheel? What size would be best for the purpose?—A. B.

[1180.]—SISTERN LININGS.—[illegible] the middle of the width of the two thirds, and vertical [illegible] for lining water cisterns, leaving [illegible] —Scotia.

[1181.]—PAVING STREETS.—[illegible] some stone that in order to afford a more perfect [illegible] for the horse, that ridges are sometimes placed between the paving stones. Will some one inform me how this is done, and if done, whether it is [illegible]? —E. [illegible].

[1182.]—PRIZE COTTAGE DESIGNS IF ANY EXIST.—Can any one oblige by sending me their address, for communication, by whom any of these designs are published, and the cost per sheet or set?—S. [illegible].

[1183.]—EMIGRATION—QUEENSLAND [illegible] NEW ZEALAND.—I am a builder and [illegible] with [illegible] trade and with a small capital intend to emigrate [illegible] land and New Zealand are the places I have in view, [illegible] you or any of your readers give me any information as to the circumstances of those places and my chance of success?—N. J. Plumbow.

[1184.]—LAW OF BUILDING SITES.—Can you tell me if there was not an Act passed during the last session for facilitating the exchange of sites for buildings for charitable purposes? If so, can you give me the title of date, or give a short abstract of the provisions?—[illegible] Lawyer.

[Yes, it was passed [illegible] 1868—31 and 32 Victoria, cap. 44. It repeals so much of previous acts as render [illegible] unalienable provided with [illegible] be made for a fair consideration, [illegible] and that [illegible] each piece of land shall not exceed [illegible] acres. It may be applied for in Chancery, but the [illegible] to be heard [illegible] in order to [illegible]—Ed. B.N.]

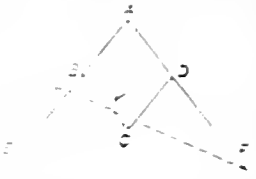
[1185.]—FIXING A BALCONY.—I have a [illegible] with long [illegible] with wire forming the [illegible] about 18in. deep and 3in. thick, and [illegible] with. I want to fix a balcony [illegible] the wire with [illegible] resting on the front [illegible] of the window sashes [illegible] intended to be formed of [illegible] ornamental [illegible]. I wish to know the best method of forming the [illegible] and how to calculate the [illegible] and the [illegible] and the best mode of securing [illegible] of the [illegible]. The balcony would at times be filled with people.—E. [illegible].

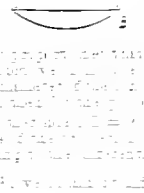
[1186.]—THE BOARD OF WORKS AND NUISANCES.—I am a householder in a large borough, and my next door neighbour complains of foul smells in the passage which adjoins my water-closet. All my drains, &c., have been examined and are in perfect order, but the inspector now says I must have the ground beneath removed and the drains examined. As no complaint has been made for the last twenty years, and the [illegible] has been [illegible] and the drains are all right, can I make them do it, or else pay the expense of examination?—J. L.

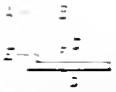
[1187.]—MARTIN'S CEMENT.—Will some of your correspondents inform me of what materials and the process of manufacture of Martin's cement, and [illegible] practical instructions to plasterers how to use the same, in the finishing of the walls in rooms, staircases, and [illegible] of buildings?—D. L. T.

REPLIES.

[1132.]—ROOF CONSTRUCTION.—If "Public's" assertion be correct, "what tensile strain is a metal rod will cover when the walls have not sufficient stability to resist the outward thrust of the rafters," and that [illegible] would be an example of bad construction. It would seem to follow that to use a tie-rod under the conditions of insufficient stability in the walls would be bad construction. But is he sure that he is right [illegible] such a theorem? He will remember that [illegible] the beam in a common [illegible] not like a [illegible] notwithstanding the stability of the walls [illegible]







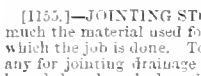
when washed over is to mix it fresh every day it is wanted. This is a tedious operation, but it repays the trouble well when the drawing is finished.—JUNIOR DRAUGHTSMAN.

[1153.]—DEALS AND BATTENS.—"The Calculator," 500 pages, 12mo., 7s. 6d., by Charles Gane, of Wisbeach, will give "A-pirant" the information he seeks.—L. D.

[1154.]—MAKING BRICKS WATERTIGHT.—I can assure your correspondent that the coating of boiled oil will not be of the slightest use in making his side wall waterproof. He may either slate it with slates laid in Portland cement, or he may pay it over with that material, which will effect a cure. The reason stucco is not generally watertight is that it is often of so very inferior a quality, being little better than dirt.—MOSLIN.

[1155.]—JOINTING STONEWARE PIPES.—It is not so much the material used for jointing pipes as the manner in which the job is done. Tough clay is as good a material as any for jointing drainage pipes, but it must be thoroughly kneaded and worked in by a man who understands the work. It will not do to merely daub it in, as I have seen it done, and suppose the job finished. The pipes will all leak after a short time. White lead, or putty, is sometimes used.—H. H. H.

[1158.]—COMPOSITION LETTERS ON STONE.—If a dovetail is cut in the stone, similar to the annexed cut, lead can be run into it and afterwards smoothed off, and will last as long as the stone itself.



A chemist will, perhaps, tell "Ignoramus" how to tint this lead various colours.—A BEAVER.

[1163.]—AREAS OF CIRCLES.—"C. E. O." will find the two following general methods useful for obtaining circles of proportionate areas to given circles. It is required to obtain a circle one-half the area of the large circle A B (fig. 1). Divide the radius A C into two equal parts at D, and with D as centre and radius D A describe the semicircle. Erect the perpendicular D E, and the chord C E will be the radius of the required circle. By a similar mode of working, any proportionate area may be obtained. Thus, suppose we wished to obtain a circle having (say) three-fifths the area of the large circle A B. Divide A C into five equal parts, and from the third division from the centre erect the perpendicular x y. The chord C y will then give the radius of the dotted circle, which will have three-fifths the area of the large circle. Second method.—It is required to find a circle of half the area of the large circle A B H. Produce the diameter A B to D, making B D equal half A B. Find a mean proportional to the two lines A B, B D, thus—on A D describe the semi circle, and from B erect the perpendicular B E. With half B E as a radius, describe the circle F G, which will have half the area of A H B. If we required any other proportionate area (say one-third), make B x = ⅓ A B; describe the dotted semi-circle, and the mean proportional B y will be the diameter of the dotted circle, which will have one-third the area of A H B. By this method of working, any parallelogram, triangle, or polygon, &c., may be made of proportional area to any given similar figure. Thus—suppose A B to represent the side of a polygon, &c., and we wished to construct a similar figure having one third the area, then B y would be the side of the required polygon, &c.—J. S. R., Nottingham.

FIG. 1.

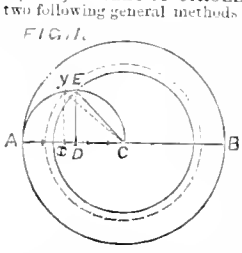
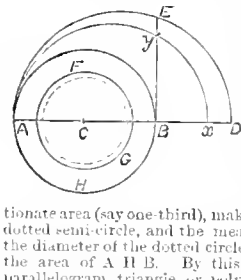
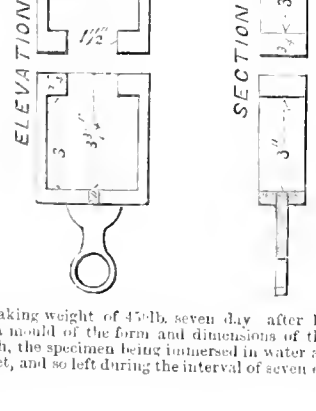


FIG. 2.



[1166.]—TEST FOR PORTLAND CEMENT.—In answer to "Cement Advocate," Portland cement should not weigh less than 100lb. per struck bushel (filled into a bushel measure as lightly as possible), and capable of maintaining a breaking weight of 450lb. seven day after being made into a mould of the form and dimensions of the annexed sketch, the specimen being immersed in water as soon as it has set, and so left during the interval of seven days.—F. C.



[1170.]—WEIGHT OF ICE.—In reply to "Jack Frost's" query, the weight of a cubic foot of ice at 32° equals 58lb. 1oz.—F. C.

[1170.]—Ice is somewhat lighter than water, inasmuch as it floats in that liquid. The specific gravity of ice is .926, that of water being unity; and if the weight of a cubic foot of water be taken as 1,000oz., the weight of a cubic foot of ice will be 1,000oz. × .926, which equals 926oz., or 57lbs. 14oz.—R. L. B.

[1176.]—WEIGHT OF CEMENT CONCRETE.—In answer to "T. T. W.," the weight of a cubic yard of cement concrete, as given by Molesworth, equals 3,591lb., or 1 ton 12cwt. 0qrs. 7lb.—F. C.

WAGES MOVEMENT.

THE operative plasterers of Leeds have served the following notice on their employers:—"We, the operative plasterers of Leeds, seeing that our trade in several of the neighbouring towns, likewise one of the building trades of Leeds, have the privilege of the diminution of the hours of labour, see no reason why the plasterers of Leeds should not have the same privilege; we therefore trust that you will take this into consideration, viz.:—For the first five days to commence work at seven a.m., and close at half-past five p.m.; and on Saturday to commence work at seven a.m., and close at half past twelve p.m.; to have meal hours as at present, the same to continue all the year round. Rate of wages—5s. 4d. for the first five days, and 3s. 4d. for Saturday. N.B.—We require the above to come into operation on the first Monday in May, 1869."

STAINED GLASS.

THE memorial window to Chaucer, immediately over his tomb in the south transept or Poets' Corner, Westminster Abbey, is intended to embody his intellectual labour and position amongst his contemporaries. At the base are the Canterbury Pilgrims, showing the setting out from London and the arrival at Canterbury. The medallions above represent Chaucer receiving a commission, with others, in 1372, from King Edward III. to the Doge of Genoa, and his reception by the latter. At the apex, the subjects are taken from the moral poem entitled "The Floure and the Leafe." "As they which honour the Flower, a thing fading with every blast, are such as look after beauty and worldly pleasure; but they that honour the Leaf, which abideth with the root, notwithstanding the frost and winter storms, are they which follow virtue and during qualities, without regard to worldly respects." On the dexter side, dressed in white, is the Lady of the Leafe, and attendants; on the sinister side is the Lady of the Floure, dressed in green. In the spandrels adjoining are the Arms of Chaucer. On the dexter side, and on the sinister, Chaucer impaling those of (Roet) his wife. In the tracery above, the portrait of Chaucer occupies the centre, between that of Edward III. and Philippa his wife; below them, Gower and John of Gaunt, and above are Wickliffe and Strode, his contemporaries. In the borders are disposed the following arms, alternately: England, France, Hainhault, Lancaster, Castile, and Leon. At the base of the window is the name Geoffrey Chaucer, died A.D. 1400, and four lines selected from the poem entitled, "Balade of gode counsaile."

"Flee fro the prees, and dwell with soth fastnesse,
Suffise unto thy good though it be small;"

"That thee is sent receyv in buxomnesse;
The wrastling for this world a-keth a fall."

This window was designed by Mr. J. G. Waller, and executed by Messrs. Thomas Baillie and George Mayer, 118, Wardour-street, London, 1868.

Two memorial windows of stained glass have just been placed in St. Peter's Roman Catholic Church, Belfast. The first window is represented by a local journal as "one of the most magnificent objects on which the eye could rest"—whatever that may mean. The other contains a representation of the "Last Supper." The windows are the production of Mr. W. H. Sullivan, of Liverpool.

STATUES, MEMORIALS, ETC.

THE Royal Mausoleum at Frogmore was visited by a large number of persons on Tuesday, and is now completed—the granite sarcophagus being placed in the centre of the floor of the building, with the marble recumbent statue of the Prince Consort, by the late Baron Marochetti, resting on its cover. The sarcophagus, which is of Scotch grey granite, stands upon a black marble plinth, with four bronze angels—also the work of Baron Marochetti—at each angle. The black marble is from Belgium, and is a gift of the late and present King of the Belgians. All that now remains to complete the decoration of the building is to place three more pictures and three more statues in the vacant niches.

A memorial tomb of grey granite, with red panels, is to be erected at Horrabridge, near Plymouth, to the memory of the late Sir James Brooke, Rajah of Sarawak. The sides of the tomb are to be filled with bronzes representing scenes in the life of the deceased.

LEGAL INTELLIGENCE.

A CIVIL ENGINEER NONSUITED.—This was an action at Nisi Prius by a civil engineer to recover £235 for professional services alleged to have been rendered to Sir Charles Fox and Son. The case for the plaintiff was, that in 1865 he suggested to Sir Charles Fox the formation of a railway between Lancashire and Cheshire, by means of a tunnel under the Mersey. Ultimately the defendants took up the scheme, and it was agreed between them that when the act of parliament was obtained he should receive £500 and be appointed resident engineer of the railway. The act was obtained, but in consequence of the commercial panic the undertaking could not be carried out. The plaintiff, however, received £500, and was satisfied with that payment. In October, 1866, an extension of the railway on each side of the river was contemplated, and the plaintiff said he was employed by the defendants to make surveys and plans for the additional works. The present action was brought to recover the sum he claimed for the services he had so rendered. The defendants denied that they were liable, on the ground that the plaintiff had undertaken the necessary surveys and the preparation of plans entirely on his own responsibility. The plaintiff was nonsuited.

CLAIM FOR COMPENSATION.—KING v. KELK, LUCAS, AND OTHERS.—ACCIDENT.—This was an action brought in the Court of Queen's Bench by the plaintiff, a house painter, to recover damages against the defendants, the well-known builders, for serious injury suffered by him in consequence of the alleged negligence of their servants. The defendants pleaded not guilty of negligence, and not liable for the consequences of the injury. It appeared from the evidence of the plaintiff that he had been previously to the accident employed as a house painter at Muswell Hill, and when in May, 1866, the work ceased, he went to the Alexandra Palace Hotel, where he heard work in his line was to be had. He was directed by a man in the defendants' employment the way to the office at which he was to make application, and while proceeding to it a man engaged on the works dropped, from a considerable height, a heavy iron chain, which struck plaintiff, knocked him down, and seriously injured his thighs and one of his feet. He was rendered insensible. When taken up he was placed on a stretcher and conveyed to his own home, where he was attended for some time by Dr. King, and subsequently by Dr. Llewellyn. He was subsequently received as an inpatient in the German Hospital; but from the time of the injury up to the present he had never been able to use his foot, and was disabled from pursuing his business as a painter. Witnesses having been examined on the one side and the other, and counsel for plaintiff and defendants having addressed the jury, the Lord Chief Justice summed up the evidence. The jury, unable to agree in their box, retired, and, after a considerable time, returned into court and gave a verdict for defendants.

Our Office Table.

Some observations lately made by Dr. Frankland tend to throw some light on the cause of the action and non-action of water on lead. He has found that water which acted on lead lost this power after being passed through a filter of animal charcoal. This, in his opinion, is owing to the presence of a minute quantity of phosphate of lime passing into the water from the charcoal. On comparing two natural waters, that of the River Kent, which acts violently on lead, and that of the Vyrnwy, which, though very soft, has no action whatever on that metal, he found that the latter contained an appreciable amount of phosphate of lime, while none could be detected in the Kent water. These facts would appear to bear out the Doctor's hypothesis, and may probably account for the discrepancy of evidence in reference to the action of soft water on lead.

The following paragraph is copied from an account of the Luther Festival at Worms, which appears in the *Jewish Herald* for this month:—"Several strangers who had come to the festival also visited the Jewish synagogue, which is one of the most ancient in Europe. It was built in the Gothic style, about 800 years ago, by one Mar Joakob. A lamp is kept perpetually alight before the Ark of Covenant, bearing this inscription, 'Eternal Lamp in Commemoration of the Two Wanderers.' It is said that during a persecution of Jews at Worms, 700 years ago, two unknown strangers, Christians, making a short stay there, were killed while trying to shield the Jews from the fury of the rabble. The names of these two devoted persons have never been known, but the grateful Jews of Worms sought to immortalise their memory by the foundation of an ever-burning lamp." Now, whatever the actual style may be, if the above account is correct as to date, the building must be an interesting one, and should any of your correspondents have the opportunity of procuring photographs of the outside and interior, the illustration of the same in the pages of the BUILDING NEWS would doubtless gratify many of your readers.—I am, &c., GEORGE MARTIN.

At the meeting of the Academy of Sciences at Paris on November 30, the Count of St. Cricq-Cazeaux proposed to cover the worn-out steps of the column in the Place Vendôme with thin sheets of aluminium bronze. M. Dumas approved of the idea, and reminded the meeting how successfully this bronze was now being used in various kinds of mechanism, especially in saws driven by steam power, which saws, although much thinner, lasted a much longer time than those of steel.

After thirty-eight days' trial in the Irish Court of Queen's Bench, a case, Doolin *v.* Dixon, between a builder and the Roman Catholic clergyman of Phibsborough, near Dublin, has terminated in a disagreement of the jury. The judge who tried the suit was Chief Baron Pigot, and the sum claimed by the plaintiff, £11,500, is said to be exceeded by the total of the legal costs on both sides.

A good many generations ago the then Earl of Derby obtained leave from his sovereign to build and fortify a castle at Liverpool. On more occasions than one well-executed subterranean means of communication between the castle and different points of the river beach have been discovered; none of these, however, surpassing in interest and distinctness one which has been brought to light within the last day or two in the area of the Exchange buildings. Here a deep excavation is being made for the cellars. In the course of this excavation, which is all through rock, a well marked gallery has been opened up. It is cut in the solid rock, is fully 6ft. in height by 3ft. in width, and its crown is about 6ft. below the surface of the natural ground. It runs almost directly north from the site of the castle, from which the Exchange is distant about 200 yards or more. It has been very carefully excavated, the tool marks of the excavators being very distinctly left in the rock.

On Thursday week the end of what is professionally termed "a silver medal year" of the Royal Academy was celebrated in the usual manner by the award of prizes to the students by Sir Francis Grant, P.R.A., in the lecture hall of the Academy, Trafalgar-square. Last year the most attractive competition was for the historical (gold) medal; on this occasion it was the competition for the travelling studentship that created the greatest amount of interest. "The Last Song of the Girondists," by Mr. C. Calthorp; a domestic picture described by the text, "The Lord giveth and the Lord hath taken away, blessed be the name of the Lord," by Mr. Frank Holl (son of the eminent engraver); and "Orestes Pursued by the Furies," by Mr. C. Rolt, were the competing works. The premium of £10 for the best drawing from the antique done during 1867 was awarded to Mr. Philip Westlake; the medal for copying to Miss Kate Aldham; the medal for the best painting from the life to Mr. Arthur Stocks, son of the eminent engraver; and the medal for the best drawing from the life to Mr. E. T. Haynes. The travelling studentship for the best architectural design of a museum for natural history was obtained by Mr. E. Marshall. The following were likewise awarded prizes:—For perspective and sciography, Mr. E. Block; drawing from the antique, Mr. W. Britten; antique model, Mr. T. Brock; life model, Mr. J. Carter; and for a restoration of a portion of the Parthenon frieze, Mr. T. Brock.

A correspondent informs us that the Gaiety Theatre, in the Strand, now nearly complete, and which will be opened on Saturday, December 26, is the only theatre in this country which has any pretensions to be fireproof. The pit floor, circles, galleries, corridors, and entrances are constructed with Messrs. Phillips' patent, a combination of their patent girders and ⊥ floor bars, forming a complete frame of wrought-iron, which is filled in with 6in. thick of Portland cement concrete. The under side of concreting is plastered, and the floors of corridors and entrances are formed of Portland cement, 1¼in. thick. The cantilevers supporting galleries are of I form, securely bolted to the columns and also into the solid brickwork of outer walls by stout tie bars. Every precaution has been taken by the architect (C. J. Phipps, Esq.) to ensure the stability of the structure in this respect. The works were only commenced in August last. Mr. Archibald Dawnay, C.E., has very ably carried out the ironwork, under the Messrs. Phillips.—[How can a theatre be called fireproof which is boarded all over inside? Possibly the skeleton of the new theatre is fireproof, as our correspondent says, but let a fire once break out there, and it will in all probability spread with amazing rapidity.]

The old town mansion of the Marquis of Salisbury is now being pulled down, and the site will be entirely cleared, and early in next year the new mansion will be commenced from Mr. W. Slater's and Mr. R. Herbert Carpenter's designs. One of the fronts will be in the Green Park and the other in Arlington-street. The block of buildings next the park will be a private residence for the family. The main block will include grand reception rooms, dining-room, and hall. Messrs. Lucas Brothers will be the contractors.

In reference to our note about Mr. Burges's chalice, a correspondent asks how it is that none of our churches possess church plate considered worth looking at, while the city companies plume themselves on their standing cups and other relics, and so do the Oxford colleges.

A correspondent notes, with regard to the proposed changes in the constitution of University College, that it is to be hoped they will be in a liberal direction, so far as architecture and engineering are concerned. As yet not one of the architect or engineer students has been created a fellow, or become a member of the governing body of the college. The proposed change of constitution is the result of a liberal action of the proprietary body. Some years ago the example was set of proprietors giving up shares to the council, who appropriated them to distinguished students under the name of fellows, thereby gradually converting the proprietary body into a constituency of graduates.

The works upon the Loughborough Park for the Suburban Village and General Dwellings Company, under the new management, are favourably progressing, giving promise of a speedy commencement of building operations. The roads have been marked out, and contracts for their construction, with sewers, &c., are being invited by the directors. The general arrangement of the estate is such as bids fair to secure, on its completion, a village capable of containing 7,000 inhabitants, who will have dwellings in every way constructed to secure domestic comfort and sanitary requirements. The efforts of the company are being appreciated by the working classes, its object being to help them without the sacrifice of their independence, and to secure them houses of their own upon better terms than many building societies. The scale of repayments extends over twenty-one years, at a smaller rate of payment than is generally asked for rent in the crowded localities of London. A selection of plots and class of house was made on Thursday, December 10, on which occasion all who had paid their calls or instalments according to priority of application had a choice, and about 100 were chosen, and will be taken possession of upon completion.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Engineers.—Continuation of paper on the "Application of Steam to the Cultivation of the Soil," by Mr. Baldwin Latham, 7.30.

TUESDAY.—Institution of Civil Engineers.—Annual general meeting for the election of the council and officers, and for the distribution of premiums, 8.

WEDNESDAY.—Geological Society, 8.
Society of Arts. Description of the Electric Organ, by Henry Bryceson, Esq., 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

798. J. AND J. THOMPSON. FIXING DOOR AND OTHER KNOBS. Dated March 7, 1868.

Among the features of this invention are the following:—In order to fix a knob on each side of a door when the door is fitted with a mortice lock, the patentees form around the boss or stem of the knob a V or similar groove; the boss or stem of the knob is received into and fits in a recess in a rose or plate which is fixed to the side of the door by screws or otherwise, and, in order to retain the boss or stem of the knob within the recess in the rose plate, two or more screws or other projections from the rose plate enter the groove in the knob, the ends of the screws or projections being caused to bear against the inclined side of the groove nearest to the door; the knob is thus held up to the side of the door, or to the rose plate upon it, but yet is free to turn within the recess in the rose plate, a square hole or recess being formed through the centre of the stem or boss of the knob to receive the end of the lock spindle, as is usual.—Patent completed.

833. S. NAYLOR. APPARATUS FOR RAISING WATER. Dated March 11, 1868.

The patentee claims mounting a wheel driven by steam power, or in other convenient manner, and having blades or arms upon it, in a narrow chase or passage, and leading the water to be raised from the lower channel into such chase or passage at a point under the axis of the wheel, so that the blades or arms, in place of striking the water as soon as they reach the level of the water in the lower channel, may not come in contact with the water until they are travelling horizontally or nearly so. He also claims the use of a jointed floating valve or flap at the entrance to the upper channels to prevent the return of the water from the upper to the lower channel when the wheel is stopped. He also claims the general arrangement of apparatus for raising water, substantially as described. Patent completed.

859. S. HOLMES. SIGNALS [illegible] INTERCOMMUNICATION IN RAILWAY TRAINS AND B[illegible]. Dated March 13, 1868.

The object of the invention is the establishment of reliable oral intercommunication, for such a length of time as may be desired, between one particular compartment or place and that with which it is wished to communicate, and the invention consists in various arrangements, which we cannot here describe, for effecting this object.—Patent abandoned.

Trade News.

TENDERS.

B[illegible].—For [illegible] at [illegible] mill, [illegible] Hanstock, architects:—

[illegible]

K[illegible].—For [illegible] Messrs. Nash and Son, [illegible], architects:—

[illegible]

NEW [illegible] LANE.—For [illegible] Notley, architect [illegible]:—

Woodward	[illegible]
Webb and Sons	[illegible]
Newman and Mann	[illegible]
Lathey Brothers	[illegible]
Adamson and Sons (too late)	[illegible]
Myers and Sons	[illegible]
Turner and Sons	[illegible]
McLachlan	[illegible]
J. Motter	[illegible]
Browne and Robinson	[illegible]
Colls and Son	[illegible]
J. Thompson	[illegible]

Agreed between the lowest two that J. Thompson should withdraw in favour of Colls and Son.

ORE.—For erecting house and offices on St. Helen's Park Estate at Ore, near Hastings, for [illegible] W[illegible], Esq. E. Habershon, Brock, and Webb, architects:—

Manley and Rogers	£ [illegible]
Simpson	[illegible]
Scrivener and White	[illegible]
Patman and Fotheringham	[illegible]
Longmire and Burge	[illegible]
Nightingale	[illegible]
Longhurst	[illegible]
Hughes	[illegible]
Howell	[illegible]

OXFORD.—For the rebuilding [illegible] at the clothing factory of Messrs. Hyde and Co., clothiers, Oxford. Mr. C[illegible], architect:—

Baker	£ [illegible]
Dover	[illegible]
Jones	[illegible]
Castle and Co.	[illegible]
Hall	[illegible]
Cowley (accepted)	[illegible]

PENZANCE.—For [illegible], &c., at [illegible] Harbour, near Penzance. Quantities supplied by Mr. Joseph Simmonds. Mr. Douglas, engineer, [illegible] Works, Penzance:—

Robbins	£[illegible]
Havan	[illegible]
Freeman and Son	[illegible]
Sharps Brothers	[illegible]
Hibbard and Long	[illegible]
Moore	[illegible]
Keswick	[illegible]

SOUTHILL.—For erecting a warehouse [illegible] in Station road, S[illegible]hill, for Mr. [illegible] and Hanstock, architects:—

Accepted Tenders.

George Mallinson, Mason	£[illegible]
Petty and North, [illegible]	[illegible]
Jonas Thornton, [illegible]	[illegible]
J. H. Senior, Plumber	[illegible]
J. W. Hey, Plasterer	[illegible]
Total	£[illegible]

WHITE [illegible].—[illegible] for the [illegible] Mr. G. H. Smith[illegible]:—

[illegible]

COMPETITIONS.

[illegible].—[illegible]

[illegible] February [illegible] Walworth.

[illegible] a public hospital and dispensary. Premiums £[illegible], £[illegible], and £[illegible]. J. Barras, honorary secretary.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

LEWISHAM.—For the construction of six houses.—W. C. Banks, architect, 39A, Gracechurch-street, City.

UPPER MOOR, BODENHAM, HEREFORDSHIRE.—For the erection of new farm buildings, and alterations to farm house. F. R. Kempson, architect, 34, Castle street, Hereford.

LITCHURCH LOCAL BOARD OF HEALTH.—January 18.—For the execution of certain drainage works in this district. W. Whiston, jun., clerk to the board.

TOTTENHAM.—December 23.—For the formation of roads on the Coleraine Park Estate. Messrs. Hudson, Matthews, and Co., solicitors, 23, Bricklersbury, E.C.

KINGSTON-ON THAMES.—December 23.—For the supply of best blue broken Guernsey and China granite. J. Bell, clerk, District Highway Board.

KINGSTON-ON-THAMES.—December 23.—For the supply of grey pit flints. J. Bell, clerk to the District Highway Board.

RADNOR COUNTY GAOL.—January 7.—For alterations to this gaol. R. Banks, clerk of the peace, Kingston, Radnorshire.

MADRID (Spain).—January 20.—For the construction of tow markets. E. Petano, Charge d'Affaires, Spanish Legation, London.

HIGHGATE.—For alteration and additions to a villa. Messrs. Habershon and Pite, 38, Bloomsbury square, W.C.

ACTON.—December 22.—For constructing a sewer and other works in Church Fields road. E. Monson, C.E., surveyor to the board.

DERBY.—January 7.—For the erection of the new hotel and shops in the corn market, W. C. Watson, Derby Improvement Company's Office, Wardwick, Derby.

METROPOLITAN BOARD OF WORKS.—January 8.—For the construction and maintaining in repair for twelve months of a brick and iron sewer in Deptford and Rotherhithe. J. Pollard, clerk, Spring gardens.

CALNE (Wilts).—December 31.—For the erection of a detached villa at Bremhill, near Calne. John Watson, architect and surveyor.

NORTH-EASTERN RAILWAY.—December 26.—For the supply of timber, bar iron, plates, bolts, nails, &c. T. Cleghorn, secretary, Railway Offices, York.

NORTHAMPTON IMPROVEMENT COMMISSIONERS.—January 6.—For the construction of a culvert in Herbert street A. B. Markham, clerk to the Commissioners, 2, Derngate, Northampton.

LEOMINSTER.—January 6.—Great Western and London and North-Western Railways.—1st. For an iron bridge of two spans, with embankment, &c. 2nd.—An iron foot bridge, of 40ft. span. J. Wait, secretary, Birkenhead.

BACUP CEMETERY CHAPELS.—January 4.—For the several works required in the erection of three chapels. Gay and Swallow, architects, &c., Exchange-buildings, Bradford.

STOURBRIDGE.—December 31.—For the erection of a new church, at Stamber mill, near Stourbridge. Thomas Smith, architect, the Mount, Stourbridge.

PROPERTY SALES.

DECEMBER 8.

AT THE MART.—By Messrs. Driver.—Freehold residence known as Canterbury House, West end lane, Hampstead, with stabling, lodge, pleasure grounds and paddock, about 2½ acres—sold for £5,000.

Freehold plot of building land fronting Southampton road, Kentish Town—£120.

Freehold plot of building land fronting Southampton road, Kentish Town—£230.

Freehold house, situate at the corner of Southampton road, Kentish Town—£560.

Leasehold house, No. 78, Southampton road, term 81¼ years unexpired, at £5 per annum—£225.

Freehold two plots of building land fronting Southampton road—£220 each.

Freehold plot of land, with dwelling thereon, fronting Gospel Oak grove, Kentish Town—£315.

Freehold plot of land fronting Lismore road, Kentish Town—£570.

Freehold plot of land fronting Gospel Oak grove, Kentish Town—£120.

Freehold the Gospel Oak Schools, and plot of land in Circus road, Kentish Town—£1,400.

Freehold residence known as Bartram's Park, Haverstock hill, with pleasure grounds and paddock, about 2¼ acres—£5,500.

Freehold house, No. 2, Leighton road, Kentish Town, let at £32 per annum—£640.

Freehold house, No. 4, Leighton road, Kentish Town, let at £25 per annum—£550.

Leasehold house, No. 6, Leighton road, Kentish Town, let at £26 per annum, term 28¼ years unexpired, free from ground rent—£330.

Leasehold house, No. 8, Leighton road, term similar to above, free from ground rent—£330.

Leasehold improved ground rent of £16 per annum, for 28¼ years, secured on Nos. 10, 12, 14, and 16, Leighton road—£130.

DECEMBER 9.

By Messrs. E. Fox and Bousfield.—Freehold marine villa, known as Charman Dean, in the parish of Broadwater, Sussex, with stabling, offices, pleasure grounds, &c., containing 72 acres—£13,700.

Freehold residence, with gardens and meadow land, 20 acres in extent, known as Vine Lodge, Sevenoaks, Kent—£8,500.

Freehold house and shop, No. 262, Roman road, Bow, let at £38 per annum, subject to a mortgage—£60.

By Messrs. Hards, Vaughan, and Leifchild.—Freehold sugar estate, known as the Greenhill Estate, situate in the parish of St. Mary Cayon, in the Island of St. Christopher, containing 390 acres—£5,450.

Freehold piece of land, containing about 8,425 square feet, situate in the parish of St. George Basseterre, in the above island—£390.

DECEMBER 10.

At the Mart.—By Messrs. Wilkinson and Horne.—Leasehold house and shop, No. 2, Romsey terrace, Well street, South Hackney, term 80 years from 1865, at £6 per annum—£850.

Leasehold house and shop, No. 3, Romsey terrace, let at £45 per annum, term and groundrent similar to above subject to a mortgage)—£65.

Leasehold house and shop, No. 4, Romsey terrace, let at £45 per annum, term and ground rent similar to above subject to a mortgage)—£50.

Leasehold business premises, No. 15, Little Bell alley, Moorgate street, City, term 21 years from 1858, at £42 10s. per annum—£500.

By Messrs. Hards, Vaughan, and Leifchild.—Freehold house and shop, with warehouse and premises in the rear, No. 4, New Park street, Great Guildford street, Borough, let at £50 per annum—£860.

Leasehold four residences, Nos. 2 to 5, Cambridge terrace, Brockley road, Forest hill, annual value £45 each per annum, term 99 years from 1866, at £24 per annum—£1,500.

Leasehold house and shop, No. 31, Upper Marylebone street, let at £80 per annum, term 60 years from 1863, at £12 per annum—£940.

By Messrs. C. C. and T. Moore.—Freehold four houses, Nos. 109, 111, 113, and 115, Kerbey street, East India road, producing £67 12s. per annum—£510.

Freehold house and shop, No. 74, St. George street, St. George's East, let at £25 per annum—£260.

Copyhold ground rent of £36 per annum, secured on seven houses situate in Jamaica terrace and Robert street, West India road, Limehouse—£670.

Copyhold ground rent of £26 6s. 6d., secured on Nos. 3 to 7, Limehouse causeway—£920.

Freehold rental of £64 per annum, secured on the Eagle, Brewery, High street, Poplar—£1,320.

Leasehold two houses, one with shop, No. 13, Grenada terrace, and 4, Bermuda street, Commercial road East, let at £50 per annum, term 25 years unexpired, at £4 per annum—£370.

Leasehold two houses, Nos. 12 and 14, Martha street, St. George's East, term 22 years unexpired, at £5 11s. per annum—£120.

At Garraway's.—By Mr. George Berry.—Freehold eight plots of land in the Spencer and Milton roads, and a corner plot in Chancer road, Dulwich road—£750.

Freehold house, shop, and premises, No. 34, Church street, King's road, Chelsea, let at £30 per annum—£440.

DECEMBER 11.

At the Mart. — By Mr. Robins. — Leasehold residence, No. 33, Islip street, Kentish Town road, let at £38 per annum, term 81 years unexpired, at £8 8s. per annum—£360.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Augustus Pickett, Thornton Heath, builder, December 31, at 12—William Skull, Lever street, St. Luke's, marble mason, January 11, at 1—William Wisher, Avenue road, Coldharbour lane, builder, December 30, at 12—Stephen Caslake, Hornsey rise, gasfitter, December 29, at 11—George Gilkes, Teddington, builder, December 24, at 12—Thomas Hughes, Arlington street, New North road, builder, January 11, at 12.

TO SURRENDER IN THE COUNTRY.

Joseph Greenacre, Yarmouth, carpenter and builder, December 23, at 12—Robert Hodgkinson, Birmingham, building surveyor, January 8, at 10—Griffith Humphreys, Corwen, builder, January 6, at 12—Joseph Rothuson, Brierley hill, carpenter, January 4, at 12—Ellis Cutlaw, Phillack, builder, January 5, at 11—Joseph Fish, Blackpool, bricksetter, December 23, at 2—Alfred Wilkinson Seymour, Manchester, joiner and builder, December 29, at 9.30—James Whatmuff, Brigg, joiner and builder, December 22, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 11, E. Foley, Leyton, builder—January 11, W. Mackenzie, Colchester street, Pimlico, builder—January 11, J. Wheeler, Althorpe road, Wandsworth Common, builder—January 18, J. Squirrell, Portland road, South Norwood, gasfitter—January 12, R. B. Talbot, Stafford, builder—January 19, J. Gadd, Kensington place, Westminster, stonemason—January 19, C. E. Birt, East India road, contractor—February 1st, B. Chandler, Worth, builder—January 22, J. E. Ward, Plaistow, builder—January 22, J. Smith, Appleford road, Westbourne Park, stonemason—January 8, J. Conlson, Bolton, joiner and builder—December 23, F. Woor, Loddon, Norfolk, brickmaker—December 30, J. Buckley, Davenham, builder.

PARTNERSHIPS DISSOLVED.

Wood and Cliff, Huddersfield, painters and paperhangers—J. and J. Chadwick, Dodley, Yorkshire, stone dealers—Taylor and Armstrong, Birkenhead, ironfounders—Knight and Hebbett, Shorcham, builders—M'Clean and Co. Great George street, Westminster, civil engineers.

DIVIDENDS.

January 9, J. George, Orleton, Herefordshire, carpenter—January 13, W. Winch, Turin street, Bethnal green road, timber merchant—January 13, D. Dunham, Toddington, Beds, builder—January 20, T. Spooner, Burton-upon Trent, surveyor—January 8, J. Turner, Cheetham hill, builder—December 23, S. Gee, Burton-on-Trent, joiner—January 2, W. Eddy, Gosport, plumber—January 2, C. Bicknell, sen., Southsea, gasfitter.

DECLARATION OF DIVIDENDS.

S. Knight, Sittinghourne, carpenter, div. 1s. 9d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

LEAD —							
Pig, English	per ton	21	0	0	0	0	0
,, Spanish Soft	do	18	7	6	0	0	0
Shot, Patent	do	22	0	0	22	5	0
Sheet	do	20	0	0	0	0	0
White	do	27	0	0	30	0	5
COPPER :—							
Sheet & Sheathing, & Bolt	per ton	78	0	0	80	0	0
Hammered Bottoms	do	88	0	0	0	0	0
Flat Bottoms, not Hammered	do	83	0	0	0	0	0
Cake and Tough Ingot	do	0	0	0	0	0	0
Best Selected	do	76	0	0	77	0	0
Australian	do	76	0	0	0	0	0
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7

IRON :—							
Welsh Bars in London	per ton	6	10	0	6	15	0
Nail Rod	do	7	12	6	7	15	0
Hoops	do	8	5	0	9	0	0
Hoops, Single	do	9	5	0	9	7	0
Staffordshire Bars	do	7	12	6	7	15	0
Bar in Wales	do	5	15	0	0	0	0
Nailrods	do	7	12	6	7	13	0
Foundry Pigs, at Glasg. No 1	do	2	14	0	2	19	6
Sweedish Bars	do	10	0	0	10	10	0
TIN :							
English Block	per ton	103	0	0	0	0	0
do Bar	do	104	0	0	0	0	0
do Refined	do	106	0	0	0	0	0
Banca	do	101	0	0	0	0	0
Straits	do	101	0	0	0	0	0
ZINC :—							
English Sheet	per ton	25	10	0	26	0	0
*Devaux's V. M. Roofing Zinc	do	27	0	0	0	0	0

* And 4 per cent. discount if laid upon the new system

STEEL :—							
Swedish Keg, hammered	per ton	15	0	0	15	10	0
Swedish Faggot	do	0	0	0	0	0	0
SPELTER :—							
On the Spot	per ton	20	0	0	0	0	0
QUICKSILVER	per btl	6	17	0	0	0	0
REGULUS OF ANTIMONY							
French	ton	48	0	0	0	0	0

TIMBER, duty 1s per load Drawback, 1s.

Teak	load	£10	10	12	10	£13	6
Quebec, red pine		3	10	4	15	8	0
,, yellow pine		3	0	4	8	6	5
St. John N.B. yellow		0	0	0	0	0	0
Quebec Oak, white		5	5	6	0	9	10
,, birch		3	15	4	15	0	0
,, elm		4	0	4	17	0	0
Dantzic oak		4	0	5	10	0	0
,, fir		2	10	4	0	0	0
Memel fir		2	10	3	0	0	0
Riga		2	15	3	0	0	0
Swedish		2	2	2	8	0	0
Masts, Quebec red pine		4	0	6	0	0	0
,, yellow pine		4	10	8	0	0	0
Lathwood, Dantzic, fm		5	10	6	10	0	0
,, St. Petersburg		7	10	8	10	0	0
Deals, per C., 12 ft, by 3 by 9 in., duty 2s per load, drawback 2s.							
Quebec, white spruce		13	0	18	0	0	0
St. John, white spruce		13	0	15	0	0	0
Yellow pine, per reduced C.							
Canada, 1st quality.		16	0	18	0	0	0
2nd do		11	5	12	0	0	0
Archangel, yellow		£10	10	£13	6	0	0
St. Petersburg, yel.		10	0	12	0	0	0
Finland		6	5	8	0	0	0
Memel		0	0	0	0	0	0
Gothenburg, yellow		8	0	9	10	0	0
,, white		0	0	0	0	0	0
Gefle, yellow		9	0	10	10	0	0
Soderham		9	0	10	10	0	0
Christiania, per C., 12 ft. by 3 by 9 in. yellow		10	10	13	0	0	0
Deck Plank, Dantzic, per 40 ft. 3 in.		0	13		18	0	0
PUMICE STONE per ton		6	0	8	0	0	0
OILS, &c.							
Seal, pale	per tun	35	10	0	0	0	0
Sperm body		92	0	0	0	0	0
Cod		39	0	0	0	0	0
Whale, Sth. Sea, pale		38	0	0	0	0	0
Olive, Gallipoli		60	0	63	0	0	0
Cocoanut, Cochin, ton		51	0	0	0	0	0
Palm, fine		43	10	45	0	0	0
Linseed		27	0	0	0	0	0
Rapeseed, Eng. pale		33	0	0	0	0	0
Cottonseed		28	0	31	0	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 25 1868.

THE "GRAND STYLE."

THERE are few things more generally distasteful than a pompous way of setting about ordinary matters. "All men," it has been said, "hate a formal fool," and Englishmen are supposed to carry this dislike of formality to a higher pitch than anyone else. In many respects this is undoubtedly true. People who talk in the manner of Mr. Micawber are sufficiently rare to be noteworthy, and the "grand style" in journalism finds little favour with the critics. But in architecture and its adjuncts the case is strangely different. We seem, speaking broadly, to have no style for every day—no architectural dress for common purposes. Our shops and warehouses are decked out with scraps from palaces and churches, or else built totally without regard to appearance; they fail to keep the desirable medium between rags and finery. Architects, as most of us must confess, too often act as if a plain design would be discreditable to them. There is too much anxiety to put all they know into every work, instead of giving to each so much elaboration only as best befits its purpose. The temptation is to be always seeking opportunities for cleverness, to put high art into a shop front, if there is no chance of doing so in a cathedral. A sort of general competition is always going on for notice and admiration—a strife as to who can outdo the rest, not in good taste and propriety, but simply in catching the public eye. Hence a building without ornament is almost unknown. We decorate everything, from banks to workhouses. We have no costume for the world to do its business and live its daily life in: we put all our clients alike into full dress.

Not the least unfortunate result of this rage for finery is that of its making beautiful forms repulsive through mere repetition. The most perfect types soon cease to please when copies of them meet the eye at every turn. Mr. Ruskin has shown how familiarity has brought the finest Greek ornament into contempt, and the same thing is taking place at this hour with Gothic detail. If our best appliances are thus degraded by vulgar associations, what is left to us when we wish to soar above vulgarity? What are we to use on grand occasions if we wear out the grand style for every day? There are purposes to which dignity and magnificence properly belong. Architecture, as well as literature, has its epic poems; but their stately language was never meant to be the common dialect of the streets. And even the highest efforts of architecture will lose their effect without the advantages of contrast. Where every word would be emphatic, there is no emphasis at all. If every part of a picture be in high light, nothing but flatness can result. Many things must be content with a subordinate place if anything is to be really prominent; and this is just as true in groups of buildings as in single ones. The best artistic effect arises here, as in many other cases, from the practice which ordinary good sense would indicate—namely, that of carefully adapting the architectural character of each work to its particular purpose. With all the elaboration of the new façades in the City, there is a singular absence of expression in most of them—a want of that "distinction" which in art, as well as in life, is more fascinating than any amount of mere cleverness. They are generally uninteresting in spite of all their decoration. It is quite possible, on the contrary, to combine great interest and individuality with simplicity and repose, and this is the ideal which one would wish for in the mass of town buildings. Let everything be well studied alike, but let the rhetoric and poetry of architecture, so to speak, be reserved for subjects on which they will not be out of place. We want good, plain prose, forcible and not inelegant, for matters on the level of ordinary existence. The ideas may be original, but the language should be unpretending. Unfortunately the exact reverse of this would fairly describe the prevailing fashion. The underlying idea—their "motive"—is commonly poor and shallow enough, but the mode of expressing it stilted in the extreme. There is almost no quiet beauty to be met with—no repose; every new building wants to be a salient point. One thinks instinctively of the advice given to the musicians in one of Longfellow's dramas—to play "with a certain modesty, and not as if each instrument were the only one in the universe." Harmony is impossible while every part aspires to be the leading one.

The misuse of the "grand style" is confined to no particular school, though it would be easy to specify some distinguished names on the Gothic side from which it has never received any support. But the truth is, this fault is prevalent in all quarters, though in all, perhaps, some happy exceptions may be found. M. Romaieu's recent work in Eastcheap, and Mr. Wilkinson's offices of some years back in Bishopsgate-street, fairly exhibit its mediæval development. The Crown Insurance Office in Fleet-street, too, is rather an advance in ornament than in art over Mr. Woodward's original design in New Bridge-street. Amongst buildings of the Italian type the difficulty is to select examples of the vice out of the multitude which present themselves. This style falls so naturally into the rigidly uniform mode of composition that most people hardly suppose irregularity to be admissible in it; and uncalled for uniformity—as much as excessive decoration—is a mark of too ambitious a method of treatment. It is only in works of a monumental class, if at all, that symmetry of arrangement should be followed as a primary object. In buildings of a lower order the natural course is to set convenience altogether above external display; and this leads nearly always not to exact symmetry, but to unaffected picturesqueness. Instead of giving a long list of new designs remarkable for inappropriate showiness, it will be more pleasant to notice a few in which better taste is manifested. The Provident Life Office in Gracechurch-street, by Mr. Kerr, though elaborated quite up to the point which its purpose would seem to warrant, has a sort of refinement and quiet elegance throughout which puts it in a very different rank from most of the surrounding architecture. The office of the General Assurance Agency, too, in the same street, though simple, is well studied and effective. Some of Mr. Blomfield's designs, again, to mention no others on the Gothic side, contrast very favourably as regards propriety of treatment with those referred to just now. The narrow frontage of the Post Office in Chancery-lane, and the premises built for Messrs. Heaton, Butler, and Bayne, are extremely free from the exaggerated architecturalism under notice. Perhaps, in the latter, at least, the tendency is almost to the opposite extreme, to a manner scarcely architectural enough for the streets of a great city. This, however, is at least erring on the safer side, and may help, as far as it goes, to oppose the popular idea that in Mediæval work everything is sacrificed for the sake of effect. Popular ideas often express themselves very absurdly; but the absurdity should not make us overlook any grain of truth which may lie at the bottom of them. When a competition committee advertises that Gothic designs will not be received, they are doing a very foolish thing, but doing it, in all probability, with a very excellent intention. The Gothic with which they are most familiar is that of some third-rate district church or Congregational chapel, and, like sensible men, they feel its childishness and unreality. They do not know that Gothic can be—and in good hands is—the most simple, natural, and unaffected way in which we can build. To them the name only suggests buttresses, tracery windows, gablets, and carved foliage, endless angles to run against, and the awkwardest of winding staircases. This sort of masquerading dress does not strike them as being the most appropriate thing for their new building, and so, to avoid it, they forbid Gothic altogether. Under existing circumstances, one cannot blame them very severely for the mistake. It only shows that the "grand style" in its Mediæval guise is felt to be even less appropriate to common matters than in any of its other forms.

MESSRS. WALFORD AND DONKIN'S ART FURNITURE.

IT is gratifying to see the attention of architects increasingly given to the amelioration of that "household taste" the lamentable condition of which is deplored so feelingly in Mr. Eastlake's recently-published work. We therefore gladly welcome all earnest efforts of volunteers for this somewhat forlorn hope; the more so because we fear they must in most cases prove the artist's sole reward, and that any very profitable return for the labour and thought expended is hardly to be looked for. As fresh labourers in this arduous field, and entitled to a share of its hard-earned laurels, we would recognize Messrs. Walford and Donkin, who have for some time been engaged in developing a style of furniture which has considerable originality and many merits. The character of the specimens of furniture represented in one of our lithographic engravings, and of other designs of theirs which we have seen, is sufficiently peculiar to deserve notice; and, although we cannot give it our unqualified admiration, we think it successful in many ways. Considering the acknowledged difficulty of the task they have set themselves to accomplish, we are not disposed to be hypercritical, but rather to look forward to the result which we believe they will be able, with further experience, to attain. The claims set forth by the authors for their style are sufficiently bold. They profess to provide "economy, comfort, and art as applied to modern domestic furniture"—an intention which, if fully carried out, ought to command the appreciation of the public. This is, however, a stiff-necked generation, and it does not always respond, even when piped to in the sweetest strains. We shall endeavour to see how far the promises thus held out have been, or are likely to be, performed, and to judge whether it will in this case be the architects or the public who are to blame if their effort prove not so successful as may be desired.

Among previous would-be reformers of our "household taste" some have adopted a far less comprehensive programme to begin with. High art has been their Alpha and Omega, and neither economy nor comfort have been objects they sought. To provide for comfort they have scorned, as pandering to the luxurious vices of the age. Sackcloth, embroidered it is true, has been the only class of material the use of which they would allow; and dust, il garnered in deeply crannies of carvings, they would not abhor. Plate glass has been gravely asserted to have been the invention of the Evil one, as a punishment for the special sins of the day, and elegance to have been a modern emanation from the same source. That the voice of such prophets should be disregarded is only what they looked for, and they have the crown of their martyrdom to solace them for their failures. Economy cannot be said to have been the aim of the designers of the painted furniture in the Mediæval Court of the Exhibition of 1862, and stories of "the wines and the beers"

richly dight on sideboards are not addressed to every-day purchasers.

However incumbent it may be upon a rightly educated public to delight in furniture put together in the true and orthodox rabbit-hutch style, the fact is that manufacturers of such wares must count upon a very limited, even though a highly select set of admirers. The recent collapse of the "Art Furniture Company" must, we think, be partly attributed to a praiseworthy resolve to teach rather than to please their customers. The object of Messrs. Walford and Donkin is more practical, if less enthusiastic and lofty-minded. The mediums through which they propose to work out art decoration are principally fret-cutting, stencilling, incising, and turning.

Fret-cutting they recommend as particularly adapted for clear and vigorous outlines. Elaborate subjects are executed by it with precision and facility, and it affords an incomparable saving over its sister art of carving.

Stencilling they advise as a substitute for parquetry and inlays, as being more readily worked by anyone who can cut a pattern or handle a brush, and by it the boldest relief is obtainable with the colours introduced.

Incising they propose to use for outlines; and by *turning* they endeavour to secure the delicacy and refinement for which it is especially adapted; and by the use of these cheaper modes of decoration they hope to bring art within the reach of the public.

We presume that it cannot be contended that any of the above processes are altogether novel even in their application to furniture. At the same time they have not been hitherto extensively used in the same manner, and consequently we have to thank these gentlemen for pointing out to us the capability of the tools we have at our command. It is, however, with the workmanship rather than with the tools that we are concerned, so we shall proceed to consider the application they have made of them. The style they have adopted must be called an eclectic one. It is mediæval so far as it is based on common-sense principles and construction unconcealed, although as regards what are called *shams* they profess themselves somewhat latitudinarian. Their qualification of such is that they should be "legitimate," and on this point they say, "We should not be inclined to quarrel with plaster or paper because our walls happen to be brick. In the same way we should not scruple to paint, print, or stencil patterns on panels, because the art of inlaying might be considered the older of the two, and the former, therefore, only an imitation. We, however, do not hold that articles made of wood should be turned into pure gold or tortoise shell, or so enveloped in leather or padding as to hide all construction or the position of their bones." Leaving them, however, to adapt these matters to their conscience, or their conscience to them, as in some of their battles with their cabinetmakers, they may find it necessary to do before they can finally settle, to the mutual satisfaction of both parties, all questions as to veneering and such like—we notice that the *motif* for much of their ornament is taken quite as much from Classic as from Gothic work, and we could wish these were its only sources, for neither of those pure styles would be glad to father the balusters which seem to creep into most of their designs, and from which we could well spare them. The objects upon which, as yet, they seem to have devoted the most pains, and with the greatest success, are their chairs, and a description of some of these will convey a tolerable idea of the character of their work. One armchair, seen, but not very favourably represented, in the illustration, does, to our mind, combine economy and comfort with no mean degree of art.

Each side, including the legs, is cut out of a single plank of birch, 22in. wide and 1in. thick, and the seat and back are composed of strips of the same wood ½in. thick, with their tenons piercing the sides and secured with small pins. The sides are perforated by fret cutting in a design, which, by a few incised lines, is cleverly made to represent two Scandinavian looking monsters armed with shields and engaged in a combat, and the upper terminations are cut and engraved as eagles' heads. Some delicate lines, like bars for music, and an octofoiled circle, simply sunk by a centre-bit, give relief to the part below the seat; the top of the back is also perforated and decorated in a similar manner. The chair is provided with a loose cushion and a pad nailed to the back and a fringe to the front of the seat. A round bar of wood connecting the back legs completes the construction.

The perforated decoration is open to the same objection as that of the carved work of the Bombay chairs, as affording a harbour for dust, and the position of the pad on the back is quite wrong, but this might be easily altered. The whole conception is, however, good, and affords ample scope for variety of design, while the cost of the chair, compared with its effect, must certainly be considerably less than those ordinarily sold.

Another chair without arms deserves remark. One piece of wood, 1½in. square, forms the side of the back and front leg, and a similar piece forms the back leg, and meets the other above the seat, giving it support just where it is wanted. These are both decorated with turning and gilding in a refined and delicate manner, and are connected together, and with the seat, by shaped pieces of board. A half-inch perforated board forms the top of the back, with a stuffed panel below finished with fringe. This chair is strong and firm, and it is constructed and decorated upon proper principles; it requires, however, a different slope of the seat and shortening of the legs.

Among the other articles of furniture is a sideboard, which invites comment, and curiously, we should say, both praise and censure in an equal degree—the former being confined to the lower portion and the latter to the part above. In fact, while we admire without much qualification the circular pedestals and the drawers which connect them, we should consign to the *Athenæum*'s "limbo of gew-gaws" the semicircular glass panel and all its appurtenances, which defy both description and criticism. This sideboard is executed in black wood, delicately relieved with incised and flat-fluted work and bold metal hinges, and has a very suggestive band of decoration representing in gilt lines a Greek four-horsed chariot and driver. This idea is the one which best supports the claim of the designers of the introduction of art into their work, and though we should prefer subjects not quite so far-fetched, we cordially appreciate its *motif* and its treatment.

For a table introduced into the foreground we cannot find a word of praise, as its only feature is the support, consisting of three nondescript balusters, with hardly less objectionable brackets and feet. The perforated sides of the bookcase worked into scrolls of foliage and birds, and a bold if somewhat eccentric cornice, are its best features, but we could not remain content with the lower portion till we had planed the bulging contours of its ends. The above description will, we hope, convey some idea of their meritorious attempts to effect an improvement in a direction where it is much needed. We hope that Messrs. Walford and Donkin will meet with many opportunities for developing and improving their ideas of domestic furniture, the originality and vigour of which we fully recognize. We should advise greater reticence in the use of notching and chamfering, and a higher development of the artistic element in their work.

The designing of furniture differs materially from the ordinary work of an architect, and demands some special training. There are certainly not many architects who would be competent, without considerable apprenticeship, to undertake it, and few who can find sufficient other professional employment would care to do so, for it is a difficult and profitless task, although an interesting one. We hear a great deal about the duty of architects to meet the requirements of the day, and we are not among those who think it incumbent upon them to denounce such on every occasion; but it is a far easier task to ring any necessary changes which climate or fashion may demand in a building than it is in its minor fittings and furniture. Precedents exist in almost all styles for any variety that can be asked for in the structure, whether it be in the number and size of its openings, affecting its proportions or otherwise; but to satisfy the claims of taste, and to fit at the same time the whims and the backs of men, women, and children, is a task not altogether to be envied.

It will not do to assert that whims ought not to exist, or that people's backs should be made to suit themselves to the chairs that have been designed for them upon purely high-art principles. Architects who undertake such work will find that they must set aside many of their preconceived ideas, for the same rules that they have been accustomed to apply to buildings will not be applicable to furniture. New problems, as it were, will present themselves for solution every instant, and without a thorough mastering of the details of this class of work, there can be but small hope of any successful result.

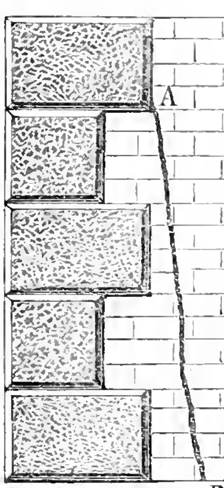
DEFECTIVE CONSTRUCTION OF MASONRY.

IS it a fact that we are rapidly losing the art of building in masonry, and that the days of bricks and mortar are fast passing away? From the specimens of the latter description of work that are daily springing out of the ground like mushrooms, it must be confessed that they bear not the slightest resemblance to the examples that have preceded them. There is not a week that we do not hear of some bridge, viaduct, or house falling down, and to no other source of weakness and instability can their downfall be attributed than to that of defective work or bad materials, and frequently to both these causes combined. Moreover, it is not at home alone that we are to look for these constructive catastrophes. They are quite as plentiful abroad—in Asia as well as in Europe; and, what is worse, in our own Indian possessions, and on railway works superintended by English engineers and constructed by English contractors. On the Great Indian Peninsula line, a number of bridges and viaducts have recently either altogether failed or manifested symptoms so serious of approaching dissolution and collapse that it was considered preferable to pull them down than to allow them to perform that operation for themselves. The report presented to the company of the line alluded to by their chief engineer is well worthy the attentive perusal of everyone engaged in the erection of structures of masonry and brickwork. Allowing for defective materials, bad mortar, and occasional "scamping" on the part of the native sub-contractors and overseers, the failures one and all are stamped with this inscription:—"To ruin were we brought by unequal settlement." From the earliest times of construction there has invariably been this obstacle to be overcome in the employment of separate and distinct materials—viz., the different manner in which they may behave under similar circumstances. It is often assumed that they will, so to speak, act together, or that, even if their action is not identical, it will be so insignificant in diversity of influence that there will be no necessity for taking any precautions to guard against unforeseen contingencies. The fallacy of this assumption and the disastrous consequences that attended the neglect of precautions was fatally demonstrated by the failure of several of the early railway bridges,

where an injudicious combination of cast and wrought iron was employed.

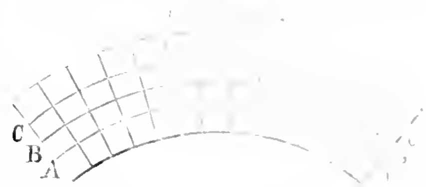
To return to the unequal settlement of masonry and brickwork. This may proceed either from employing two different descriptions of material in the same structure, such as stone and brick, or by using two or more varieties of work. If a wall, a pier, the abutment of a bridge, or a house, be built entirely of brick, there can be no unequal settlement take place, unless the foundation yield, which is a condition we shall not take into consideration at present, as that would be sufficient to cause cracks in the best structure ever erected. But if a structure be erected partly of brick and partly of stone, then, if the two materials be very unequally distributed and badly bonded together, there is considerable likelihood that there will be a settlement, originating in the vicinity of their union, and spreading gradually over the entire building. Let us take as a general illustration of our meaning the example in Fig. 1,

FIG. 1.



where the structure is of brick with stone quoins. The absolute difference of settlement between the two materials depends obviously upon the much greater number of joints that there are in the brickwork compared with the stone. As the mass of the brickwork settles, it shrinks away from the stone faster than the latter can follow it, and occasions a crack that will resemble that represented in the cut. The line of crack or "thread," as it is technically termed, will start somewhere in the neighbourhood of the bricks that lie vertically between the quoins, and which cannot settle to the same extent as the others; these will, therefore, be split across by the weight of the rest of the wall pressing upon them. Another fruitful source of the collapse of piers and abutments in which two classes of work are used is the want of bond between the facework and the "hearting" or filling. It is manifest that, if the bond be insufficient, the facework is nothing more than a mere veneering, and the least inequality of settlement would cause the face to sheer clean off from the rest of the structure. There would be, in fact, almost a complete "straight joint" between the exterior and interior of the work. It appears that the employment of two different descriptions of stonework in the face and backing of the piers and abutments of the viaducts in India was the chief reason of their collapsing. Manifestly, too great care cannot be adopted in bonding in uncoursed or rubble work in the backing with coursed ashlar work in the face. If the stones in the face be all stretchers and no headers, then there is no union between the face and the interior, and the structure as a whole is defective, unsound, and unreliable.

Many of the works alluded to were provided with wrought-iron superstructures, but others supported arches of masonry and brickwork in the ordinary manner. To the use of bad mortar, large joints, and inferior workmanship may be attributed the downfall of many of these. A glance at fig. 2 will



demonstrate the necessity that exists for small joints and mortar of the strongest and most adhesive description whenever, as is commonly the case, the arch is turned in half-brick rings. There is clearly not the slightest vertical bond or connection between the separate rings. The curved lines A A, B B, C C, represent complete concentric straight joints, and we could easily imagine the ring A A separating or dropping away from the other three while they remained sound and intact. An additional evil of this method of building arches is that unless the bricks be "gauged" the difference between the circumference of the intrados and the extrados must be made up by the joints, which in itself is a direct incentive to bad work. The perfection of an arch would be found in its being all in one piece, and, next to that, the depth of its voussoirs or rings should be equal to the thickness of the arch, a condition usually fulfilled in stone arches, but never in brick ones, excepting, of course, in such insignificant instances as window-heads and door and relieving arches. It is fortunate for the progress of engineering works abroad that we have made so extensive a use of iron, but, at the same time, it is neither sound nor economical policy to be compelled to employ it in situations where there are abundant materials for introducing a more solid and permanent type of construction. The proper use of iron is to employ it and make it available where other means for effecting the desired object cannot be obtained, but not to use it to the prejudice of more substantial materials simply because there is a difficulty in getting them put together so as to constitute sound and durable work. It has become so much the custom to build in iron that structures are often erected of that material in situations where masonry and brickwork could be employed at a much less cost, and with greater advantages with regard to correct æsthetical principles.

PROPOSED SEWERAGE OF GLASGOW.

EVERY practical man is ready to admit in the fullest sense that, although the sewage of London is not utilised to the extent it ought to be and could be, yet it is removed from the immediate vicinity of the metropolis in a manner which leaves nothing to be desired on the score of health, rapidity, and sanitary considerations. That other large cities and towns should follow the example of London with regard to getting rid of the offensive matter from the habitations of men is only what might be expected, and that they should, in addition, provide measures for effecting its ultimate utilisation might likewise be reasonably anticipated. From the fact, as expressed by some unreflecting rustic, that "it is very extraordinary rivers should always flow by towns," the utilisation of sewage is nearly invariably connected with the purification of the rivers, streams, or watercourses into which it was previously discharged with all its fœtid impurities. The whole problem of the utilisation of sewage is summed up in the phrase, "Take it out of the rivers and put it on the land." Simple as this proposed remedy may appear, it is not equally simple when attempts are made to carry it into practical execution. Nor, strange as it may seem, is every professional man agreed upon the propriety of the step. We should be quite prepared to allow for differences of opinion as to [illegible] respecting the [illegible] practically executing the principle we [illegible] that the absolute advisability of applying sewage to land is disputed. That the only effectual method of [illegible] its application to the soil, we regard as a truism confirmed by experiment and established by experience.

To return to the immediate object of our article, there are several plans proposed for the utilisation of the sewage of Glasgow, involving incidentally the purification of the Clyde. The only one of these which offers any real and practical solution of the difficulties is that of Messrs. Bateman and Bazalgette, who propose to utilise the sewage in the proper sense of the term, as understood by every engineer who has had any experience in this limited and novel branch of the profession. The proposal of Mr. [illegible] to create an artificial double current up and down the river by dividing it into two parts by a longitudinal wall, makes matters worse as it converts the Clyde into a double sewer instead of leaving it as a single one. Moreover, the scheme would totally spoil the appearance of the river, and is one which, in our opinion, has not a single redeeming feature. Mr. Scott proposes to purify the Clyde by bringing a quantity of sea water up to a certain point, and discharging it into the polluted stream. This is equivalent to a man first putting a dose of prussic acid into the water he is about to drink, and then diluting it with an enormous amount of water to prevent it killing him on the spot. We should be inclined to assert that the preferable plan would be not to let the poison get into the draught at all—in other words, not to let the sewage into the Clyde, and thus fulfil the ancient adage "prevention is better than cure," bearing in mind that we altogether deny that any cure of a polluted river would be effected by simply diluting the noxious impurities it contains. It must not be supposed that we ignore the purifying action of large quantities of water, or that, theoretically, a given amount of sewage would not be rendered inoffensive by the addition of a certain amount of water; but practically to apply this principle upon a very extensive scale, and also continuously, is a point we do not for a moment concede. In addition, all these projects are suicidal, and that is quite sufficient to stamp them, in the present age of *[illegible]*, as unworthy the adoption of a provident and thrifty people, who believe that by proper means and a due exercise of skill and care they may prove universally that nothing should be wasted. Undoubtedly at present we know little or nothing about the scientific management and utilisation of sewage, but time and experience will develop all that is required upon this point, so long as we remain true to the system we have adopted. One thing we are thoroughly acquainted with, that in adopting the utilisation of sewage by its application to land we have chosen the right path, and are daily acquiring knowledge which will enable us to perfect those details and subsidiary features which at the present, from our limited experience with respect to the whole [illegible], could not be anything else but crude and imperfect. But, on the other hand, if we once stray from the right path, if we once desert the principle that we know to be the only sound and correct one, then we are voluntarily refusing the good and choosing the evil, and must not be surprised if the end we attain is incommensurate with the means employed, and if the goal which we arrive is one not of reward but of punishment. And such will unquestionably be the result if, instead of adhering to the established truism we have laid down, and the principle recognised by the most eminent engineers as the only sound and reliable one, we allow ourselves to be diverted by other projects

which but imperfectly remove the sewage, but partially purify the contaminated rivers and streams, and effect no utilisation whatever of the fertilising material.

HOMERTON FEVER AND SMALL-POX HOSPITALS FOR THE METROPOLITAN ASYLUM DISTRICT.

THE committee invited six architects to compete for the above hospitals, and designs have been received from Messrs. Watson, Knightley, Bracebridge, Wilson, Scott, jun., and Giles and Biven, and it appears from the several plans that the requirements have generally been observed.

The style of the design submitted by Mr. Watson partakes somewhat of the ordinary house building with a few Gothic features. In the plan the kitchens are placed in the basement, and cleverly arranged to supply the general building. The entrance buildings have passages badly lighted, and it does not appear that the shape of this building is well arranged for its purpose, the squarer forms displayed in some of the other designs being preferable. The system of one corridor for each sex, divided in the centre by means of a blank wall, appears to us objectionable, the classes being brought too close together; and the ventilation impeded. The dormitories have one great fault, and that is the position of the bath, which being at the end destroys the advantage of having this part of the room well lighted. One day-room for each class is provided. This cannot be sufficient. Generally, this plan contains many points of merit, and might be greatly improved by further consideration. The estimated cost for both buildings is £42,700.

Mr. Knightley gives a very fair design of Italian character, and perhaps it may be said quite equal to any exhibited. The entrance building of this plan is well arranged, being somewhat square in form. The dormitories are well arranged, and separated from each other in a manner beyond that of any other competitor. The day-rooms are too far removed from the dormitories, and the special wards in main corridors must be objectionable. The intermediate dormitories are only one story. This plan increases the amount of air space. The minor portions of this plan have been well considered, and the kitchen, laundry, and other arrangements are satisfactory. The estimated cost for both buildings is £33,000, a sum we consider not sufficient for the work proposed.

The design by Mr. Bracebridge does not indicate the amount of skill displayed by some of the other competitors. The style is of a very plain character, and has not, perhaps, had sufficient attention, probably on account of its being secondary to the general arrangement. The entrance block is badly lighted, and all the offices seem to be small in their dimensions. The dormitories are very objectionable on account of the day-rooms being at the end, and the approaches to nearly all the ground floor dormitories are beneath the staircases. The estimate is £51,500, and we should think that the committee ought to have a much better building for such an outlay.

Mr. Wilson appears to have devoted considerable time to the preparation of his design; it would have been much to his advantage if he had confined himself to the preparation of one design. The style may be termed Italian, and the plan possesses some merit in the administrative department. The dormitories have no day-rooms, and the nurses' rooms and scullories are badly placed; the passages and corridors are not properly lighted, and many alterations are required to make this plan suitable for its purposes. The estimated cost is £41,350.

Mr. Gilbert Scott, jun., presents a design that may be considered somewhat French in character. The plan of entrance is good, and well arranged for lighting. The dormitories are well lighted, and the water-closets are well cut off from the several dormitories. A day-room for each dormitory has been provided; the position being in the angle is very objectionable, and it must be a miserable apartment. The kitchen and offices of this plan are placed in the basement, which appears to be a very unsatisfactory arrangement. Generally, this plan does not display the same knowledge as that shown by some of the other competitors in many minor accommodations and arrangements; and without such provisions the plan would be wanting in many essential features. The cost of the building is £64,000, and, considering that the arrangements are scant and the architecture of the plainest description, the estimate is too much.

Messrs. Giles and Biven have an alternative plan, which is inferior to the others submitted. The design is Italian and of fair character. The entrance buildings are small, and might with advantage be increased. The kitchen is in a bad position, being in the centre of the main corridor; other offices in connection therewith being placed on the opposite side. This arrangement is improved upon in the plan of the small-pox hospital. The wards for contagious diseases are very objectionable as to their position, opening as they do upon the main corridors. We expected something beyond this production from the authors. The cost is estimated at £44,000.

In reviewing the several plans we are not satisfied that either design is of sufficient merit as it now stands to be erected. It must be a matter of regret to find that, considering the amount of the highest estimate, the remuneration is little above 2½ per cent.; and all members of the profession must have reason to lament that so many will give so much labour for a payment so inferior to a fair charge. It will be remembered that this subject was enlarged upon at the opening meeting of the Institute, and it is sad to meet with such a result as displayed in this competition.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual meeting of the Royal Institute of British Architects took place on Monday night week, Mr. Joseph Clarke, vice-president, in the chair. A paper was read by Professor T. Hayter Lewis, F.S.A., Fellow, entitled—

NOTES ON THE CELTIC, ROMAN, MOORISH, AND OTHER REMAINS IN ALGERIA.

Professor LEWIS commenced by briefly describing the town of Algiers, and the districts round it, which comprised the district he intended to describe. Algiers itself was best known as a nest of pirates, but years ago Northern Africa was occupied by nobler races. Their descendants still form a large portion of its population, and are known under the name of Kabyles—in early history as Berbers—and are supposed to have been a branch of one of the Semitic nations of Asia. Of their architecture the Professor had nothing positive to say, but he called attention to some few specimens of an art still practised among them, many of which were of singular beauty. They were very peculiar, being worked chiefly on a base of white metal, on which a pattern is raised by thin lines of the same metal, precisely in the manner of Cloisonné enamel, but in such a manner as clearly to show that it was without the intention of filling it up. Some portions were, however, filled with delicate enamel or corals, chiefly of green or red, arranged with such skill as to produce a rich yet delicate effect. Some specimens of this work were exhibited in the Algerian collection in the Paris Exhibition of 1867, and the best of them have been retained in the present Government museum at Algiers. Their pottery also, though rude in shape and primitive in colour, offered no mean examples of the art. The Professor noticed at some length the successive occupations of Northern Africa by the Carthaginians, the Romans, the Saracens, and the French. Of the various works of all these peoples he would notice first those usually termed—for want of a better name—Celtic or Druidic. Of the rudest class of these he had found abundance near Algiers on the margins of a deep ravine of the Sahel, near the modern French village of Guyotsville. They were simply cromlechs similar to those at Kits Coty House, near Maidstone. They were formed of large rude unworked stones set up edgeways so as to make a small chamber, which was covered with one or more large flat stones at top. That these were sepulchres there was no doubt, from the presence of bones in all of them when newly opened. The most common articles found in them were flint implements, and no trace of a tumulus had been found over any of the cromlechs. No mark of a tool had been found by the Professor on any of the stones, and the only idea suggested of their origin was that they were the burial-places of an Armorican legion from Brittany which was known to have been located in Northern Africa. More curious remains of these early races, whatever they were, were to be found in the eastern province at Djebel Karonba, and these seemed quite peculiar to the country. Circular on plan, with an external diameter of about 20ft., they had thick external walls of good large rough coarse stonework, and were covered with flat stones in oversailing courses. They bore no mark, and possessed not even a tradition to tell of their authors or date.

Twelve miles west of Kiloa, 850ft. above the seashore, is the famous Kbour-er-Roumia, or Tomb of the Christian Lady. This monument is 200ft. diameter, on a platform 210ft. square; and on this is a circular range of engaged columns, projecting rather more than three-fourths of the diameter. They rest on bold mouldings, which, with their bases, remain pretty perfect. The bases are the well-known attic, and above them the shafts are continued to about 16ft. or 17ft. in height. Thence the exterior is destroyed. But, at about the height at which we should expect to find the blocking course above the cornice, a series of gradini commences, ending with a level platform 13ft. in diameter. At the four cardinal points are four false doorways, with panelled doors, having bold architrave mouldings, all the upper parts, however, being broken away. The shafts are Ionic, boldly but coarsely worked, and the carving of the capitals coarse and untrue. The tomb is so immense as to render it a certainty that it must have been built to enshrine some precious corpse, but, though effort after effort has been made by the French, no trace or skeleton, sarcophagus, shrine, or sepulchre had been discovered. As to the date of the work, the whole of the details gave one the idea of their having been copied by Roman artists from Greek originals, and this was the opinion of M. Berbrugger, who assigns the structure to Juba II., who died A.D. 19, and to his queen Cleopatra, daughter of the celebrated Egyptian.

Of a similar type to this is the Medracen, in the eastern province near Batna. The general description of the Kbour applied to this. It is, however, in a much better condition, except in one place at the entrance. The monument is 184ft. diameter to the projection of the cornice, 16ft. 5in. high to the top of the cornice, and 60ft. 6in. to the top platform from base. The top of the platform is 39ft. diameter. Between the columns outside are long ranges of sculpture, too decayed to allow of their being assigned to any peculiar style, though the subjects are to be made out. They represent the elephant, hyena, and other animals, but nothing had yet been done towards deciphering the meaning of these strange decorations. The most probable idea of the date of this monument seems to be that it served as a royal mausoleum for the kings of Numidia, and that it was built in the reign of King Syphax, who was sent to Rome B.C. 203.

Somewhat similar to the above, but of square outline on plan, are those known as the Djedav, in the south-east of the province of Oran, discovered in 1842. They are three in number, built of large stones on a square base with a pyramidal top formed of steps, as in the Madracen and Kbour. The perpendicular part at bottom is 112ft. square and only 11ft. high. Above are 12 steps 11ft. high in all, and all this is of squared large stones. Above the steps is a kind of pyramid also 11ft. high, and made of rude stones, as though broken or unfinished. One only of these structures has been opened. The entry was from the south-east, at some distance above the perpendicular part, and descending at an inclination of 25 deg. to a gallery running round three sides of the building, and having seven branches leading

out of it apparently for burial. The dates of these works are also unknown. Arab historians state that the Djedar were found during an expedition by the Calif el Mansour, who saw on a stone in front the following inscription :—"I am Solurian the Serdegos (strategos). The inhabitants of this town having revolted, the king sent me against them. God assisted me to conquer them." From some fragments of an inscription since found, the story seems to be authentic. Solurian was the Byzantine general who succeeded Belizarius, but the form of the monument resembles nothing left of Byzantine work, and all French archæologists give them a date much more ancient.

Between the time of the Romans and the Byzantines there is nothing architectural to remark. Among the records, however, of this date in the museum are some of considerable interest. One gives as an epitaph an account of probably the earliest pilgrimage recorded, and which must have been a long one, as the pilgrim—a female—speaks of having visited all the cities of the whole earth on naked feet. Another made during the persecution in the reign of Diocletian gives an inventory of the sacred vessels and vestments appertaining to a Christian church.

Few of the great works of the Byzantines are left, though the marks of their connection with Africa are indelibly stamped on much of the work executed in later times.

At Tipasa are said to be the ruins of a large church now filled up by the huts of an Arab village, which, by an unfortunate accident, Professor Lewis was prevented from visiting, nor could he obtain any description of them. At Bon Ismail he found the ruins of an apparently very early church in a tolerably perfect state. The plan was a parallelogram about 143ft. by 43ft. clear of the walls. To the west were the remains of an arcade—(the narthex). At the east end is a large crypt consisting of an apse with a chamber on each side, now almost perfect, the whole built and vaulted in very good squared masonry. Remains of steps leading to the central crypt still exist, and in the centre of it is a singular excavation, somewhat in the form of a coffin in the solid rock, with steps cut in it at one end.

At Constantine are the scanty ruins of a church said to have been founded in the time of the emperor of that name, but the church may have been built over and over again since the time of its foundation.

The chief works of the Arabs, so far as Professor Lewis could personally speak of them, were in the town of Algiers. The whole town is comparatively modern, and dates from about the same period as that of the chief Renaissance architects of Italy (Michael Angelo 1474-1563; Palladio, 1518-1580; Sansovine died 1570; Scamozzi 1552 1616). The streets or thoroughfares are mere alleys winding about the side of the hill in paths so tortuous and irregular that a stranger has but one means of discovering his means of escape from them, viz., by persistently going down hill wherever they may lead, by which method he must of course find himself at the bottom of the Arab part, which is built on the side of a steep hill. The houses, mosques, and palaces, their domes and minarets, are white, having flat roofs with little or no gable and few and small windows. Of all its buildings one of the most ancient and interesting is the grand mosque the Djama Kebir. It stands close to the sea, a small part of the sea wall rising above the rest and marking the place of the sacred niche fronting Mecca. The plan is the usual one—a series of arcades surrounding an open court in which is a pretty fountain shaded by a mulberry tree. All the arches are of the same height—all avenues of the same width. There is no grand vault, no transept, nothing on plan or section or elevation, to show that the architect thought of bringing the edifice into one grand mass. Just outside the door of the mosque is a well-designed though simple building, in which the cadi's court is held. It is square on plan and covered with a dome, and has in front a little colonnade with marble benches, the whole forming as picturesque a composition as could well be found, outlines and details being graceful alike. All this is genuine Arabic, as the date would show, the mosque having been built in 1000 and the minaret in 1322. Close by is another mosque—that of the Fishery or the new mosque, Djama Djedid. This is markedly different throughout. It has no open court, its fountain is in the mosque itself, as our fonts are, and the whole edifice is designed as one complete building, with high nave, aisles of a lower height, spacious transepts, and a dome boldly carried on pendentives, whose graceful outlines please the eye even through the horrible daubings of paint with which the French have sought to please their Mahommedan subjects. These outlines are not Saracenic. Their history declares itself to the eye of the architect at once — viz., that they were designed by a Christian architect of Greek extraction, and whose recompense for the work, according to the stories—it was said untruly told of him, could scarcely have been countenanced by the Institute's scale of charges. For the accounts merely differ as to whether he was bowstrung or burnt to death, but agree as to the date—viz., the sixteenth century, under the Turks. He seems to have given the mere outlines only, and either to have had no workmen to whom he could entrust the execution of the usual Byzantine details, or to have trusted to being able to encrust the walls with the usual marble or mosaics, which, in this case, he never had. The pulpit and the mihrab, or sacred niche, however, show at once that if the masters were Greek the workmen were true Saracens ; for the ornamentation is as markedly their work as the design was his, and it would be difficult to find anything more delicate and graceful.

In walking through the streets in the Moorish quarter nothing is seen of the interior of the houses, and the narrowness of the streets allows little even of the exterior to be seen ; in the Jewish quarter, however, it is different. Of one of these houses Professor Lewis exhibited drawings. The exterior is of the plainest kind, with no regard to picturesque effect, symmetry, or proportion. With the entrance door begins one's sense that Moorish work is not to be judged of at first sight. A long corridor is entered, having on each side a wide marble bench, which serves as a stylibate to a row of white marble columns carrying arches of a very peculiar shape, but common enough in Algiers. The front of the bench is lined with coloured tiles, and the floor is of white marble or tiles, with which the walls at the back of the columns are also lined. In some houses the steps lead to an open court, in others to the staircase. The flights of stairs are arranged one over the other, but the soffits do not slant as with us, but are horizontal, and follow the raking line by succession of steps, which have an excellent effect. The treads are about 14in. wide, and the risers are of tiles, with which the walls are lined about 3ft. or 4ft. high. The soffits have open timbers resting on a small plain cornice. The stairs lead into an open courtyard, always square, surrounded by colonnades two stories high never less, but sometimes one or more extra stories—which then recede to the range of the walls, leaving an open terrace over the colonnade.

The whole work forms a singular mixture of styles. The central court is as much Italian as Moorish ; and the central doorway to each gallery, the little windows opening out of the small domes at the end of the colonnades, the railings to the front, and some minor details are Saracenic, and in many cases of exquisite beauty.

Nothing could be more beautifully designed or worked out than the small domes of the archbishop's palace or of that of the governor ; yet all the main doorways to the corridors and staircases throughout are Italian —of a very debased kind, yet clearly copied from a good example. But, curiously, every doorway throughout the town, no matter of what size or where, is of the same identical pattern, or so near it as to show that it was copied from the original. The columns are well nigh as curious—always of marble—and the capitals and mouldings boldly carved. None of them, as far as Professor Lewis could see, were antique, and few were copies from the antique. In the corridors they have spiral shafts, and in many instances on the colonnade. A peculiar form of capital is also to be met with all over the town. The same patterns of tiles are also seen everywhere, and these are recorded to have come from Leghorn, and to have been Italian. The design of the large window is equally curious with the other parts, as they are as invariably square as the doors are circular, and almost always have wide architraves with ornamental scroll work of the kind found in the archbishop's palace.

Fixing the date of the town at the end of the sixteenth century, when the Turks had possession, we can only imagine that among their captives they had some master mind as an architect ; that he gave the general outlines and sketched out the details of some of the buildings, which met with the Turk's intense approval, and that the details of the numerous others were worked out from his sketch by Saracenic, Byzantine, or Italian workmen. The facts, however, only [illegible] theory, as [illegible] and [illegible] met with.

The construction [illegible] enough. They were [illegible] very hard and much better than bricks [illegible] now, with mortar of a red kind of earth and [illegible]. In common [illegible] parts of the [illegible] were of [illegible] only, in the latter [illegible] were squared, and the [illegible] was [illegible]. The tiles used are of [illegible] peculiar [illegible]. They are of coarse earthenware of a light tint, which is covered with a very thick white. On this the pattern is painted, and then burned [illegible] by hand, and the whole [illegible].

Of modern Algiers little need be said. Though much has been done of late years there is little to interest the architect. Whether good or bad, the modern buildings are clearly French, and in carrying his architecture to a foreign land the Frenchman has gone on the right path, and will leave his mark to succeeding times, as the Turk, the Roman, and the [illegible] have done before him.

CRANBROOK CHURCH

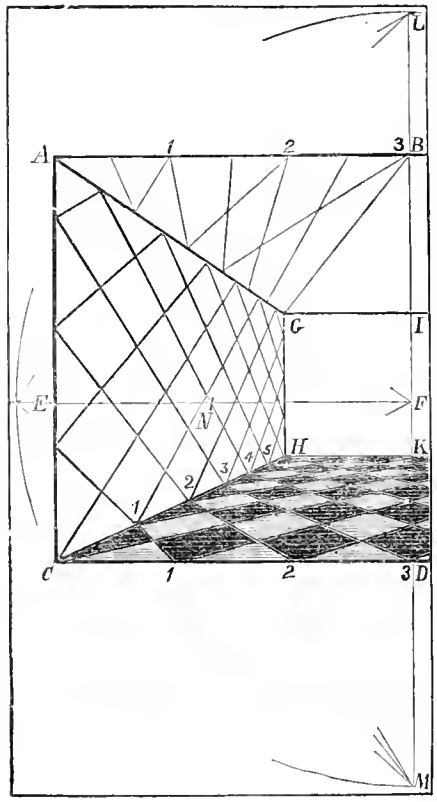
Cranbrook Church, Kent, called "the cathedral of the Weald of Kent," had suffered more than usual from the "modern churchwarden improvements." The magnificent roofs of its nave and aisles were utterly destroyed, a few pieces only being used again as ceiling joists. The ceilings were perfectly flat, and the ancient parapets were destroyed and modern ones placed in their stead. The dimensions of the church are as follows:—The nave is 110ft. long and 2[illegible]ft. wide, [illegible]ft. high to the plate. The whole width, including aisles, is 65ft. The arches are of the richest Third Pointed type, with beautifully clustered piers. Between each of the clerestory windows is a moulded shaft, supporting a sculptured angel, forming the corbel of the roof principal. The great range of aisle windows contains [illegible] Third Pointed work. The tower is of the usual Kentish type, low and massive. The chancel is early in date, and of poor proportions. Opening out of it, on each side, is a chantry of late date, with fine five-light windows. The restoration has been commenced, under Messrs. Slater and Carpenter, by the erection of a new nave roof and the restoration of the parapet stonework. This is now completed. The ancient fragments were carefully studied, and [illegible] remained to serve as guides for the new work. The pitch is low, and the [illegible] moulded tie-beams, the space between which and the principals is filled in with tracery. Under the tie-beams are arched braces, springing from the angel corbels, the [illegible] being [illegible] with rich carving. The [illegible] and [illegible] elaborately moulded, and are supported by curved braces springing from the king-posts of the principals, and supported on carved [illegible]. These introduce Henry VII. and his queen, and the Archbishop in whose reign the building was erected, as well as Queen Victoria and the late Archbishop, to serve as a date of its restoration. The next works that will be proceeded with are the aisle and chantry roofs, and then the [illegible]. The chancel was restored some few years ago by the Ecclesiastical Commissioners, and the oak chancel stalls and fittings were then erected. There is a curious baptistery in the church, a great square space enclosed by walls about 7ft. high, with stairs down into it from the top of the wall. As the bottom of this and the floor of the church are the same, the effect of this is somewhat remarkable. The works have been carried out by Mr. Jenner, and after his death by Mr. [illegible], resident clerk of works to Mr. A. J. B. Beresford Hope, M.P. [illegible] by Messrs. Pepper, of Brighton.

The new pigment [illegible] in some lead mines in New Jersey, U.S., in comparison with the other pigments in general use, is stated to [illegible] [illegible] great opacity [illegible] than [illegible]. It [illegible] oxide of zinc [illegible]. It [illegible] will wear much longer [illegible] weather [illegible]. It [illegible] greater [illegible] hydrogen and other [illegible] quickly discolour white lead. At the same time [illegible].

SCALES OF PERSPECTIVE DRAWINGS AND PHOTOGRAPHS.

THE application of photography to architectural subjects gives rise to inquiry concerning the scale of representations thus produced. Photographs are so frequently substituted for drawings made on the principle of perspective projection, which are known to have determinate proportions, that it may be useful to glance at the optical laws to which both the manual and mechanical methods are subject. The apparent size of any object depends on the angle at which rays from its extremities meet at the eye. The measure of this angle depends, in its turn, upon the actual size of the thing and its distance from the point of sight. The angle becomes less as the degree of removal increases, and a small object that is near may seem equal to a large one far off; but when the distance from the spectator and the angular measure of an object are known, the scale of a picture may be fixed if its position on the distance line be given, and the ratio of the two parts into which that distance is broken is ascertained—*i.e.*, as the distance between the eye and the picture is to that between the eye and the object, so is the size of the picture to that of the object. For the sake of familiar example let an observer standing at one foot from a window trace upon the glass the appearance of something ninety-six feet away from him. The representation will be reduced to one ninety-sixth of the real dimensions, or to the scale of an eighth of an inch to a foot, as very commonly used for architectural drawings. This proportion relates to things that come up to the face of the picture or are in contact with the plane of projection, and to which a scale of parts would be as applicable as to a geometrical elevation. But there is another order of proportion, or rather an extension of the same rule to receding parts of the picture; and these are measurable by an *échelle fuyante*. On this system the original distance (say ninety-six feet) is taken as one distance, and the size of objects on the edge of the picture as the standard of comparison. Then it is found that objects at two distances are only half the size of the first, at three distances only a third, and so on.

The accompanying diagram shows how the mathematical reasoning is brought to bear on the work of the draughtsman. A B C D indicate the section of one-half of a room on the plane of projection. F is the central vanishing point, from which a distance equal to that of the observer from the front of the object is set off horizontally at E. The horizontal lines at right angles to the face of the picture, as those of the wall A G and C H, run towards the centre F, and those which are parallel to the picture, as G I and H K, continue horizontal. The geometrical distances 1, 2, 3, &c., are set along the ground line C D, and lines drawn thence in the direction E, giving corresponding perspective measures along the wall C H. The plan of the room is a square equal to double the width C D. The back wall is, therefore, removed by twice C D and once E F from the place of the observer, together something under three times E F. The size of G H I K is consequently slightly larger than a third of A B C D. By fixing points L M above and below F, with the distance E, diagonal compartments on the vertical face of the wall A C G H may be delineated. The lines on the ceiling show the method of obtaining perspective lengths by half distances on the geometrical line, and drawing towards the point N midway between E and F. The accuracy is proved by another set of lines drawn in the direction E with the full dimensions 1, 2, 3, &c., on A B. No fixed proportion, however, is necessary. The architect in this way, by the aid of known dimensions, produces a perspective without recourse to a plan. Photography effects results of truthful representation utterly unapproachable by hand drawing, and it requires none of the subsidiary constructions, as the plans, sections, and elevations commonly necessary in linear perspective are sometimes called. It certainly appears too exacting to demand that photographic pictures should not only give perfect



similitudes, but the actual dimensions of objects. Still it is a point of great interest, and requires careful consideration. The artist ordinarily regards the human eye as a mere point, but it must now be examined more closely. It is an orb or globe of fluid contained in a tunicated skin of several coats. The open part (the iris and pupil) consists of a lens, through which the rays of vision pass to the inner coating at the back, called the retina, upon which the impression of outer objects is formed. There is this distinction of principle between a drawing and a photograph, viz., that the plane of a drawing is interposed between the eye and the scene, while the lens of the photographic camera comes between the scene and the picture. The camera operates, in fact, as a gigantic eye. The focusing distances of the lenses are always pretty accurately known, and the size of any object in the picture will be to that of the real objects as the ratio of focal length to the actual distance; but, according to the conditions already stated, under which pictorial proportion rests upon angular measures, it becomes obvious that the distance or the size of an object must be known before a scale can be decided.

TECHNICAL EDUCATION.

CONSEQUENT upon a conference held in the room belonging to the Society of Arts on the 14th of March last, under the presidency of the Earl of Lichfield, a "Workmen's Technical Education Committee" was formed for the promotion of the instruction of artisans in the practice of the respective crafts. The committee thus appointed have now published a report showing what steps have been already taken and what further proceedings should in their judgment be adopted. Their first step was to provide for the delivery of popular lectures, which had for their principal object to demonstrate how greatly the success of the national industry depends upon the progress of scientific discovery and the diffusion of scientific knowledge among all classes. Nine of these lectures were delivered during the months of May and June, at the London Mechanics' Institution, to small audiences, and reports of some of them appeared in our own columns. The scheme, however, did not escape the general drawback to most of such projects. It did not pay.

The committee have inquired carefully into the existing means of technical instruction in the metropolis, and their conclusion is that there is no adequate provision for scientific and detailed instruction available by working men at such hours and on such terms as would place it within their reach. They recommend, therefore, the establishment of science and art classes in the industrial quarters of London, and that the instruction at present afforded by the School of Mines and the School of Chemistry in the daytime should be also available at night, and in localities more convenient to the working man. The report further calls on the Government to establish or to aid in establishing a few great central schools for foremen and managers, similar to the Ecole des Arts et Métièrs of France, to which students may proceed by means of scholarships and exhibitions from the more elementary schools.

Reviewing at some length recent reports on the subject of technical education—viz., those issued by the sub-committee of the Society of Arts and the report of the Select Committee of the House of Commons—the report approves and confirms the former, but considers the latter to have failed in its purpose, and to have rendered it "more incumbent on this committee to pursue its work." The committee appeal to all classes to aid them in their effort to bring the cause they advocate before the public of this city, so that gradually—first in one district and then another—museum-schools may be set on foot. To working men they especially appeal for support in the task which they have undertaken, and the furtherance of which will necessarily involve some expenditure.

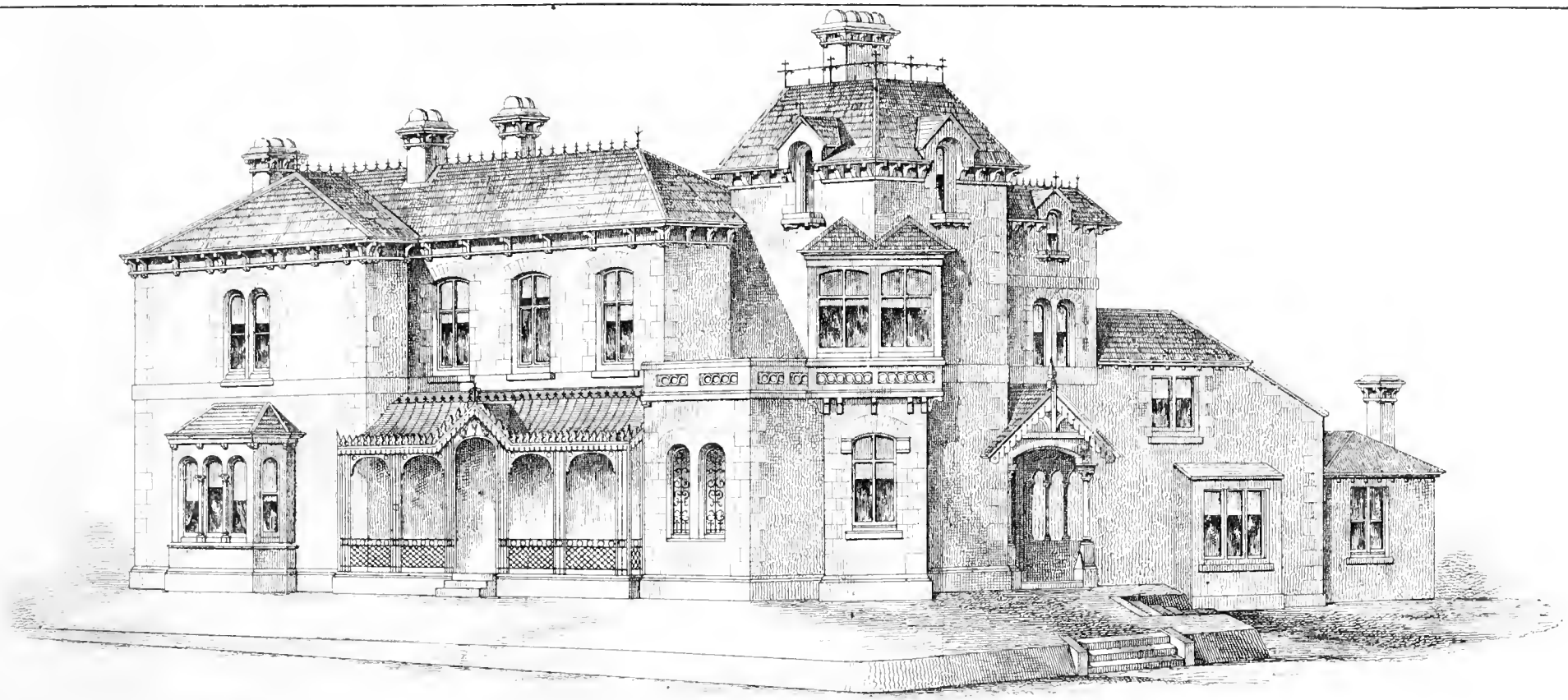
THE INSTITUTION OF CIVIL ENGINEERS.

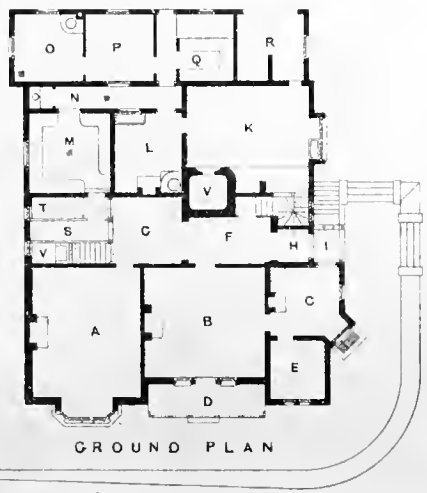
THE annual general meeting of this institution took place on Tuesday evening last. From the report we find that the following papers were read and discussed during the last session:—The Irrigation in India, Spain, and other warm climates, and on the proper construction of Irrigating Canals; the Manufacture and Wear of Railway Bars; the relation of the Fresh-water Floods of Rivers to the areas and physical features of their basins; on Floods in the Nerbudda Valley, with remarks on Monsoon Floods in India generally; on the Victoria Pridge on the line of the Victoria Station and Pimlico Railway; on New Railways at Battersea, and the widening of the Victoria Bridge; the City Terminus Extension of the Charing Cross Railway, embracing a description of the Cannon-street Bridge and Station; the Durability of Materials; the Supporting Power of Piles, and on the Pneumatic Process of Sinking Iron Columns, as practised in America; and the Experimental Determination of the Strains on the Suspension Ties of a Bow-string Girder. Although the topics thus dealt with had been comparatively limited in number, yet it was believed they might be fairly regarded as representing some of the principal problems now engaging the attention of engineers.

The new building, with furniture, cost upwards of £17,000. There were on the books on the 30th of November last, 16 honorary members, 637 members, and 896 associates, making a total of 1,549, inclusive of students. The admissions to the class of students, which had only been in existence one session, had amounted to the same date to 133.

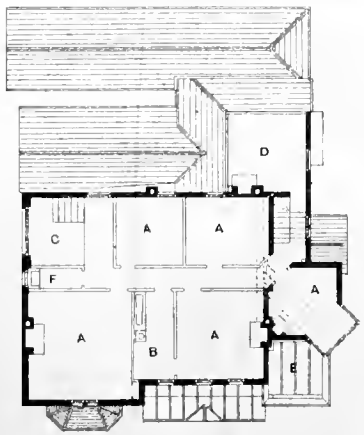
The following gentlemen were elected to fill the several offices on the council for the ensuing year:—Charles Hutton Gregory, president; Joseph Cubitt, Thomas Elliot Harrison, Thomas Hawksley, and Charles Vignoles, vice-presidents; James Abernethy, William Henry Barlow, John Frederick Bateman, Joseph William Bazalgette, Nathaniel Beardmore, Frederick Joseph Bramwell, James Brunlees, George Willoughby Hemans, John Murray, and George Robert Stephenson, members; and Major-General Sir W. T. Denison, K.C.B., and Frederick Ransome, associates.

On Thursday week Mr. Raphael Brandon read a paper at the Inventors' Institute, describing his scheme of reform for railways and reduction of fines, which was duly reviewed in our columns some time since.





GROUND PLAN



FIRST FLOOR PLAN.

House at Danea, Cambs.

FOR MICHAEL SEARS ESQ^RE

S. E. VIEW.

Red Brick Facing, White Brick Dressings, Terra Cotta Panels & Trusses, Stone Chimney Caps, Wooden Verandah. South Front. Now in course of Erection, under the Superintendence of Arthur Winder, Arch^t 29 Bloomsbury S^t London. W.C. Excavation & Bricks found. Amount of Lowest Tender £ 1313.

REFERENCE TO GROUND PLAN.

A. *Drawing R^m* B. *Dining R^m* C. *Ante R^m or Library*. D. *Verandah*. E. *Store*.
F. *Hall*. G. *Vestibule*. H. *Lobby*. I. *Porch*. K. *Kitchen*. L. *Scullery*. M. *Dairy*. N. *Open Passage*.
O. *Wash house*. P. *Mangle R^m* Q. *Pantry*. R. *Turf & Coals*. S. *Back Entrance*. T. *Boots &c*.
U. *Water Closet*. V. *Oven*. W. *Trap for access to Wine Cellar*.

REFERENCE TO FIRST FLOOR PLAN.

A. A. *Bed R^ms* B. *Dressing R^m* C. *Principal Stairs*. D. *Man's R^m* E. *Flat*. F. *Water Closet*.

SCALE.

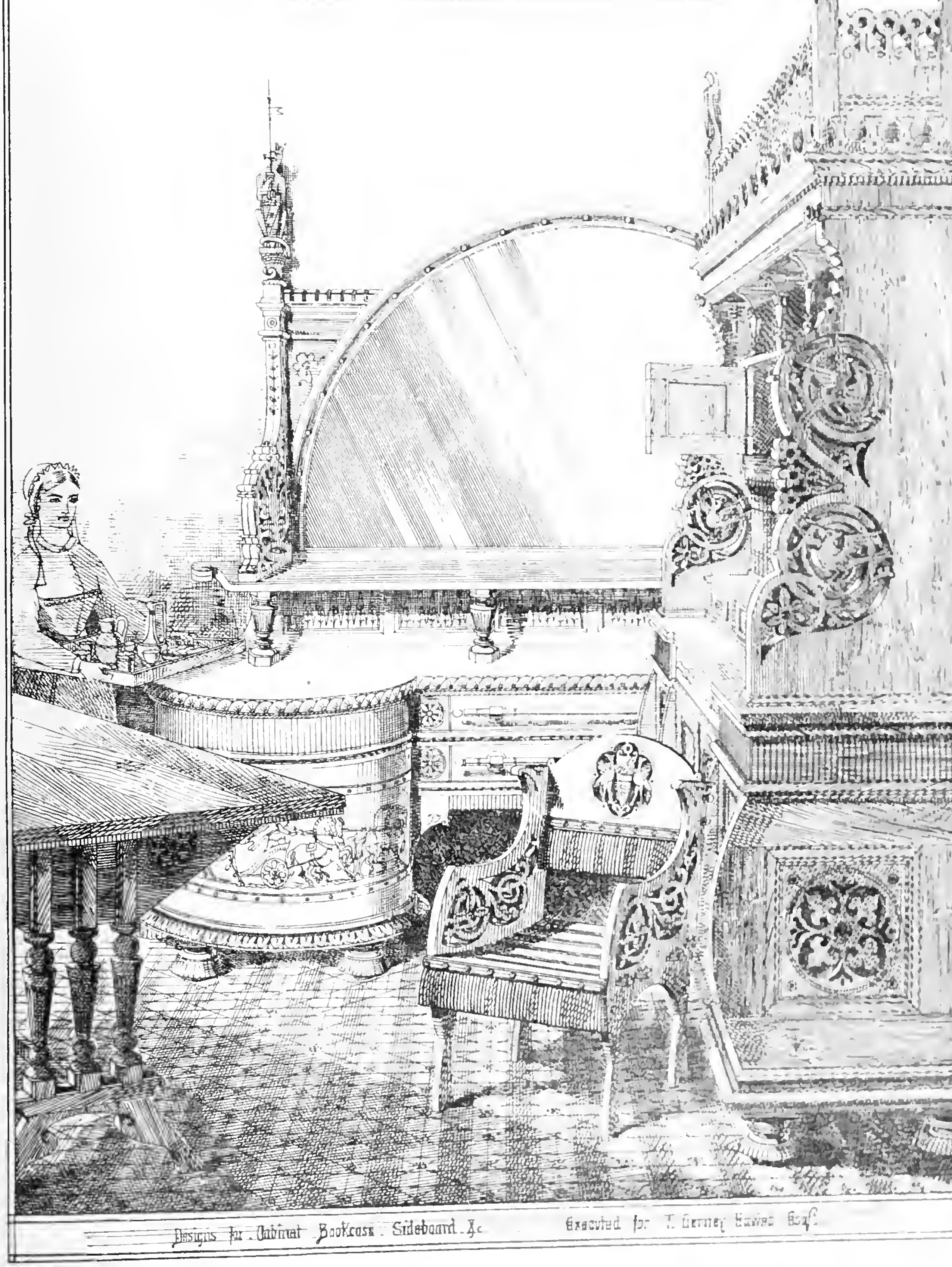
10 0 10 20 30 FEET

H. Abbott, Lith.

Printed by Whitemans

ART·FURNITURE

Walford and Donkin Architects
3. Queen Square. S.W.



Designs for Cabinet Bookcase. Sideboard &c. Executed for T. Gurney Hawes Esq.

THE HOLY SEPULCHRE.

LATE advices from Jerusalem describe the present state of the work of restoration and repair of the Holy Sepulchre, now so near completion. Our information is from a French and not a Russian quarter. The works, as is known, are carried out under a protocol signed at Constantinople by the Grand Vizier, again in office, Aali Pasha, and the ambassadors of France and Russia. One great political and religious difficulty consisted in this, that the Greeks or Orthodox, profiting by Sir Sidney Smith's exploits at Acre and the decline of French influence, not only took possession of the Lamp Gallery, but in 1808 reconstructed the great dome, painting it with Greek saints, some of whom had been opponents of the Roman see, and decorating it with Greek inscriptions. The Latins claimed that the dome should be brought back to an ancient state of Latinity. After political difficulties on this question, culminating in the Crimean war, it was shown that the dome was again in danger, and it was arranged to pull it down and rebuild it. So far as bricks and mortar were concerned there was no difficulty, but the religious ornamentation was an unappeasable contest between the rival ecclesiastics. After great delay the matter was settled by personal arrangements between the Emperor Napoleon and the Emperor Alexander, the Ottoman Porte acting as moderator. Messrs. Mauss and Eppinger have been the respective architects. From the commencement of this year the works have been pushed on with great rapidity, so that the completion has been announced. The new dome is rather higher than the old one, and shows much better in the view of the city. The cross was placed on the dome by the beginning of August, and was uncovered on the 15th, the saint's day of the Emperor Napoleon, when a kind of inauguration took place. The painting of the interior of the dome is completed, but at the last advices they were waiting for the railings of the gallery of lamps, which are supplied from Paris, and also the door of the gallery and the door of the dome.

THE GAIETY THEATRE.

THIS theatre, built on the site of the Strand "Musick" Hall, was opened on Monday evening last. There has recently been something like a rage for theatre building in the metropolis. During the last two or three years a theatre and an amphitheatre have been built in Holborn, also the Queen's in Long Acre. About a month since the Globe, in Newcastle-street, Strand, was opened, and about 100 or 150 yards from the same spot the Gaiety has sprung into existence. The Strand and two or three adjacent streets may be regarded as the theatrical head-quarters of the metropolis. Within about 200 yards of Exeter Hall, there are no less than nine theatres. Besides three we have mentioned there are the Adelphi, Covent Garden, Drury-lane, the Olympic, the Lyceum, and the Strand theatres. About ten or eleven o'clock at night all the streets are crowded with vehicles, from the Dowager's splendid carriage to the cab, all waiting to take home theatre-goers. If speculators will go on building theatres in the same neighbourhood as they have been doing recently, the streets will have to be widened for the accommodation of cabs and carriages.

The Gaiety Theatre just opened is a novelty. Not only is it a novelty, but it is an excellent move in an important direction. The old London theatres are, with hardly an exception, a standing disgrace to the age, and only one degree less dingy, stuffy, and uncomfortable than their brethren of the same age in Paris. Many of the new or partially new ones, too, are little better; but to these the Amphitheatre, the Queen's Theatre, and the new Gaiety stand out in honourable distinction. The opening of the youngest of the numerous family has been heralded with such a flourish of trumpets, and the theatre itself is in many respects so good, that it deserves more than the passing notice that buildings of its class usually receive, even from journals devoted, like our own, to constructional and artistic topics. As far as we can call to mind, the Gaiety is the first theatre in this country in which any attempt has been made to introduce the Gothic style of architecture; and we suppose that one reason that has induced Mr. Phipps to do so in this instance is that he had to appropriate some portions of the Strand Music Hall, which was Gothic with a vengeance. We may perhaps on a future occasion enter into the question of the applicability of Mediæval treatment to playhouses, but for the moment we are merely concerned with the new house as it stands. Its Gothic character internally consists chiefly in a series of blunt pointed arches above the gallery, in the clustered proscenium columns, and in a considerable proportion of the ornament. This however, is in itself a step forward, if only in the way of protest against the ever-recurring abuses of theatrical tradition. Another uncommon, though not absolutely novel feature in London, is the arrangement borrowed from the new French theatres of the projecting balcony with private boxes behind. This balcony is in itself perhaps one of the most pleasant inventions for those of the audience who frequent it, but it cannot be disguised that, in this instance at least, it has been introduced at a sacrifice of all considerations alike of comfort and convenience to frequenters of the pit. We attended both the first and second performances, and were careful to try the effects of sight in every part of the house. We found that from the pit nothing was to be seen but the performers and a very limited portion of the scenery; the same defect, though from another cause, manifested itself in the gallery. Of the pit only a limited portion of the first four benches is clear of the balcony, and the remainder is covered in by the balcony and the boxes so closely that a tall man with a hat on would find it somewhat difficult to stand upright. Another mistake in the pit, as we take it, is the lobby running all round it, whereby much valuable space is lost, and the draughts are unpleasantly intensified; nor can we believe that the wall separating the pit from the lobby is in itself a structural necessity. In the gallery, which is, by the requirements of the Gothic treatment of the house, raised to such a lofty elevation that the spectators obtain but a bird's-eye view of the performance, both sight and sound are materially affected by the arches alluded to. These may be in part a necessity. It has long been conceded that one of the greatest difficulties in theatre building has been to combine structural truth and strength with a large and open gallery. Of the boxes, balcony, orchestra stalls, and upper circle we can only say that they are commodious and well arranged. Still it should always be borne in mind that it is the pit and the gallery which make a house pay—a fact too habitually ignored by theatrical managers and architects.

We have seen several of Mr. Phipps' theatres, and on entering the Gaiety we were struck with the great difference between the general appearance of the new house and those with which we were previously familiar. The first impression is that of brilliancy, the second that of restlessness. Doubtless this is in some degree to be attributed to the style adopted; for Gothic, except in the hands of a master of its resources, is wanting in repose. But we find on examination that this hypothesis explains but little of what, as the evening advances, becomes more apparent. The more the eye wanders round the house, the more it passes from floor to ceiling and from ceiling to column, the more are we forced to the conclusion that there is something wrong in the treatment. Firstly, the admixture of raised and painted decoration has been anything but effected; secondly, there is an incongruous combination of details culled from the Gothic, Greek, and Egyptian styles; to say nothing of others less easy to define; and thirdly, there is a fundamental error in the treatment of the gold. Into these details we intend entering more fully next week, and we must for the present content ourselves with an expression of admiration of the thoroughly satisfactory way in which Mr. Marks has accomplished his task by no means easy. Instances of defects above the proscenium are admirable. Where the decoration has succeeded and where and why he has failed we shall endeavour to point out in a future article.

Our next number will also contain an illustration and plan of the new theatre.

RUBENS AND GOLD.

IN these papers I have been trying to show generally what it really is that in truth distinguishes old from modern art: that it is not merely a change in style of art and external circumstances, but a total change in the principles of art action and method of work, indeed, a complete reversal in the means whereby a work of art is produced. Some there are, it is to be hoped, who are beginning to see this, and the great fact that a work of art, whatever it is, cannot be produced by the present system of art manufacture, and that art is verily but another name for individuality of human action, that a man can no more be hired to paint a picture for another, or draw an outline for him, than he can write a letter or sign his name for him. Art is handwriting in material, whether in a picture, a building, or a painted tile. I admit this to be a hard saying, but the real question is, Is it a true one? The object of these notes is to prove that it is. Past art having, therefore, been what it was—viz., the result of individuality of artistic action, and the art so called of the present time being the very reverse of this, it becomes, if there be any truth whatever in the proposition, a matter of the deepest interest to single out the few things that are left to us from that past, and to study them with all attention. Example is always better than precept, and I would ask anyone to look at such buildings as St. Paul's Cathedral, before commented on, and the Temple Church, the roof of it particularly, the new additions and additions to Westminster Abbey, and at what is perhaps the best specimen of Italian or Renaissance architecture in England, the banquet-room, Whitehall, or, as it now is, the Chapel Royal. Of course it is well known to every reader of this journal that this fine room is but a part, and a very small part, of a complete royal palace, designed and planned by Inigo Jones for Charles I., and had it been completed by the architect it would have been beyond comparison the best and most magnificent building, as a whole in Europe; but the fates willed it otherwise, and its architect had to content himself with building and leaving this single room only as a specimen of what he could do. Perhaps, since the Gothic days, this has been the greatest loss that English art has experienced, and we must for ever lament the unfortunate circumstances that refused to so clever and original a genius [illegible] at Whitehall the opportunity which they afforded to Nash at Buckingham Palace, and to his modern successors on the same ground. But the history of art is full of these disasters and hindrances, so that we must content ourselves with the little we have, and try to make the most of it, and, above all, to keep and preserve it in the state it was left by its authors, or, when that has been all but destroyed by modern improvements, to at least advocate, if we cannot help, its true restoration. For the present, then, we may confine ourselves to the simple interior of this royal room or

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—G. H. G.—W. B.—H. W. M. W. (with four photographs)—W. M.—T. W. C.—J. P. S.—I. N.—G. R. and Co.—W. P.—G. R. T.—G. H. S. W. B. S. and Sons.—W. D.—I. H. H. and Co.—C. L.—A. H. H.—C. R. A.—R. C.—W. H. (Leed-), with photograph of Almshouses.—J. E., jun.: Your letter contains not an atom of criticism on Mr. Moyr Smith's drawings.—Messrs. M'F. and Co.—G. H. G.—A. R. and Co.—W. P.—I. N.—Messrs. M'F.—S. H. G.—W. P.—H. W.

Correspondence.

THE GROTESQUE IN ART.

To the Editor of the BUILDING NEWS.

SIR,—Your correspondent Mr. Statham has so completely refuted the apologists for grotesque art that little need be added save that the majority of your readers must endorse his sentiments. The "grotesque" in art is both unfeeling and certainly not in harmony with the spirit either of an enlightened thought or Christianity. Indeed, is it not quite repugnant to the sentiments of the latter? Those who have considered the circumstances and conditions of religious thought under which the "grotesque" arose cannot for a moment entertain its admissibility in the present day, but must rather pity those who delight to design and carve the hideous and deformed—only fit embodiments of a religious terrorism. Things of the past are oftener valued more in the shade of obscurity than when brought out into strong relief by the strong light of the present; at least, those who expose them to it are their worst enemies.—I am, &c.,

G. HUSKISSON GUILLAUME.

HER MAJESTY'S THEATRE.

SIR,—Will you kindly permit us to explain to your correspondent of last week that the decorated box fronts from the old house which we exhibited at the *conversazione* of the Architectural Association were not those to which he evidently alludes in the body of his letter? As the explanatory label got mislaid on the occasion referred to, and as the articles attracted some curiosity, it may not be out of place to mention that in bringing forward the proscenium two years ago a length of each box front was removed. On removing the canvas with the existing decorations, various substrata of canvas, paper, paint, and distemper were found, and lastly a series of figure subjects, painted on gold grounds, and in very fair preservation. We cleaned them, and restored them only where materially damaged. We have been unable to ascertain anything definite respecting them, but they must be of considerable age—if not the original decorations. They appear as if painted in distemper, but wash like oil. Though they possess considerable power, and are altogether interesting, a similar treatment would be inapplicable at the present day. The surface canvases, however, which are similar in treatment to the remainder of the theatre at the time of its destruction, are still in existence (though very tender and greatly damaged). We need scarcely add that we shall be most happy to show them to anyone who may feel interested in the matter.—We are, &c.,

GREEN AND KING.

23, Baker-street, Portman-square, Dec. 21.

CONVENT OF ST. MARGARET, EAST GRINSTEAD.

SIR,—As the author of this design is reputed to be a thoughtful man and a good draughtsman, and as he is the chosen architect of what will perhaps be the most important building of modern times—the Law Courts—I turned to the view of St. Margaret's Convent with much interest, expecting to see evidence of ability of the highest order. I was greatly disappointed; and as I think a criticism of the design may benefit the younger portion of your readers, I have jotted down the particulars which chiefly struck me.

The centre apartment, called gateway (N), appears to be really a hall with a doorway at each end and a small window. The window appears to be not more than 6in. wide, and what is its use? If light was necessary why not a proper sized window? If not required for light, why any window at all? It will be seen in the perspective that its height from the ground is about 9ft., so that it can't be used to look out of. From this hall, to the right, is a passage about 50ft. long unlighted, except something be got from the staircase, which, however, appears to be enclosed. On the opposite side of the hall is another passage, in which for a length of more than 50ft., forming a right angle, there is no light. The darkness of these passages would, of course, be repeated on floors above. Attached to the last-named passage is what is called a court (Y), but which, as it is roofed and is lighted by a window, is really a room. From it is another dark passage leading to coal-cellars and water-closets, the latter having neither light nor external ventilation. Many of the apartments, I notice, have no fireplace. This is an especial hardship for the portress. A staircase is near a class-room, between internal walls without light. As a contrast to those parts deficient in light, the passage at end of kitchen has seven windows!

The refectory, which is nearly 70ft. long, has apparently only two windows—one in the gable, the other in a recess at side. The dais, which is at one end, though appropriate, and necessary in an old baronial hall, is not required, and ought not to be in a convent refectory—bad in principle and contrary to ancient usage.

Except the gable windows the chapel appears to be without light. The *grees* to altar table is a notable point. The reformers of the English Church directed that the officiating clergyman should stand on the side of the Communion table, and such until recently was the universal usage, but the ritualists prefer the Romish practice, and to compel refractory celebrants to do the same gave no standing room at the side of the table. The great number of steps now put to the communion table is at variance not only with Protestant custom but the ancient practice. It is one of those points in which ritualists out-Rome Rome herself.

As the coal cellar comes next to the scullery I should have expected to see a doorway leading from one to the other instead of this. To get from one side of the wall to the other the servant or sister will have to go a roundabout way in the open air. The "knives," too, I should have thought would be better opening from scullery.

In the perspective the roof of lean-to to the left is strangely out of drawing. The greater part of the drawing is shown finishing under the eaves of the higher roof, but the end, which looks as if meant to represent a hip, though the angle is wrong, runs up into the higher roof. This could not be in execution. The higher roof I refer to is high indeed. The perpendicular height of the roof I judge to be about 25ft.; the span is about 22ft. It may be noticed in this design the affectation of construction, putting relieving arches over one-light windows, mere squints, other three-light windows have no such arch. The high and small windows are surely not necessary to a religious house; they give the idea of gloom, secresy, and enforced seclusion. The drawing of perspective appears to me to be altogether wrong. The front is almost in elevation, and with any such view possible the sides of the buildings could not show to anything like the extent displayed in the view. The very conspicuous turret has no *locus* on the plan, though so essential to the perspective. The thing is simply fudged, it appears to me. A sort of inner doorway appears to principal entrance on the perspective, but nothing of the kind shows on the plan.—I am, &c.,

M.

Intercommunication.

NOTICE.—As several mistakes have recently been made in the figures and formulæ in "Intercommunication," correspondents are respectfully requested to write as legibly as possible, and to write on only one side of the paper. Questions should, if possible, have short generic names put to them, for the purpose of reference and indexing. Answers should always have the corresponding number and name of the questions prefixed to them.

QUESTIONS.

[1188.]—NEW COLLEGE AT BEDFORD.—Some time ago I saw in the BUILDING NEWS a design for a new college at Bedford. I should like to know if the same is built, and if so if any of your correspondents can give me any information about it.—C. P. E.

[1189.] CHARGING FOR MATERIALS.—Will any practical builder or builder's clerk please give me the subjoined information? After what principle does he money out or charge for his materials? Admitting that he charges less to the trade, does he go from a certain price list, either of his own or that of Skyring, Laxton, or other party? because I have seen bills made out by the same builder against different customers at as many different rates for the same sort of goods, and am at a loss to understand the why and wherefore, especially as the material supplied was under the same trouble. Is it proper to have an uniform rate and keep to one list and abate if necessary on payment? or is it legal to charge one man £5 and another £6 for precisely similar articles? A reply from an experienced gentleman will oblige.—R. C.

[1190.]—KEEPING BUILDERS' ACCOUNTS.—Will any kind friend in a builder's office help me out of a dilemma? I commenced keeping a builder's accounts at the beginning of this year, and have continued them till now on a principle differing greatly from their former fashion. Now the way in which they were previously kept was by a ledger, in which the materials and labour were entered from a board, but not priced out till the year's end; the bills were then made out against the customers at prices varying greatly. On the bill being paid it was settled in this ledger by two large black lines extending from corner to corner, and here the bookkeeping begun and ended. Of course no balance of cash, goods, stock, profit and loss, or any other balance was made, and the business is considerably more than this: not even accounts of goods bought were kept. My way of doing the thing is to keep a waste book containing all the matter of the day, both inwards and outwards, cash, and everything else, balancing the cash daily together with a separate bill book. From the day book I journalise and arrange for the ledger, in which no particulars are to be seen, but are referred to by folios. My ledger is double, and in it are debited and credited twice over all the journal entries; I make frequent trial balances, and from the nature of this double entry all my debits and all my credits equal each other. I propose at the year's end to make a final balance, close the ledger, and prove the books, of course showing the profit of the year's proceeds. This is all kept up regularly, and yet my friends say it is all nonsense, and that the old way is practical and quite right. Please, therefore, insert this for public opinion.—PARIS.

[1191.]—SECTIONS AND SCANTLINGS.—Perhaps some of your readers would kindly inform me what are the best sections and proper scantlings for wood and iron girders to carry the floor of a lecture hall 36ft. wide, girders to be 12ft. apart from centre to centre: headway is a consideration. H. C.

[1192.]—DAMPPROOF BRICK WALL.—Can any of your correspondents inform me if there is any really effectual method of making an ordinary uncemented 9in. external brick wall exposed to the south and west damp proof? Many preparations are advertised, but few of them are successful. I should be very glad if some of your readers could give me a preparation which they have proved to be effectual.—A SUBSCRIBER.

[1193.]—GLUE.—How can I prevent glue cracking as it does when very dry, thereby causing objects fastened together with it to fall asunder?—JOINER.

[1194.]—RESTORING OIL PAINTINGS.—Does varnishing injure oil paintings? I want to clean one or two, and have been advised to wash and varnish them. Can any subscriber advise a safer mode of proceeding?—LOUIS J.

[1195.]—HARD TRANSPARENT VARNISH.—Can anyone inform me if there is any varnish applicable to Stevens's wood stains, transparent, yet hard enough to protect the wood.—A STAINER.

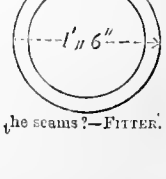
[1196.]—SOLIDIFYING MARBLE.—Can any reader of the BUILDING NEWS advise me as to the best method of solidifying marble after it has been pounded, or of incorporating a mixture of marbles of uneven qualities so as to form a substance that might be used as terra cotta?—ÆSCULAPIUS.

[1197.]—BRICK AND PIPE SEWERS IN LAND.—Will any of your professional readers kindly state their mode of constructing brick and pipe sewers in bog land reclaimed from the sea or otherwise? Having no solid foundation from 20ft. to 50ft. deep, what means were employed to procure a proper foundation, and if such means were effectual?—C. E.

[1198.]—EAVES RIGHTS.—The eaves of A.'s house project 6in. on B.'s ground, and has been exercised for 23 years. Has B. a right to remove the eaves of A.'s roof, or build a wall close to its wall and above the eaves? One surveyor states that A. has a right to the drip of his eaves. Another surveyor says B. has a right to build perpendicular from the extent of his ground at bottom. Will some one explain this difference of opinion, or refer me to some decision thereon? which will oblige—W. F. VARNEY.

[1199.]—ENGINE FOUNDATIONS.—I am getting in some foundations for a steam hammer, and have been informed that something must be put between the bedplate of the hammer and the concrete in order to form a kind of cushion to deaden the weight of the blow. Can any of your correspondents give me their own experience on the subject? An early reply will greatly oblige, as I have already got the concrete nearly up to the proper level.—A YOUNG CONTRACTOR.

[1200.]—STRENGTH OF IRON CYLINDERS.—I wish to ascertain the strength of a wrought-iron cylinder, of the dimensions shown in the figure, to resist steam pressure. The height of the cylinder is 4ft. 3in., and it is made of the best boiler plate. What would be the bursting pressure, and how would the cylinder fail? Would the ends be blown out, or the metal ripped open along the seams?—FITTER.



[1201.]—SCARFING TIMBER. — Would one of your subscribers to "Intercommunication" give me a sketch in your next number of the best way of scarfing two half balks of memel, 12in. by 6in.? They are intended to be used in supporting the floor of a warehouse; no support can be allowed nearer than 5ft. on each side of the joint.—A CONSTANT TAKER OF THE "BUILDING NEWS."

[1202.]—DERRICK CRANE.—I should be extremely grateful to anyone who would let me know what should be the scantlings of the post, jib, and tie of a derrick crane to lift up to one ton and a half. I have some good sound Dantzic timber, but cannot afford to buy oak for the purpose.—WHARFINGER.

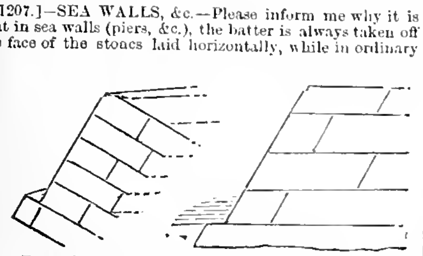
[1203.]—BROWN INK.—Can anyone recommend me a good rich brown ink, which will not fade? I used some about twelve months since described as indelible brown, but which, I think, ought to be called invisible, as lines which I then made with it, strong and dark, are now scarcely perceptible.—NEMO.

[1204.]—GILDING ON WOOD.—I shall be glad if some one can inform me of some description of gold that can be applied with the brush. I am acquainted with Bessemer's gold paint, which I do not like. I wish to have something that will be equal in effect to gilding with gold leaf.—AURE.

[1205.]—STEARINE.—Can any of your readers inform me of the best method of preserving plaster casts from soiling? I am aware that stearine is used for the purpose, but do not know how to apply it.—PLASTER.

[1206.]—FAMILY VAULTS.—Will some of your correspondents kindly inform me what is considered the best arrangement for a family vault for a cemetery or churchyard; and what is the best method of providing for interment therein? I presume the vault should be accessible by steps (ordinarily covered with a flag or landing), at the foot of which would be placed the vault proper, leaving a passage 3ft. wide, with the shelves on either side, say 2ft. 3in. wide, the length being about 7ft. I should be particularly obliged if some one of your experienced correspondents would kindly give me some hints on the matter, and oblige—A CONSTANT SUBSCRIBER.

[1207.]—SEA WALLS, &c.—Please inform me why it is that in sea walls (piers, &c.), the batter is always taken off the face of the stones laid horizontally, while in ordinary



Retaining Wall. Sea Wall.

retaining walls it is got by laying the bed of the stones at right angles to the line of batter on the face.—INQUIRER.

REPLIES.

[1080.]—RETAINING WALLS.—"X + Y" cannot have reduced the equations for rectangular walls given in my last communication, or he would have found that the thickness for stability is not twice that for equilibrium; for, in the equation for equilibrium $O = h\,w\,x \times \frac{x}{2}$, $x = \sqrt{\frac{2O}{h\,w}}$, and in that for stability $O = h\,w\,x \times \frac{x}{4}$ (or its equivalent $2O = h\,w\,x \times \frac{x}{2}$), $x = \sqrt{\frac{4O}{h\,w}}$. In the case of the wall with triangular section, his formulæ for D are correct. For equilibrium, $D = \sqrt{\frac{3O}{W\,H}}$; for stability, $D = \sqrt{\frac{6O}{W\,H}}$. The overturning force must be in all cases doubled for stability, and not the thickness of the wall.—J. L.

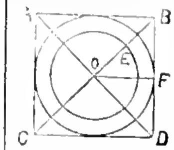
[1127.]—GUINEAS.—"E. P." is not quite right in his explanation of the legend on the reverse of George III.'s guineas. As it stands on the coin it is "M. B. F. et H. Rex F. D. B. et L. D. S. R. I. A. T. et E.;" this is meant to suggest "Magnæ Britanniæ, Franciæ, et Hiberniæ Rex; Fidei Defensor, Brvnsvicensis et Lunenburgensis Dvx; Sacri Romani Imperii Archithesavrarivs et Elector;" *i.e.* "(George D. G.) King of Great Britain, France, and Ireland; Defender of the Faith; Duke of Brunswick and Lunenburg; Arch-Treasurer of the Holy Roman Empire, and Elector." The crown of Charlemagne, which is on a small inescutcheon on the fourth quarter of the shield, is the symbol of the office of Arch-Treasurer of the Holy Roman Empire. Obscure as abbreviations often are, I think the height of obscurity has been reached by this ridiculous legend.—J. H. M.

[1129.]—TRIANGLES.—"W. J. C.," in yours of the 18th, tells us that the sign ° is used in land surveying to express links. I beg to say it is no such thing, and that links are always written down by themselves in whole numbers. The sign °, in the surveyor's field book, is, I think, sometimes used to denote stations on the survey, the crossings, intersections, and meetings of lines, and so also the accompanying signs.

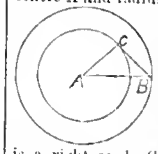
+ . T . × . S . ⊙ .

Besides, "R. F." himself says that he meant feet.—ROBERT CARPENTER, Great Marlow.

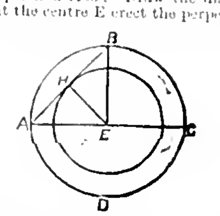
[1163.]—AREAS OF CIRCLES.—Your correspondent "C. E. O." may find the radius of the smaller or inner circle that he requires as follows:—Draw the square A B C D circumscribing the outer circle and the diagonals A D, B C intersecting at the centre O. Bisect O B at E, and O E will be the radius required. The demonstration is this: Draw O F parallel to A B or C D, and bisecting B D at F. Now as the areas of circles are as the areas of their circumscribing squares, that is, as the squares of their diameters, and O B equal to twice O E, is the diameter of the inner circle, the area of the outer circle is to the area of the inner circle as the square of B D is to the square of O B; but the square of B D is equal to four times the square of B F, or of its equal O F, and the square of O B is equal to the sum of the squares of O F and B F, or to twice the square of B F; therefore the square of B D is equal to twice the square of O B, and the area of the outer circle is consequently equal to twice the area of the inner circle.—JOS. S. DAVIES, Leeds.



[1163.]—On A B, the radius of the outer circle, describe the right-angled triangle A C B, having the sides A C, C B, which subtend the right angle, equal to each other. With centre A and radius A C describe the inner circle. Then shall the area of the space between the circles be equal to the area of the inner circle, and they shall each of them be equal to half the area of the outer circle. Let A B = r, and A C = r_1; then area of outer circle = πr^2, and area of inner circle = πr_1^2. Therefore, the area of space between the circles = $\pi (r^2 - r_1^2)$. Because A C B is a right angle $CB^2 = AB^2 - AC^2 = r^2 - r_1^2$, therefore $\pi\,CB^2 = \pi (r^2 - r_1^2)$, that is to say, the area of the space in question is equal to a circle whose radius is the length of the line B C, and is also equal to the area of the inner circle, for by construction A C = B C. But these two equal areas are together equal to the area of the outer circle, therefore they are each equal to half its area.—PURLIN.



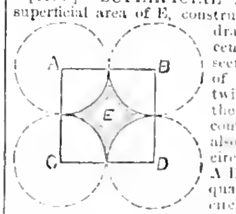
[1163.]—I think the following demonstrates what "C. E. O." requires in question 1163:—Draw the diameter A E C of the circle; at the centre E erect the perpendicular E B;



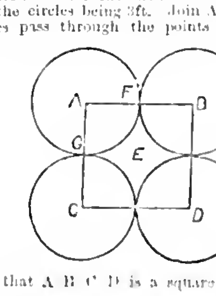
join B A, and bisect it in H; join H E, which will be the radius of the inner circle. This I can prove, if required.—C. P. E.

[Answers to this question have also been received from "J. T.," "Jack-plane," "F. C.," "Henry Carter," "Jos. A. Davis, Leeds," "Nix," "J. Battye, 25, Brazenose-street, Manchester," "A. S., Lincoln."—ED. B. N.]

[1165.]—SUPERFICIAL MEASUREMENT.—To find superficial area of E, construct the square A B D C by drawing lines from centre to centre of each circle. It will be seen that the length of any side of the inscribed square, being twice the radius of any one of the given circles, will equal the common diameter of the circles; also that four quadrants of the circles are inscribed in the square A B D C; but the area of four quadrants equal the area of one circle; therefore, the area of the square A B D C, less the area of one circle, equals the area of E. The area of a circle is obtained by multiplying the square of the diameter by .7854; hence we have—6^2ft. — (6^2ft. × .7854) = 7.736ft. = area of E, when the common diameter of the circles is 6ft. Again—3.5^2in. — (3.5^2in. × .7854) = 2.63in. = the area of E, when the common diameter of the circles is 3½in.—HERBERT PETTIFER, Soho Hill, Birmingham.



[1165.]—Let A B C D be the centres of four equal circles. It is required to find the area of the quatrefoil E, the radius of the circles being 3ft. Join A B, A C, C D, D B. These lines pass through the points of contact of the



circles, so that A B C D is a square; and A F G is a quadrant.

$$\therefore \text{Area of E} = A\,B\,C\,D - \frac{\pi r^2}{2}$$

$$= 36 - 14.1372$$

$$= 21.8628\text{ft. approximately.—H. C. B.}$$

[1165.]—Multiply the square of the diameter by 0.2146. The area of E is clearly equal to the area of the square A B C D, minus the area of the circle, or E = $d^2 - d^2 \times .7854 = d^2 \times (1 - .7854) = d^2 \times 0.2146$.—J. A. D.

[Answers have also been received from "D., Weymouth," "Jos. A. Davis, Leeds," "J. T.," "H. C. B.," "Nix," "A. S., Lincoln."—ED. B. N.]

[1166.]—TEST FOR PORTLAND CEMENT.—Road washed grit being the compound to mix with best Portland cement, one sixth of the last named for blocks, one fourth for paving, and thoroughly set, it is combined for testing in any shape.—JAMES SAXBY.

[1167.]—PAINTING ZINC.—Let "Village Builder" try the following. I met with it somewhere a short time back, and find it answer. Dissolve 1 part of chloride of copper, 1 of nitrate of copper, and 1 of sal-ammoniac in 64 parts of water, and then add 1 part of commercial [illegible] acid. Brush the zinc over with this wash; it gives it a deep black; leave to dry twenty-four hours, and any oil colour will then firmly adhere to it, and withstand both heat and damp.—K.

[1169.]—CHIMNEY POTS.—[illegible] chimney pots [illegible] washed [illegible] cement, is the thing. [illegible] broom or [illegible].—JAS. [illegible].

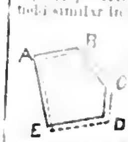
[1172.]—INDIAN INK.—[illegible] a small quantity of ox-gall with his ink or colours it will lay evenly.—G. H.

[1174.]—HOUSE CISTERNS.—[illegible] containing from [illegible] gallons would be sufficient for all purposes. As a cubic foot of water contains [illegible] gallons, the cubical contents of the cistern [illegible] would be sufficient.—R. I. B.

[1174.]—"Henry Carter" [illegible] head for each man, woman, and child, and [illegible] room for three days' supply [illegible] number of heads [illegible] by the number of gallons per head (15), we obtain [illegible] which, multiplied by [illegible] gives 900, the number of gallons the cistern will have to contain. Now the dimensions of the cistern must be ruled somewhat by the position it will have to occupy; but, assuming the space to be unlimited, we may put it at (say) 6ft. long by 5ft. broad, and 4ft. deep, giving 120 cubic feet; this multiplied by 6.250 the number of gallons contained in a cubic foot nearly, gives [illegible] the number of gallons which a cistern of the above dimensions will hold, thus allowing [illegible] gallons for an emergency. With regard to the second cistern for rain water, I do not see the need of it if the first is to meet all requirements [illegible] absolutely necessary to collect the rainfall, I think an underground brick cemented tank would be better adapted for that purpose, but to determine the size of which the area of roofs, &c., would have to be taken into consideration.—HENRY HOPKINS, Banbury.

[1174.]—Sufficient data are not given in this question to enable a [illegible] answer to be given, but a tentative answer may be given in such a manner that if it does not meet the requirements exactly the exact answer can be deduced from it by the questioner himself by varying the assumed conditions. It is assumed then, in this reply, that the water supply from the public service is a daily one. It is assumed also that the rainwater to be caught and used is that only which falls upon the roofs of buildings, and that that area is, in this case, about [illegible] square feet, being about four times the area of an average house, as the population (20 persons) is four times that of an average house, which has 5 persons, or thereabouts, taking big and little. Further, in the absence of a specified depth of rainfall per annum, taking an average of a series of years that depth is assumed to be, in this case, [illegible]. Now the quantity of water consumed for household purposes is from [illegible] to [illegible] gallons a day for each man, woman, and child of the population. If the rainwater be stored for use, the quantity required from the public service will be diminished by the quantity of rainwater that can be used, and this will be, where the annual rainfall is [illegible], and the surface upon which it falls is [illegible] square feet, [illegible] gallons a day, or from [illegible] to 4 gallons per head of the population per day. This is allowing nothing for loss by evaporation or absorption, which, indeed, is very small on such surfaces as house roofs. The quantity, then, to be stored in the cistern of the public service water (and therefore the size of the cistern) is for 20 inhabitants, from [illegible] to [illegible] gallons, taking [illegible] gallons per head per day, being the total quantity [illegible]. This would be contained in a cistern of, say, [illegible]. To arrive at the size of the rainwater cistern it is necessary to proceed on other data [illegible], however, we may [illegible] theoretically that it will be better to proceed on the basis of the practical experience in large waterworks' reservoirs, &c., although the circumstances of the two cases are not the same, there is sufficient analogy between them to warrant the preference of this mode of calculation to that of theoretical inquiry. The practical experience, then, in waterworks reservoirs, is that nothing less than a capacity of 20,000 cubic feet per acre of gathering ground is sufficient to retain the rainfall for use. In various parts of England this capacity varies with the amount of rainfall and the nature of the surface upon which it falls, but for present purposes it will be near enough to take it as stated. If, then, the size of the rainwater cistern be calculated on these data it will be found to amount to [illegible] cubic feet at the least; but as we cannot pretend to be very exact in such calculations as these it will be enough to say that the rainwater cistern in question ought to contain [illegible] cubic feet.—W. W.

[1177.]—HEDGES AND DITCHES.—In measuring a field similar in shape to the annexed diagram A B C D E, I [illegible] "Nix" that the fence [illegible] should be included in the quantity [illegible] when the ditch [illegible] [illegible] fence, as from A to B and A to [illegible] portion of the field [illegible] the remainder from B to D [illegible] property [illegible] the distance [illegible] [illegible] for the ditch.—H. H. H., Liverpool.



[1178.]—DAMP LIME OF FLOORING.—[illegible] rubble with [illegible] dust [illegible] with washed road grit and Portland cement [illegible].

[1181.]—PAVING STREETS.—In answer to "[illegible]," I may say that in laying pavements and particularly roads there is considerable economy when the joints are adapted only as allotted to the [illegible] [illegible] joints between each row of stones a course of [illegible] which has been brought to the same level to [illegible] the same extent as depth of the stones themselves. This plan, however, is not frequently adopted, though it cannot be denied that it affords a stay for the horse's foot by the formation of a series of small grooves about 1in. in thick-

ness and depth. This method has been adopted in Tooley-street, Southwark. The other and more frequently

FIG. 1. FIG. 2

adopted method consists in merely placing the paving stones in a canted position in their beds, as shown in Fig. 2. This method forms a series of ledges, or steps, which secures a good foothold.—A MAN IN THE STREETS.

[1186.]—THE BOARD OF WORKS AND NUISANCES.—I suppsoe "F. E." could make anyone pay for vexatiously interfering. He will, however probably find the inspector in the right; at least, such was the case with me a short time back.—B.

WATER SUPPLY AND SANITARY MATTERS.

FILTER-VANS FOR INDIA.—The *Lancet* speaks in favourable terms of a new invention for supplying troops on the march in India with good water. The Commander in-Chief recently inspected the vehicles, which are light, compact, easy of draught, and filled by means of a pump and hose near the driver's seat. The water is drawn off for use after passing through the filtering apparatus. Each van is capable of conveying and filtering 1,000 gallons of water per diem. Messrs. E. H Bayley and Co., of Newington Causeway, are the manufacturers.

LAND AND BUILDING SOCIETIES.

THE annual general meetiog of the members of the Guardian Permanent Building Society was held at Bristol on Thursday week, under the presidency of Mr. Jas. Derham, chairman of the board of directors. From the directors' report for the past year it appears that the total cash receipts amount to £19,436, as against £17,127 11s. 7d in the preceding year, and £15,582 15s. 2d. in the year 1866. During the year the directors have had the accounts of the society for the triennial period ending October 31, 1867, carefully investigated. After making due provision for future expenses in respect of existing shares, the net profit realised during the three years amounts to £1,172 11s; and the large sum of £841 6s. 9d. has been appropriated for distribution among the shareholders of all classes in accordance with rule 81. The residue, amounting to £281 4s 3d., has been added to the guarantee fund formed in 1865, which now amounts to £368 19s. 3d.; and during the seven years of the society's existence no loss whatever has been sustained, and consequently the guarantee fund remains intact.

STAINED GLASS.

THROUGH the munificence of a lady residing in New Brighton a handsome stained glass window, or rather set of four windows, has recently been placed in St. James's Church, New Brighton. They together represent the Ascension of Christ; the artist being Mr. Camm, of Smethwick, near Birmingham.

A stained glass window has been erected in the east end of the chancel of St. Thomas's Church, Batley. The window is in plan of the Decorated period, consisting of five principal compartments, and a magnificent wheel tracery has been filled with rich stained glass by Messrs. O'Connor, of Berners street, London. The artists have taken one idea as the motive of design for the whole window, viz., "The Love of Children," as shown in our Lord's teaching. In the principal part of the centre light is a life-size representation of the "Good Shepherd" leading into the fold a stray sheep. He holds the wicket open, looking down with benignity on the sheep whom he is specially tending, and whom the other sheep are hastening to welcome. The ground is strewn with flowers, and the evening sky is lighted up with stars. The picture is enshrined in a frame composed of the vine fruit and foliage which also encloses a most richly designed quatrefoil at the base composed of a lily worked into a cross. In the upper part of the same compartment is also a richly jewelled mosaic cross within a vesica. In the two compartments on the dexter side of this is a very large and bold group representing the Nativity and the visit of the worshipping Magi or wise men. In the two compartments on the sinister side the group represented is that of little children brought to our Lord. Both these groups are surmounted by very rich mosaic shrine work founded upon ancient examples in Westminster Abbey. The grand tracery is filled with a treatment of our Lord in glory, and St. Peter and St. Paul and a host of angels with musical instruments and palm branches, &c. The window has been presented by Mr. Sheard, the architect of the church, in memory of his daughter.

LEGAL INTELLIGENCE.

WORKMEN'S TIME.—A case of considerable interest, though only involving a small sum (1s 2d), was brought before Mr. Blanshard, in the North Shields County Court, on the 17th inst. A joiner, named Lumsdon, summoned Mr. Addison Potter, of Willington Quay, for the recovery of the sum mentioned; and as solicitors were employed on each side - Mr. Wheldon for the plaintiff, and Mr. H. A. Adamson for the defence—it was the principle rather than the value of the money involved that was contested. It was this:—The plaintiff, with some other men, had been engaged in out door joiner work in Mr. Potter's factory, and a day's work in such circumstances is from daylight to dark. Mr. Potter has a workshop where joiner work goes on before daylight and after dark by gas, or from six to six. The plaintiff, with some other men, had been working in the open air; but between two and three o'clock in the afternoon the material necessary to keep them employed ran short, and the foreman of the joiners told the plaintiff he must go into the work-shop and get some doors ready. He went, but at dark he knocked off. Next morning he returned, but there was no employment for him, and he had to go home. He summoned Mr. Potter for the quarter day he lost. The judge maintained that he was entitled to it. It was quite clear that the plaintiff was employed upon a definite class of work, viz., in the open air, the time for which was from daybreak to dark; and the defendant having failed to keep him supplied with material, it did not entitle him to order him into the workshop to get ready material that should have been got ready for him, except in the time for which he had been working previously. He gave judgment for the plaintiff with costs, and his day's pay as a witness.

WELL SINKING.—JAMES CHATTERTON *v.* WILLIAM GODDARD.—In this case, tried before the Cheadale County Court, £3 6s. was claimed, the balance of an account for well sinking. Mr. C. J. Blagg was for the plaintiff, and Mr. Bagshaw for the defendant. The plaintiff is a well sinker, residing near Froghall, and the defendant is a sub-contractor on the work now in progress connected with the building of the new college at Denstone. The plaintiff was employed at Denstone by the defendant in July last to sink a well, a portion of the sides of which gave way after the sinking had proceeded a certain depth, on which the defendant refused to pay the plaintiff the balance now sued for. The chief question involved was whether the falling in arose from the plaintiff's fault in not properly curbing (*i.e.*, supporting by circular wooden frames) the sides of the well as the sinking progressed, or whether it arose from the defendant's neglect in not duly providing the necessary curbs as they were wanted After listening to a great deal of evidence on either side of a technical character, his Honour gave judgment for the defendant.

THE VALUE OF WRITTEN CONTRACTS.—At the Clerkenwell County Court on Wednesday week, the case of Trattles *v.* Barnett was heard. This was an action brought by a joiner to recover £20 13s. 9d from James Barrett, of St. John's Park, Upper Holloway. The defendant, a speculating builder, had employed plaintiff on several occasions to make staircases. In January last he employed plaintiff to put staircases into two houses, and payment for these gave rise to the dispute. Plaintiff said the defendant had agreed to pay the measurement value for the work, which was £62, while defendant alleged that there was a verbal contract between them that the whole work should come to £45, which he had paid. The £45 was paid by instalments, and receipts were put in to show that it was the custom of defendant to pay the money by instalments as the work progressed Plaintiff, who contradicted himself continually on cross examination, admitted that verbal contracts had existed in respect to other jobs, but denied that there was any contract in this case. Defendant, on being put into the box, said that there was a verbal contract, and stated that he never gave a man a job in his life without fixing a price, although he seldom made written contracts. His Honour gave judgment for the defendant, believing that there was a verbal contract, but he refused costs, as defendant, by making a written contract, might have saved all the expense and trouble that had accrued from this action. Defendant's counsel here urged that the objection to written contracts was, that they had to be stamped. His Honour said the cost of the stamp would have been sixpence, and as the defendant thought to be economical, he must take the consequences.

Our Office Table.

A fine arts exhibition is to take place at Munich during next year.

Sir Charles Eastlake's art library, one of the best in existence, has been purchased for the National Gallery, where it is intended to form a reading-room, in the place of the Royal Academy Library.

Mr. E. J. Tarver writes to us to say that he is not one of the new sub-committee of the Architectural Association for the improvement of professional education, as stated by us last week.

It is stated by the *Athenæum* that Mr. Digby Wyatt is shortly to receive the honour of knighthood.

The situation of gas examiner to the Corporation of Loudon is vacant. The salary is £500 per annum. Testimouials aud applications are to be forwarded on or before January 4, 1869.

The trustees of the new chapel to be built at Melbourne, Derbyshire, met on Monday last, and after much patient consideration decided upon selecting the designs of Messrs. Wilson and Willcox, of Bath, architects. The competition was advertised lately in the BUILDING NEWS, and no fewer than eighty competitors entered the lists.

The railway whistle, says the *Levant Herald*, is at length to be heard in Persia. A combination of English capitalists has received from the Shah a concession giving them, for twenty years, the exclusive right to construct railways in the country; and last week Mr. Salomans, an agent of the concessionaires, passed through Pera on his way to Teheran, to break ground at once with a short six-mile line from the capital to the suburban village of Rey (Shah Abd-ul-Azui), a famous weekly resort of pious Tehcranlees. The ground has already been surveyed, and the report of the engineer employed estimates that the line may be constructed and stocked for a sum considerably under £100,000, on which the passenger traffic of some 40,000 devotees a week will, he reckons, yield a remunerative dividend—exclusively of an 8 per cent. guarantee.

The Sussex memorial to Cobden has just been completed. It is situated near Midhurst, and takes the form of a plain obelisk of sandstone rock, 34ft. in height. In plain bold letters, cut in on one side of the obelisk, is the simple inscription "Richard Cobden." Mr. Grist, of Midhurst, executed the work.

On Wednesday week the usual fortuightly meeting of the Edinburgh Architectural Association was held in the rooms, 5, St. Andrew-square, Mr. A. Ballantine, president, in the chair, when, after several new members had been elected, the second paper on "The Merits, Beauties, and Characteristics of Grecian and Mediæval Art," was read by F. G. Sumichrast-Roussy. The essay was confined to a treatment of the orders developed by the Grecians, which the lecturer showed were derived from the architecture of Nineveh and Egypt, and that the Greeks superadded to the architecture of those nations the elements of beauty, and that their art was characterised by intellectuality and refinement. A hearty vote of thanks to Mr. Roussy closed the proceedings.

Several new railways, which will greatly facilitate metropolitan travelling, are on the point of being opened. To-day (Christmas-day) that portion of the Metropolitan District Railway extending from Brompton to Westminster Bridge will be opened. There are stations at St. James's Park, Victoria, and Sloane-square. The trains will run "through" from Westminster to Moorgate-street, thus giving direct access to Kensington, Bayswater, Baker-street, and all the stations on the Metropolitan line. On the 1st of January a new line is to be opened to Kew and Richmond. This line is an extension of the Hammersmith and City line, which latter (an extension of the Metropolitan line) has long been opened. By this new line direct communication will be opened up between Richmond, Kew, the West End, and the City. On the same date the long-neglected facilities offered by the Charing Cross line for taking South-Western traffic into the City at Cannon-street will (partially, at any rate) be utilised.

From Cairo a private letter brings tidings that the viceregal capital is in the course of Haussmannic transformation. Squares, gardens, and boulevards are being cut in all directions, and the picturesque narrow and winding streets which have for centuries delighted the eye of the artist will presently be only seen in their works or in photographic reproductions. There is to be a grand Square of Roumelia, of which the principal ornaments will be the Saracenic mosques, now in course of repair. The bazaars have as yet been spared; but if during the visit his Highness paid last year to the Exhibition Baron Haussman imparted any portion of his spirit of demolition, these Oriental characteristics of the ancient city of the Mamelukes will speedily be made even with the ground, and in their stead a row of modern houses, with all the newest improvements, erected, of which the basement stories will be occupied by *marchands de nouveutes* and photograph vendors.

We have to record the death of the Rev. John Lewis Petit, B.A., the well-known archæologist and artist. He was born at the commencement of the present century, and was nephew of Louis Hayes Petit, M.P. Studying at Trinity College, Cambridge, he took his B.A. degree in 1823. He was a frequent contributor of papers on architecture and archæology to various journals, and at the time of his death was engaged upon an illustrated description of Howden Church. Amongst his published works we may mention "Illustrations of Church Architecture," in 1841; "Remarks on Architectural Character, and on the Principles of Gothic Architecture as applied to ordinary Parish Churches," in 1846; "A Description of the Abbey Church, Tewkesbury," in 1848; "Lectures on Architectural Principles," and "Lectures on Architectural Studies," in 1854.

The *Tablet* states that Mr. Henry Parker, the president of the Anglo-Roman Antiquarian Society, has returned to Rome, and the sittings of the members will be resumed, as well as the antiquarian excursions, as the weather and lengthening days admit of them. The accord that exists between this and the Roman Archæological Society, presided over by the Cavaliere Rossi, has been attended by the best results, and the entire plan of ancient Rome, regal, consular, and imperial, is being gradually subjected to searching discussion, and will, it may be hoped, form the subject of a permanent work in the English language, at a price accessible to all. To students of ancient art this would be a great desideratum.

Several improvements have recently been effected at the Crystal Palace. The strong draught caused by cold air streaming up between the boards no longer exists. The whole of the basement has been divided by numerous walls, and extra heating furnaces have been provided, while under the central transept 5,000ft. of additional hot-water pipes have been laid down.

According to a correspondent of the *Westminster Gazette*, considerable dissatisfaction exists among the Catholic laity respecting the appointment of Mr. Clutton as architect of the new cathedral in Westminster. It is contended that so important a work should have been competed for by the best men in the profession; for not merely competency, but talents of a very high order, should have been called into requisition. It is but fair to add that the rumour is contradicted in other quarters.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—Royal Institution, Albemarle street.—The first of a course of six lectures on "The Chemical changes of Carbon," by W. Odling, M.B., F.R.S.

THURSDAY.—Royal Institution, Albemarle street.—The second lecture on "Chemical Changes of Carbon," by W. Odling, M.B., F.R.S.

Trade News.

TENDERS.

ACTON.—Drainage Contract, No. 5, for Acton Local Board. Mr. E. Monson, C.E., Surveyor to the Board. Quantities by Mr. D. W. Young:—

Brunsdon	£695
Wigmore	669
Messrs. Blick	660
J. and S. Williams	645
Thackrah	630
Crockett	625
Towell	595
Adamson and Sons	595
Bloomfield	590
Young	575
Nicholson	532
Parker	529
James Pizzey (accepted)	525

DENBIGH.—For completing a covered reservoir and filter beds, for Denbigh Waterworks, at Love-lane, Denbigh. Charles H. Beloe, Esq., C.E., 22, Lord street, Liverpool. Quantities supplied by Mr. G. Shakeshaft:—

	Reservoir.	Gates, &c.
Thomas Stone	£850 0 0	£14 15
Fawkes and Mand	798 15 0	13 16
Dixon and Sleight	720 0 0	15 0
Clark	666 0 0	13 7
M'Lellan and Co.	663 0 0	20 0
J. Chester	647 0 0	18 10
Fogg and Co.	638 1 6	33 8
G. Stead	627 0 0	22 10
Evan Evans	600 0 0	29 0

HAYWARD'S HEATH.—For erecting a house at Hayward's Heath, for Fredk. Willard, Esq., of Brighton. Goulty and Gibbins, architects:—

Arthur R. Parr	£836

LONDON.—For the extension of the female chronic wards at the St. Marylebone Workhouse, for the guardians of the poor of the parish of St. Marylebone. Mr. H. Saxon Snell, architect:—

Thomas and Son	£5097	Colls and Sons	£4378
Jay	4809	Ball and Russell	4322
Temple and Forster	4775	Brown	4300
Turrell	4738	Simpson	4299
Johnson	4719	Turner	3997
Wigmore	4600	Scrivener and White	3987
Myers and Son	4567	Till	3984
Kirke	4496	Manley and Rogers	3884
Blackmore and Mally	4488	Baker and Constable	3.00
Bennett	4480	Foale	3670
Cooper and Cullum	4450	Crabb and Vaughan	
Ebbs	4387	(accepted)	3649

PULBOROUGH.—For alterations and additions to the Corn Exchange, Pulborough, for Messrs E. Robins and Son, of Brighton. Goulty and Gibbins, architects:—

J. and C. Whitcomb	£468
Iron roof for do—	
Morewood and Co.	124

COMPETITIONS.

SOUTH METROPOLITAN SCHOOLS, SUTTON (Surrey).—February 2.—For designs for the erection of an infant establishment adjoining the present schools. Premiums of 40 guineas each for the three designs considered the best. J. Burgess, clerk to the managers, Vestry Hall, Walworth.

ROTHERHAM.—March 15.—For plans for the erection of a public hospital and dispensary. Premiums of £75, £50, and £25. J. Barras, honorary secretary.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

LITCHURCH LOCAL BOARD OF HEALTH.—January 18.—For the execution of certain drainage works in this district. W. Whiston, jun., clerk to the board.

RADNOR COUNTY GAOL.—January 7.—For alterations to this gaol. R. Banks, clerk of the peace, Kingston, Radnorshire.

MADRID (Spain).—January 20.—For the construction of tow markets. E. Petano, Chargé d'Affaires, Spanish Legation, London.

DERBY.—January 7.—For the erection of the new hotel and shops in the corn market. W. C. Watson, Derby Improvement Company's Offices, Wardwick, Derby.

METROPOLITAN BOARD OF WORKS.—January 8.—For the construction and maintaining in repair for twelve months of a brick and iron sewer in Deptford and Rotherhithe. J. Pollard, clerk, Spring gardens.

CALNE (Wilts).—December 31.—For the erection of a detached villa at Bremhill, near Calne. John Watson, architect and surveyor.

NORTHAMPTON IMPROVEMENT COMMISSIONERS.—January 6.—For the construction of a culvert in Herbert street. A. B. Markham, clerk to the Commissioners, 2, Derngate, Northampton.

LEOMINSTER.—January 6.—Great Western and London and North-Western Railways.—1st. For an iron bridge of two spans, with embankment, &c. 2nd.—An iron foot bridge, of 40ft. span. J. Wait, secretary, Birkenhead.

BACUP CEMETERY CHAPELS.—January 4.—For the several works required in the erection of three chapels. Gay and Swallow, architects, &c., Exchange-buildings, Bradford.

STOURBRIDGE.—December 31.—For the erection of a new church, at Stambermill, near Stourbridge. Thomas Smith, architect, the Mount, Stourbridge.

EAST MEON, NEAR PETERSFIELD (Hampshire).—January 9.—For the restoration and refitting of the parish church. Mr. Christian, architect, 84, Whitehall place, S.W.

KENSINGTON.—For the erection of a coach factory and other works. G. Stanham, 24, Gresham street.

ST. JAMES, WESTMINSTER.—January 11.—For the erection of a new institution building for the Royal Society for Prevention of Cruelty to Animals. J. Colane, secretary, 172, New Bond street.

WESTBURY-ON-TYNE, NEAR BRISTOL.—January 4.—For the erection of a police station. Mr. J. Medland, county surveyor, Gloucester.

CATFORD BRIDGE, NEAR LEWISHAM.—December 31.—For the construction of roads and sewers on the Springfield estate. H. O. Martin, land agent, Alliance House, Adam street, Adelphi.

STAMBER MILL, NEAR STOURBRIDGE.—December 31.—For the erection of a new church. T. Smith, architect, The Mount, Stourbridge.

LOCAL BOARD OF HEALTH, DONCASTER.—January 11.—For forming subsidiary tanks, altering outfall sewer, and laying out 37 acres of land for irrigation. Mr. B. S. Brundell, 1, Princes street, Doncaster.

PROPERTY SALES.

DECEMBER 14.

AT THE MART.—By Mr. Champness.—Freehold two houses, situate in Heath street, Barking, producing £33 16s. per annum—sold for £430.

Leasehold three houses, Nos. 11 to 13, Church road, Barking; also a cottage in the rear, producing £43 12s. per annum, term 99 years from 1852, at £15 10s. per annum—£185.

DECEMBER 15.

At the Mart.—By Messrs. Farebrother, Clarke, and Company.—Advowson and next presentation to the vicarage of Steyning, Sussex, with parsonage house and glebe, annual value £535, age of incumbent 65—£3,610.

Freehold two residences, Nos. 24 and 26, Finchley road—£1,010.

By Mr. Joseph Salter.—Leasehold three houses, Nos. 12 to 14, Grafton street East, Tottenham court road, producing £102 per annum, term 3[illegible] years unexpired, at £21 per annum—£1,290.

Leasehold house, No. 1, Leighton road, Kentish Town, term 88 years from 1853, at £6 6s. per annum—£340.

Leasehold three houses, Nos. 1 to 3, Exeter street, Hawley road, Kentish Town, producing £83 16s. per annum, term 93½ years from 1842, at £10 per annum—£615.

Leasehold house, No. 127, Bayham street, Camden Town, let at £32 10s. per annum, term 96½ years from 1819, at £3 3s. per annum—£270.

By Messrs. Bray and Webb.—Leasehold house, No. 120, Wenlock street, New North road, Hoxton, let at £30 per annum, term 59 years from 1843, at £1 4s. per annum—£325.

Freehold house, No. 6, Billingsgate street, Billingsgate Dock, Greenwich, let at £15 12s. per annum—£85.

By Messrs. C. and H. White.—Leasehold two residences, Nos. 17 and 18, Hanover place, Clapham road, producing £60 per annum, term 77 years unexpired, at £10 per annum—£555.

DECEMBER 16.

At the Mart.—By Messrs. Rushworth, Abbott, and Co.—Leasehold town mansion, No. 23, Portman square, with stabling and coach house in Berkley mews, term 65 years unexpired, at £23 18s. per annum—£5,050.

DECEMBER 17.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer.—Freehold warehouse known as New Crane Wharf, adjoining New Crane stairs, Wapping, let on lease at £180 per annum—£3,000.

Freehold residence, situate at Peckham Rye, annual value £45—£525.

Leasehold residence, No. 18, Camberwell New road, let at £40 per annum, term 77½ years from 1824, at £7 per annum—£350.

By Mr. Newbon.—Freehold two houses, with shops, Nos. 84 and 86, Kingsland road, let on lease, and producing £61 10s. per annum—£1,210.

Leasehold house, No. 2, Union row, Kingsland road, let on lease at £11 per annum, term 92½ years from 18[illegible], at £3 per annum—£80.

Leasehold two houses, known as Norfolk villas, Lower Edmonton, producing £31 per annum, term 99 years from 1852, at £4 10s. per annum—£310.

Leasehold improved ground rents, amounting to £22 10s. per annum, secured on eleven houses in Three Colt street and Prince Arthur's avenue, Roman road, Old Ford, term 99 years from 18[illegible], at £16 per annum—£300.

Leasehold cottage residence, known as Woodbine Cottage, Warner road, Camberwell New road, let at £3[illegible] per annum, term [illegible] years unexpired, at £[illegible] per annum—£[illegible].

Leasehold house, No. 42, F[illegible] street, New North road, Hoxton, let at £32 per annum, term 60 years from 18[illegible], at £[illegible] per annum—£245.

Leasehold house, No. [illegible], H[illegible] road, Thornhill square, Islington, let at £34 per annum, term £[illegible] years unexpired, at £10 per annum—£[illegible].

Leasehold three houses, Nos. 1, [illegible], and 4, Hope street, Eden grove, Cornwall place, Holloway, producing £87 [illegible] per annum, term [illegible] years from 1867, at £[illegible] per annum—£245.

Leasehold house, No. 40, [illegible] street, Liverpool road, Barnsbury, annual value £[illegible], term [illegible] years unexpired, at [illegible] per annum—£240.

By Messrs. Dowsett and Chattell.—Leasehold residence, No. 84, Tavistock crescent, Westbourne Park, let at £[illegible] per annum, term 99 years from 1861, at £[illegible] per annum—£[illegible].

Leasehold residence, No. [illegible], Tavistock crescent, let at £[illegible] per annum, term and ground rent similar to above—£520.

DECEMBER 18.

At Garraway's.—By Mr. Robert Reid.—Leasehold business premises, situate Nos. 1 and 2, High street, Bloomsbury, comprising shops, warehouses, [illegible], and vaults, annual value £300; also premises in [illegible] street, comprising stabling, yard, and house, annual value £120; terms—No. 1, High street, held for 24 years unexpired, at £1[illegible] per annum; No. 2, held for 9½ years unexpired, at £[illegible] per annum; Endell street property held from 1856, at £[illegible] per annum—£1,410.

DECEMBER 21.

At the Mart.—By Mr. Frost.—Life interest of £1,[illegible] East India Stock, producing £[illegible] per annum, on the life of a gentleman aged 51 years—£400.

Absolute reversion in £[illegible] 13s. 4d. sterling, receivable on the decease of a lady in the 63rd year of her age—£285.

DECEMBER 22.

By Messrs. C. and H. White.—Leasehold residence, No. 3, Sussex place, [illegible] road, [illegible], annual value £40, term 35½ years unexpired, at £5 per annum—£350.

BATH STONE OF BEST QUALITY.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Golbolt, King's road, Chelsea, builder, January 7, at 11—Thomas Lane, Penge, builder, January 13, at 12—John Chalcroft, jun., Milton grove, Upper Holloway, builder, January 4, at 1—Henry Hillary and John Ashfold, Canterbury road, Kilburn Park, builders, January 4, at 11—Augustus Cornelius King, [illegible] Orchard crescent, Caledonian road and Holloway road, builder, January 11, at 2.

TO SURRENDER IN THE COUNTRY.

Joel Bromfield, Wilmington, Devon, builder, December 30, at 11—John Onn, Newark on Trent, painter, January 6, at 12—Thomas Pickard, Rawdon, Yorkshire, painter, December 31, at 11—George Stables, Manchester, joiner and builder, January 12, at [illegible]—John William Wilson, Wantage, painter and glazier, January [illegible], at [illegible]—Thomas Wynne, Carnarvon, joiner and builder, January 6, at 10—Edward Booth, Birkenhead, slater and plasterer, December 30, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 18, T. M. Cape, Commercial road, Peckham, builder—January 18, G. King, New cross, builder—January 29, A. Morel, Brewer street, Golden square, carpenter—January 8, J. Foster, Leeds, plasterer—January 2[illegible], J. Tebbutt, Rowell, Northamptonshire, builder—January [illegible], J. Wolerton, Thrussington, Leicestershire, carpenter—January 13, J. Caine, Hulme, joiner—January 11, E. Elton, Derby, joiner and builder—January 25, W. C. Howes, Norwich, decorative painter—January 4, C. Jones, Fenton, joiner—January 22, R. Arrow, St. Paul's Cray, Kent, builder—January 22, A. Ellis, [illegible] street, Walworth, builder—January 2[illegible], G. A. C. Stoddard, Colney Hatch, carpenter and builder—January 4, T. V. Lee, M[illegible] place, Bedford row, civil engineer—January 11, M. H. Bourke, Richmond, railway contractor—January [illegible], W. Few, Hargrave park road, Upper Holloway, builder—January 8, G. Hucal, Great James street, Bedford row, builder—January [illegible], C. Parks, Foley street, Marylebone, builder—January 14, J. H. Deely, Manchester, builder—January 19, J. Bell, [illegible] and builder—January 20, J. Hawksford, Aston, near Birmingham, carpenter—December 31, R. J. Lyons, Caister next Great Yarmouth, carpenter and joiner.

DIVIDENDS.

January 6, W. F. Ireland, Bolton, slater—January 18, J. F. King, Seven Sisters road, builder—January 7, H. Green, Cardiff, builder.

PARTNERSHIPS DISSOLVED.

Rogers and Co., Liverpool, contractors—Sp[illegible] and Derby, Edgcombe road, Camberwell, builders—Watson and James, Queen street place, Southwark Bridge, architects—A. and C. Squires, Wakefield, joiners and builders—[illegible] and Bucknall, Ashton in Makerfield, lock and hinge manufacturers.

DECLARATION OF DIVIDENDS.

M. Wigall, [illegible]ham, ventilator manufacturers, div. 11[illegible]—T. G. Wireland, New Bridge street, Vauxhall, gas fitter, div. [illegible].

BANKRUPTCY ANNULLED.

John Beale, Richmond road, West Brompton, builder, December 17.

SCOTCH SEQUESTRATIONS.

Elizabeth and James Mitchell, Dundee, contractors, December 28, at 11.

LATEST PRICES OF MATERIALS USEI IN CONSTRUCTION.

TIMBER, duty 1s per load Drawback, 1s.

Teak ....load	£10	10	12	10	Archangel, yellow ..	£10	10	£13	0
Quebec, red pine	3	10	4	15	St. Petersburg, yel...	10	0	12	5
,, yellow pine..	3	0	4	8	Finland	6	5	8	0
St. John N.B. yellow	0	0	0	0	Memel............	0	0	0	0
Quebec Oak, white..	6	5	6	0	Gothenburg, yellow	8	0	9	10
,, birch........	3	15	4	16	,, white	9	0	0	0
,, elm	4	0	4	17	Gefle, yellow........	9	0	10	10
Dantzic oak	4	0	5	10	Soderham	9	9	10	10
,, fir	2	10	4	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	10	10	13	0
Memel fir	2	10	3	0					
Riga	2	15	3	0					
Swedish	2	2	3	8	Deck Plank, Dantzic, per 40 ft. 3 in.	0	12		18
Masts, Quebec red pine	4	0	6	0					
,, yellow pine..	4	10	6	0	PUMICE STONE pr ton	6	9	8	0
Lathwood, Dantzic, fm	5	10	6	10	OILS, &c.				
,, St. Petersburg	7	10	8	10	Seal, pale....per tun	35	10	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	92	0	0	0
					Cod	39	0	9	0
					Whale, Sth. Sea, pale	38	0	0	0
Quebec, white spruce	13	0	18	0	Olive, Gallipoli......	60	0	66	0
St. John, white spruce	13	9	15	9	Cocoanut, Cochin, ton	51	0	0	0
Yellow pine, per reduced C.					Palm, fine	43	10	45	0
					Linseed	27	0	0	0
Canada, 1st quality.	15	0	18	0	Rapeseed, Eng. pale..	33	0	0	0
2nd do......	11	5	12	0	Cottonseed	23	9	31	9

METALS.

LEAD —								
Pig, English	per ton	21	0	0	0	0	0	2½
,, Spanish Soft	do	18	7	6	0	0	0	
Shot, Patent	do	22	0	0	22	5	0	
Sheet	do	20	0	0	0	0	0	
White	do	27	0	0	30	0		6
COPPER :—								
Sheet & Sheathing, & Bolt	per ton	78	0	0	80	0	0	3
Hammered Bottoms	do	88	0	0	0	0	0	
Flat Bottoms, not Hammered	do	83	0	0	0	0	0	
Cake and Tough Ingot	do	0	0	0	0	0	0	
Best Selected	do	76	0	0	77	0	0	
Australian	do	76	0	0	0	0	0	
Yel. Metal Sheathing & Rods	per lb	0	0	6½	0	0	7	
IRON :—								
Welsh Bars in London	per ton	6	10	0	6	15	0	3
Nail Rod	do	7	12	6	7	15	0	2½
Hoops.	do	8	5	0	9	0	0	
Hoops, Single	do	9	5	0	9	7	0	
Staffordshire Bars	do	7	12	6	7	15	0	
Bar, in Wales	do	5	15	0	0	0	0	3
Nailrods	do	7	12	6	7	13	0	2½
Foundry Pigs, at Glasg. No 1	do	2	14	0	2	19	6	net.
Sweedish Bars	do	10	0	0	10	10	0	2½
TIN :—								
English Block	per ton	103	0	0	0	0	0	2½
do Bar	do	104	0	0	0	0	0	
do Refined	do	106	0	0	0	0	0	
Banca	do	101	0	0	0	0	0	net
Straits	do	101	0	0	0	0	0	
ZINC :—								
English Sheet	per ton	25	10	0	26	0	0	2½
* Devaux's V. M. Roofing Zinc	do	27	0	0	0	0		
STEEL :—								
Swedish Keg, hammered	per ton	15	0	0	15	10	0	2½
Swedish Faggot	do	0	0	0	0	0	0	
SPELTER :—								
On the Spot	per ton	20	0	0	0	0	0	
QUICKSILVER	per btl	6	17	0	0	0	0	
REGULUS OF ANTIMONY								
French	ton	48	0	0	0			

* And 4 per cent. discount if laid upon the new system

BREAKFAST.—A SUCCESSFUL EXPERIMENT.—The *Civil Service Gazette* has the following:—"There are very few simple articles of food which can boast so many valuable and important dietary properties as cocoa. While acting on the nerves as a gentle stimulant it provides the body with some of the purest elements of nutrition, and at the same time corrects and invigorates the action of the digestive organs. These beneficial effects depend in a great measure upon the manner of its preparation, but of late years such close attention has been given to the growth and treatment of cocoa that there is no difficulty in securing it with every useful quality fully developed. The singular success which Mr. Epps attained by his homœopathic preparation of cocoa has never been surpassed by any experimentalist. Far and wide the reputation of Epps's Cocoa has spread by the simple force of its own extraordinary merits. Medical men of all shades of opinion have agreed in recommending it as the safest and most beneficial article of diet for persons of weak constitutions. This superiority of a particular mode of preparation over all others is a remarkable proof of the great results to be obtained from little causes. By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating round us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."